COMPUTATIONAL APPROACHES TO DETECT PATHOGENS IN THE PRESENCE OF COMPLEX BACKGROUNDS

A Dissertation Presented to

the Faculty of the Department of Computer Science

University of Houston

In Partial Fulfillment

of the Requirements for the Degree

Doctor of Philosophy

By

Mark Rojas

December 2012

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ABSTRACT

Fast and accurate identification of pathogenic microorganisms in complex clinical and environmental samples is essential for the prevention and treatment of infectious diseases. The most sensitive and accurate detection approaches are based on the examination of the nucleic acid composition of the sample in order to identify the presence of pathogens DNA and/or RNA. A large spectrum of nucleic acid-based tests (such as PCR, RT-PCR, and oligonucleotide microarrays) is designed to examine a sample for the presence of pre-defined genomic signatures: short pathogen-specific DNA and/or RNA fragments.

Identification of such signatures however, represents significant computational challenges. To be pathogen specific, each signature (or combination of signatures) must be present (conserved) across all strains of the pathogen, and absent in all other organisms including its close neighbors, and must have assay specific biochemical and thermodynamic properties, such as binding energy, melting temperature, and nucleotide composition. All available signature design algorithms rely on heuristics and are known to miss cases when potential signatures are (explicitly or with small number of mismatches) also present in host (human) and/or non-pathogen microorganisms causing false positive outcomes. Even greater challenge for the design of biochemical platform specific genomic signatures (probes and primers) is that each type of instrument uses

different biochemical protocols to detect signatures which also have to be included in the consideration during the signatures design process.

To address these challenges we have developed novel algorithms and data structures able to bring all possible subsequences located in given pathogen genome into signatures design process. Moreover, the developed algorithms make it possible to consider mismatches (insertions, deletions, and substitutions for all positions and combinations) into the design process. We also have developed the concept of ***ultra-specific genomic islands***: genomic regions in which every subsequence is several mismatches away from the closest subsequence which may appear in a host genome and/or non-pathogenic near-neighbors of targeted pathogen. This concept allows to improve the quality and flexibility (genomic islands can be used to identify thermodynamically acceptable signatures) of the design of biochemical platform specific detection tests. Developed approach was successfully used to design a variety of tests for Category A, B, and C, pathogens including the 2009 H1N1 Influenza outbreak originated in Mexico.

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CHAPTER 1

INTRODUCTION

Accurately detecting biological toxins and virulent pathogenic microorganisms, the agents responsible for various diseases, in complex clinical and environmental samples is vital to the health and security of our nation. The speed at which one can now travel between cities, countries, and even continents has consequently increased the speed in which diseases can spread. In just one day's time, even before the onset of symptoms, a highly contagious pathogen can be transmitted on a global scale potentially leading to a pandemic. Thus, fast and accurate identification of pathogenic microorganisms and understanding their virulence is essential for the prevention and treatment of infectious diseases.

An example of a pathogenic virus that demonstrated an exceptionally rapid geographical spread with sustained human-to-human transmission was the emergence of a novel strain of influenza announced in April of 2009 by the United States Centers for Disease Control and Prevention (CDC) [1, 2]. By June 11, 2009, the World Health Organization declared this the first influenza pandemic of the 21st century. Since the outbreak of the 2009 H1N1 pandemic to August 1st, 2010, more than 214 countries had reported laboratory confirmed human cases worldwide [3]. Though most of the healthy individuals infected with the pandemic H1N1 virus developed an uncomplicated

influenza-like illness with full recovery within a week, high infection rates had been seen in the younger population (<35 years of age) [4, 5, 6] and as of August 2010 the CDC had estimated that in the United States alone, the 2009 H1N1 influenza had infected between 43 to 89 million people resulting in an estimated 195,000 to 403,000 hospitalizations and 8,870 to ~18,300 deaths [7]. Thus, early detection of the virus in humans during disease onset has proven crucial in many cases, due to the increased pathogenesis observed in the young and in a portion of the population infected with the pandemic strain [8, 9].

Virulent pathogenic microorganisms such as influenza that spread by human-to-human transmission are a major concern; however, the National Institute of Allergy and Infectious Diseases (NIAID) also classify these pathogenic agents with a recognizable bioterrorism potential into three priority areas (A, B, and C). Category A pathogens such as *Bacillus anthracis* (anthrax) are those organisms/biological agents that pose the highest risk to national security and public health. Contamination of critical infrastructure, including city water supplies, public services, mass transit stations, and airports, has the potential to cause massive casualties, thus, testing for pathogenic organisms in public areas is routinely performed. These areas are likely targets of bioterrorist acts such as were the anthrax attacks of 2001 in the U.S. and the intercepted plans of ricin attacks in the London Underground and Washington D.C. in 2003.

The ongoing development of diagnostic tests to detect pathogenic microorganisms in clinical and environmental samples have increased allowing for the study of patterns

and their variations in response to a pathogenic outbreak. It is the speed, sensitivity, and reliability of these diagnostic tests that are most important when faced with a pathogen capable of threatening human health at epidemic or pandemic proportions.

1.1 Methods for Pathogen Detection

Historically, diagnosis of pathogenic infection relied on the isolation and culture of the offending organism. Isolation of these organisms is difficult because pathogens are obligate intracellular parasites found in conjunction with host cells. While isolation followed by culture provides the most definitive means of detection, both are labor-intensive, time consuming and thus ill-suited for use in the field. Thus, immunological assays designed to monitor specific antigens and host antibodies towards pathogens have emerged as the primary method of diagnosis for their ease of use and ability to test a great number of samples, both necessities when confronting an epidemic. With some diseases, however, it can take days after the initial infection for the amount of antibody titers to be above the level which can be detected. The reliability of these assays is yet another issue as, for example, immunological assays have problems distinguishing *Bacillus anthracis* from its nonpathogenic relative *Bacillus cereus*, commonly present in the environment [10]. Consequently, diagnoses are not typically made based upon the results of a single immunoassay.

Recently, new methods have been developed for pathogen detection and diagnosis using nucleic acid-based technologies including the polymerase chain reaction (PCR),

nucleic acid sequence-based amplification (NASBA) assays, and microarrays of cDNA and oligonucleotides [10-14]. Nucleic acid-based methods are founded on the principles of hybridization and include primer/probe sequences (signatures) which are complimentary to a region of the target organism's genome material such that in the presence of the target organism, the signature will hybridize to the target's DNA/RNA. Thus, identification is based on the presence of one or a few unique signatures as indicators of the target of interest. Nucleic acid-based assays are both quick and easy, offering the same advantages as immunological methods with the potential to provide the same specificity, sensitivity, and reliability of culture-based diagnosis depending upon the quality and combination of the signatures in the assay.

1.2 Current Methods for Designing Nucleic Acid-based Assays

Designing reliable and robust nucleic acid-based assays is significantly more difficult than developing diagnostic tests for any of the aforementioned conventional methods because:

1. **Signature Specificity** – candidate signature sequences must be complementary to the target organism genomic sequences while not being complementary to any non-target sequence, e.g. those belonging to near-neighbor non-pathogenic organisms, the host organism, biological contaminants, etc. Furthermore, signature sequences should not be complementary to any other similar regions in non-target sequences as this

may result in mispriming (e.g. 1 or 2 nucleotides difference). Thus, the design of a candidate signature sequence requires the pathogen's genomic sequence as well as the genomic sequences of non-target organisms. Even when isolation of the pathogen is performed, it is possible that foreign DNA/RNA still remains.

2. **Signature Sensitivity** – identifying sequences that are complimentary to the target organism's DNA/RNA is elementary if just one sequence is available. Signatures designed using multiple sequences representing multiple strains are significantly more robust than signatures designed using a single sequence because multiple sequences provide information regarding the mutational variance which is tolerated within a viable organism. Candidate signature sequences should be complementary to conserved sequences or sequences highly probable to occur. In doing so, these sequences are more likely to hybridize with emerging strains resulting in a reduced rate of false positive misdiagnosis.
3. **Assay Design** – while the candidate signature sequences may be both specific for and sensitive to the pathogenic target organism, the quality of the assay is dependent upon the collective performance of the set of signatures. The biological and chemical properties of sequences, e.g. the melting temperature and free energy, as well as cross-reactivity between signature sequences must be examined. The complexity of the design may impact the expediency in which a diagnosis can be made. Furthermore, complex assays may increase

the cost of the test and the level of expertise required for technicians to correctly interpret the results. Thus, a simplistic design is preferable.

Each of these factors poses significant computational challenges in signature selection and assay design. Multiple sequence comparisons between target and non-target sequences (specificity) as well as among target strains (sensitivity) are necessary to select good candidate signature regions of interest. Determining the best set of signatures to use for an assay design presents a multi-dimensional search space in which many parameters must be considered, e.g. number of sequences, reactivity between sequences, etc.

Existing computational signature design methods identify specific candidate signatures by performing sequence alignments. The algorithms developed by Needleman and Wunsch [15] and Smith and Waterman [16] identify the best alignment sequences. However, the exceptionally high time and memory complexity $O(n^3)$, required to implement either of these algorithms especially when aligning large numbers (millions) of complete genomic sequences in a "real" project is infeasible. Thus, several techniques which rely on heuristics have been developed to reduce the time and memory complexity in selecting candidate signature sequences, e.g. BLAST [17] and MUMmer [18]. These heuristic methods, however, cannot ensure the uniqueness of a signature as well as exhaustive alignment algorithms, thus compromising the specificity of the assay.

Computational techniques for assay design have primarily focused on approximating the biological and chemical properties of sequences to predict a

signature's performance. Significantly less attention has been focused on finding the minimal combination of signatures necessary for accurate and reliable detection. This is in large part due to the minimization problem which is an example of the minimum set cover problem which is NP-complete.

1.3 Proposed Approach to Identify Ultra-specific Genomic Islands (USGI)

The majority of currently available primer/probe design algorithms rely on heuristics; thus, computationally designed diagnostic assays require extensive experimental validation. This dissertation presents a collection of novel algorithms and data structures used to develop a computational pipeline to efficiently calculate the frequency of all subsequences (*n*-mers) of length 5 to 20+ nucleotides for virtually any nucleic acid-based platform with an extraordinary high specificity and sensitivity. In addition, all subsequences present in or within one, two, up to 7 changes (insertions, deletions, and substitutions in any position and all possible combinations) away from the nearest genome sequence can be computed. Thus, those subsequences present within a certain number of changes from the host/background genome (e.g., human) can be excluded in the signature-island design process with increased speed and predictability in comparison to current alignment-based methods.

Those sequences present in the genome of interest and absent from the host genome are referred to as being **host-blind** subsequences. The more changes required in the host-blind subsequence to be found in the host genome, the less likely the host-blind

subsequence, when used as a signature, is to mispair with the host's genomic sequence. Those host-blind subsequences that are significantly distant from the host (3+ changes away) are referred to as **ultra-specific genomic subsequences**. We also have developed the concept of **ultra-specific genomic islands** (USGI): genomic regions in which every adjacent ultra-specific genomic subsequence is several mismatches away from the closest subsequence which may appear in a host genome and/or non-pathogenic near-neighbors of targeted pathogens. This concept allows for the improvement of the quality and flexibility in the design of biochemical platform specific detection tests.

1.4 Scope and Organization

The scope of my research has been to develop computational tools and methods to address the challenges of pathogen detection in a complex host and improve the performance for identifying ultra-specific genomic islands. To implement the novel data structures, I have used the C++ programming language; however, the methodologies and results should be applicable to other programming languages. The organization of this dissertation is structured such that Chapter 2 discusses pathogen detection techniques that fall into one of two categories (nucleic acid-based technologies and computational methods) providing a basic background in molecular concepts, a review of available technologies in addition to their applications in the identification and detection of pathogens. In Chapter 3, an extensive study of the statistical properties of genomic sequences is presented. Chapter 4 discusses in detail the set of novel algorithms and data structures for host-blind ultra-specific genomic islands design. The experimental

validation for the 2009 H1N1 Influenza outbreak which originated in Mexico in Chapter 5 proves that the proposed method of signature design produces a highly sensitive, specific, and robust means of identification. Concluding remarks and future development of this technology are then provided.

CHAPTER 2

PATHOGEN DETECTION TECHNIQUES

The leading techniques currently used to identify microbial pathogens rely upon established conventional clinical microbiology approaches; however, there are a number of significant drawbacks. Standard isolation and culture of the organism permits pathogen identification but is laborious, time-consuming, and expensive. Conventional techniques also do not manage large numbers of environmental or clinical samples.

Each pathogen contains a unique DNA or RNA signature that differentiates it from other organisms. In 1977, the first DNA virus genome *Enterobacteria phage phiX174* was sequenced and in 1995 the first bacterial genome *Haemophilus influenza* was completely sequenced. Since then, more than 3,200 genomes have been completed or are currently in progress and publicly available through the National Center for Biotechnology Information (NCBI) [19] database from such sources as JGI [20], Sanger [21], and TIGR [22] just to name a few. One of the challenges is to identify a sensitive and specific signature for each microorganism of interest to be used for rapid detection. Pathogen detection has become an important part of research in many fields (i.e., biodefense, food safety, pathology).

2.1 Basic Molecular Concepts

DNA, or deoxyribonucleic acid, is a genomic sequence containing the hereditary material specifying the biological development of all cellular forms of life. The information in DNA is stored as a code made up of four nucleotide bases: A (Adenine), G (Guanine), C (Cytosine), and T (Thymine). The order, or sequence, of these bases determines the information available for building and maintaining an organism, similar to the way in which letters of the alphabet appear in a certain order to form words and sentences. DNA sequences can exist as a single strand or as a double helical structure (Figure 2.1). The double helix is formed through the hybridization or pairing of purine bases (A and G) of one strand with complementary pyrimidine bases (T and C) of the other strand where A hybridizes with T and G with C. Although DNA can exist as a single strand, the double stranded form is preferred. The entire amount of DNA of a living cell is called its genome.

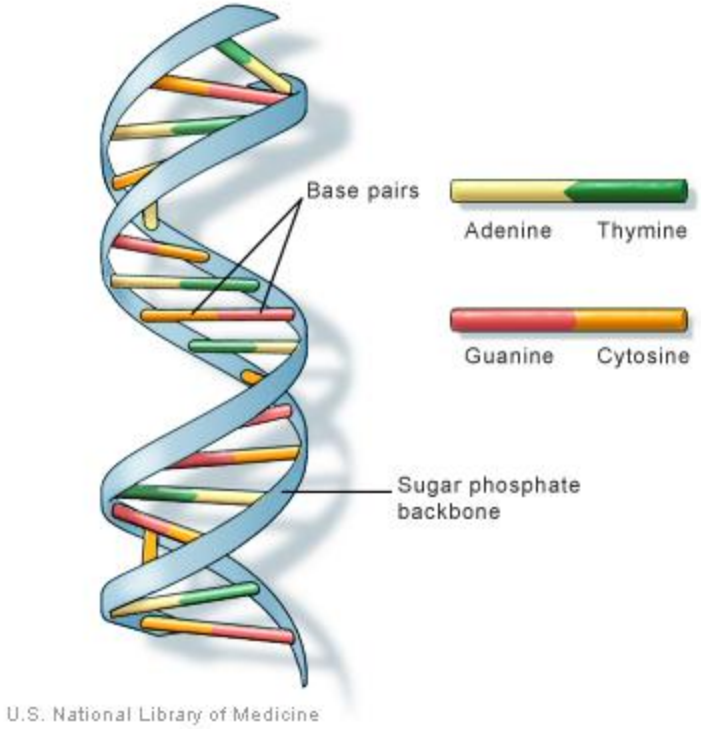

Figure 2.1 Double Helix DNA formed by base pairs attached to a sugar-phosphate backbone [23]**.**

Within the genomic sequence of each living organism lies the "instructions" or genes for the development and functionality of the organism. These instructions are "read" and actualized through a process referred to as the central dogma of molecular biology (Figure 2.2). Through the process of transcription, the double helix DNA genome is separated such that the gene sequence can be copied or transcribed creating a new copy of RNA called the messenger RNA (mRNA). The mRNA is then transported from the nucleus to the cytoplasm, where it is translated into a protein. During translation, the mRNA sequence is read in which three nucleotides are read at a time. Every three

nucleotides also referred to as a codon, directly corresponds to one of 20 amino acid molecules. Thus, the process of translation produces a specific amino acid chain, or polypeptide, that will later fold into an active protein. The final protein molecule may consist of several hundred amino acids linked together according to the instructions encoded in the mRNA. All of the nucleotides within the mRNA sequence, however, may not be translated to an amino acid such that some regions called introns may be "spliced" out or removed, most exclusively found in eukaryotic organisms. The regions which are not spliced out, exons, are translated into amino acids.

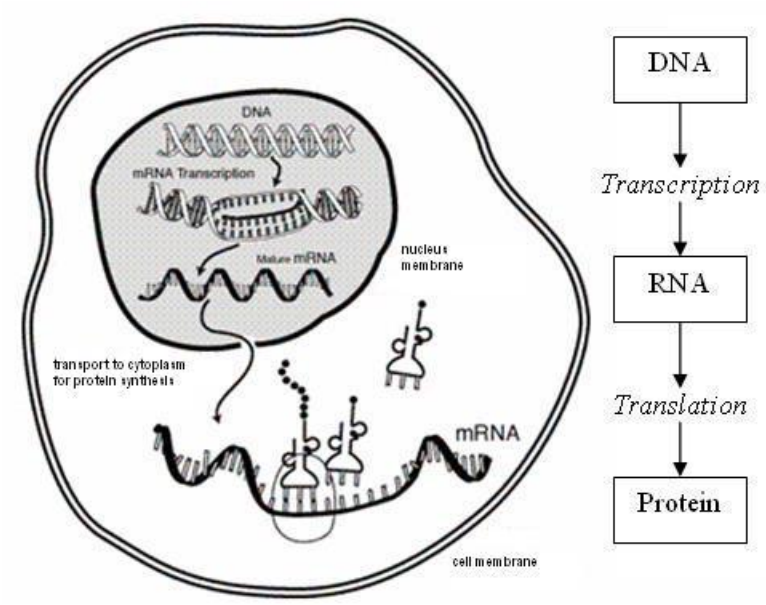

Figure 2.2 The Central Dogma of Molecular Biology [24].

Several different nucleic acid-based methods have been developed for detection/identification of a target organism through recognition of the target organism's DNA/RNA genomic sequence and/or mRNA transcripts. Despite the fact that each of

these methods has individual nuances, two attributes are common to all nucleic acid-based methods:

1. Incorporation of a primer/probe sequence(s) are used to detect and identify the presence of the target organism.
2. Identification is based on the principles of hybridization for the formation of a double stranded DNA or RNA/DNA complex.

2.2 Nucleic Acid-based Methods for Pathogen Detection

2.2.1 Polymerase Chain Reaction (PCR) / Quantitative PCR (qPCR)

PCR-based methods are the most widely used molecular test for pathogen detection and identification in large part due to the fact that it is both easy to use and economical. Assays for detection of numerous viral, microbial and fungal pathogens have been developed resulting in an abundance of available literature, the majority of which discuss the techniques used for detection of a particular or few individual pathogenic organisms or strains.

As shown in Figure 2.2.1, PCR amplifies the target DNA using two primers which determine the beginning and end of the region to be amplified. The primers hybridize to their complementary sequences on opposite strands of the denatured DNA target. These primers are extended towards each other by a DNA polymerase. After replication of the segment between the primers is

complete, the two new duplexes are heat denatured to generate single-strands. These single-strands now serve as templates for the generation of future copies. A second cycle of replication is carried out by lowering the temperature in the presence of all the components necessary for polymerization. The processes of synthesis and denaturation are repeated increasing the number of segments or amplicons exponentially with each cycle. These amplicons are identifiable by methods such as mass spectrometry or gel electrophoresis.

The selection of the primer sequences is of key importance. Not only do the sequences need to surround the sequence desired to be amplified, several other factors must be considered including specificity of the primer sequences and melting temperature. If a primer sequence is complementary to the target region as well as other non-target region it is possible that amplification of regions other than the one intended will also occur. Furthermore, if the primer sequence is complementary to numerous other non-target regions, the primer may be exhausted such that the primer will hybridize to these non-target regions rather than the intended site and thus the expected amplification does not occur. A number of applications are available to assist in the design of primer sequences for pathogen detection (e.g. Applied Biosystems [25], Invitrogen [26], Roche Diagnostics [27], and SY-LAB [28]).

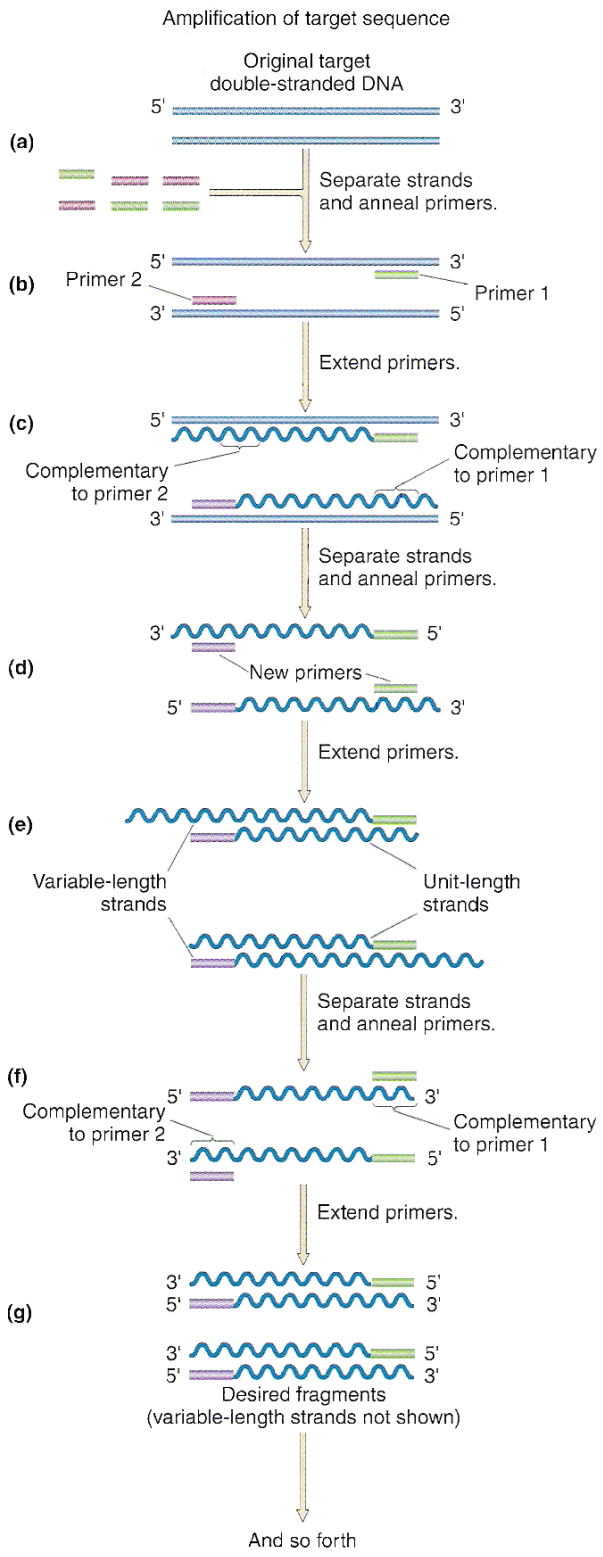

Figure 2.2.1 The PCR (Polymerase Chain Reaction). (a) Double-stranded DNA containing the target sequence. (b) Two chosen or created primers have sequences complementing primer-binding sites at the 3' ends of the target gene on the two strands. The strands are separated by heating, allowing the two primers to anneal to the primer-binding sites. Together, the primers thus flank the targeted sequence. (c) *Taq* polymerase then synthesizes the first set of complementary strands in the reaction. These first two strands are of varying length, because they do not have a common stop signal. They extend beyond the ends of the target sequence as delineated by the primer-binding sites. (d) The two duplexes are heated again, exposing four binding sites. (For simplicity, only the two new strands are shown.) The two primers again bind to their respective strands at the 3' ends of the target region. (e) *Taq* polymerase again synthesizes two complementary strands. Although the template strands at this stage are variable in length, the two strands just synthesized from them are precisely the length of the target sequence desired. This is because each new strand begins at the primer-binding site, *at one end of the target sequence*, and proceeds until it runs out of template, *at the other end of the sequence*. (f) Each new strand now begins with one primer sequence and ends with the primer-binding sequence for the other primer. Subsequent to strand separation, the primers again anneal and the strands are extended to the length of the target sequence. (The variable-length strands from part c are also producing target-length strands.) (g) The process can be repeated indefinitely, each time creating two double-stranded DNA molecules identical with the target sequence. [29]

With real-time PCR, it is possible to not only detect the target but also quantify the amount of DNA present based on the production of a fluorescent signal. There are various techniques for creating this signal but perhaps the most widely used method for real-time PCR is the TaqMan based detection.

The TaqMan assay produces a quantifiable signal during the amplification of the target with a specialized probe in addition to a primer pair (Figure 2.2). The TaqMan probe, typically 20-30 nucleotides in length, is complementary to the target and includes a fluorescent reported and quencher molecule affixed at the 5' and 3' ends respectively. Because the quencher is in close proximity to the reporter molecule, the reporter will not fluoresce. The primers in a TaqMan assay are extended by the Taq polymerase (Figure 2.2 (1, 2)). As the Taq polymerase proceeds towards the 5' end, the hybridized probe is digested causing the fluorescent reporter to be released and fluoresce (Figure 2.2 (3, 4)). As the amplification continues, more reporter molecules will be released increasing the signal produced by the reaction. This signal can then be measured by a real-time PCR instrument.

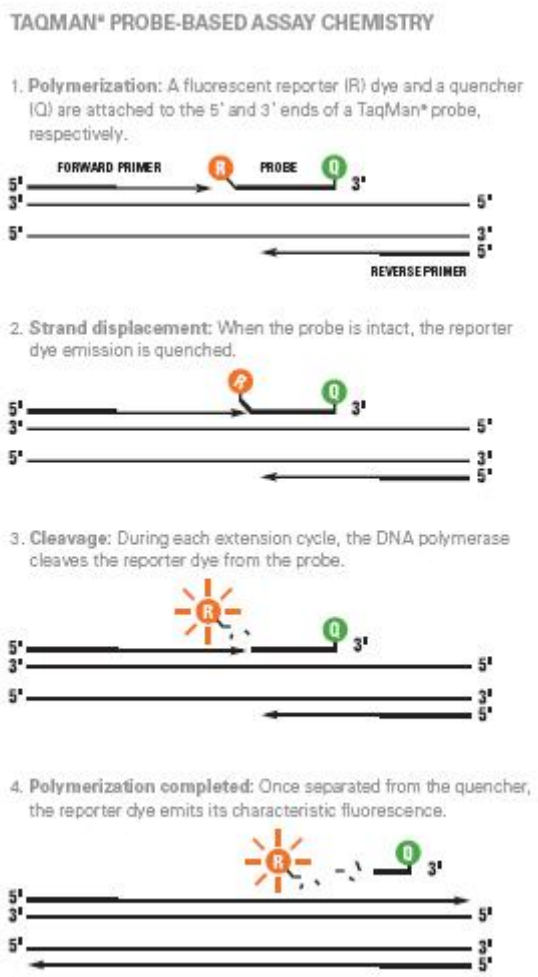

Figure 2.2. The TaqMan Probe-based Assay Chemistry

In addition to the TaqMan based detection which detects specific amplification products only, the SYBR-Green-based detection can be used to detect all amplified double-stranded DNA, including non-specific reaction products.

The SYBR-Green uses the SYBR Green I dye to detect PCR products. When SYBR Green I dye is added to a sample, it immediately binds to all double-stranded DNA present in the sample. During the PCR, AmpliTaq Gold DNA

Polymerase [25] amplifies the target sequence, which creates the PCR products, or amplicons. The SYBR Green I dye then binds to each new copy of double-stranded DNA. As the PCR progresses, more amplicons are created. Since the SYBR Green I dye binds to all double-stranded DNA, the result is an increase in fluorescence intensity proportionate to the amount of PCR product produced. A comparison between the TaqMan and SYBR-Green detection chemistry can be seen in Figure 2.3.

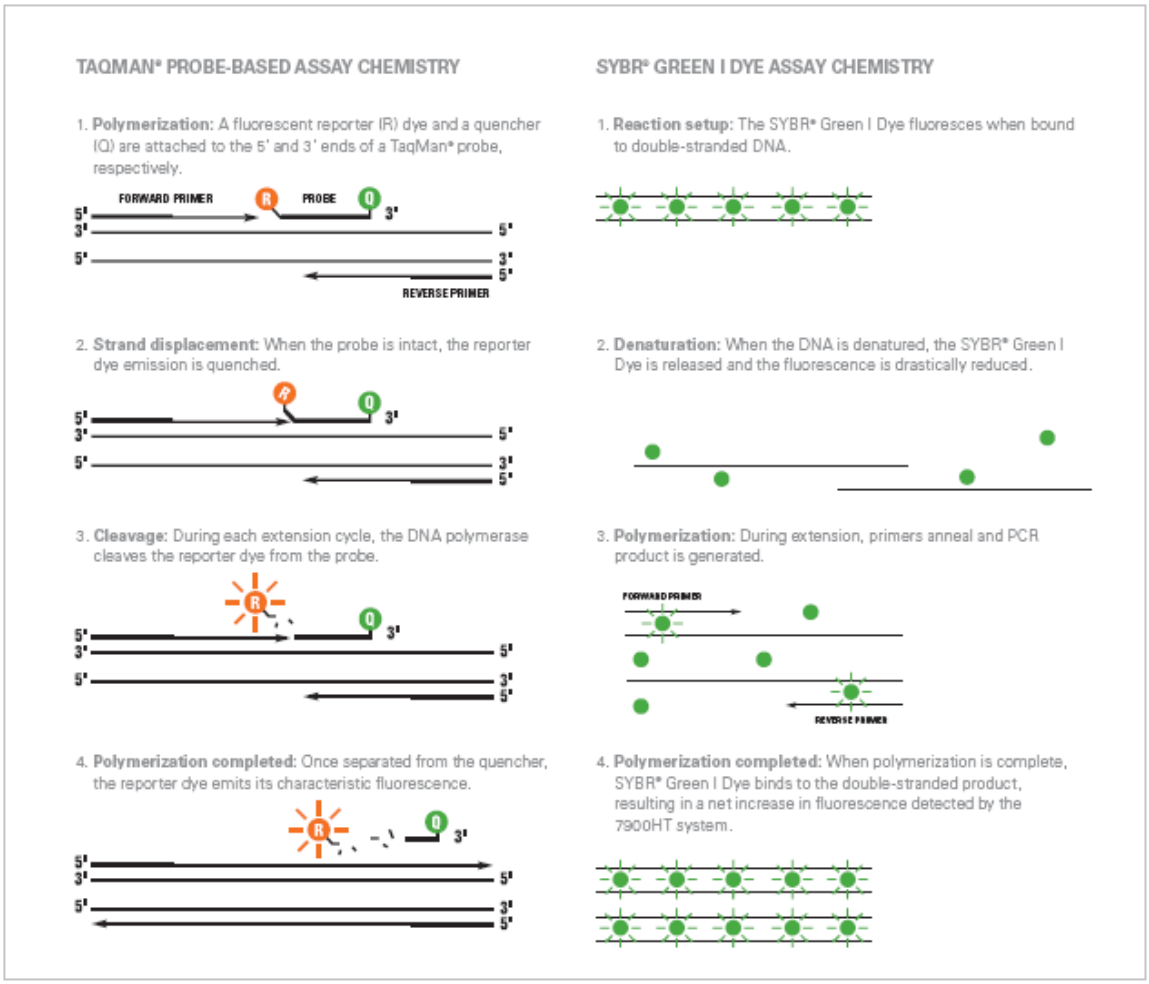

Figure 2.3. Comparison of TaqMan and SYBR-Green-based Detection Workflows

The TaqMan assay can be multiplexed by using multiple probes each labeled with a different reporter molecule having a distinguishable fluorescence and by eliminating post-PCR processing, assay labor and material costs are reduced; however, a different probe has to be synthesized for each unique target sequence. The SYBR-Green assay does not require probes, which reduces assay setup and running costs while still having increased sensitivity for detecting amplification products; however, by binding to double-stranded DNA—including nonspecific sequences—it may generate false positive signals [25].

2.2.2 Microarray-based Pathogen Detection

A microarray is a solid surface in which DNA subsequences (probes) complementary to the sequences of interest are affixed in a predetermined order. Microarrays are fabricated on glass or nylon substrates. The microarray contains grids where thousands of microscopic quantities of these probes can be spotted or affixed. Production of microarrays is a highly automated process using either a pin-based robotic arrayer or an inkjet microdispensing liquid handling system to print the DNA molecules on the surface [30]. Several other methods have also recently been developed for synthesis of the oligos on the surface including CombiMatrix's electrical synthesis and the optical processes of Affymetrix and Nimblegen. Regardless of how the probes are synthesized, spotted or affixed, the sample is then eluted over the surface. If the complementary DNA of interest is

present in the sample (also called the target), it will bind or hybridize to the probe on the microarray. By labeling the sample with fluorescent labels, after hybridization the microarray can be scanned and an image can be created for future analysis. By taking advantage of the binding properties of nucleotides, microarrays are able to determine if a particular strand of DNA is present in the sample.

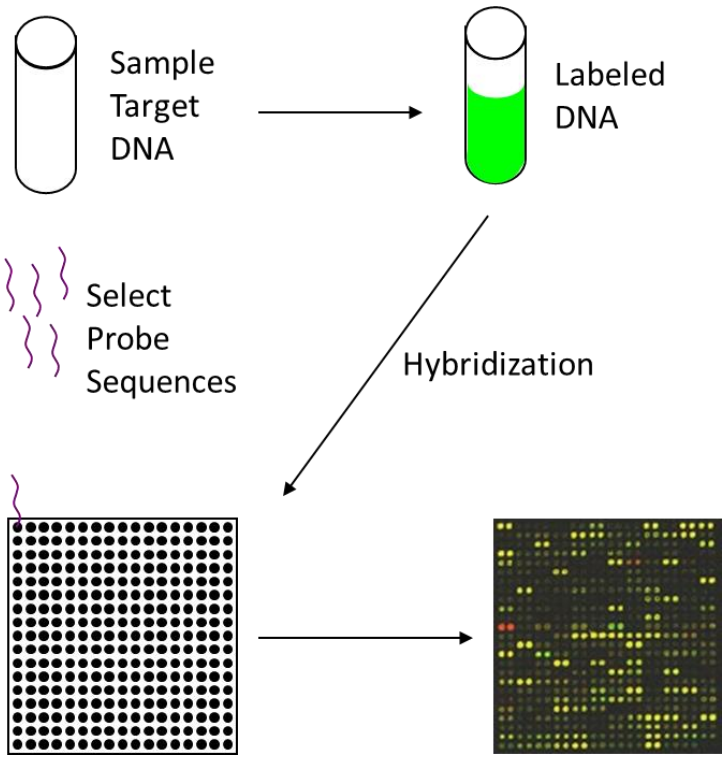

Figure 2.3 Microarray experimental scheme.

The process and outcome of this microarray experiment can be seen in Figure 2.3. Each spot on the microarray image represents a probe. A brightly colored spot signifies hybridization between the probe and the target DNA sequences. A dim grey spot signifies poor hybridization if there is hybridization at all. The

microarray image is processed by image analyzing software to convert the image into intensity data. Conclusions of whether the target DNA sequence is present in the sample can be drawn based on systematic statistical analysis of the intensity data.

The microarray format is particularly attractive for pathogen detection because it is possible to test for multiple pathogens simultaneously, e.g. the set of pathogens causing similar symptoms in hosts or those rampant in the same regions in which the infection has occurred. The number of pathogens an array is able to detect is directly related to the number of probes used. Unfortunately, the cost of producing a microarray is dependent upon the size of the design, i.e. the number of probes employed. This cost, however, has been gradually decreasing as this platform has become more popular. Furthermore, it is possible to produce smaller assays in-house for a significantly lower cost, which for some experiments is more than adequate.

Microarrays offer two methods for detecting pathogens. Most commonly associated with microarrays is the analysis of gene expression in which probe sequences are designed to be complementary to mRNA transcripts. Microarray probes designed to be complementary to pathogen mRNA can be used to assess the viability of the pathogen. Furthermore, the host response to a particular pathogen can be studied using this platform providing a more complete picture of the host-pathogen interactions in play. The second method for pathogen

detection differs only in design. Rather than the probes being complementary to mRNA, the probes can be complementary to the pathogen's genome. Microarrays have been used for the detection of numerous viral, microbial, and fungal pathogens from a variety of sample (blood, environmental, food, water, etc.) with applications in clinical diagnostics as well as national security.

2.2.3 Loop-mediated Isothermal Amplification (LAMP)

Loop-mediated isothermal amplification (LAMP) utilizes *Bst* DNA polymerase and two sets of primers specifically designed to hybridize to the target DNA strand in close proximity [31]. Figure 2.4 illustrates the process of amplification in a LAMP assay. In Figure 2.4A, the four primers consist of two inner primers (FIP and BIP) and two outer primers (F3 and B3). The FIP and BIP primers each contain two distinct regions. FIP has the complementary sequence of the F1 region followed by the sequence of the F2 region; whereas, the BIP primer has the sequence of the B1 region followed by the complementary sequence of the B2 region. The LAMP reaction begins with the synthesis of the complementary strand when the FIP primer hybridizes to the F2 region and is eventually replaced by the strand extended by the outer primer (F3 or B3) as shown in Figure 2.4B. In Figure 2.4C, the released (replaced) strand forms a looped out structure and acts as a template for the BIP primer. Consequently a dumb-bell form DNA is produced in Figure 2.4D which serves as the material for

the LAMP cycling event. The final products are a mixture of stem-loop DNA's with various lengths [32].

LAMP has been used for the detection of microbial and fungal organisms, e.g., *Clostridium difficile* [33], *Salmonella enterica* [34], and *Ochroconis gallopava* [35]. By including a reverse transcription step, LAMP can be used to detect the presence of RNA-based organisms in addition to the amplification of DNA. As a result, reverse transcription LAMP (RT-LAMP) has been successfully used for the identification of Japanese yam mosaic virus (JYMV) [35], tomato spotted wild virus (TSWV) [32], viral hemorrhagic septicemia virus (VHS) [36], West Nile virus (WNV) [37], and Dengue virus (DENV) [38], to name a few. Because the LAMP technique is based upon the recognition of six distinct sequences (two regions for each inner primer and one region for each outer primer), higher specificity for target amplification is expected and has been observed as true [37, 38]; however, it has yet to be extensively validated for other common pathogens [39].

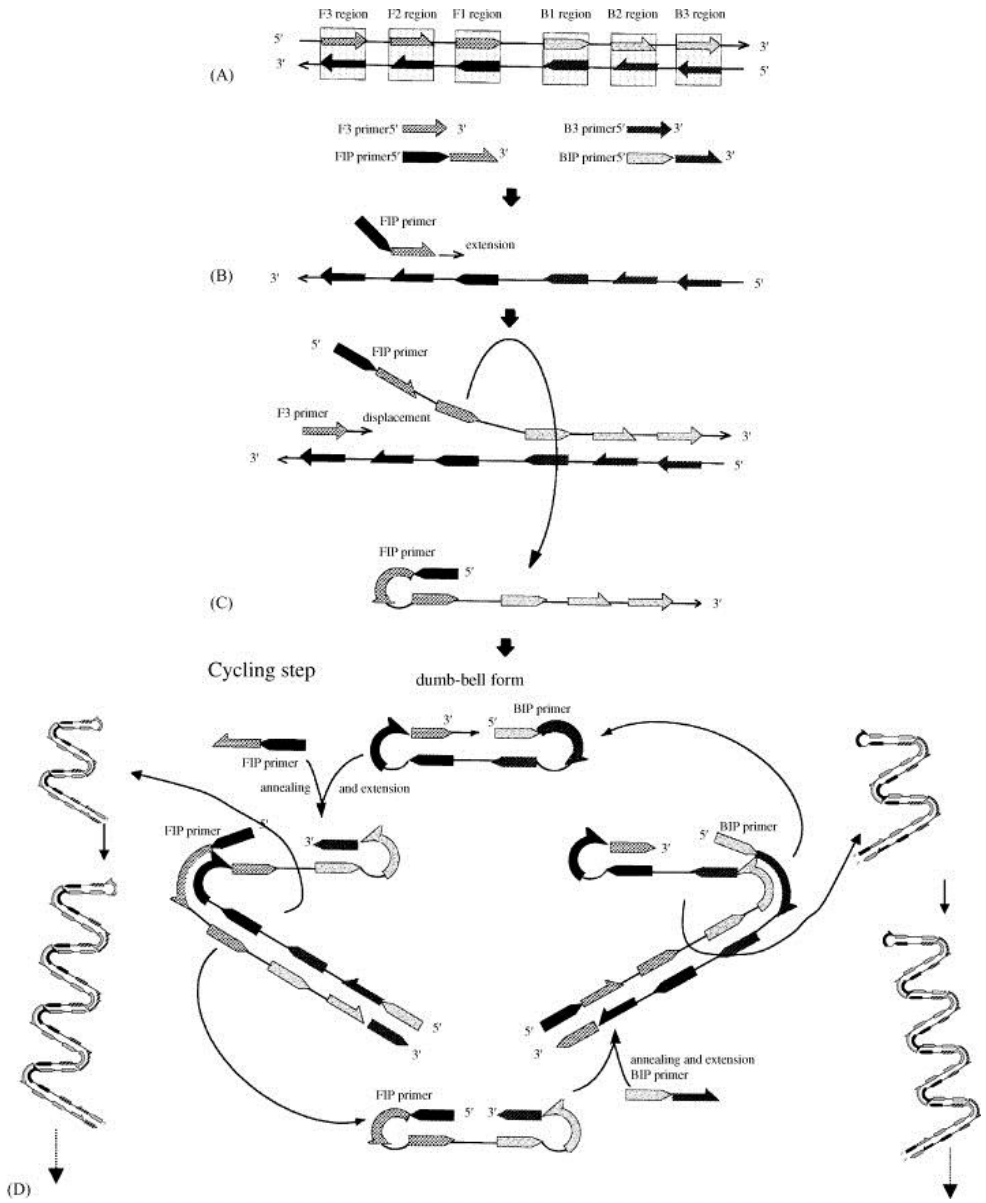

Figure 2.4 Loop-mediated isothermal amplification (LAMP) [32].

2.3 Traditional Methods to Design Primers / Probes

2.3.1 Selecting Sequence(s)

The ability of any nucleic acid-based method to provide a reproducible and reliable identification of a pathogen is largely dependent upon the sequences selected as primers and/or probes. An optimal primer/probe sequence must be complementary to the target it is trying to detect. Here the target can be a particular mRNA transcript, a particular gene, or the entire genome of the pathogenic organism being detected. Furthermore, if more than one target sequence is available, e.g. multiple strains of the same pathogenic organism, the sequence must be complimentary to regions in each target sequence in order to be used as an identifier of the group, e.g. species, genus, for which all strains belong.

Ideally, this sequence should also be a unique signature, i.e. not complimentary to any other DNA/RNA found in the sample or closely related organisms. In stipulating that the primer/probe will only bind to the intended site, the specificity of the assay is greatly improved and the likelihood of misidentification or misdiagnosis is significantly reduced. Proper evaluation of uniqueness must go beyond just presence in the target and absence in the background or near-neighbor sequences which may be present in a sample. This requires a *priori* knowledge of the genomic sequence of the target organism as well as all near-neighbors. While this may sound easy, difficulties arise when the organisms contained within the sample are unknown (e.g. bioterrorists agent

screening of food, air, and water samples) or there is little or no sequence information available for the target organism. As next-generation sequencing technologies improve and the cost decreases, additional sequencing of strains and/or near-neighbors of pathogenic organisms has been done to improve their identification.

There are numerous primer/probe design algorithms and software available as open source or by fee listed in Table 2.1. Sequence specificity is most often assessed using alignment methods and/or screening using such BLAST [17]. One must keep in mind that BLAST uses heuristics to accelerate a search [17] which has serious implications for primer/probe selection. BLAST uses pre-indexed databases in which sequences are stored according to the collection of their subsequences or words of a particular length (minimum length of seven nucleotides and maximum length of eleven nucleotides). When BLAST is used, the query sequence is converted into a list of words and the database is scanned for these words as well as words that are similar. Segments are formed when two non-overlapping words within a certain distance of each other are found. The segment is extended to flanking bases, scoring nucleotide matches, mismatches and gaps, according to a predefined scoring matrix, until the score meets or falls below a threshold value. Thus, mismatches are only tolerated at the head or tail of the sequence. If two sequences are identical except for a one nucleotide difference (mismatch) at an interior position of the sequence, BLAST will not recognize the similarity between the two sequences.

Software	Algorithm / Method	Usage	Availability
AlleleID [40]	ClustalW [73]	Both	Cost
ARB [41, 42]	Suffix Tree	Probes	Free (Web)
Array Designer [43]	BLAST [17]	Both	Cost
Beacon Designer 8.02 [44]	BLAST [17]	Both	Cost
CommOligo 2.0 [45]	Global alignment based on Myers' bit-vector algorithm [76]	Probes	Free (Web)
DNASIS MAX 3.0 [46]	Smith-Waterman [16], BLAST [17]	Both	Cost
FAST PCR [47]	DiAlign [71]	Primers	Free (Web)
Genamics Expression [48]	MultAlin [72] or ClustalW [73]	Primers	Cost
GeneFisher 2 [49]	Clustalw [73] or Divide-and-Conquer (DCA) [74]	Primers	Cost
GenomePRIDE [50]	BLAST [17]	Both	Cost
GST-PRIME [51]	Undisclosed	Primers	Per request
LAMP Designer [52]	Undisclosed search algorithm, BLAST [17]	Primers	Cost
OliCheck [53]	BLAST [17]	Probes	Free (Web)
OLIGO 7 [54]	Undisclosed	Both	Cost
OligoArray 2.0 [55]	BLAST [17] plus MFOLD [75]	Probes	Per request
OligoPicker [56]	BLAST [17]	Probes	Free (Web)
OligoWiz 2 [57]	BLAST [17]	Probes	Free (Web)
PRIMEGENS [58]	Primer3 (local alignment) [61]	Primers	Per request
Primer Design Assistant [59]	Undisclosed	Primers	Free (Web)
Primer Premier [60]	ClustalW [73]	Primers	Cost
Primer3 [61]	Local Alignment	Both	Free (Web)
Primer-Blast [62]	Primer3 [61] or BLAST [17]	Primers	Free (Web)
PrimerPlex [63]	BLAST [17]	Primers	Cost
PrimerQuest [64]	Local Alignment	Both	Free (Web)
PrimerSelect [65]	BLAST [17]	Primers	Cost
PrimerX [66]	Undisclosed	Primers	Free (Web)
ProbeEffects [67]	Undisclosed	Probes	Free (Web)
PROBEmer [68]	Suffix Tree	Probes	Free (Web)
ProbeSelection [67]	Undisclosed	Probes	Free (Web)
Web Primer [69]	Undisclosed	Primers	Free (Web)
Xpression Primer [70]	BLAST [17]	Primers	Free (Web)

Table 2.1 Available primer/probe design algorithms/software.

There are several other factors that must also be taken into consideration when selecting prime/probe sequences. The location in which the primer/probe will hybridize is important. For example, the TaqMan probes and molecular beacons must be located internal to the two primer sequences while the previously discussed LAMP method requires that the two forward primers are in close proximity to each other as well as the two reverse primers. In PCR assays, the

primer pair(s) must have similar melting temperatures (T_m). Although there are several formulas for calculating the T_m, e.g. Breslaur [77], Sugimoto [78], and Unified [79], just to name a few, the nearest-neighbor method by SantaLucia [80] is probably the most widely used. SantaLucia defines the melting temperature as follows:

$$T_m = \Delta H^o / (\Delta S^o + R \ln C_T)$$

where ΔH^o and ΔS^o are the enthalpy and entropy for the sequence, R is the gas constant 1.987 cal/(K mol), and C_T is the total strand concentration. The enthalpy and entropy are calculated using the thermodynamic parameters for DNA helix initiation and propagation as defined by SantaLucia [80]. The length and the number of G and C nucleotides in the sequence directly affect the T_m by increasing the values of ΔH^o and ΔS^o. While a longer sequence having a higher T_m may be ideal for a particular assay, another factor must be taken into consideration: longer primers/probes are more tolerant of mispriming than shorter primer/probes. Thus, shorter probes will offer greater specificity than longer ones. Primer/probe sequences may also form secondary structures, e.g. hair-pin loops, primer-dimers, rendering the sequences unable to bind to the target possibly resulting in false negative. Calculation of the free energy or integration of secondary structure applications such as MFOLD [75] can be used to identify primers/probes which will perform poorly due to the formation of a secondary structure.

2.3.2 Algorithms for Optimal Sequence Specificity

All of the available primer/probe design tools rely on heuristic methods to enhance the speed and overall performance of the application. While such methods provide a proficient service, higher probabilities of false positives or false negatives exist than if more exhaustive design methods were implemented. Furthermore, many of the tools listed in Table 2.1, e.g. OligoWiz 2 [57] and ProbeSelection [81], do not permit the user to select which sequences the primer/probe candidates should be specifically screened against. Tools utilizing suffix trees or suffix arrays gain speed by pre-computing the trees/arrays for which candidate primers/probes must be screened against. The number of sequences made publicly available is increasing exponentially and with the advancements in Next Generation Sequencing technologies [82], may proceed even more rapidly. Thus, suffix trees and arrays must be current in order to provide a reliable and useful tool for primer/probe design. Several methods have been developed using rigorous computing to select primers/probes with increased specificity at the cost of increased time and memory requirements.

2.3.3 Longest Common Factor (LCF) Approach

One method for designing primer/probe sequences specific to a target is an implementation of the *longest common factor* (LCF) approach first introduced by Rahmann [83]. In this approach, the LCF l of two target sequences s and t of variable lengths is the maximum length $l_{\max}$ of a substring that occurs in both s

and *t*. In addition to the LCF, Rahmann also introduced the term – *longest common prefix* or the longest string common to both a prefix of *s* and *t*. The goal of this approach is to compute matching statistics $ms^{s|t} = (ms_0,\ldots,ms_{|s|-1})$, where ms_i denotes the length of the longest string that starts at position *i* in *s* and present at any position(s) in *t* and is absent from a set of background sequences. In Figure 2.5, an example of how the matching statistic is shown. In this example, the maximum ms_i value is 4 ($ms_3 = 4$) thus $ms^{s|t} = 4$. The matching prefix is extended in *s* and *t* until the first nucleotide base difference is observed. If the matching statistic allows for one base difference (mismatch), then the matching statistic is denoted as $ms_1^{s|t}$, accepting one mismatch between *s* and *t* when extending the prefix until the second base difference is observed. Suffix arrays are then used to compute the matching statistics ms and ms_1 of the target sequences against the background collection. Oligos within the target(s) are ranked according to their matching statistics ms and ms_1.

	s								***t***								
	1	2	3	4	5	6	7		1	2	3	4	5	6	7	8	
	G	A	A	T	A	C	T		A	T	A	C	G	A	C	T	
	G	A	A	T	A	C	T		A	T	A	C	**G**	A	C	T	$ms_1 = 2$
	G	**A**	A	T	A	C	T		A	T	A	C	**G**	**A**	C	T	
	G	**A**	**A**	T	A	C	T		A	T	A	C	**G**	**A**	**C**	T	
	G	**A**	A	T	A	C	T		**A**	T	**A**	C	G	**A**	C	T	$ms_2 = 1$
	G	**A**	**A**	T	A	C	T		**A**	**T**	**A**	**C**	G	**A**	**C**	T	
	G	A	**A**	T	A	C	T		**A**	T	**A**	C	G	**A**	C	T	$ms_3 = 4$
	G	A	**A**	**T**	A	C	T		**A**	**T**	**A**	**C**	G	**A**	**C**	T	
	G	A	**A**	**T**	**A**	C	T		**A**	**T**	**A**	C	G	A	C	T	
	G	A	**A**	**T**	**A**	**C**	T		**A**	**T**	**A**	**C**	G	A	C	T	
	G	A	**A**	**T**	**A**	**C**	**T**		**A**	**T**	**A**	**C**	**G**	A	C	T	
	G	A	A	**T**	A	C	T		A	**T**	A	C	G	A	C	**T**	$ms_4 = 3$
	G	A	A	**T**	**A**	C	T		A	**T**	**A**	C	G	A	C	T	
	G	A	A	**T**	**A**	**C**	T		A	**T**	**A**	**C**	G	A	C	T	
	G	A	A	**T**	**A**	**C**	**T**		A	**T**	**A**	**C**	**G**	A	C	T	
	G	A	A	T	**A**	C	T		**A**	T	**A**	C	G	**A**	C	T	$ms_5 = 3$
	G	A	A	T	**A**	**C**	T		**A**	**T**	**A**	**C**	G	**A**	**C**	T	
	G	A	A	T	**A**	**C**	**T**		A	T	**A**	**C**	**G**	**A**	**C**	**T**	
	G	A	A	T	A	**C**	T		A	T	A	**C**	G	A	**C**	T	$ms_6 = 2$
	G	A	A	T	A	**C**	**T**		A	T	A	**C**	**G**	A	**C**	**T**	
	G	A	A	T	A	C	**T**		A	**T**	A	C	G	A	C	**T**	$ms_7 = 1$

Figure 2.5 Computing the matching statistic for two sequences.

The memory usage of this algorithm is directly related to the size of the suffix array. Given the length of the target sequence(s) and background collection, *n*, 10**n* bytes are required. The performance of the algorithm is correlated to the choice of the bucket prefix length. The greater the bucket length, the smaller the buckets are and the less time needed to scan the bucket for the sequence. Thus, choosing a bucket prefix length equal to $O(\log n)$ where n is the length of the suffix array, results in an expected running time for calculating the matching statistics of $O(|s|)$ where *s* is the size of the target sequence. It is

important to note; however, that examples presented in the literature [83] are significantly small when compared to such sequences as human genome as a background (≈ 3GB) which would require 30GB of RAM.

CHAPTER 3

STATISTICAL PROPERTIES OF GENOMIC SEQUENCES

Statistical analysis of the appearance of short or *n*-mers in different DNA sequences, from individual genes to full genomes is important for such applications as the development of assays for organism identification and detection. Several attempts [84-90] have been made to employ the frequency distribution of *n*-mers to identify species with relatively short genome sizes (microbial). In such an approach, the shape of the frequency distribution for certain short subsequences (2-4-mers [84-88] and 8-9-mers [89, 90]) has been used to identify microbial genomes, based on a given piece of genome or a whole genome.

Sequences of this size, while informative, perform poorly as PCR primers and/or microarray probes. Sequences of greater length are needed for such assays. When considering longer *n*-mers; however, the likelihood of their appearance occurring more than once within the genome decreases.

Thus, an alternative statistic of the frequency of presence/absence of *n*-mers can be employed to examine genomic sequences. To design higher quality primer/probe sequences, one must first know the degree to which the frequency of presence/absence of *n*-mers can be considered as random and can be considered as independent. As a result, one can select signature sequences of the appropriate length for pathogen identification

and select the necessary number of signature sequences required to distinguish between closely related organisms.

3.1 Frequency of Presence in Random Sequences

The ***frequency of the presence*** of *n*-mers, the frequency in which *n*-mers are present/absent, in random sequences can be analytically determined. Let *G* be a random sequence of length *M* of four characters {A,C,G,T} and *S* be one of the 4^n possible *n*-mers. Enumerating them, $\sum_{S=1}^{4^n}$ will stand for the sum with respect to all *n*-mers. If we let $F^{M,n}(S,k)$ be the probability that a particular *n*-mer, *S*, appears exactly *k* times in *G*, the *frequency of appearance* of *S* in *G* can be formulated. To define this probability, one can imagine a random statistical set of *N* sequences of the same length. If in this set there are N_k sequences that contain *S* exactly *k* times, then

$$F^{M,n}(S,k) = \lim_{N\to\infty} \frac{N_k}{N}$$

Now, if we let $f^{M,n}(S)$ be the probability that *S* is present at least once in *G* (the *frequency of presence*). It is clear that

$$f^{M,n}(S) = \sum_{k=1}^{M} F^{M,n}(S,k) = 1 - F^{M,n}(S,0)$$

We now consider $P(\{k_s\})$ to be the probability distribution of the presence/absence of *n*-mers where p_s, is the probability of finding the *n*-mer *S* in *G*. For *n*=1, the values for p_s, are reduced to the "elementary probabilities", p_l to find the character *l* in *G*, *l*={A,C,G,T}.

If the p_l are given, the assumption that n-mers S for $n > 1$ are composed in a random manner (i.e., the characters in S are not correlated), then

$$p_s = p_a p_t \ldots p_c, \qquad S = [at \ldots c]$$

For instance, equal probabilities $p_l = 1/4$ lead to a homogeneous distribution,

$$p_s = const = \frac{1}{4^n}$$

Considering the characteristics of the appearance of n-mers in G, all of the related statistical information contained in the distribution of probabilities such that

$$\{n\text{-mer } S \text{ appears } k_s \text{ times}, S=1,2,\ldots 4^n \equiv n_1\}, \quad \sum_{S=1}^{n_1} k_s = M - n + 1 \equiv M_n$$

where M_n is a total number of n-mers in G. This distribution is denoted by

$$P(k_1,k_2,\ldots,k_s,\ldots,k_{n1}) = P(\{k_s\})$$

The distribution has a multinomial form

$$P(\{k_S\}) = M_n! \prod_{S=1}^{n_1} \frac{p_S^{k_S}}{k_S!}$$

Here the product is taken over all configurations, such that

$$\sum_{S=1}^{n_1} k_S = M_n$$

One finds immediately the *frequency of appearance* of S in G.

$$F^{M,n}(S,k) = \sum_{\{k_T, T\neq S\}} P(\{k_T\}) = \frac{M_n! p_S^k q_S^{M_n-k}}{k!(M_n-k)!}, \qquad q_S = 1 - p_S$$

The mean number of appearance, $\bar{k}_S$, the variance $\sigma_S^2 = \overline{k_S^2} - (\bar{k}_S)^2$, covariance, $\sigma_{ST}^2 = \overline{k_S k_T} - \bar{k}_S \bar{k}_T$ and the correlation coefficient, $C_{ST} = \sigma_{ST}^2 / \sigma_S \sigma_T$ are given as

$$\bar{k}_S = M_n p_S, \quad \sigma_{ST}^2 = -M_n p_S q_S, \quad \sigma_{ST}^2 = -M_n p_S p_T, \quad C_{ST} = -\sqrt{\frac{p_S p_T}{q_S q_T}}$$

Therefore, if $p_S = 1/4^n$, $q_S = 1-1/4^n$, the correlation coefficient takes on the value $C_{ST} = -1/(4^n-1)$. In the homogeneous case for the probability of presence, $f^{M,n}(S) = 1 - F^{M,n}(S,0) = 1 - (1 - p_S)^{M_n}$, all probabilities are equal: $p_S = 1/4^n$. It is convenient to introduce the variable, $y = M / 4^n$, and consider the common Poisson limit of the Bernoulli distribution:

$$f^{M,n}(S) = 1 - (1 - \frac{y}{M_n})^{M_n} \rightarrow 1 - e^{-y}$$

Introducing another variable, $y = 4^n / M_n = 1/y$, the formula can then be reduced to what is henceforward referred to as the "random boundary"

$$f^{M,n}(S) = 1 - e^{-1/x}$$

3.2 Frequency of Presence in Genomic Sequences

It is widely known that when genome size $M > 4^n$, the presence of n-mers in several genomes are in fact, not random [91-95]. However, when the condition $M << 4^n$

is held, several reasons exist by which one could expect that the distributions of presence of longer *n*-mers are also not random. First, genomes (especially large ones) contain structural repeats. Second, since the occurrence statistics for short oligonucleotides (2- and 3-mers) is not random, this affects the occurrence distributions for longer *n*-mers, since they contain 2- and 3-mers as structural elements.

It is worth mentioning that as n increases, the total number of possible n-mers, 4^n, strongly exceeds the total sequence length M and most of the possible n-mers do not appear because the maximum number of n-mers contained in this sequence is $M-n+1 \approx M$. Thus, for a reasonably high ratio, $4^n / M$, most of the n-mers which appear tend to appear only once, in accordance with the fact that the number of present n-mers becomes very close to M. Table 3.1 shows a list of approximated genome lengths for various organisms as well as their total sequence length M which accounts for both the original (positive) and complementary (negative) strands of the genome. In addition, the value of n is listed to demonstrate where $4^n \geq \mathrm{M}$ and $4^{n-1} < M$.

	Organism	Genome Length (m)	Total Sequence Length (*M*)	*n*
1	*Amoeba dubia*	670,000,000,000	1,340,000,000,000	21
2	*Amoeba proteus*	290,000,000,000	580,000,000,000	20
3	*Fritillaria assyriaca* (bulbous plant)	130,000,000,000	260,000,000,000	19
4	*Pan troglodytes* (chimpanzee)	3,799,600,000	7,599,200,000	17
5	*Mus musculus* (mouse)	3,454,200,000	6,908,400,000	17
6	*Homo sapiens* (human)	3,400,000,000	6,800,000,000	17
7	*Gallus gallus* (chicken)	1,200,000,000	2,400,000,000	16
8	*Saccharomyces cerevisiae* (yeast)	12,067,280	24,134,560	13
9	*Bacillus anthracis* (anthrax)	5,228,663	10,457,326	12
10	*Escherichia coli* K12	4,639,221	9,278,442	12
11	*Mycobacterium tuberculosis*	4,397,000	8,794,000	12
12	*Neisseria meningitides*	2,272,360	4,544,720	12
13	*Streptococcus* M1 GAS	1,852,441	3,704,882	11
14	*Swinepox virus*	146,454	292,908	10
15	*Human herpesvirus* 8	137,969	275,938	10
16	SARS *coronavirus*	29,751	59,502	8
17	*Ebola virus*	18,595	37,190	8
18	*Influenza A* H1N1	13,588	27,176	8
19	HIV 2	10,359	20,718	8
20	*Human papillomavirus*	7,212	14,424	7

Figure 3.1 Range of genomic sizes of organisms [96].

3.3 Independence

The principal goal of this analysis (published in [97]) was to find out how independent/correlated the appearances of *n*-mers are in different genomes. One of the ways to approach this question was to use the well-known multiplication property for the joint probability of the intersection of events, according to which two events, *A* and *B*, can be treated as independent if $p(A \cap B) = p(A)p(B)$. As an example, if the following three different genomes are considered: (1) *Salmonella typhi* (NC_003198), (2) *Mycobacterium tuberculosis* H37Rv (NC_000962) and (3) *Bacillus subtilis* (NC_000964). A complete set of *n*-mers would contain 4^n *n*-mers, which, for $n = 12$, is 4^{12} =16,777,216. Considering both strands of the complete genome sequences for the calculations, then total sequence length $M=2*m$. $N(n, G)$ stands for the number of

different *n*-mers in genome *G*. In Table 3.2, the number of different 12mers that occur in each of these three genomes together with the corresponding frequency of presence (i.e. the probability of finding randomly picked 12mers in each genome, $p = N(12, G)/4^{12}$) is listed.

Genome (*G*)	***m***	***M***	***N*(12,*G*)**	$p = N(12, G)/4^n$
(1) *Salmonella typhi*	4,809,037	9,618,074	5,813,330	34.65%
(2) *Mycobacterium tuberculosis* H37Rv	4,411,529	8,823,058	4,361,508	26.00%
(3) *Bacillus subtilis*	4,214,814	8,429,628	5,346,103	31.87%

Table 3.1 Frequency of presence of 12mers within the three microbial genomes.

The number $N(n,G_1,G_2)$ of *n*-mers (n = 12) that appear in each pair of genomes (G_1, G_2) was also computed. Based on this, one can compare the probabilities of finding randomly picked 12mers in two genomes simultaneously with the probabilities calculated using the multiplication rule. As shown in Table 3.1, the actual and calculated (expected) probabilities do not differ greatly from each other. This allows us treating the presence/absence of randomly picked 12mers in these three genomes as independent events.

Case	**Number of 12-mers**	$N(n,G_1,G_2)/4^n$	**Calculated probability assuming independence**
Present in genomes (1) and (2)	1,943,814	11.6%	9.0%
Present in genomes (1) and (3)	2,335,710	13.9%	11.0%
Present in genomes (2) and (3)	1,334,288	8.0%	8.3%

Table 3.2 Actual and predicted simultaneous presence of 12-mers within the 3 microbial genomes.
(1) *Salmonella typhi*, (2) *Mycobacterium tuberculosis* H37Rv, (3) *Bacillus subtilis*

The actual and expected probabilities for each pair of genomes in three groups (viruses, microbes, and multicellular organisms ~ 1,000,000+pairs in total) were

calculated during the aforementioned study of randomness of genomes. Special interest was in the range of n which gives rise to the frequency of presence, $p*$, of different n-mers in the genome between 5% and 50% of the total possible number of n-mers (4^n). This range for different microbial genome sizes can be numerically determined from Figure 3.1. The corresponding frequency of presence for purely random sequences (random boundary) is shown in Figure 3.1 by a solid line.

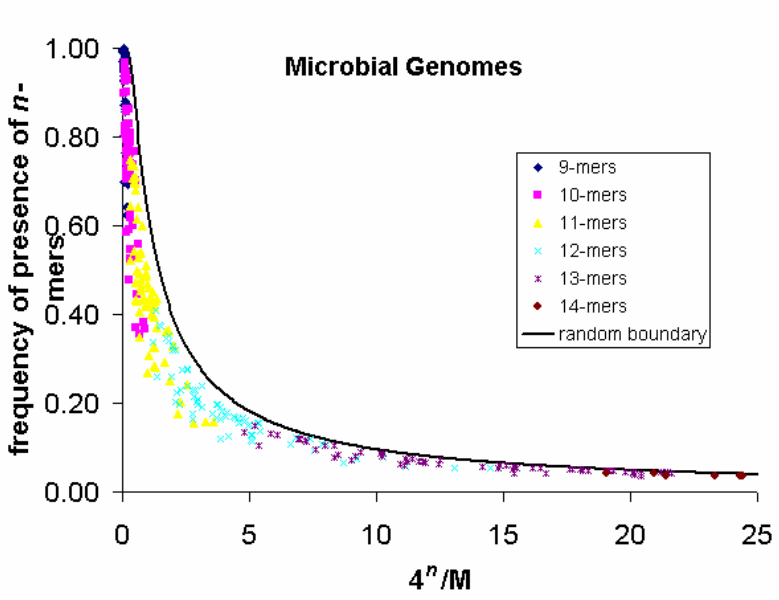

Figure 3.1 Frequency of presence of different *n*-mers, $p = N(n, G)/4^n$), as function of the ratio $4^n/M$.

The analytical formula for the random boundary can be used to estimate this range analytically:

$$n^* = \frac{\log[\frac{M(1-p^*)}{p^*}]}{\log(4)}$$

The upper and lower bounds of n^* for genome sizes between 0.8 and 10 Mb, which are typical for microbials, are shown in Table 3.3. In accordance with this, the value n = 12 appears to be the most reasonable one for all microbial genomes.

M	***n** determined for freq of presence 50% (*p**=0.5)**	***n** determined for freq of presence 5% (*p**=0.05)**
0.8	9.80	11.93
2.0	10.47	12.59
10.0	11.63	13.75

Table 3.3 Optimal length of *n*-mers (*n) for different genome sizes and frequencies of presence (p∗)**

For 11,990 pairs of microbial genomes with a value of n=12, the average ratio of actual and expected probabilities is 1.37 ± 0.67. For viral genomes and the value of n=7, the average ratio of actual and expected probabilities was found to be 1.07 ±0.12 for 387,840 genome pairs DNA-based viruses and 1.10±0.12 for 621,732 genome pairs RNA-based viruses. Thus, it was concluded that for this range of n the presence of n-mers in different genomes, to a good approximation; can be treated as independent events.

The highest deviations between the expected and actual probabilities were found among closely related genomes. For instance, using 7mers, a high ratio (185%) was found for Duck hepatitis B virus (NC_001344) versus Stork hepatitis B virus

(NC_003325) with 8.1% expected and 15.0% actual. An example of closely related microbial genomes would be *Chlamydophila pneumoniae* CWL029 (NC_000922), *C.pneumoniae* AR39 (NC_002179) and *C.pneumoniae* J138 (NC_002491), which have the highest (8-fold) ratio of actual and expected probabilities for 12mers (1.5% expected and 12.3% actual). The results for these three microbial genomes are presented in Table 3.4.

Case	Number of 12-mers	Number of 12-mers / 4^n (%)	Calculated probability assuming independence (%)
Present in genome (a) and absent in genome (b)	7,712	0.046%	
Absent in genome (a) and present in genome (b)	7,214	0.043%	
Present in genomes (a) and (b)	**2,058,304**	**12.268%**	**1.52%**
Present in genome (a) and absent in genome (c)	11,526	0.069%	
Absent in genome (a) and present in genome (c)	10,706	0.064%	
Present in genomes (a) and (c)	**2,054,490**	**12.246%**	**1.52%**
Present in genome (b) and absent in genome (c)	6,939	0.041%	
Absent in genome (b) and present in genome (c)	6,617	0.039%	
Present in genomes (b) and (c)	**2,058,579**	**12.270%**	**1.52%**

Table 3.4 Actual and predicted simultaneous presence of 12mers within the 3 extremely close microbial genomes:
(a) *C.pneumoniae* CWL029, (b) *C.pneumoniae* AR39 and (c) *C.pneumoniae* J138**.**

Assuming that these results are statistically sound, it is then expected that similar results would be extended to other genomes (many yet to be sequenced). In this case, one may use relatively small sets of randomly picked *n*-mers for differentiating between different viruses and organisms. This idea can be illustrated by continuing with the example for three microbial genomes listed in Table 3.4. Let n^* be the size of *n*-mer, which fits the interval where from 5% to 50% of all possible *n*-mers show up for a

desirable range of genome lengths. Given a genome G_1 with the frequency of presence of n-mers p_1, it is expected that $K = p_1L$ n-mers present in G_1 will appear also in the random set, forming a 'fingerprint' of G_1. The probability, ε, that the fingerprint of G_1 will exactly coincide with the fingerprint of some other genome G_2 (with the frequency of presence of n-mers p_2) is:

$$\varepsilon = (1-p_1-p_2+2p_{12})^L$$

Given a desirable probability of error, ε, one can determine that appropriate size, L, of a random set of n-mers which can be used for reliable identification of genomes as:

$$L=\frac{\log \varepsilon}{\log (1-p_1-p_2+2p_{12})}$$

There is a logarithmic dependence of the sampling or microarray size, L, on the error probability, ε. This feature is of principle importance for the estimation procedure under discussion. The value of L, necessary to distinguish these two genomes with the error probability, can be estimated by the formula:

$$L=\frac{\log \varepsilon}{p \log (1-\frac{mn}{N})} \leq \frac{M\,|\log \varepsilon|}{pmn}$$

Based on this statistical analysis, it can be concluded that the appearance of relatively long *n*-mers ($4^n >> M$, where M is the genome length) in all analyzed genomes is near random and a nearly independent process. Thus, when selecting sequences for use as potential primers/probes, sequences of appropriate length must be considered, e.g. relatively short *n*-mers ($4^n << M$) are much more likely to occur more than once than longer *n*-mers.

CHAPTER 4

IDENTIFYING ULTRA-SPECIFIC GENOMIC ISLANDS (USGI)

The design of PCR primers/probes for the analysis of DNA sequences, from individual genes to full genomes, has focused on the appearance of short subsequences. This analysis consisting of repeatable searches for the short subsequences (patterns) in genomes is known as the exact string matching problem. Exact string matching is a well-developed area in computer science. The traditionally accepted definition of this problem is as follows: *Given a string P of size n called the pattern and the longer sting T of size m called the text, the exact matching problem is to find all occurrences, if any, of pattern P in text T*. A significant number of algorithms have been previously developed [98, 99] based on the idea of pre-computing.

Some algorithms, such as Rabin-Karp [100], Boyer-Moore [101], Knuth-Morris-Pratt [102], and Suffix Tree [103, 104] apply pre-computing to the pattern. The memory usage in such approaches is relatively minimal, and if $n << m$, the time proportional to the length of the text or sequence: $O(m)$. Other widely implemented approaches are based on the idea of pre-computing the text [105]. While such algorithms, when the text is precomputed, are more memory-expensive and the estimation of the time required for pre-computing is $O(m)$, string matching can be done extremely fast and depends only on the pattern size: $O(n)$. It is important to note that there is some variation in the problem

definition where in some cases one needs to find any occurrence instead of all occurrences of the pattern in the text; nevertheless, the problem has same notation.

To choose the optimal algorithm, additional parameters must be taken into account. It is rare to match just one pattern against one sequence when designing PCR primers and microarray probes. In such cases, a finite set of k sequences and a finite set of l patterns require $k*l$ searches to identify the occurrence of all patterns in all sequences. Additionally, the average ratio $r = n/m$ should also be considered. Assume one compares the algorithms, Knuth-Morris-Pratt [102] and the Suffix Tree [103, 104] to estimate runtimes. First considering that the pre-computing time will be $O(l*n)$ for Knuth-Morris-Pratt and $O(k*m)$ for the Suffix Tree, the estimated runtimes would be $O(l*n+l*k*m)$ and $O(k*m+l*k*n)$ respectively. If memory usage is not a concern, one can estimate with ease which algorithm would be preferable based on the parameters of a given "real" problem.

The problem of finding all possible subsequences (n-mers) that usually range between 10-100 nucleotides (typical length for primer/probe) in a sequence ranging between 1,000-1 billion nucleotides (typical length for genome) is a very specific kind of matching problem. Four important points distinguish this problem from others previously discussed:

1. Alphabet only consists of 4 characters: A, T, C, G
2. The pattern lengths are relatively short: $\max(n) = 25$

3. For each value of *n*, the search has to be performed simultaneously for all possible 4^n *n*-mers
4. Only interested in the presence/absence of *n*-mer in each genome

4.1 Host-blind Ultra-specific Genomic Islands (USGI)

By selecting sequences which are present in the pathogen and absent from the host for use as primers/probes in nucleic acid-based detection, a more robust and specific diagnostic tool can be developed. Because primers and probes can misprime with host DNA or contaminating DNA/RNA causing false positives, absence alone is not sufficient. Therefore, the host-blindness or specificity of a sequence is quantified by determining how far away a pathogen signature is from the host or contaminating DNA. In other words, how many improper base pairings would be present in a mispriming? This allows exclusion of all subsequences that are present in a selected host/background genome in the PCR primer/probe design step with increased speed, predictability and effectiveness compared to current design methods. The sequences that are present in the genome of interest and absent from the host genome are termed as being "host-blind" sequences [106]. Likewise, sequences that are present in the genome of interest and absent from the genomes belonging to a particular background sample, e.g. water sample, air sample, soil sample, can be considered as being "background-blind" sequences. The greater the number of changes necessary to "convert" such host-blind sequence to a sequence found in the host genome, the less likely the host-blind sequence, when used as

a primer/probe, is to mispair with the host's genomic sequence. Thus, the algorithms can also exclude in the design step all host-blind sequences one, two, three, etc. changes away from the nearest host sequence. Such sequences are referred to as host-blind with one [two, three, etc.] changes away from the nearest host sequence (Fig. 4.1)

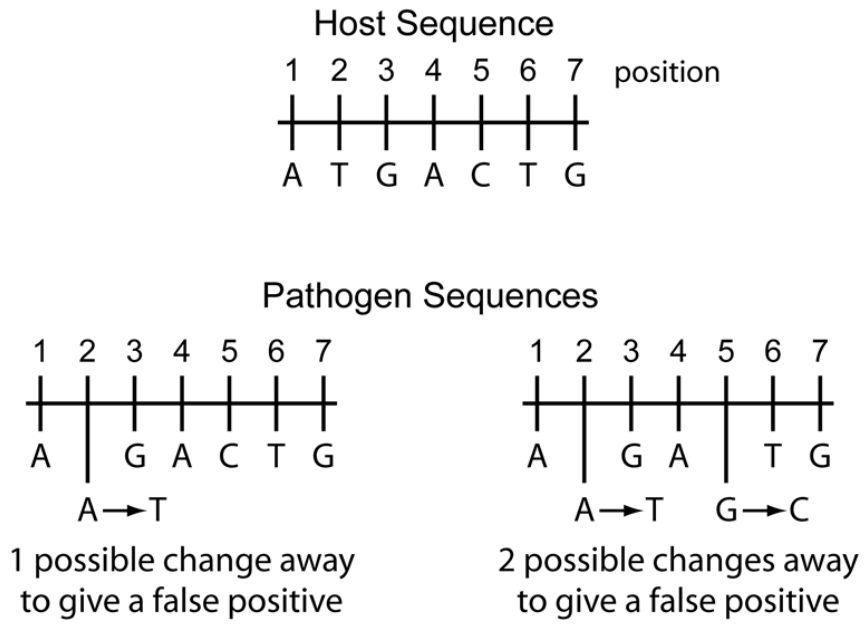

Figure 4.1 The Sensitivity of Host-Blind Sequences.
The pathogen sequences are examples of host-blind sequences that are one possible change (left) and two possible changes (right) away from the nearest host sequence (top) [106].

This approach can readily be extended to develop assays which are insensitive to the background of a host such a food (animal or plant) species, pathogen vector, or any other environmental background for which genomic sequence information is available. By using sequences three or four changes away, one can reduce and possibly eliminate false positives in the presence of contaminating genomes in the background.

4.2 Computing Distance

Because every *n*-mer contained within a pathogen genome can potentially be used as a primer/probe, the distance of each *n*-mer from the host/background DNA must first be determined so as to select only those sequences with are distant enough to provide a reliable and robust signature. Furthermore, it is important that the number of sequences absent from the host/background genome(s) be large enough such that there is a reasonable probability that some of them will occur within the much smaller viral genome. New algorithms and data structures have been developed for the computation and storage of the distance (number of changes away) from the host/background sequence for each short *n*-mer at each position in the target pathogen genome. Two different data structures are used for the calculation of the distance: one for the host/background sequence(s) and one for the pathogen sequence [107].

4.2.1 Host Sequence: *Counting Array*

The host sequence is stored in a specialized structure called a *counting array*. This array consists of 4^n elements such that each of the 4^n *n*-mers corresponds to a particular element in the counting array *A* necessitating a procedure to convert the *n*-mer character sequence to the index of an element in *A*. Such an array can be thought of as the extreme case of the hash table and the procedure to convert the sequence to the index as the hash function. It is important to note that only one *n*-mer size can be considered at a time, e.g. all 16-mers can be considered at once but all 16- and 17-mers must be

considered separately. Algorithm 1 calculates how many different *n*-mers are present in text *T*.

```
Algorithm 1
NUMBER_OF_N-MERS_IN_TEXT (T,n)
    for i ← 0 to 4^n-1
        do A[i] ← 0
    sum ← 0
    for j ← 0 to length [T]-n
        do index=CONVERT_TO_INTEGER_VALUE (T(j,j+n-1))
            if A[index]=0 then
                    sum ← sum+1
                    A[index]=1
    return sum
```

In this algorithm, ($T(j1,j2)$) stands for the substring of the string *T* starting in position j_1 and ending in the position j_2. The function CONVERT_TO_INTEGER_VALUE(*s*) is needed to convert string *s* of length *n*, which in this example is created using a 4 character alphabet (A, T, C, and G), to a unique integer value corresponding to an index in the array *A*. If each character of this alphabet is assigned values from 0-3, each string can be interpreted as an integer value in a base-4 number system. Using a naïve algorithm this function can be implemented to have an estimated runtime of $O(n)$. Because only 2 bits are needed for each character and the text *T* is read sequentially, so that each string $T(j_1,j_2)$ already contains *n*-1 elements of the next one ($T(j_1+1, j_2+1)$, the function CONVERT_TO_INTEGER_VALUE(*s*) can be executed in $O(1)$ time through the use of simple binary shift operations. The overall running time estimation for Algorithm 1 is then $O(4^n+m)$. Practically, if both text *T* and the counting array *A* can be placed in memory it takes only seconds on a regular PC to calculate.

Due to the size necessary to create the counting array *A*, the primary concern with Algorithm 1 is memory consumption. The size of *A* is dependent upon two factors: *n* and the characteristics of the problem. If the problem is refined to determining the presence/absence of each particular *n*-mer, only 1 bit is needed for each element denoting if the pattern has already appeared in the text [example—yes=1, no=0]. When considering the presence/absence of 17-mers, the counting array requires 4^{17} bits = 17,179,869,184 bits = 2 GB. While this size of RAM can be allocated on practically any PC or workstation, large values of *n*, say 20 in length, cannot. Table 3.1 illustrates the minimum RAM required for different values of n.

n	**Minimum RAM**
16	512 MB
17	2 GB
18	8 GB
19	32 GB
20	128 GB
21	512 GB
22	2 TB

Table 4.1 Minimum RAM required for calculating host-blind sequence of size *n*.

If the required memory is not available or inconvenient, the counting array can be decomposed following a simple divide-and-conquer strategy. The *n*-mer is divided into two parts: a *prefix* of size n_1 and *suffix* of size n-n_1. The counting array *A* then tracks the appearance of (n-n_1)-mers in the suffixes and summarizes results for all prefixes as is shown in Algorithm 2.

Algorithm 2

```
NUMBER_OF_N-MERS_IN_TEXT_2 (T,n,n1)
sum ← 0
for prefix ← 0 to 4^n1-1
    for i ← 0 to 4^(n-n1)-1
        do A[i] ← 0
    for j ← 0 to length [T]-n
        if (prefix=CONVERT_TO_INTEGER_VALUE (T(j,j+n1-1)) then
            index=CONVERT_TO_INTEGER_VALUE (T(j+n1,j+n-1))
            if A[index]=0 then
                sum ← sum+1
                A[index]=1
return sum
```

The operation count of algorithm 2 is $O(4^{n1}(4^{n-n1} + m)) = O(4^n + 4^{n1}m)$. In fact, in the case mentioned above, if the available computer has more than 2Gb RAM, which means it can handle an array A necessary to keep track of 17-mers, it takes approximately 4 times longer to count all 18-mers and 64 times longer to count all 20-mers. It is important to note that in this algorithm increasing the prefix size n1 causes an exponential increase of the run time. Table 4.2 lists the minimum amount of RAM required for creating the counting array when using prefixes. Table 4.3 lists the increase in time to be expected for a given requested amount of RAM due to the implementation of prefixes. Using Algorithm 2, the number of 20-mers in the *Yersinia pestis* CO92 genome can be calculated in less than a minute on a 2 GHz CPU and all 20-mers for human genome (all chromosomes) takes less than one hour.

	Prefix Value (Nucleotide)				
n	**0**	**1**	**2**	**3**	**4**
16	512 MB	128 MB	32 MB	8 MB	2 MB
17	2 GB	512 MB	128 MB	32 MB	8 MB
18	8 GB	2 GB	512 MB	128 MB	32 MB
19	32 GB	8 GB	2 GB	512 MB	128 MB
20	128 GB	32 GB	8 GB	2 GB	512 MB
21	512 GB	128 GB	32 GB	8 GB	2 GB
22	2 TB	512 TB	128 GB	32 GB	8 GB

Table 4.2 Minimum RAM required for calculating host-blind sequences of size *n* for a given prefix size

n	**RAM**	**1GB**	**2GB**	**4GB**	**8GB**	**16GB**
16	512 MB	t	t	t	t	t
17	2 GB	$4t$	t	t	t	t
18	8 GB	$16t$	$4t$	$4t$	t	t
19	32 GB	$64t$	$16t$	$16t$	$4t$	$4t$
20	128 GB	$256t$	$64t$	$64t$	$16t$	$16t$
21	512 GB	$1024t$	$256t$	$256t$	$64t$	$64t$
22	2 TB	$4096t$	$1024t$	$1024t$	$256t$	$256t$

Table 4.3 Relative increase in computational time due to unavailability of RAM through the use of prefixes (listed in Table 4.2)

At the same time, because the algorithm can be easily parallelized (for example, using the for loop of prefix in line 2 of Algorithm 2), the required run time can be essentially linearly decreased by increasing the number of processors. For instance, the calculation of 18-mers which requires 8GB of RAM to create the counting array without the use of prefixes (as indicated in Table 4.3) can be done in time t rather than $4t$ if four processors each with at least 2GB of available RAM are used. Such scaling makes the large-scale application of this algorithm very attractive.

4.2.2 Pathogen Sequence: *BG_Distance*

The sequence of interest (pathogen) can also be kept in a counting array. This array; however, is not a suitable solution for this particular problem because the host genome is most often significantly, on the order of many magnitudes, longer than the pathogen sequence. To find sequences which are likely not to occur in the host genome, *n*-mers of length *n* where the length of the hosts genome (M_h) is less than the total number of possible *n*-mers, $M_h < 4^n$ must be explored. Because the length of the pathogen genome (M_p) is significantly smaller for these greater values of *n*, $4^n >> M_p$, the majority of *n*-mers are simply absent in the pathogen genome, creating an array *A* primarily occupied by zeros. Significant amounts of memory would thus be devoted to storing zeros which provide no information. Thus, a second data structure, BG_Distance (Figure 4.4), has been created to store the pathogen sequence and its distance from the background or host. It is essential to minimize the amount of memory needed by the BG_Distance data structure because the large amount of memory that is consumed by the counting array of the host genome.

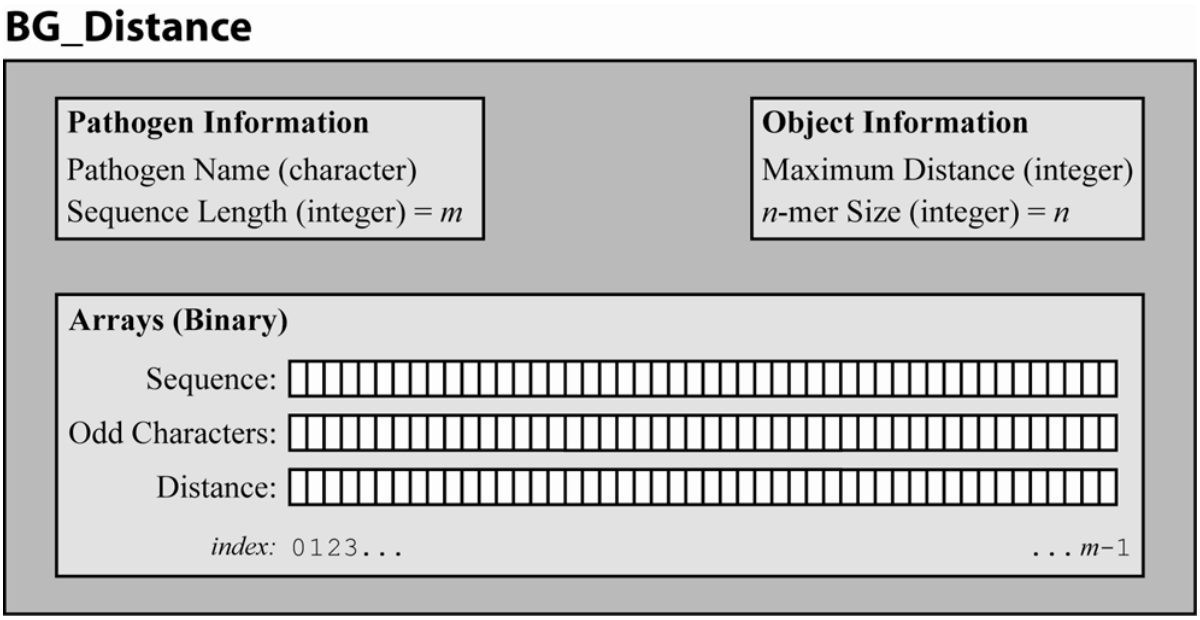

Figure 4.4 BG_Distance Object.

The BG_Distance class contains three arrays: the host sequence, information about odd characters (characters other than A, T, C, and G), and the distance of each *n*-mer from the host/background sequence(s). Once again, each character of the pathogen sequence is assigned values from 0 to 3, such that each *n*-mer can be interpreted as integer value in a base-4 number system. Thus, for a pathogen sequence of length M_p, $M_p/4$ bytes are needed to store the pathogen sequence as opposed to $2^* M_p$ bytes which would be needed if the sequence were to be stored as characters rather than bits. An additional array is included in the BG_Distance class which stores the position of any odd characters in the pathogen sequence; *n*-mers containing are not considered present and their distance from the host genome is not calculated. Rather than store a list of integer values signifying the positions in a sequence containing odd characters, an array of M_p bits is introduced. If the sequence at position *i* is an odd character, the value of the odd

character array at index *i* is set to 1. Because the sequence array is based on just 4 characters, the actual character assigned to the sequence array at position *i* will be one of the four bases. The odd character array's value of 1 will signify that the base seen in the sequence array at that position is not valid. If the sequence at position *i* is a valid nucleotide, an A, T, C, and G, the value of the odd character array at index *i* is 0. By storing the odd character positions as a bit array, it is possible to quickly assess if the *n*-mer being considered is an odd character by referring to the value of the array at the index position.

Lastly, an array of the distances for each *n*-mer from the host/background sequence(s) is contained within the BG_Distance object. Once again, a binary representation of integer values is used. This decreases the amount of memory needed to store the information. The maximum distance an *n*-mer can be accurately measured from the host/background sequence is dependent upon the number of bits allocated for each element of this distance array. Thus, the distance array necessitates M_p*b bits of memory. The distance each *n*-mer is from the host/background sequence is stored at the ith position of the array where the nucleotide at the ith position is the first nucleotide of the *n*-mer sequence. Figure 4.5 is a black screen representation of the data stored within the BG_Distance data structure when considering 16-mers present in a given target (e.g. virus) genome and absent from a given host (e.g. human) genome. For each 16-mer within the sequence, the distance from the host sequence is stored. In the first row labeled by its position 10560 in the sequence, the 16-mer starting with the g (ggttatgaaggcccct) is 2 (as the number below this first 'g' reports) nucleotide base

changes away from presence in the host genome. Since in this example, 16-mers are under consideration, the last 15 nucleotides (in red boxes) cannot be the first nucleotide in any 16-mer sequence. Their distance is then automatically set to 0. Likewise, if an *n*-mer contains an unknown character, its distance is also set to 0.

```
10560   ggttatgaaggcccctggctttggccaggagggggagagggaaaattggcattccctct
        2221112222222221112221111111121111112212211112221221122222211

10620   caggagatttcctccccctacaactaaatttccccctgccatgcagggggggcggttctt
        1122221111221211111111111222222222112222222221222100000000000

10680   gttct
        00000
```

Figure 4.5 Sequence and Distance Array.

The BG_Distance data structure also stores the name of the pathogen sequence, the length of the sequence, the *n*-mer size being considered and the maximum distance being measured so that it is easy to generate statistics on the pathogen sequence. To determine the number of *n*-mers in the sequence for each distance, the distance array must be scanned only once and the dth counter incremented when the distance is d. In the example of Figure 4.6, the maximum distance which can be counted with accuracy is 3 (d_max), thus *n*-mers can be assigned a distance of 0 changes away from the host (or present in the host), 1 change away from the host, 2 changes away from the host, 3 changes away from the host, or 4 signifying more than 3 changes away from the host genome. In Figure 4.6, the pathogen Alkhurma virus genome is 10,685 bases long. The number of 16-mers present in the viral sequence that are also present in the host with a

distance of 0 is 270 (including the last 15 bases which automatically have a distance of 0). 5,502 16-mers require 1 genomic change, 4,907 require 2 genomic changes, and 6 16-mers require 3 changes. All 16-mers present in the Alkhurma sequence are present in the host if 4 or more genomic changes are made.

```
BG_Distance Statistics:
Alkhurma virus, complete genome
n_elements=10685
n_mer_size=16           d_max=3
Number of n-mers with distance0 = 270
Number of n-mers with distance1 = 5502
Number of n-mers with distance2 = 4907
Number of n-mers with distance3 = 6
Number of n-mers with distance4 = 0
```

Figure 4.6 Statistics which can be derived from the BG_Distance data structure.

4.2.3 Algorithm for Computing Distance

The distance of each *n*-mer can be calculated once the counting array containing the host sequence has been instantiated and the BG_Distance has been instatiated to contain the pathogen sequence array and unknown character array. For each *n*-mer of the pathogenic sequence, the integer value of the *n*-mer is calculated using the previously mentioned CONVERT_TO_INTEGER_VALUE (T (j, j+n_1-1)) function call. If the value of the counting array A at this integer index value is 1, the *n*-mer contained in the pathogen genome is also contained in the host genome. Thus, the distance of this *n*-mer is 0 and a 0 is inserted for this *n*-mer into the distance array. In the event that

A[index]=0, the *n*-mer is present in the pathogen sequence but not present in the host/background sequence.

An *n*-mer does not occur in the host/background sequence(s), genomic changes at all possible positions of the sequence are then considered – first one base change, then any two base changes, then any three base changes, etc. As is described in Algorithm 3, each number of changes is considered sequentially (line 4).

<u>Algorithm 3</u>

```
CALCULATE_DISTANCES (S, n, d_max)
1   dist ← 0
2   index=CONVERT_TO_INTEGER_VALUE (S)
3   if A[index]=0 then
4       for i ← 1 to d_max
5           for j ← 0 to 3*(n-i)
6               S_new=ENUMERATE_NEW_NMERS (S, i, j)
7               index=CONVERT_TO_INTEGER_VALUE (S_new)
8               if A[index]=1 then
9                   dist=i
10      if dist=0 then
11          dist=d_max+1
12  return dist
```

For a sequence *S* of length *n*, there are 3*n* possible *n*-mers which can be derived by changing only one base. Two changes results in 3*n**3(*n*-1) possible *n*-mers. Thus there are $\prod_0^c 3(n-c)$ possible *n*-mers which can be derived from a single *n*-mer *S* given *c* base changes. The function in Algorithm 3 ENUMERATE_NEW_NMER (*S*, *i*, *j*) determines the next *n*-mer to be derived from the sequence *S*. This is determined based upon the sequence itself, the minimum/maximum number of changes being considered

when the function is called, *i*, and the number of times this function has been called *j* (to insure a new *n*-mer is being enumerated). Because the sequence is stored bitwise, generating the *n*-mers which can be made given a particular number of changes can be done by bit shifting and manipulating the bits. For each of these possible *n*-mers, the integer value of the sequence is calculated and the value of the counting array *A* at this index is referenced. If any of the derived *n*-mers given a base change or base changes *c* has a value of 1, the *n*-mer *S* can be converted to an *n*-mer in the host sequence given *c* changes. Thus the distance of *S* from the host sequence is *c*. Once the distance is determined for a particular *n*-mer *S*, subsequent changes do not need to be checked. In other words, if any *n*-mer is one change away from occurring in the host sequence, it is not necessary to enumerate all derivatives of *S* with two base changes, three base changes, etc. An illustration of this process is shown in Figure 4.7.

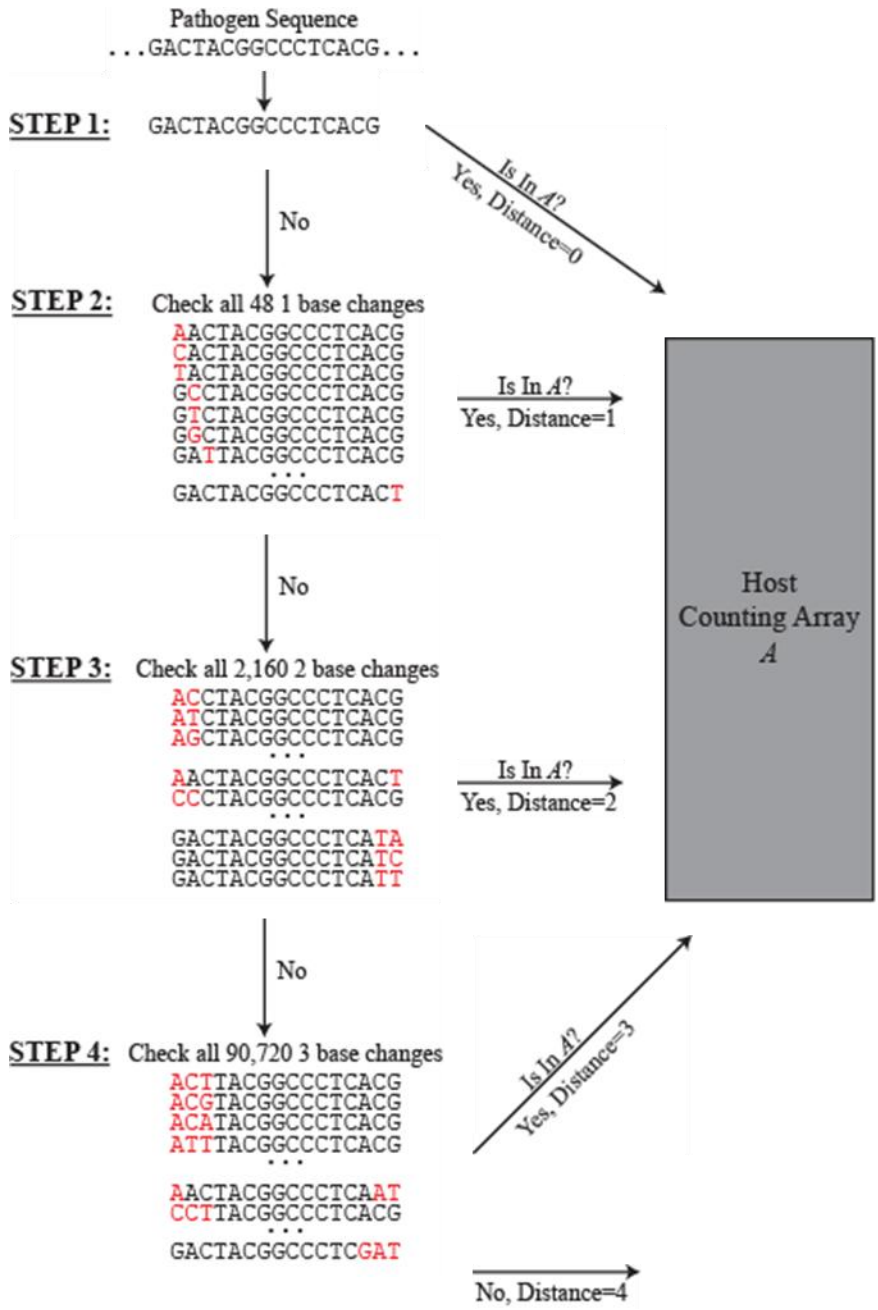

Figure 4.7 Calculation of the distance of a particular *n*-mer.
Nucleotides in red signify the point of mutation being considered.

In practice, the inner for loop of Algorithm 3 has been condensed into function calls to verify the distance for 1 change, 2 changes, and 3 changes from the host

sequence(s) improving the efficiency of the implementation. The code below is the function for determining if a certain *n*-mer (represented by its bit value i) with a length of n_mer_size is present in the host sequence given all one possible nucleotide changes.

```
Is_in_1change(UINT64 I, unsigned int n_mer_size)
{
      UINT64 j;
      UINT64 t, t1, t2;
      unsigned char value=0;

      for(j=0; j<n_mer_size; j++)
      {
         t1=i;
         t1=t1<<(62-(j<<1));
         t1=t1>>62;
         t1=t1<<(j<<1);
         t2=ONE<<(j<<1);
         t=i-t1;
         for(UINT64 k1=0; k1<4; k1++)
         {
            get_value(t+k1*t2,value);
            if(value!=0)return true;
         }
      }
      return false;
}
```

4.2.4 Using the Distances to Select Primers/Probes

The greater number of changes necessary to “convert” such a host-blind sequence to a sequence found in the host genome, the less likely the host-blind sequence, when used as a primer/probe, is to mispair with the host’s genomic sequence (Figure 4.8).

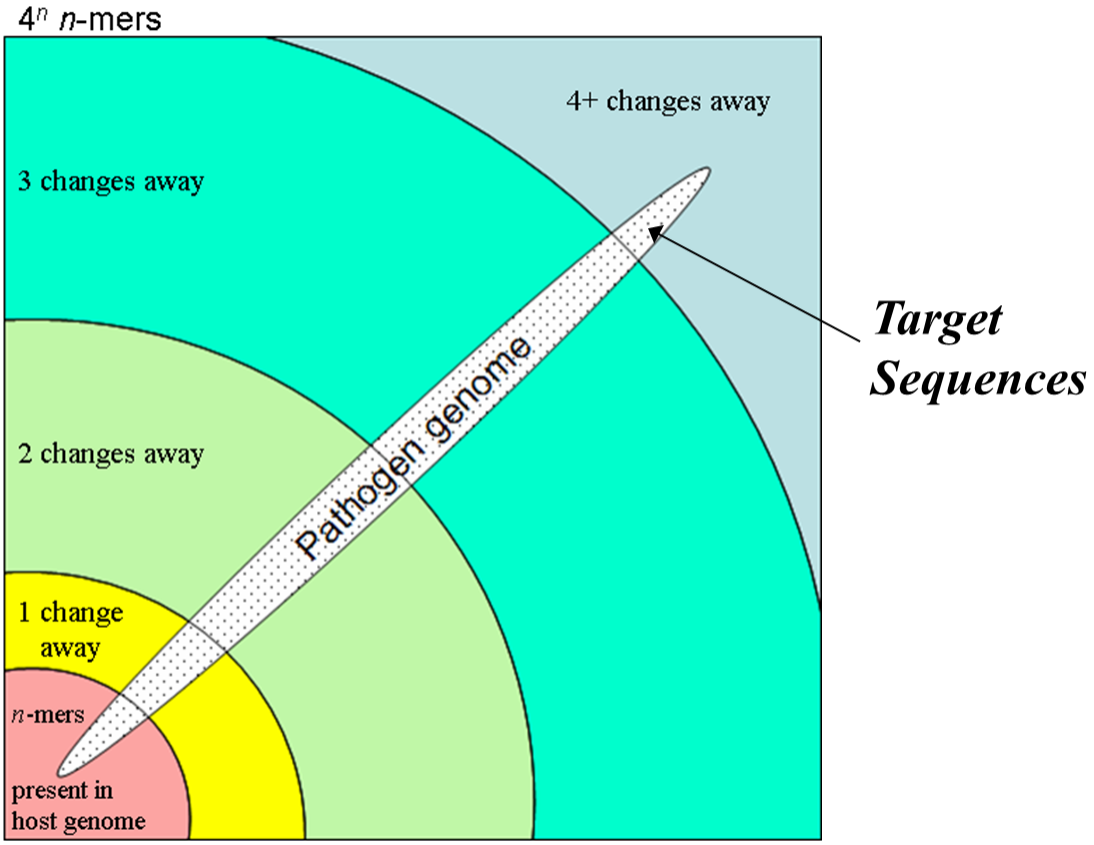

Figure 4.8 Sequences ideal for use as primers/probes are those sequences most distant from the host genome.

Thus, once the distances have been assigned to all *n*-mers contained within a pathogenic sequence, primers/probes can be selected to identify the pathogenic DNA/RNA in the presence of the host and/or background DNA(s). Sequences can be selected by scanning the distance array and selecting only those *n*-mers with a distance greater than a specific threshold. The sequences selected are specific to the particular pathogenic sequence and the particular host/background sequence(s).

4.2.5 Ultra-specific Genomic Islands (USGI)

DNA signatures are nucleotide sequences that can be used to detect the presence of an organism and to distinguish that organism from all other species. To increase the specificity of host-blind signature, it is ideal to insure that the subsequences within a signature sequence are also host-blind. Here we describe a new computational approach for the rapid identification of ultra-specific genomic islands that can be used as signatures in the genomes of bacteria and viruses. With the hundreds of complete bacterial and viral genome sequences publicly available from NCBI [19], it is now possible to use computational methods to identify genomic islands in all of these species, and to use these islands as potential signatures for diagnostic assays to detect and genotype pathogenic microbes in both environmental and clinical samples. An example of where this approach was successfully tested is when we sought to identify unique ultra-specific genomic islands used as signatures conserved across 2009 H1N1 sequences obtained early during the pandemic (as of July 2009); and to evaluate whether such signature sequences could be used to design highly specific gene-specific primers to diagnose the pandemic 2009 H1N1 virus [2].

This new computational approach for identifying ultra-specific genomic islands can be used for signature selection that make it possible to efficiently calculate the frequency of all subsequences (*n*-mers) of varying lengths (6-22+ nucleotides) in any sequenced genome within a few hours depending on the size of the genome(s). This allows exclusion of all subsequences that are present in a selected host/background genome (i.e., human, near-neighbor species) in the signature design step with greatly

increased speed, predictability and effectiveness compared to current alignment-based design methods. Sequences that are present in the genome of interested and absent from the host genome are referred to as being host-blind. The greater the number of changes necessary to convert such host-blind sequences to a sequence found in the host genome, the less likely the host-blind sequence, when used as a signature, is to misalign with the host's genomic sequence. Sequences that are host-blind with one, two, three or more changes away from the nearest host sequence are referred to as being ultra-specific genomic sequences. When adjacent ultra-specific genomic sequences are combined, they are considered to be islands. By combining the algorithms and data structures it is possible to identify ultra-specific signature islands that can be used as candidate signatures with greater sensitivity and specificity than existing methods.

Likewise, short host-blind sequences can be used to create longer more specific signatures. This allows one to design even more robust and specific (blind to the background) pathogen signatures of virtually any length without increasing the amount of memory needed to consider greater values of n. In doing so, it is possible to design genomic signatures to be not only blind (several mismatches away) from the host/background, but also make sure that every subsequence of particular length present in the signature is also significantly blind to the background (Figure 4.9).

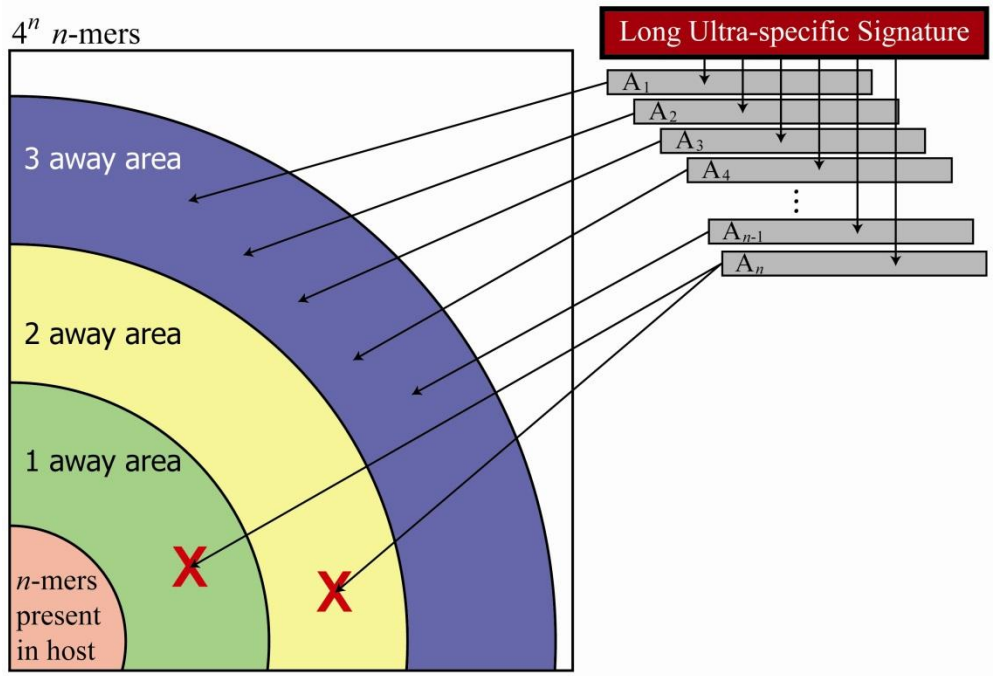

Figure 4.9 Ultra-specific Genomic Islands.
A1-An represent all subsequences of a particular size which are present within the longer signature

4.3 Performance Evaluation

Comparing to existing algorithms that precompute the pattern, the proposed approach has a significantly shorter execution time. When using counting arrays it takes $O(1)$ to retrieve the presence/absence information of an *n*-mer once the counting array has been populated. In comparison to algorithms that precompute the text, the counting array uses memory much more efficiently as each element in the counting array takes only 1 bit. The proposed approach takes advantage of the efficient search time of precomputing the text and avoids the heavy memory consumption by using a counting array data structure. Furthermore, by introducing prefixes, memory requirements can easily be adjusted to accommodate the RAM available on any machine. It allows computations of large *n*-mer sizes on standard desktop PCs or workstations, which is previously impossible, in a reasonable time. The computational time and memory complexity of exact analysis of a set of *t* patterns of size *n* in a set of *b* texts, each of size m_b are summarized in Table 4.4.

Algorithm	Memory Complexity	Time Complexity	
		Initialization	Search
Counting Array	$O(4^n)$	$O\left(4^n + \sum_{i=1}^{b} m_b\right)$	$O(tn)$
Precomputing the Text	$O\left(\sum_{i=1}^{b} m_b\right)$	$O\left(n\sum_{i=1}^{b} m_b\right)$	$O(btn)$
Precomputing the Pattern	$O(tn)$ or $O(t)$	$O(tn)$	$O\left(tn\sum_{i=1}^{b} m_b\right)$

Table 4.4 Comparison between counting array and alternative algorithms in terms of computational time and memory complexity.

CHAPTER 5

USGI APPLICATION FOR 2009 H1N1 (MEXICAN) INFLUENZA OUTBREAK SPECIFIC SIGNATURES

The emergence and rapid spread of the 2009 H1N1 pandemic influenza left many diagnostic tests unsuitable for detecting the novel virus isolates. In most countries the probe-based TaqMan assay developed by the United States Centers for Disease Control and Prevention was used for diagnostics. The substantial sequence data that became available during the course of the pandemic created the opportunity to utilize bioinformatics tools to evaluate the unique sequence properties of this virus for the development of diagnostic tests. We used a comprehensive computational approach to examine conserved 2009 H1N1 sequence signatures that are at least 20 nucleotides long and contain at least 2 mismatches as compared to any other known H1N1 genome. We found that the Hemagglutinin (HA) and Neuraminidase (NA) genes contained sequence signatures that are highly conserved among 2009 H1N1 isolates. Based on the NA gene signatures we used Visual-OMP to design primers with optimal hybridization affinity and used ThermoBLAST to minimize amplification artifacts. This procedure resulted in a highly sensitive and discriminatory 2009 H1N1 detection assay. Importantly, we found that the primer set can be used reliably in both, a conventional TaqMan and a SYBR Green RT-PCR assay with no loss of specificity and sensitivity. We validated the diagnostic accuracy of the NA SYBR Green assay with 125 clinical specimens obtained between May and August of 2009 in Chile, which showed comparable diagnostic

efficacy as the CDC assay. Our approach highlights the use of systematic computational approaches to develop robust diagnostic tests during a viral pandemic.

5.1 Viral Sequence Collection

All influenza genomic sequences including types A, B, and C that were available as of July 20, 2009 were downloaded from GenBank (Table 5.1).

Segments[a]	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**TOTALS**
Type A	6,724	6,732	6,705	10,744	6,967	10,449	8,610	7,908	**64,839**
Type B	371	369	372	2,739	389	1,071	395	499	**6,205**
Type C	90	88	88	138	87	108	123	0	**722**
TOTALS	**7,185**	**7,189**	**7,165**	**13,621**	**7,443**	**11,628**	**9,128**	**8,407**	**71,766**

Table 5.1 Influenza A, B, C genomic sequences per segment used in sequence analysis.
[a] Downloaded from GenBank on July 20, 2009.

For clarity and ease in subsequent analyses, the type A influenza sequences were grouped into sub-groups based on known serotypes (Table 5.2).

Segments[a]	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**TOTALS**
H1N1 (old)	1066	1065	1053	1881	1132	1930	1294	1123	**10544**
H1N1 (2009)	268	268	258	234	341	314	425	311	**2419**
H3N2	1989	2000	1971	3019	2136	3373	2675	2169	**19332**
H2N2	101	96	101	89	104	118	105	110	**824**
H5N1	1211	1183	1223	2192	1259	1766	1437	1493	**11764**
H6N1	80	85	85	168	82	170	158	159	**987**
H9N2	262	257	263	775	321	687	679	672	**3916**
Others	1747	1778	1751	2386	1592	2091	1837	1871	**15053**
TOTALS	**6724**	**6732**	**6705**	**10744**	**6967**	**10449**	**8610**	**7908**	**64839**

Table 5.2 Influenza A sequences per segment used in sequence analysis.
[a] Influenza viruses downloaded from GenBank on July 20, 2009 grouped by serotypes.

To confirm that the signature sequences identified using the July 20, 2009 data collection were still conserved; we extended the collection to all influenza genomic sequences available from GenBank as of April 30, 2010. In addition, to avoid misidentifying non-flu virus sequences during the data analysis, an additional 23 sequences of viruses that produce symptoms similar to those of influenza virus infections and that were available on July 20, 2009 were also added to our sequence database (Table 5.3).

GenBank Accession Number	**Virus**[a]
NC_001405	Human adenovirus C
NC_001428	Human enterovirus C
NC_001430	Human enterovirus D
NC_001454	Human adenovirus F
NC_001460	Human adenovirus A
NC_001472	Human enterovirus B
NC_001490	Human rhinovirus B
NC_001612	Human enterovirus A
NC_001617	Human rhinovirus 89
NC_001781	Human respiratory syncytial virus
NC_001796	Human parainfluenza virus 3
NC_002645	Human coronavirus 229E
NC_003266	Human adenovirus E
NC_003443	Human parainfluenza virus 2
NC_003461	Human parainfluenza virus 1
NC_004148	Human metapneumovirus
NC_005147	Human coronavirus OC43
NC_005831	Human coronavirus NL63
NC_006577	Human coronavirus HKU1
NC_006879	Simian adenovirus 1
NC_009887	Human enterovirus 100
NC_010646	Coronavirus SW1
NC_011202	Human adenovirus B2

Table 5.3 Sequences of viruses presenting similar symptoms to influenza used for background validation of sequence signatures.
[a] Viruses that have clinical symptoms defined as Influenza like illness.

5.2 Design Approach and Bioinformatics Analysis

Target sequences are defined as the set of sequences of interest (i.e. the 2009 pandemic H1N1 isolates). In contrast, background sequences are defined as all other sequences in the collection that are not part of the target set (including seasonal H1N1 variants from previous years and other influenza strains). Table 5.4 shows the original list of sequences (downloaded on July 20, 2009) used as a target or background in each case.

Signature Target		**Signature Background**	
Virus Sequences	**Number of Sequences (All Segments)**	**Virus Sequences**	**Number of Sequences (All Segments)**
Previous H1N1[a]	10,544	Type A,B,C and viral sequences (excluding Previous H1N1)	61,245
2009 H1N1	2,419	Type A,B,C and viral sequences (excluding 2009 H1N1)	69,370
H3N2	19,332	Type A,B,C and viral sequences (excluding H3N2)	52,457

Table 5.4 List of sequences used as target or background sequences for signature analysis.
[a] All other H1N1 sequences that are not 2009 H1N1, as obtained from GenBank on July 20, 2009.

The analysis was re-validated with an updated list of sequences used as a target or background downloaded on April 30, 2010. All computational analysis was completed using a collection of in house software developed at the University of Houston Center for BioMedical and Environmental Genomics (CBMEG) with the assistance of the publicly available BioEdit alignment software in both Windows and Linux environments. The identification of signature islands was completed using an SGI Altix 3700 cluster running SUSE Linux Enterprise 10 with approximately 60 125 1.3GHz Itanium2 processors and 512GB RAM running as a single system image. The first step used for finding sequence

signatures specific to the target, the 2009 H1N1 virus, was to identify all regions of a given length (i.e. subsequences) that are conserved in the target set. The second step is to check the conserved sequences to confirm that they are not found in the background set with required number of mismatches (all possible combinations of insertions, deletions, and substitutions for all possible positions). We performed rigorous analysis of all signature sequences of lengths ranging from 16 to 22 nucleotides. Generally, shorter lengths produce more target signatures with fewer background mismatches, while longer lengths produce fewer target signatures with more mismatches in the background. The results (not shown) indicated that a length of 20 nucleotides produced the desired balance between the quantity and quality of signatures obtained with at least 2 or more mismatches. Further analysis confirmed that only segment 4 and segment 6 were sufficient in this approach to design a signature specific to the 2009 H1N1 pandemic influenza subtype (Table 5.5).

Signature Target	**Number of Sequences**	**Number of Subsequences Blind to Background (Blind Sequences)**	**Number of Unique Blind Sequences (Unique Sequences)**	**Number of Unique Sequences Conserved Across >= 200 Sequences (Potential Signatures)**	**Signature Nucleotide Length (Min/Max)**
2009 H1N1 Segment 4	234	234	73	14	20/38
2009 H1N1 Segment 6	314	225	86	28	20/57

Table 5.5 Number of sequence signatures identified for the H1N1 (2009) primer design.

Once the signature sequences were identified, those that were next to each other were grouped into signature islands extending beyond 20 nucleotides. A total of 42 islands were identified in segments 4 and 6. These 42 islands were later re-validated using additional influenza sequences (collected on April 30, 2010) to confirm that they are still conserved across the set of target sequences and still composed of sequences with 2 or more mismatches away from the background.

5.3 Primer and Probe Design

The primers and fluorescent probe for the SYBR Green and TaqMan assays for the NA gene of 2009 H1N1 were designed using Visual OMP and ThermoBLAST software (DNA Software Inc, Ann Arbor, MI). We decided to focus our primer design on the longest signature sequence islands (57 and 55 nucleotides long) found in the NA gene of segment 6 that were identified using the bioinformatics approach outlined above. We selected these long signature islands since they allow flexibility in choosing the length and position of primer sequences. By chance, the two islands happen to be 49 nucleotides apart and thus are amenable to producing an appropriately sized amplicon to allow for efficient amplification for real-time PCR using either SYBR Green or TaqMan probe. Candidate primers and probes of varying lengths within the signature islands of the NA gene of 2009 H1N1 were automatically generated by utilizing Visual OMP. Next, primer pairs were assembled from the candidate lists for reverse and forward

primers so that they match in hybridization affinity to ensure efficient amplification of sense and antisense target strands [108].

5.4 Validation

To ensure specificity, the best candidate primer and probe sets were then scanned against a series of sequence databases using the ThermoBLAST algorithm [108]. ThermoBLAST also automatically identifies all potential false amplicons, which are a source of background and false positive PCR assays. The first databases used by ThermoBLAST are listed in Tables 5.1 and 5.2. The results were used to select the primer and probe set that is most specific and only amplifies 2009 H1N1. The ThermoBLAST experiments provided an additional check ensuring compatibility with all the original 314 H1N1 2009 NA genomes (Table 5.2) that are intended to be amplified by these primers. Lastly, ThermoBLAST was also used to verify that the designed primers would not produce false amplicons due to the genomes of 23 common respiratory tract flora and pathogens [109] and 22 gut flora (Tables 5.6 and 5.7, respectively) and the human genome, which would result in potential false positive assays or decreasing assay sensitivity by the presence of background amplification.

GenBank Accession Number	Organism
NC_002929	Bordetella pertussis Tohama I
NC_011728	Borrelia burgdorferi ZS7
NZ_AACQ00000000	Candida albicans SC5314
NC_005043	Chlamydophila pneumoniae TW-183
NC_002935	Corynebacterium diphtheriae NCTC 13129
NC_003454	Fusobacterium nucleatum subsp. nucleatum ATCC 25586
NC_009567	Haemophilus influenzae PittGG
NC_011283	Klebsiella pneumoniae 342
NC_009648	Klebsiella pneumoniae MGH 78578
NC_012731	Klebsiella pneumoniae NTUH-K2044
NC_000912	Mycoplasma pneumoniae M129
NC_000962	Mycobacterium tuberculosis H37Rv
NC_013016	Neisseria meningitidis alpha14
NC_008024	Streptococcus pyogenes MGAS10750 chromosome
NC_009656	Pseudomonas aeruginosa PA7
NC_009632	Staphylococcus aureus subsp. aureus JH1
NC_009782	Staphylococcus aureus subsp. aureus Mu3
NC_004461	Staphylococcus epidermidis ATCC 12228
NC_013853	Streptococcus mitis B6
NC_013928	Streptococcus mutans NN2025
NC_003028	Streptococcus pneumoniae TIGR4
NZ_ACLO00000000	Streptococcus salivarius SK126
NZ_ACYH00000000	Treponema vincentii ATCC 35580

Table 5.6 Genome sequences for respiratory tract flora and pathogens used in ThermoBLAST to check primer and probe sequence designs for hybridization that could cause false positive tests.

GenBank Accession Number	Organism
NC_003228	Bacteroides fragilis NCTC 9343
NC_004663	Bacteroides thetaiotaomicron VPI-5482
NC_009614	Bacteroides vulgatus
NC_008618	Bifidobacterium adolescentis ATCC 15703
NC_011835	Bifidobacterium animalis subsp. lactis AD011
NC_012814	Bifidobacterium animalis subsp. lactis Bl-04
NC_012815	Bifidobacterium animalis subsp. lactis DSM 10140
NC_004307	Bifidobacterium longum NCC2705
NC_010816	Bifidobacterium longum DJO10A complete genome.
NC_008226	Clostridium difficile 630 plasmid pCD630
NC_013316	Clostridium difficile R20291
NC_009778	Cronobacter sakazakii ATCC BAA-894 chromosome
NC_009436	Enterobacter sp. 638
NC_004668	Enterococcus faecalis V583
NC_012759	Escherichia coli BW2952
NC_006814	Lactobacillus acidophilus NCFM
NC_010999	Lactobacillus casei BL23
NC_010609	Lactobacillus reuteri JCM 1112
NC_010729	Porphyromonas gingivalis ATCC 33277
NC_010554	Proteus mirabilis HI4320
NC_004631	Salmonella enterica subsp. enterica serovar Typhi str. Ty2
NC_002305	Salmonella typhi (antibiotic resistance plasmid)

Table 5.7 Genome sequences for gut flora and pathogens used in ThermoBLAST to check primer and probe sequence designs for hybridization that could cause false positive tests.

Primer sequences for amplification of segment 7 corresponding to the M gene, were obtained from CDC through the WHO website (http://www.who.int/csr/resources/publications/swineflu/sequencing_primers/en/index.html). The primer sequences were checked for consensus by alignment of all available H1N1 sequences in the GenBank database. The final set of primers and probes for all assays are shown in Table 5.8.

Primer/Probe	Seg (No.)	Sequence (5' - 3')	Position[a]	Refs.
2009 H1N1 NA Signatures[b]				
2009H1N1_NA-F	NA (6)	CAATTCAACTTGGGAATCAAAATCAGA	110-136	This study
2009H1N1_NA-R	NA (6)	CTGACTGTCCAGCAGCAAAGTT	217-238	This study
2009H1N1_NA-P	NA (6)	FAM-AGCGTCATTACTTATGAAAACAACACTTGGGT-BHQ1	154-185	This study
H1N1 M Consensus[c]				
InfA_M-F	M (7)	**TGTAAAACGACGGCCAGT**AGCAAAAGCAGGTAG[d]	1-15[c]	[c]
InfA_M-R	M (7)	**CAGGAAACAGCTATGACC**AGTAGMAACAAGGTAGT[d]	1011-1027[c]	[c]
CDC 2009 H1				
SW H1 Forward	HA (4)	GTGCTATAAACACCAGCCTYCCA	902-924	[6]
SW H1 Reverse	HA (4)	CGGGATATTCCTTAATCCTGTRGC	994-1017	[6]
SW H1 Probe	HA (4)	CAGAATATACA T-FAM CCRGTCACAATTGGARAA-BHQ1	928-957	[6]
2009 H1N1 N1				
panN1-sense	NA (6)	ACATGTGTGTGCAGGGATAACTG	865-887	[110]
panN1-antisense	NA (6)	TCCGAAAATCCCACTGCATAT	949-969	[110]
panN1-probe	NA (6)	FAM-ATCGACCGTGGGTGTCTTTCAACCA-BHQ1	899-923	[110]

Table 5.8 Conventional and quantitative RT-PCR primers and probes used for detection assays.

[a] Nucleotide position based on the sequence of A/California/04/2009 (H1N1), GenBank accession numbers FJ966082.1, FJ966084.1 and FJ966085.1 for segments 4, 6 and 7, respectively.

[b] NA specific primers designed based on signature sequences of the pandemic 2009 H1N1 influenza virus. Primers designed based on signature sequences of the 2009 H1N1 found when analyzed against background (see Materials and Methods for details).

[c] Genomic sequencing primers for the M gene obtained from CDC through the WHO (http://www.who.int/csr/resources/publications/swineflu/sequencing_primers/en/index.html).

[d] Bold nucleotides correspond to the M13 forward and reverse sequences incorporated to the 5' end of both forward and reverse primers, respectively.

5.5 High Specificity of a SYBR Green NA Specific Assay Based on Signatures

To establish whether the designed 2009 H1N1 NA gene signature primers allowed sufficient specificity to discriminate novel pandemic 2009 H1N1 strains from those of other H1N1 viruses previously circulating in the human population, we used a conventional RT-PCR to amplify representative H1N1 strains spanning from 1930 to the 2009 H1N1. Amplification of the expected product (129 bp) was only achieved for the 3 reference isolates (Mex09, Cal09 and Neth09) of pandemic 2009 H1N1 used. The signature primers did not amplify any of the previously circulating H1N1 strains nor the H3N2 strains used as negative controls (Figure 5.1A). A parallel experiment in which the same viral RNAs were subjected to RT-PCR with influenza strain generic primers to the full length M gene, showed the correct amplification product for all the virus strains, confirming that the NA signature primers are highly discriminating and only detect pandemic H1N1 isolates (Figure 5.1A). To evaluate the suitability of the primers in a real-time qRT-PCR assay without loss of specificity for the pandemic 2009 H1N1, we performed a SYBR Green one-step qRT-PCR assay with our panel of H1N1 virus strains and the H3N2 controls. The 2009 H1N1 NA signature primers showed high specificity for the 2009 H1N1 strains and no specific amplification of product for any of the other strains (Figure 1B). This was confirmed by a melting curve run at the end of the assay (Figure 5.1C), which only showed a corresponding curve for the 2009 H1N1 reference strains. A minor level of background amplification was observed for the negative samples on cycles 36-40 (Figure 5.1B). Altogether, these data validated the high level of specificity of the primers designed.

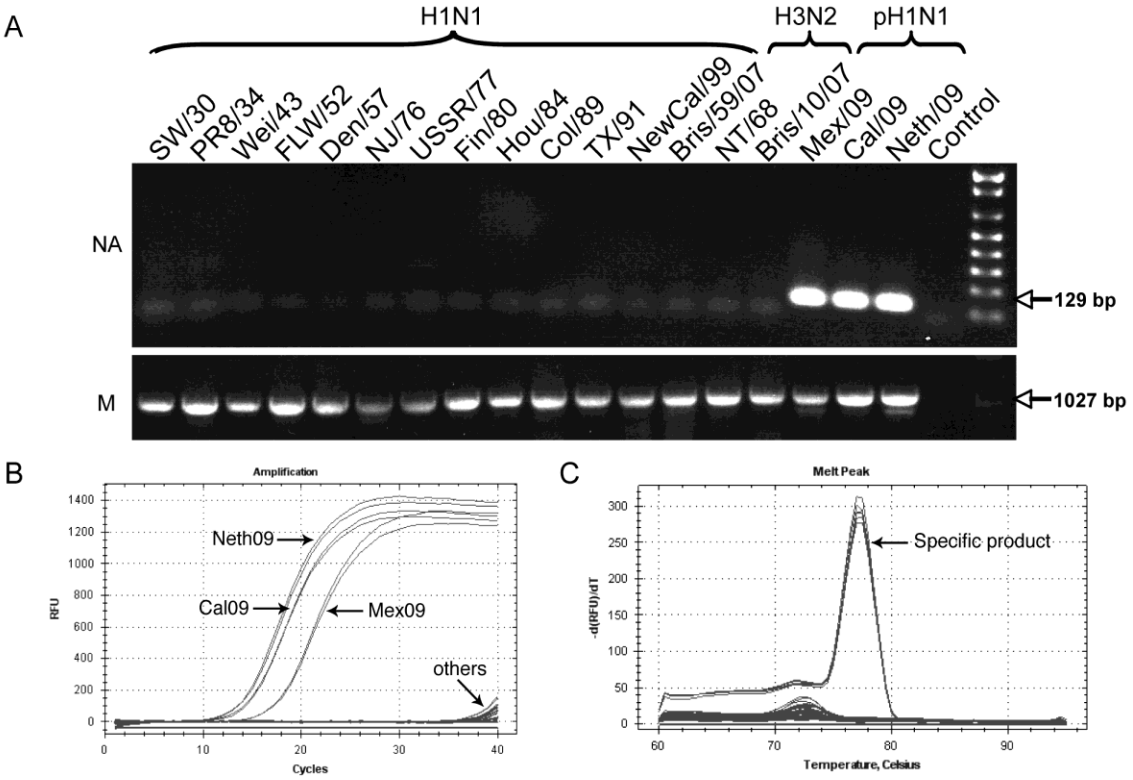

Figure 5.1 The experimental validation of the primers and probe set designed.

Overall, the data indicate that both the 2009 H1N1 NA signatures-SYBR Green and the TaqMan assays are highly sensitive and specific for use in clinical diagnosis of the 2009 H1N1 pandemic influenza virus. Thus, these data validate the significance of the combined ultra-specific signature islands computational approach in the wake of a pandemic, where sequence signatures were used to identify optimal regions to design specific and sensitive primers for establishing a reliable, accurate and robust qRT-PCR assay suitable for human clinical diagnosis of an important viral pathogen. Additionally, the availability of such highly sensitive 2009 H1N1 NA SYBR Green assay for influenza

diagnosis, provides a novel and cheaper alternative to the more expensive fluorescent probe-based assay, that could be widely used for human diagnosis, screening, and surveillance of pandemic 2010-2011 H1N1 influenza A viruses, particularly in underdeveloped regions of the world or in research and clinical settings with limited resources.

CHAPTER 6

CONCLUDING REMARKS

Bacterial and viral pathogens have always represented one of the greatest threats to human health, and in recent times this threat has increased due to the possibility of engineered biological agents. For these and other reasons, the genome sequencing field has targeted and sequenced the complete genomes of hundreds of bacteria and thousands of viruses over the past decade, making it possible to develop probe-based assays capable of identifying any of hundreds of organisms in environmental and clinical samples. As discussed in Chapter 2, such assays rely on detecting a DNA sequence that distinguishes the target organism from all other known bacteria and viruses and from background material, which could include DNA from humans, other animals, plants, or other species. This in turn demands nucleic acid-based diagnostic tools to have a decreased rate of false positives and true negatives with increased specificity and sensitivity. Though experimental validation is the most important step in the assay design process, it is also the most time consuming. Therefore, a well-designed computational method to select potential signature sequences for experimental testing is of highest importance. Even, as more computational techniques do become available, they are all based on the concept of sequence alignment. The computational complexity of these heuristic based alignment approaches discussed in Chapter 4 and an increase in the amount of sequence data available, unfortunately results in a less specific and sensitive assay.

Using the novel algorithms and data structures discussed in Chapter 4, it is possible to identify signature islands having an increased specificity and sensitivity needed for developing robust assays. By performing an exhaustive approach rather than the other heuristic-based methods, the run-time and memory usage could be slightly greater, though it is realistic to say that the computations could be performed on any workstation and easily accommodate any high performance computing machine. The higher quality signature sequences most distant from the host and/or background offer a degree of specificity far superior to the signatures designed by any of the existing techniques thus outweighing the increase in resource cost.

The experimental validation presented in Chapter 5 provides proof of the concept for this technology. Using a combination of comprehensive sequence databases, novel algorithms, in addition to using primer design tools, scanning tools for avoiding false positive amplicons, the design, development, and validation of a robust qRT-PCR assay to diagnose and distinguish the pandemic 2009 H1N1 influenza virus from other influenza strains performed experimentally as expected, hybridizing only in the presence of target organisms and not to the host or closely related organisms. By utilizing the algorithms and data structures presented to identify ultra-specific signature islands, bioinformatics tools can be established for improving current assays and the rapid development of future diagnostic tests in the scientific community.

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Appendix A

Data Set of Publicly Available Pandemic Influenza 2009 H1N1 (Segment 4) Sequences Considered

ACCESSION #	VIRUS NAME	ACCESSION #	VIRUS NAME	ACCESSION #	VIRUS NAME
AB505440	(A/Osaka/47/2009)	CY053277	(A/Brownsville/39H/2009)	CY063083	(A/California/VRDL89/2009)
AB514226	(A/Saitama/55/2009)	CY053285	(A/Brownsville/40OS/2009)	CY063091	(A/California/VRDL90/2009)
AB514227	(A/Saitama/43/2009)	CY053293	(A/Brownsville/43OS/2009)	CY063099	(A/California/VRDL91/2009)
AB530161	(A/Nagasaki/HA-4/2009)	CY053301	(A/Brownsville/43H/2009)	CY063107	(A/California/VRDL92/2009)
AB530249	(A/Nagasaki/HA-6/2009)	CY053309	(A/Brownsville/37OS/2009)	CY063115	(A/California/VRDL93/2009)
AB530461	(A/Nagasaki/HA-9/2009)	CY053338	(A/Beijing/718/2009)	CY063123	(A/California/VRDL96/2009)
AB530462	(A/Nagasaki/HA-10/2009)	CY053348	(A/Beijing/720/2009)	CY063131	(A/California/VRDL97/2009)
AB530463	(A/Nagasaki/HA-11/2009)	CY053353	(A/Beijing/721/2009)	CY063139	(A/California/VRDL98/2009)
AB530464	(A/Nagasaki/HA-12/2009)	CY053416	(A/Russia/149/2009)	CY063147	(A/California/VRDL99/2009)
AB530465	(A/Nagasaki/HA-13/2009)	CY053474	(A/Taiwan/143/2009)	CY063155	(A/California/VRDL100/2009)
AB530466	(A/Nagasaki/HA-14/2009)	CY053482	(A/Taiwan/156/2009)	CY063163	(A/California/VRDL101/2009)
AB530467	(A/Nagasaki/HA-15/2009)	CY053490	(A/Taiwan/167/2009)	CY063171	(A/California/VRDL102/2009)
AB530468	(A/Nagasaki/HA-16/2009)	CY053498	(A/Taiwan/177/2009)	CY063219	(A/Wisconsin/629-D01351/2009)
AB530469	(A/Nagasaki/HA-17/2009)	CY053506	(A/Taiwan/206/2009)	CY063227	(A/Wisconsin/629-D00675/2009)
AB530470	(A/Nagasaki/HA-18/2009)	CY053619	(A/swine/Italy/290271/2009)	CY063235	(A/Wisconsin/629-D02442/2009)
AB530471	(A/Nagasaki/HA-22/2009)	CY053627	(A/Russia/165/2009)	CY063243	(A/Wisconsin/629-D00830/2009)
AB530472	(A/Nagasaki/HA-25/2009)	CY053645	(A/swine/4/Mexico/2009)	CY063251	(A/Wisconsin/629-D00692/2009)
AB530473	(A/Nagasaki/HA-26/2009)	CY053681	(A/Russia/14/2009)	CY063259	(A/Wisconsin/629-D00740/2009)
AB530474	(A/Nagasaki/HA-27/2009)	CY053689	(A/Russia/191/2009)	CY063267	(A/Wisconsin/629-D02082/2009)
AB530475	(A/Nagasaki/HA-28/2009)	CY053728	(A/Russia/74/2009)	CY063275	(A/Wisconsin/629-D00888/2009)
AB530476	(A/Nagasaki/HA-29/2009)	CY053736	(A/Russia/178/2009)	CY063283	(A/Wisconsin/629-D02008/2009)
AB530477	(A/Nagasaki/HA-31/2009)	CY053744	(A/Russia/190/2009)	CY063291	(A/Wisconsin/629-D00292/2009)
AB530478	(A/Nagasaki/HA-32/2009)	CY053752	(A/Russia/200/2009)	CY063299	(A/Wisconsin/629-D00859/2009)
AB530479	(A/Nagasaki/HA-33/2009)	CY053896	(A/Argentina/HNRG13/2009)	CY063307	(A/Wisconsin/629-D01572/2009)
AB530480	(A/Nagasaki/HA-34/2009)	CY053901	(A/Argentina/HNRG14/2009)	FJ966082	(A/California/04/2009)
AB530481	(A/Nagasaki/HA-35/2009)	CY053904	(A/Argentina/HNRG15/2009)	FJ966952	(A/California/05/2009)
AB530482	(A/Nagasaki/HA-36/2009)	CY053907	(A/Argentina/HNRG16/2009)	FJ966959	(A/Texas/05/2009)
AB530483	(A/Nagasaki/HA-38/2009)	CY053910	(A/Argentina/HNRG17/2009)	FJ966960	(A/California/06/2009)
AB530484	(A/Nagasaki/HA-39/2009)	CY053913	(A/Argentina/HNRG18/2009)	FJ966974	(A/California/07/2009)
AB530485	(A/Nagasaki/HA-40/2009)	CY053919	(A/Argentina/HNRG21/2009)	FJ966982	(A/Texas/04/2009)
AB530486	(A/Nagasaki/HA-41/2009)	CY053922	(A/Argentina/HNRG23/2009)	FJ969509	(A/New York/19/2009)
AB530487	(A/Nagasaki/HA-42/2009)	CY053928	(A/Argentina/HNRG3/2009)	FJ969511	(A/California/10/2009)
AB530488	(A/Nagasaki/HA-44/2009)	CY053936	(A/Argentina/HNRG31/2009)	FJ969540	(A/California/07/2009)
AB530489	(A/Nagasaki/NU-1/2009)	CY053939	(A/Argentina/HNRG32/2009)	FJ971076	(A/California/08/2009)
AB531444	(A/swine/Osaka/1/2009)	CY053942	(A/Argentina/HNRG33/2009)	FJ974024	(A/Toronto/3184/2009)

ACCESSION #	VIRUS NAME	ACCESSION #	VIRUS NAME	ACCESSION #	VIRUS NAME
AB535738	(A/Nagasaki/HA-24/2009)	CY053945	(A/Argentina/HNRG36/2009)	FJ974026	(A/Toronto/3141/2009)
AB535739	(A/Nagasaki/HA-30/2009)	CY053947	(A/Argentina/HNRG37/2009)	FJ981612	(A/Texas/04/2009)
AB535740	(A/Nagasaki/HA-37/2009)	CY053950	(A/Argentina/HNRG39/2009)	FJ981613	(A/California/07/2009)
AB535741	(A/Nagasaki/NU-2/2009)	CY053953	(A/Argentina/HNRG40/2009)	FJ981615	(A/Texas/04/2009)
AB535742	(A/Nagasaki/HA-48/2009)	CY053956	(A/Argentina/HNRG41/2009)	FJ982430	(A/Denmark/513/2009)
AB535743	(A/Nagasaki/HA-50/2009)	CY053959	(A/Argentina/HNRG42/2009)	FJ984337	(A/New York/12/2009)
AB535744	(A/Nagasaki/HA-52/2009)	CY053962	(A/Argentina/HNRG44/2009)	FJ984347	(A/New York/11/2009)
AB535745	(A/Nagasaki/HA-53/2009)	CY053965	(A/Argentina/HNRG45/2009)	FJ984355	(A/New York/18/2009)
AB535746	(A/Nagasaki/HA-59/2009)	CY053968	(A/Argentina/HNRG48/2009)	FJ984360	(A/New York/31/2009)
AB535747	(A/Nagasaki/HA-60/2009)	CY053971	(A/Argentina/HNRG5/2009)	FJ984364	(A/New York/23/2009)
AB535748	(A/Nagasaki/HA-63/2009)	CY054279	(A/Rio de Janeiro/5090/2009)	FJ984375	(A/New York/10/2009)
AB536768	(A/Nagasaki/HA-57/2009)	CY054280	(A/Rio de Janeiro/5826/2009)	FJ984385	(A/Texas/06/2009)
AB536769	(A/Nagasaki/HA-58/2009)	CY054281	(A/Rio de Janeiro/9685/2009)	FJ984394	(A/New York/19/2009)
AB536770	(A/Nagasaki/HA-62/2009)	CY054282	(A/Rio Grande do Sul/7108/2009)	FJ984397	(A/Ohio/07/2009)
AB538389	(A/Nagano/RC1/2009)	CY054283	(A/Santa Catarina/459/2009)	FJ984401	(A/Ohio/07/2009)
AB538394	(A/Nagano/RC1/2009)	CY054296	(A/Mexico City/MCIG01/2009)	FJ998207	(A/Canada-NS/RV1535/2009)
AB539046	(A/Nagasaki/HA-56/2009)	CY054546	(A/Unmugobi/9586/2009)	FJ998208	(A/Mexico/InDRE4487/2009)
AB539047	(A/Nagasaki/HA-49/2009)	CY054548	(A/Bayanulgii/9912/2009)	FJ998209	(A/Canada-ON/RV1527/2009)
AB539048	(A/Nagasaki/NU-3/2009)	CY054590	(A/Thailand/0316-00-N0/2009)	FN401574	(A/Regensburg/D6/2009)
AB540654	(A/Nagasaki/HA-46/2009)	CY054591	(A/Thailand/0404-00-N0/2009)	FN423713	(A/Luxembourg/43/2009)
AB558535	(A/Nagasaki/HA-64/2009)	CY054592	(A/Thailand/0419-00-N0/2009)	FN434444	(A/Quebec/147023/2009)
AB558536	(A/Nagasaki/HA-65/2009)	CY054593	(A/Thailand/0440-00-N0/2009)	FN434453	(A/Quebec/147365/2009)
CY039527	(A/Netherlands/602/2009)	CY054594	(A/Thailand/0445-00-N0/2009)	FN434458	(A/Quebec/144147/2009)
CY039893	(A/New York/1669/2009)	CY054595	(A/Nepal/NP09A-284/2009)	FN434469	(A/Quebec/144180/2009)
CY039901	(A/New York/1682/2009)	CY054596	(A/Nepal/NP09A-294/2009)	GQ117024	(A/New York/22/2009)
CY039986	(A/Nonthaburi/102/2009)	CY054597	(A/Nepal/NP09A-295/2009)	GQ117032	(A/Texas/09/2009)
CY039999	(A/New York/3008/2009)	CY054598	(A/Thailand/PMKD0028/2009)	GQ117040	(A/California/14/2009)
CY040007	(A/New York/3012/2009)	CY054599	(A/Thailand/PMKD0030/2009)	GQ117043	(A/Massachusetts/06/2009)
CY040015	(A/New York/3014/2009)	CY054600	(A/Thailand/PMKE0009/2009)	GQ117044	(A/California/04/2009)
CY040023	(A/New York/3049/2009)	CY054601	(A/Thailand/PMKSV0305/2009)	GQ117051	(A/Texas/08/2009)
CY040031	(A/New York/3099/2009)	CY054602	(A/Thailand/THA0364/2009)	GQ117056	(A/South Carolina/09/2009)
CY040042	(A/New York/3007/2009)	CY054603	(A/Thailand/THB0389/2009)	GQ117059	(A/Kansas/02/2009)
CY040457	(A/Tennessee/1-560/2009)	CY054604	(A/Thailand/THB0390/2009)	GQ117062	(A/Kansas/03/2009)
CY040605	(A/New York/3219/2009)	CY054605	(A/Thailand/THB0402/2009)	GQ117067	(A/Arizona/01/2009)
CY040613	(A/New York/3220/2009)	CY054606	(A/Thailand/THB0405/2009)	GQ117079	(A/Arizona/02/2009)
CY040621	(A/New York/3221/2009)	CY054607	(A/Thailand/THB0408/2009)	GQ117082	(A/New York/20/2009)
CY040629	(A/New York/3234/2009)	CY054608	(A/Thailand/THB0411/2009)	GQ117086	(A/New York/20/2009)
CY040637	(A/New York/3191/2009)	CY054609	(A/Thailand/THB0415/2009)	GQ117091	(A/Texas/07/2009)
CY040645	(A/New York/3194/2009)	CY054610	(A/Thailand/THB0419/2009)	GQ117097	(A/Indiana/09/2009)
CY040653	(A/New York/3201/2009)	CY054611	(A/Thailand/THB0420/2009)	GQ117100	(A/Ohio/07/2009)
CY040661	(A/New York/3202/2009)	CY054612	(A/Thailand/THB0421/2009)	GQ117103	(A/Massachusetts/07/2009)
CY040669	(A/New York/3218/2009)	CY054613	(A/Thailand/THB0423/2009)	GQ117112	(A/Michigan/02/2009)
CY040677	(A/New York/3222/2009)	CY054614	(A/Thailand/THB0427/2009)	GQ117116	(A/New York/13/2009)
CY040685	(A/New York/3223/2009)	CY054615	(A/Thailand/THB0428/2009)	GQ117119	(A/Colorado/03/2009)
CY040693	(A/New York/3232/2009)	CY054616	(A/Thailand/THB0433/2009)	GQ122097	(A/Texas/15/2009)

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CY040701	(A/New York/3235/2009)	CY054617	(A/Thailand/THB0434/2009)	GQ131023	(A/Korea/01/2009)
CY040709	(A/New York/3237/2009)	CY054618	(A/Thailand/THB0435/2009)	GQ132142	(A/Canada-NS/RV1538/2009)
CY040717	(A/New York/3238/2009)	CY054619	(A/Thailand/THB0437/2009)	GQ132143	(A/Canada-ON/RV1526/2009)
CY040725	(A/New York/3239/2009)	CY054620	(A/Thailand/THB0438/2009)	GQ132144	(A/Canada-ON/RV1529/2009)
CY040734	(A/New York/3240/2009)	CY054621	(A/Thailand/THB0441/2009)	GQ132145	(A/Mexico/InDRE4114/2009)
CY040742	(A/New York/3242/2009)	CY054622	(A/Thailand/THB0442/2009)	GQ132146	(A/Canada-AB/RV1532/2009)
CY040750	(A/New York/3243/2009)	CY054623	(A/Thailand/THB0444/2009)	GQ132147	(A/Canada-NS/RV1536/2009)
CY040758	(A/New York/3244/2009)	CY054624	(A/Thailand/THB0454/2009)	GQ149623	(A/Mexico/4486/2009)
CY040766	(A/New York/3245/2009)	CY054625	(A/Thailand/THB0472/2009)	GQ149630	(A/Mexico/4603/2009)
CY040774	(A/New York/3246/2009)	CY054626	(A/Thailand/THB0474/2009)	GQ149634	(A/Mexico/4604/2009)
CY040782	(A/New York/3252/2009)	CY054630	(A/Russia/4/2009)	GQ149641	(A/Mexico/4603/2009)
CY040790	(A/New York/3253/2009)	CY054638	(A/Russia/12/2009)	GQ149647	(A/Mexico/4486/2009)
CY040798	(A/New York/3255/2009)	CY054646	(A/Russia/19/2009)	GQ149654	(A/Mexico/4108/2009)
CY040806	(A/New York/3257/2009)	CY054654	(A/Russia/61/2009)	GQ149662	(A/Mexico/4108/2009)
CY040814	(A/New York/3259/2009)	CY054662	(A/Russia/100/2009)	GQ149668	(A/Mexico/4108/2009)
CY040822	(A/New York/3260/2009)	CY054670	(A/Russia/171/2009)	GQ149671	(A/Mexico/4482/2009)
CY040830	(A/New York/3261/2009)	CY054678	(A/Russia/180/2009)	GQ149674	(A/Mexico/4482/2009)
CY040838	(A/New York/3262/2009)	CY054683	(A/Wisconsin/629-D00589/2009)	GQ149677	(A/Mexico/4482/2009)
CY040846	(A/New York/3263/2009)	CY054691	(A/Managua/4467.05/2009)	GQ149684	(A/Mexico/4603/2009)
CY040854	(A/New York/3264/2009)	CY054707	(A/California/VRDL4/2009)	GQ149689	(A/Mexico/4108/2009)
CY040862	(A/New York/3265/2009)	CY054715	(A/California/VRDL5/2009)	GQ149692	(A/Mexico/4115/2009)
CY040880	(A/Norway/1177/2009)	CY054723	(A/California/VRDL6/2009)	GQ150328	(A/swine/Alberta/OTH-33-8/2009)
CY040888	(A/Mexico/47N/2009)	CY054731	(A/California/VRDL7/2009)	GQ150335	(A/Christchurch/2/2009)
CY041050	(A/New York/3166/2009)	CY054739	(A/California/VRDL8/2009)	GQ150338	(A/Auckland/4/2009)
CY041058	(A/New York/3168/2009)	CY054747	(A/California/VRDL9/2009)	GQ150342	(A/Nonthaburi/102/2009)
CY041066	(A/New York/3169/2009)	CY054755	(A/California/VRDL19/2009)	GQ160526	(A/Florida/04/2009)
CY041074	(A/New York/3170/2009)	CY054763	(A/California/VRDL20/2009)	GQ160527	(A/New York/37/2009)
CY041082	(A/New York/3172/2009)	CY054771	(A/California/VRDL21/2009)	GQ160531	(A/Tennessee/05/2009)
CY041090	(A/New York/3173/2009)	CY054779	(A/California/VRDL22/2009)	GQ160534	(A/New Jersey/01/2009)
CY041098	(A/New York/3176/2009)	CY054787	(A/California/VRDL23/2009)	GQ160538	(A/New Mexico/04/2009)
CY041106	(A/New York/3178/2009)	CY054795	(A/California/VRDL25/2009)	GQ160541	(A/Delaware/03/2009)
CY041114	(A/New York/3193/2009)	CY054803	(A/California/VRDL26/2009)	GQ160542	(A/New York/05/2009)
CY041122	(A/New York/3214/2009)	CY054811	(A/California/VRDL27/2009)	GQ160543	(A/New York/35/2009)
CY041130	(A/New York/3215/2009)	CY054819	(A/California/VRDL28/2009)	GQ160550	(A/Texas/23/2009)
CY041138	(A/New York/3258/2009)	CY054827	(A/California/VRDL29/2009)	GQ160553	(A/New Jersey/04/2009)
CY041146	(A/New York/3181/2009)	CY054835	(A/California/VRDL30/2009)	GQ160556	(A/New York/18/2009)
CY041154	(A/New York/3183/2009)	CY054843	(A/California/VRDL31/2009)	GQ160560	(A/New Jersey/02/2009)
CY041162	(A/New York/3185/2009)	CY054851	(A/California/VRDL32/2009)	GQ160565	(A/Maryland/05/2009)
CY041170	(A/New York/3186/2009)	CY054859	(A/California/VRDL33/2009)	GQ160566	(A/New York/30/2009)
CY041178	(A/New York/3187/2009)	CY054867	(A/California/VRDL34/2009)	GQ160567	(A/New York/34/2009)
CY041186	(A/New York/3188/2009)	CY054875	(A/California/VRDL35/2009)	GQ160568	(A/New York/04/2009)
CY041194	(A/New York/3190/2009)	CY054883	(A/California/VRDL36/2009)	GQ160574	(A/Texas/22/2009)
CY041202	(A/New York/3199/2009)	CY054891	(A/California/VRDL38/2009)	GQ160578	(A/Washington/09/2009)
CY041482	(A/New York/3189/2009)	CY054899	(A/California/VRDL39/2009)	GQ160579	(A/California/11/2009)
CY041490	(A/New York/3184/2009)	CY054907	(A/California/VRDL40/2009)	GQ160582	(A/New Hampshire/02/2009)

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CY041498	(A/New York/3195/2009)	CY054915	(A/California/VRDL41/2009)	GQ160586	(A/North Carolina/05/2009)
CY041506	(A/New York/3196/2009)	CY054923	(A/California/VRDL43/2009)	GQ160591	(A/Virginia/04/2009)
CY041514	(A/New York/3203/2009)	CY054931	(A/California/VRDL45/2009)	GQ160594	(A/Delaware/02/2009)
CY041522	(A/New York/3204/2009)	CY054939	(A/California/VRDL48/2009)	GQ160599	(A/Nebraska/03/2009)
CY041530	(A/New York/3205/2009)	CY054947	(A/California/VRDL50/2009)	GQ160601	(A/New York/24/2009)
CY041541	(A/New York/3209/2009)	CY054955	(A/California/VRDL51/2009)	GQ160602	(A/New York/39/2009)
CY041549	(A/New York/3210/2009)	CY054963	(A/California/VRDL52/2009)	GQ160605	(A/Wisconsin/08/2009)
CY041557	(A/New York/3211/2009)	CY054971	(A/California/VRDL53/2009)	GQ160606	(A/California/12/2009)
CY041565	(A/New York/3225/2009)	CY054979	(A/California/VRDL55/2009)	GQ160607	(A/California/13/2009)
CY041573	(A/New York/3227/2009)	CY054987	(A/California/VRDL58/2009)	GQ160611	(A/Brisbane/17/2009)
CY041581	(A/New York/3230/2009)	CY054995	(A/California/VRDL61/2009)	GQ160613	(A/Auckland/1/2009)
CY041589	(A/New York/3236/2009)	CY055003	(A/California/VRDL64/2009)	GQ162170	(A/Mexico/4108/2009)
CY041597	(A/New York/3177/2009)	CY055011	(A/California/VRDL65/2009)	GQ162172	(A/Mexico/4269/2009)
CY041605	(A/New York/3207/2009)	CY055019	(A/California/VRDL67/2009)	GQ162174	(A/Mexico/4593/2009)
CY041613	(A/New York/3002/2009)	CY055027	(A/California/VRDL68/2009)	GQ162182	(A/Mexico/4176/2009)
CY041621	(A/New York/3100/2009)	CY055035	(A/California/VRDL69/2009)	GQ162183	(A/Mexico/4627/2009)
CY041629	(A/New York/3149/2009)	CY055043	(A/California/VRDL70/2009)	GQ162185	(A/Mexico/4486/2009)
CY041637	(A/New York/3307/2009)	CY055051	(A/California/VRDL71/2009)	GQ162190	(A/Mexico/4482/2009)
CY041645	(A/New York/3313/2009)	CY055059	(A/Australia/3/2009)	GQ162191	(A/Mexico/4595/2009)
CY041726	(A/New York/3247/2009)	CY055067	(A/Australia/4/2009)	GQ162194	(A/Mexico/3955/2009)
CY041734	(A/New York/3206/2009)	CY055075	(A/Australia/6/2009)	GQ162195	(A/Mexico/4502/2009)
CY041742	(A/New York/3231/2009)	CY055169	(A/Dundgobi/9746/2009)	GQ162197	(A/Mexico/4575/2009)
CY041750	(A/New York/3323/2009)	CY055196	(A/Malaysia/3758/2009)	GQ162200	(A/Mexico/4635/2009)
CY041758	(A/New York/3413/2009)	CY055198	(A/Malaysia/4038/2009)	GQ162202	(A/Mexico/4486/2009)
CY041766	(A/New York/3354/2009)	CY055200	(A/Malaysia/4039/2009)	GQ162204	(A/Mexico/4646/2009)
CY041774	(A/New York/3532/2009)	CY055202	(A/Malaysia/4737/2009)	GQ165814	(A/Narita/1/2009)
CY041782	(A/New York/3337/2009)	CY055204	(A/Malaysia/4847/2009)	GQ165815	(A/Narita/1/2009)
CY041790	(A/New York/3463/2009)	CY055206	(A/Malaysia/5027/2009)	GQ166212	(A/Bayern/63/2009)
CY041798	(A/New York/3468/2009)	CY055208	(A/Malaysia/5057/2009)	GQ166213	(A/Hamburg/4/2009)
CY041806	(A/New York/3408/2009)	CY055210	(A/Malaysia/5103/2009)	GQ166223	(A/Sichuan/1/2009)
CY041814	(A/New York/3351/2009)	CY055212	(A/Malaysia/5112/2009)	GQ166661	(A/England/195/2009)
CY041822	(A/New York/3352/2009)	CY055214	(A/Malaysia/5162/2009)	GQ166752	(A/Lisboa/26/2009)
CY041830	(A/New York/3348/2009)	CY055216	(A/Malaysia/5163/2009)	GQ166760	(A/Israel/644/2009)
CY041960	(A/Santo Domingo/572N/2009)	CY055218	(A/Malaysia/5175/2009)	GQ168606	(A/Hong Kong/01/2009)
CY041968	(A/Israel/276/2009)	CY055220	(A/Malaysia/5192/2009)	GQ168617	(A/New York/26/2009)
CY041973	(A/Israel/277/2009)	CY055222	(A/Malaysia/5193/2009)	GQ168620	(A/Texas/19/2009)
CY041976	(A/Israel/70/2009)	CY055224	(A/Malaysia/5218/2009)	GQ168623	(A/Washington/07/2009)
CY041983	(A/Santo Domingo/0573N/2009)	CY055226	(A/Malaysia/5225/2009)	GQ168628	(A/New York/23/2009)
CY043078	(A/Japan/1070/2009)	CY055228	(A/Malaysia/5234/2009)	GQ168631	(A/North Carolina/06/2009)
CY043086	(A/Brawley/40081/2009)	CY055230	(A/Malaysia/5237/2009)	GQ168633	(A/Texas/08/2009)
CY043094	(A/Brawley/40082/2009)	CY055232	(A/Malaysia/5258/2009)	GQ168636	(A/Delaware/04/2009)
CY043102	(A/Santo Domingo/565T/2009)	CY055234	(A/Malaysia/5262/2009)	GQ168642	(A/Iowa/04/2009)
CY043110	(A/Santo Domingo/568T/2009)	CY055236	(A/Malaysia/5270/2009)	GQ168644	(A/Kansas/03/2009)
CY043118	(A/Bethesda/SP508/2009)	CY055238	(A/Malaysia/5272/2009)	GQ168645	(A/New York/28/2009)
CY043123	(A/New York/3389/2009)	CY055240	(A/Malaysia/5277/2009)	GQ168650	(A/New York/08/2009)

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CY043131	(A/New York/3514/2009)	CY055242	(A/Malaysia/5283/2009)	GQ168652	(A/New York/11/2009)
CY043139	(A/New York/3529/2009)	CY055244	(A/Malaysia/5286/2009)	GQ168655	(A/New York/09/2009)
CY043147	(A/New York/3551/2009)	CY055246	(A/Malaysia/5670/2009)	GQ168657	(A/New York/14/2009)
CY043155	(A/New York/3418/2009)	CY055248	(A/Malaysia/8860/2009)	GQ168659	(A/New York/27/2009)
CY043163	(A/New York/3454/2009)	CY055250	(A/Malaysia/9117/2009)	GQ168661	(A/New York/31/2009)
CY043171	(A/New York/3460/2009)	CY055252	(A/Malaysia/9118/2009)	GQ168664	(A/Washington/12/2009)
CY043179	(A/New York/3488/2009)	CY055254	(A/Malaysia/9131/2009)	GQ168668	(A/New York/13/2009)
CY043187	(A/New York/3499/2009)	CY055256	(A/Malaysia/9147/2009)	GQ168671	(A/Texas/09/2009)
CY043195	(A/New York/3324/2009)	CY055258	(A/Malaysia/9237/2009)	GQ168673	(A/New York/12/2009)
CY043203	(A/New York/3338/2009)	CY055260	(A/Malaysia/9254/2009)	GQ168676	(A/Washington/11/2009)
CY043211	(A/New York/3420/2009)	CY055262	(A/Malaysia/9343/2009)	GQ168851	(A/New York/06/2009)
CY043219	(A/New York/3455/2009)	CY055264	(A/Malaysia/9451/2009)	GQ168861	(A/Texas/05/2009)
CY043227	(A/New York/3501/2009)	CY055266	(A/Malaysia/9541/2009)	GQ168886	(A/New York/09/2009)
CY043235	(A/New York/3502/2009)	CY055271	(A/Malaysia/10226/2009)	GQ169382	(A/Thailand/104/2009)
CY043243	(A/New York/3509/2009)	CY055279	(A/Malaysia/12617/2009)	GQ183617	(A/Beijing/01/2009)
CY043251	(A/New York/3545/2009)	CY055287	(A/Malaysia/5259/2009)	GQ183625	(A/Beijing/02/2009)
CY043259	(A/New York/3552/2009)	CY055295	(A/Malaysia/5259/2009)	GQ183633	(A/Finland/553/2009)
CY043267	(A/New York/3563/2009)	CY055303	(A/Singapore/GN285/2009)	GQ184630	(A/Moscow/01/2009)
CY043275	(A/New York/3651/2009)	CY055423	(A/New York/4887/2009)	GQ200208	(A/Oregon/06/2009)
CY043283	(A/New York/3449/2009)	CY055431	(A/New York/4977/2009)	GQ200217	(A/Minnesota/03/2009)
CY043291	(A/New York/3469/2009)	CY055439	(A/New York/4979/2009)	GQ200221	(A/Texas/12/2009)
CY043299	(A/New York/3498/2009)	CY055447	(A/California/VRDL11/2009)	GQ200231	(A/District of Columbia/02/2009)
CY043307	(A/New York/3534/2009)	CY055455	(A/California/VRDL12/2009)	GQ200237	(A/Georgia/01/2009)
CY043334	(A/Denmark/523/2009)	CY055463	(A/California/VRDL14/2009)	GQ200250	(A/New York/21/2009)
CY043342	(A/Denmark/524/2009)	CY055471	(A/California/VRDL18/2009)	GQ200255	(A/Oklahoma/02/2009)
CY043350	(A/Denmark/528/2009)	CY055479	(A/California/VRDL72/2009)	GQ200268	(A/District of Columbia/03/2009)
CY044048	(A/New York/3566/2009)	CY055486	(A/California/VRDL73/2009)	GQ200270	(A/Oregon/05/2009)
CY044056	(A/New York/3567/2009)	CY055494	(A/California/VRDL74/2009)	GQ200273	(A/Wisconsin/09/2009)
CY044064	(A/New York/3568/2009)	CY055502	(A/California/VRDL75/2009)	GQ200287	(A/Shandong/1/2009)
CY044072	(A/New York/3702/2009)	CY055510	(A/California/VRDL76/2009)	GQ202695	(A/Norway/1168/2009)
CY044080	(A/New York/3715/2009)	CY055518	(A/California/VRDL78/2009)	GQ205434	(A/Auckland/1/2009)
CY044088	(A/New York/3740/2009)	CY055526	(A/Australia/1/2009)	GQ205436	(A/Auckland/3/2009)
CY044096	(A/New York/3895/2009)	CY055534	(A/Australia/7/2009)	GQ205438	(A/Auckland/3/2009)
CY044104	(A/New York/3898/2009)	CY055542	(A/Australia/9/2009)	GQ214138	(A/Paris/2590/2009)
CY044112	(A/New York/3992/2009)	CY055550	(A/Australia/10/2009)	GQ214144	(A/Paris/2580/2009)
CY044120	(A/New York/4197/2009)	CY055558	(A/Australia/11/2009)	GQ214151	(A/Paris/2573/2009)
CY044128	(A/New York/3516/2009)	CY055565	(A/Australia/12/2009)	GQ214156	(A/Paris/2592/2009)
CY044136	(A/New York/3528/2009)	CY055573	(A/Australia/13/2009)	GQ219573	(A/Amagasaki/2/2009)
CY044147	(A/Bogota/0466N/2009)	CY055581	(A/Australia/14/2009)	GQ219574	(A/Amagasaki/1/2009)
CY044155	(A/Managua/0536N/2009)	CY055589	(A/Australia/15/2009)	GQ219575	(A/Hyogo/1/2009)
CY044163	(A/Mexico/48N/2009)	CY055597	(A/Australia/16/2009)	GQ219576	(A/Hyogo/2/2009)
CY044171	(A/Bethesda/SP506/2009)	CY055605	(A/Australia/20/2009)	GQ219577	(A/Kobe/1/2009)
CY044179	(A/Silver Spring/SP509/2009)	CY055613	(A/Australia/21/2009)	GQ219578	(A/Osaka/1/2009)
CY044187	(A/Silver Spring/SP510/2009)	CY055621	(A/Australia/23/2009)	GQ219579	(A/Osaka/2/2009)
CY044196	(A/Taiwan/T0724/2009)	CY055629	(A/Australia/24/2009)	GQ219580	(A/Osaka-C/1/2009)

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CY044204	(A/Taiwan/T1338/2009)	CY055637	(A/Australia/25/2009)	GQ219581	(A/Osaka-C/2/2009)
CY044212	(A/Taiwan/T1339/2009)	CY055645	(A/Australia/26/2009)	GQ219586	(A/Moscow/IIV01/2009)
CY044220	(A/Taiwan/T1773/2009)	CY055653	(A/Australia/27/2009)	GQ221694	(A/GuangzhouSB/01/2009)
CY044228	(A/Taiwan/T1821/2009)	CY055661	(A/Australia/28/2009)	GQ221786	(A/New York/19/2009)
CY044235	(A/San Antonio/PR921/2009)	CY055668	(A/Australia/29/2009)	GQ221788	(A/Arizona/02/2009)
CY044243	(A/San Antonio/PR922/2009)	CY055676	(A/Australia/31/2009)	GQ221791	(A/Oklahoma/01/2009)
CY044251	(A/San Antonio/PR923/2009)	CY055684	(A/Australia/32/2009)	GQ221794	(A/South Carolina/09/2009)
CY044256	(A/swine/Argentina/SAGiles-31215/2009)	CY055692	(A/Australia/35/2009)	GQ221798	(A/Texas/04/2009)
CY044861	(A/New York/3726/2009)	CY055700	(A/Australia/36/2009)	GQ221801	(A/Nebraska/02/2009)
CY044869	(A/New York/3571/2009)	CY055708	(A/Australia/37/2009)	GQ221803	(A/New York/17/2009)
CY044877	(A/New York/3573/2009)	CY055716	(A/Australia/39/2009)	GQ221805	(A/Arizona/03/2009)
CY044885	(A/New York/3580/2009)	CY055724	(A/Australia/40/2009)	GQ221809	(A/Arizona/04/2009)
CY044893	(A/New York/3582/2009)	CY055732	(A/Australia/42/2009)	GQ221812	(A/Colorado/03/2009)
CY044901	(A/New York/3611/2009)	CY055740	(A/Australia/43/2009)	GQ221814	(A/New York/16/2009)
CY044909	(A/New York/3612/2009)	CY055748	(A/Australia/44/2009)	GQ221818	(A/California/11/2009)
CY044917	(A/New York/3613/2009)	CY055756	(A/Australia/45/2009)	GQ221820	(A/Colorado/04/2009)
CY044925	(A/New York/3617/2009)	CY055764	(A/Australia/47/2009)	GQ221823	(A/Delaware/05/2009)
CY044933	(A/New York/3623/2009)	CY055772	(A/Australia/48/2009)	GQ221826	(A/Idaho/02/2009)
CY044941	(A/New York/3625/2009)	CY055780	(A/Australia/51/2009)	GQ223112	(A/Mexico/4108/2009)
CY044949	(A/New York/3627/2009)	CY055788	(A/Australia/53/2009)	GQ223408	(A/Beijing/501/2009)
CY044957	(A/New York/3629/2009)	CY055796	(A/Australia/54/2009)	GQ223435	(A/Guangdong/05/2009)
CY044965	(A/New York/3653/2009)	CY055804	(A/Australia/56/2009)	GQ223440	(A/GuangzhouSB/01/2009)
CY044973	(A/New York/3744/2009)	CY055812	(A/Australia/57/2009)	GQ225349	(A/Zhejiang/1/2009)
CY044981	(A/New York/3747/2009)	CY055820	(A/Australia/58/2009)	GQ225357	(A/Shanghai/1/2009)
CY044989	(A/New York/3751/2009)	CY055828	(A/Australia/59/2009)	GQ225365	(A/Fujian/1/2009)
CY044997	(A/New York/3828/2009)	CY055836	(A/Australia/60/2009)	GQ225373	(A/Beijing/01/2009)
CY045005	(A/New York/3709/2009)	CY055844	(A/Australia/61/2009)	GQ225381	(A/Beijing/3/2009)
CY045013	(A/New York/3796/2009)	CY055852	(A/Australia/63/2009)	GQ227545	(A/Stockholm/29/2009)
CY045021	(A/New York/3803/2009)	CY055860	(A/Australia/64/2009)	GQ231981	(A/South Carolina/10/2009)
CY045029	(A/New York/3812/2009)	CY055868	(A/Australia/65/2009)	GQ231987	(A/Missouri/02/2009)
CY045037	(A/New York/3967/2009)	CY055876	(A/Australia/66/2009)	GQ231990	(A/South Dakota/04/2009)
CY045045	(A/New York/4006/2009)	CY055884	(A/Australia/69/2009)	GQ231993	(A/Ohio/09/2009)
CY045053	(A/New York/4052/2009)	CY055892	(A/Australia/70/2009)	GQ231995	(A/New York/35/2009)
CY045061	(A/New York/4099/2009)	CY055900	(A/Australia/72/2009)	GQ231996	(A/New York/34/2009)
CY045069	(A/New York/4290/2009)	CY055908	(A/Australia/73/2009)	GQ231999	(A/New York/33/2009)
CY045077	(A/New York/4072/2009)	CY055916	(A/Australia/79/2009)	GQ232002	(A/Texas/10/2009)
CY045085	(A/New York/3574/2009)	CY055924	(A/Australia/80/2009)	GQ232003	(A/Oregon/04/2009)
CY045093	(A/New York/3614/2009)	CY055932	(A/Australia/81/2009)	GQ232007	(A/Vermont/03/2009)
CY045143	(A/New York/3577/2009)	CY055940	(A/Australia/82/2009)	GQ232009	(A/Kentucky/05/2009)
CY045151	(A/New York/3655/2009)	CY055948	(A/San Diego/INS01/2009)	GQ232010	(A/California/13/2009)
CY045159	(A/New York/3818/2009)	CY055956	(A/San Diego/INS02/2009)	GQ232014	(A/Texas/28/2009)
CY045167	(A/New York/3819/2009)	CY055964	(A/San Diego/INS03/2009)	GQ232017	(A/New York/39/2009)
CY045175	(A/New York/3959/2009)	CY055972	(A/San Diego/INS04/2009)	GQ232019	(A/Texas/17/2009)
CY045183	(A/New York/3960/2009)	CY055980	(A/San Diego/INS05/2009)	GQ232023	(A/District of Columbia/01/2009)
CY045191	(A/New York/4014/2009)	CY055988	(A/San Diego/INS06/2009)	GQ232028	(A/Illinois/01/2009)

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CY045199	(A/New York/4048/2009)	CY055996	(A/San Diego/INS09/2009)	GQ232033	(A/Louisiana/04/2009)
CY045207	(A/New York/4057/2009)	CY056004	(A/San Diego/INS10/2009)	GQ232035	(A/Wisconsin/11/2009)
CY045215	(A/New York/4074/2009)	CY056012	(A/San Diego/INS11/2009)	GQ232037	(A/Arizona/06/2009)
CY045226	(A/Taiwan/115/2009)	CY056020	(A/San Diego/INS12/2009)	GQ232038	(A/California/17/2009)
CY045234	(A/Taiwan/126/2009)	CY056028	(A/San Diego/INS16/2009)	GQ232044	(A/Rhode Island/02/2009)
CY045242	(A/Taiwan/137/2009)	CY056036	(A/District of Columbia/INS17/2009)	GQ232049	(A/New York/25/2009)
CY045482	(A/Sachsen-Anhalt/101/2009)	CY056044	(A/District of Columbia/INS18/2009)	GQ232052	(A/Ohio/10/2009)
CY045490	(A/Sachsen-Anhalt/97/2009)	CY056052	(A/District of Columbia/INS19/2009)	GQ232054	(A/South Dakota/05/2009)
CY045495	(A/Baden-Wurttemberg/448/2009)	CY056060	(A/District of Columbia/INS20/2009)	GQ232057	(A/Delaware/08/2009)
CY045503	(A/Bayern/66/2009)	CY056068	(A/District of Columbia/INS21/2009)	GQ232060	(A/North Dakota/04/2009)
CY045511	(A/Toronto/R8564/2009)	CY056076	(A/District of Columbia/INS24/2009)	GQ232064	(A/New York/18/2009)
CY045938	(A/Toronto/C0270/2009)	CY056084	(A/District of Columbia/INS25/2009)	GQ232067	(A/Louisiana/03/2009)
CY045946	(A/Toronto/C2781/2009)	CY056092	(A/District of Columbia/INS27/2009)	GQ232070	(A/Missouri/03/2009)
CY045954	(A/Toronto/T0106/2009)	CY056100	(A/District of Columbia/INS28/2009)	GQ232073	(A/Wisconsin/10/2009)
CY045962	(A/Toronto/T5294/2009)	CY056108	(A/District of Columbia/INS29/2009)	GQ232076	(A/Texas/11/2009)
CY045970	(A/Toronto/T5362/2009)	CY056116	(A/District of Columbia/INS31/2009)	GQ232085	(A/Guangdong/02/2009)
CY045978	(A/Toronto/T9842/2009)	CY056124	(A/District of Columbia/INS33/2009)	GQ232093	(A/Beijing/4/2009)
CY046061	(A/Italy/128/2009)	CY056132	(A/San Diego/INS34/2009)	GQ232099	(A/Milan/UHSR1/2009)
CY046062	(A/Italy/129/2009)	CY056140	(A/San Diego/INS35/2009)	GQ243749	(A/Philippines/2009/2009)
CY046063	(A/Italy/130/2009)	CY056148	(A/Pensacola/INS37/2009)	GQ243751	(A/Victoria/2001/2009)
CY046064	(A/Italy/131/2009)	CY056156	(A/Pensacola/INS38/2009)	GQ243753	(A/Philippines/2001/2009)
CY046065	(A/Italy/132/2009)	CY056164	(A/Pensacola/INS40/2009)	GQ243755	(A/Perth/29/2009)
CY046066	(A/Italy/133/2009)	CY056172	(A/San Diego/INS42/2009)	GQ243757	(A/Darwin/2001/2009)
CY046187	(A/Wisconsin/629-D01793/2009)	CY056180	(A/District of Columbia/INS43/2009)	GQ243759	(A/Philippines/2003/2009)
CY046195	(A/Wisconsin/629-D02312/2009)	CY056188	(A/District of Columbia/INS46/2009)	GQ243760	(A/Philippines/2006/2009)
CY046203	(A/Wisconsin/629-D02408/2009)	CY056196	(A/San Diego/INS48/2009)	GQ243761	(A/Victoria/2004/2009)
CY046211	(A/Wisconsin/629-D00869/2009)	CY056204	(A/San Diego/INS52/2009)	GQ247724	(A/Sao Paulo/1454/2009)
CY046219	(A/Wisconsin/629-D01251/2009)	CY056212	(A/San Diego/INS53/2009)	GQ247726	(A/Moscow/IIV02/2009)
CY046227	(A/Wisconsin/629-D01296/2009)	CY056220	(A/San Diego/INS68/2009)	GQ249333	(A/Paris/2591/2009)
CY046235	(A/Wisconsin/629-D01735/2009)	CY056228	(A/San Diego/INS69/2009)	GQ249337	(A/Paris/2629/2009)
CY046243	(A/Wisconsin/629-D01606/2009)	CY056236	(A/San Diego/INS70/2009)	GQ250161	(A/Guangdong/03/2009)
CY046251	(A/Wisconsin/629-D02432/2009)	CY056387	(A/Managua/3119.01/2009)	GQ251035	(A/Italy/05/2009)
CY046259	(A/Wisconsin/629-D01773/2009)	CY056395	(A/New York/4925/2009)	GQ253492	(A/Shanghai/37T/2009)
CY046267	(A/Wisconsin/629-D00933/2009)	CY056403	(A/New York/4944/2009)	GQ253498	(A/Shanghai/71T/2009)
CY046275	(A/Wisconsin/629-D01092/2009)	CY056411	(A/New York/4945/2009)	GQ255897	(A/Kaluga/01/2009)
CY046283	(A/Wisconsin/629-D02473/2009)	CY056419	(A/New York/4947/2009)	GQ255900	(A/Moscow/02/2009)
CY046291	(A/Wisconsin/629-D01817/2009)	CY056427	(A/New York/4981/2009)	GQ255901	(A/Moscow/03/2009)
CY046299	(A/Wisconsin/629-D01486/2009)	CY056435	(A/New York/4984/2009)	GQ258462	(A/South Australia/2001/2009)
CY046307	(A/Wisconsin/629-D01642/2009)	CY056443	(A/New York/4985/2009)	GQ259909	(A/Jiangsu/1/2009)
CY046315	(A/Wisconsin/629-D01308/2009)	CY056451	(A/New York/4986/2009)	GQ261272	(A/Himeji/1/2009)
CY046323	(A/Wisconsin/629-D01810/2009)	CY056459	(A/New York/4987/2009)	GQ261275	(A/Sakai/2/2009)
CY046331	(A/Wisconsin/629-D01505/2009)	CY056467	(A/New York/4988/2009)	GQ261277	(A/Shiga/1/2009)
CY046339	(A/Wisconsin/629-D02455/2009)	CY056475	(A/New York/4990/2009)	GQ267839	(A/Sakai/1/2009)
CY046347	(A/Wisconsin/629-D01017/2009)	CY056483	(A/New York/4995/2009)	GQ268003	(A/GuangzhouSB/01/2009)
CY046355	(A/Wisconsin/629-D01529/2009)	CY056491	(A/New York/5074/2009)	GQ280264	(A/Nanjing/1/2009)

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CY046363	(A/Wisconsin/629-D00790/2009)	CY056499	(A/New York/5079/2009)	GQ280797	(A/California/04/2009)
CY046371	(A/Wisconsin/629-D01705/2009)	CY056507	(A/New York/5083/2009)	GQ283484	(A/Italy/49/2009)
CY046379	(A/Wisconsin/629-D01980/2009)	CY056515	(A/New York/5086/2009)	GQ283488	(A/Finland/554/2009)
CY046387	(A/Wisconsin/629-D00750/2009)	CY056523	(A/New York/5130/2009)	GQ283493	(A/Finland/555/2009)
CY046395	(A/Wisconsin/629-D01189/2009)	CY056531	(A/New York/5141/2009)	GQ286175	(A/Castro/JXP/2009)
CY046403	(A/Wisconsin/629-D00807/2009)	CY056539	(A/New York/5150/2009)	GQ287619	(A/Fukuoka-C/1/2009)
CY046411	(A/Wisconsin/629-D00447/2009)	CY056547	(A/New York/5173/2009)	GQ287621	(A/Shiga/2/2009)
CY046419	(A/Wisconsin/629-D00767/2009)	CY056555	(A/New York/5199/2009)	GQ287623	(A/Shiga/3/2009)
CY046427	(A/Wisconsin/629-D00677/2009)	CY056563	(A/New York/5227/2009)	GQ287625	(A/Tokushima/1/2009)
CY046435	(A/Wisconsin/629-D02262/2009)	CY056571	(A/New York/5755/2009)	GQ287627	(A/Yokohama/1/2009)
CY046443	(A/Wisconsin/629-D01226/2009)	CY056579	(A/New York/5782/2009)	GQ288372	(A/Fuzhou/01/2009)
CY046451	(A/Wisconsin/629-D01558/2009)	CY056587	(A/New York/5886/2009)	GQ290059	(A/Moscow/226/2009)
CY046459	(A/Wisconsin/629-D01861/2009)	CY056595	(A/New York/5916/2009)	GQ290106	(A/Beijing/502/2009)
CY046467	(A/Wisconsin/629-D01962/2009)	CY056603	(A/New York/5931/2009)	GQ293077	(A/Zhejiang/2/2009)
CY046475	(A/Wisconsin/629-D00015/2009)	CY056611	(A/New York/5976/2009)	GQ303340	(A/Mexico/InDRE4487/2009)
CY046483	(A/Wisconsin/629-D00349/2009)	CY056619	(A/New York/5988/2009)	GQ323443	(A/Florida/11/2009)
CY046491	(A/Wisconsin/629-D02028/2009)	CY056627	(A/New York/6018/2009)	GQ323446	(A/Maine/03/2009)
CY046499	(A/Wisconsin/629-D00378/2009)	CY056635	(A/New York/6019/2009)	GQ323451	(A/Rhode Island/03/2009)
CY046507	(A/Wisconsin/629-D02425/2009)	CY056643	(A/New York/6079/2009)	GQ323455	(A/Texas/32/2009)
CY046515	(A/Wisconsin/629-D02141/2009)	CY056651	(A/New York/6110/2009)	GQ323464	(A/Kentucky/06/2009)
CY046523	(A/Wisconsin/629-D00183/2009)	CY056659	(A/New York/6182/2009)	GQ323470	(A/Kentucky/07/2009)
CY046531	(A/Wisconsin/629-D00714/2009)	CY056667	(A/New York/6213/2009)	GQ323473	(A/Louisiana/05/2009)
CY046539	(A/Wisconsin/629-D01313/2009)	CY056675	(A/New York/6214/2009)	GQ323483	(A/California/18/2009)
CY046547	(A/Wisconsin/629-D00179/2009)	CY056683	(A/New York/6257/2009)	GQ323486	(A/Arizona/09/2009)
CY046555	(A/Wisconsin/629-D00228/2009)	CY056691	(A/New York/6292/2009)	GQ323489	(A/Arizona/09/2009)
CY046563	(A/Wisconsin/629-D01919/2009)	CY056699	(A/New York/6293/2009)	GQ323495	(A/Arkansas/03/2009)
CY046571	(A/Wisconsin/629-D00905/2009)	CY056707	(A/New York/6300/2009)	GQ323509	(A/Washington/14/2009)
CY046579	(A/Wisconsin/629-D01909/2009)	CY056715	(A/New York/6346/2009)	GQ323520	(A/Michigan/05/2009)
CY046587	(A/Wisconsin/629-D02452/2009)	CY056723	(A/New York/6473/2009)	GQ323530	(A/Illinois/04/2009)
CY046595	(A/Wisconsin/629-D01482/2009)	CY056731	(A/New York/6546/2009)	GQ323551	(A/Massachusetts/08/2009)
CY046603	(A/Wisconsin/629-D00487/2009)	CY056739	(A/New York/6571/2009)	GQ323560	(A/Florida/09/2009)
CY046611	(A/Wisconsin/629-D01055/2009)	CY056747	(A/New York/6607/2009)	GQ323564	(A/Utah/02/2009)
CY046619	(A/Wisconsin/629-D00575/2009)	CY056755	(A/New York/6663/2009)	GQ323574	(A/Texas/31/2009)
CY046627	(A/Wisconsin/629-D01839/2009)	CY056763	(A/New York/6668/2009)	GQ323576	(A/Texas/34/2009)
CY046635	(A/Wisconsin/629-D00967/2009)	CY056771	(A/New York/6669/2009)	GQ323579	(A/West Virginia/01/2009)
CY046643	(A/Wisconsin/629-D02227/2009)	CY056779	(A/New York/6675/2009)	GQ329066	(A/Rennes/2671/2009)
CY046651	(A/Wisconsin/629-D01837/2009)	CY056787	(A/New York/6775/2009)	GQ329070	(A/Caen/2716/2009)
CY046659	(A/Wisconsin/629-D00997/2009)	CY056795	(A/New York/6776/2009)	GQ329076	(A/Paris/2722/2009)
CY046667	(A/Wisconsin/629-D00064/2009)	CY056803	(A/New York/6808/2009)	GQ329082	(A/Paris/2670/2009)
CY046675	(A/Wisconsin/629-D01305/2009)	CY056811	(A/New York/6809/2009)	GQ329088	(A/Strasbourg/2611/2009)
CY046683	(A/Wisconsin/629-D00978/2009)	CY056819	(A/New York/6810/2009)	GQ329093	(A/Paris/2709/2009)
CY046691	(A/Wisconsin/629-D00434/2009)	CY056827	(A/New York/6846/2009)	GQ329100	(A/Paris/2650/2009)
CY046699	(A/Wisconsin/629-D01445/2009)	CY056835	(A/New York/6864/2009)	GQ329106	(A/Strasbourg/2609/2009)
CY046707	(A/Wisconsin/629-D01787/2009)	CY056843	(A/New York/6868/2009)	GQ330645	(A/Moscow/IIV03/2009)
CY046715	(A/Wisconsin/629-D00752/2009)	CY056851	(A/New York/6909/2009)	GQ334330	(A/Fukuoka-C/2/2009)

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CY046723	(A/Wisconsin/629-D02427/2009)	CY056859	(A/San Diego/INS15/2009)	GQ334338	(A/Fukuoka-C/3/2009)
CY046731	(A/Wisconsin/629-D01521/2009)	CY056867	(A/District of Columbia/INS44/2009)	GQ334346	(A/Shizuoka/759/2009)
CY046739	(A/Wisconsin/629-D00084/2009)	CY056875	(A/San Diego/INS51/2009)	GQ334355	(A/Utsunomiya/1/2009)
CY046747	(A/Wisconsin/629-D02064/2009)	CY056883	(A/San Diego/INS54/2009)	GQ338335	(A/New York/58/2009)
CY046755	(A/Wisconsin/629-D00160/2009)	CY056891	(A/San Diego/INS55/2009)	GQ338339	(A/Louisiana/02/2009)
CY046763	(A/Wisconsin/629-D02298/2009)	CY056899	(A/San Diego/INS57/2009)	GQ338349	(A/Michigan/04/2009)
CY046771	(A/Wisconsin/629-D00722/2009)	CY056907	(A/San Diego/INS60/2009)	GQ338355	(A/Delaware/07/2009)
CY046779	(A/Wisconsin/629-D01894/2009)	CY056915	(A/San Diego/INS61/2009)	GQ338358	(A/Hawaii/09/2009)
CY046787	(A/Wisconsin/629-D02276/2009)	CY056923	(A/San Diego/INS63/2009)	GQ338361	(A/Wisconsin/12/2009)
CY046795	(A/Wisconsin/629-D01026/2009)	CY056931	(A/San Diego/INS65/2009)	GQ338364	(A/Minnesota/02/2009)
CY046803	(A/Wisconsin/629-D00223/2009)	CY056939	(A/Brussels/INS71/2009)	GQ338368	(A/Ohio/08/2009)
CY046811	(A/Wisconsin/629-D00698/2009)	CY056947	(A/Aarhus/INS82/2009)	GQ338372	(A/Nevada/04/2009)
CY046819	(A/Wisconsin/629-D02013/2009)	CY056955	(A/Athens/INS85/2009)	GQ338375	(A/Texas/36/2009)
CY046827	(A/Wisconsin/629-D02144/2009)	CY056963	(A/Copenhagen/INS95/2009)	GQ338378	(A/Oklahoma/03/2009)
CY046835	(A/Wisconsin/629-D01883/2009)	CY056971	(A/Copenhagen/INS96/2009)	GQ338381	(A/Rhode Island/04/2009)
CY046843	(A/Wisconsin/629-D02361/2009)	CY056979	(A/Copenhagen/INS98/2009)	GQ338385	(A/New Jersey/03/2009)
CY046851	(A/Wisconsin/629-D00244/2009)	CY056987	(A/Warsaw/INS100/2009)	GQ338391	(A/Washington/08/2009)
CY046859	(A/Wisconsin/629-D01415/2009)	CY056995	(A/Wisconsin/629-D00734/2009)	GQ338394	(A/Delaware/06/2009)
CY046867	(A/Wisconsin/629-D02272/2009)	CY057003	(A/Wisconsin/629-D02367/2009)	GQ338400	(A/Pennsylvania/10/2009)
CY046875	(A/Wisconsin/629-D00396/2009)	CY057011	(A/Wisconsin/629-D02041/2009)	GQ338402	(A/Pennsylvania/09/2009)
CY046883	(A/Wisconsin/629-D00498/2009)	CY057019	(A/Wisconsin/629-D02133/2009)	GQ338405	(A/New York/57/2009)
CY046891	(A/Wisconsin/629-D01880/2009)	CY057027	(A/Wisconsin/629-D00357/2009)	GQ338409	(A/Texas/37/2009)
CY046899	(A/Wisconsin/629-D00829/2009)	CY057078	(A/swine/Italy/85429/2009)	GQ338414	(A/Wisconsin/07/2009)
CY046907	(A/Wisconsin/629-D01083/2009)	CY057206	(A/Managua/167.01/2009)	GQ338416	(A/Indiana/12/2009)
CY046915	(A/Wisconsin/629-D01764/2009)	CY057214	(A/Managua/109.01/2009)	GQ339881	(A/Mexico/4283/2009)
CY046946	(A/Norway/1613/2009)	CY057222	(A/Managua/611.01/2009)	GQ351290	(A/Italy/85/2009)
CY046949	(A/Norway/1623/2009)	CY057230	(A/New York/5045/2009)	GQ351314	(A/Hong Kong/2369/2009)
CY046952	(A/Norway/2010/2009)	CY057238	(A/New York/5158/2009)	GQ351319	(A/Firenze/10/2009)
CY046955	(A/New York/3654/2009)	CY057246	(A/New York/5161/2009)	GQ356787	(A/Sao Paulo/2303/2009)
CY046963	(A/New York/3576/2009)	CY057254	(A/New York/5186/2009)	GQ359758	(A/Zhejiang/DTID-ZJU01/2009)
CY046971	(A/New York/3443/2009)	CY057262	(A/New York/5196/2009)	GQ359765	(A/Stockholm/31/2009)
CY047310	(A/New York/3074/2009)	CY057270	(A/New York/5217/2009)	GQ359771	(A/Puerto Montt/Bio87/2009)
CY047318	(A/New York/3124/2009)	CY057278	(A/New York/5221/2009)	GQ360060	(A/Stockholm/33/2009)
CY047326	(A/New York/3167/2009)	CY057286	(A/New York/5271/2009)	GQ365368	(A/Stockholm/35/2009)
CY047334	(A/New York/3364/2009)	CY057294	(A/New York/5276/2009)	GQ365410	(A/Akita/1/2009)
CY047342	(A/New York/3345/2009)	CY057302	(A/New York/5297/2009)	GQ365418	(A/Fukushima/1/2009)
CY047350	(A/New York/3365/2009)	CY057310	(A/New York/5447/2009)	GQ365426	(A/Iwate/1/2009)
CY047358	(A/New York/3741/2009)	CY057318	(A/New York/5667/2009)	GQ365428	(A/Iwate/2/2009)
CY047366	(A/New York/3795/2009)	CY057326	(A/New York/6072/2009)	GQ365436	(A/Kagoshima/1/2009)
CY047374	(A/New York/3753/2009)	CY057334	(A/San Diego/INS08/2009)	GQ365444	(A/Osaka/180/2009)
CY047382	(A/New York/4100/2009)	CY057342	(A/San Diego/INS75/2009)	GQ365446	(A/Sapporo/1/2009)
CY047712	(A/Hangzhou/1/2009)	CY057350	(A/Hamburg/INS92/2009)	GQ365455	(A/Utsunomiya/2/2009)
CY047713	(A/Hangzhou/2/2009)	CY057358	(A/Wisconsin/629-D02485/2009)	GQ365658	(A/Bayern/62/2009)
CY047714	(A/Hangzhou/3/2009)	CY057366	(A/Wisconsin/629-D00643/2009)	GQ365666	(A/Brandenburg/19/2009)
CY047744	(A/Taiwan/526/2009)	CY057374	(A/Wisconsin/629-D01850/2009)	GQ365674	(A/Brandenburg/20/2009)

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CY048925	(A/Malaysia/820/2009)	CY057382	(A/Wisconsin/629-D02192/2009)	GQ368664	(A/Sao Paulo/2233/2009)
CY048933	(A/Malaysia/854/2009)	CY057390	(A/Wisconsin/629-D00036/2009)	GQ368665	(A/Mato Grosso/2329/2009)
CY049060	(A/Singapore/ON305/2009)	CY057398	(A/Wisconsin/629-D01469/2009)	GQ368667	(A/Distrito Federal/2611/2009)
CY049068	(A/Singapore/ON129/2009)	CY057406	(A/Wisconsin/629-D00832/2009)	GQ369403	(A/swine/Alberta/OTH-33-1/2009)
CY049076	(A/Singapore/ON141/2009)	CY057414	(A/Wisconsin/629-D01802/2009)	GQ369406	(A/swine/Alberta/OTH-33-2/2009)
CY049084	(A/Singapore/ON279/2009)	CY057422	(A/Wisconsin/629-D00485/2009)	GQ369409	(A/swine/Alberta/OTH-33-3/2009)
CY049092	(A/Singapore/ON354/2009)	CY057430	(A/Wisconsin/629-D01935/2009)	GQ369412	(A/swine/Alberta/OTH-33-7/2009)
CY049100	(A/Singapore/ON511/2009)	CY057438	(A/Wisconsin/629-D01522/2009)	GQ369417	(A/swine/Alberta/OTH-33-21/2009)
CY049108	(A/Singapore/ON581/2009)	CY057446	(A/Wisconsin/629-D01355/2009)	GQ369422	(A/swine/Alberta/OTH-33-23/2009)
CY049116	(A/Singapore/ON923/2009)	CY057454	(A/Wisconsin/629-D00748/2009)	GQ369425	(A/swine/Alberta/OTH-33-24/2009)
CY049124	(A/Singapore/ON193/2009)	CY057462	(A/Wisconsin/629-D00839/2009)	GQ375284	(A/Moscow/03/2009)
CY049132	(A/Singapore/ON226/2009)	CY057470	(A/Wisconsin/629-D00402/2009)	GQ377035	(A/Alaska/04/2009)
CY049140	(A/Singapore/ON304/2009)	CY057478	(A/Wisconsin/629-D01237/2009)	GQ377043	(A/Montana/07/2009)
CY049148	(A/Singapore/ON504/2009)	CY057486	(A/Wisconsin/629-D00346/2009)	GQ377045	(A/Tennessee/07/2009)
CY049156	(A/Singapore/ON507/2009)	CY057494	(A/Wisconsin/629-D00287/2009)	GQ377047	(A/Texas/39/2009)
CY049164	(A/Singapore/ON584/2009)	CY057502	(A/Wisconsin/629-D00565/2009)	GQ377052	(A/California/08/2009)
CY049172	(A/Singapore/ON588/2009)	CY057510	(A/Wisconsin/629-D00410/2009)	GQ377061	(A/Texas/20/2009)
CY049180	(A/Singapore/ON590/2009)	CY057518	(A/Wisconsin/629-D00891/2009)	GQ377064	(A/Virginia/05/2009)
CY049188	(A/Singapore/ON594/2009)	CY057526	(A/Wisconsin/629-D01391/2009)	GQ377069	(A/New York/59/2009)
CY049196	(A/Singapore/ON621/2009)	CY057534	(A/Wisconsin/629-D00250/2009)	GQ377072	(A/Texas/04/2009)
CY049204	(A/Singapore/ON628/2009)	CY057542	(A/Wisconsin/629-D00853/2009)	GQ377075	(A/Washington/18/2009)
CY049212	(A/Singapore/ON635/2009)	CY057550	(A/Wisconsin/629-D02337/2009)	GQ377082	(A/Nebraska/02/2009)
CY049220	(A/Singapore/ON639/2009)	CY057558	(A/Wisconsin/629-D00690/2009)	GQ377085	(A/California/20/2009)
CY049228	(A/Singapore/ON894/2009)	CY057566	(A/Wisconsin/629-D00834/2009)	GQ377087	(A/Oregon/07/2009)
CY049236	(A/Singapore/ON896/2009)	CY057574	(A/Wisconsin/629-S1252/2009)	GQ377093	(A/California/12/2009)
CY049244	(A/Singapore/ON899/2009)	CY057582	(A/Wisconsin/629-D01749/2009)	GQ377095	(A/California/24/2009)
CY049252	(A/Singapore/ON901/2009)	CY057590	(A/Wisconsin/629-D02090/2009)	GQ377101	(A/California/19/2009)
CY049260	(A/Singapore/ON975/2009)	CY057598	(A/Wisconsin/629-D01080/2009)	GQ377103	(A/New York/45/2009)
CY049268	(A/Singapore/ON978/2009)	CY057606	(A/Wisconsin/629-D00557/2009)	GQ377107	(A/Utah/04/2009)
CY049276	(A/Singapore/ON980/2009)	CY057614	(A/Wisconsin/629-S1309/2009)	GQ379822	(A/Mexico/InDRE4114/2009)
CY049284	(A/Singapore/ON981/2009)	CY057622	(A/Wisconsin/629-S1313/2009)	GQ385300	(A/Toronto/0462/2009)
CY049292	(A/Singapore/ON380/2009)	CY057630	(A/Wisconsin/629-S1348/2009)	GQ392017	(A/Singapore/TLL01/2009)
CY049300	(A/Singapore/ON384/2009)	CY057638	(A/Wisconsin/629-S1350/2009)	GQ392022	(A/Moscow/IIV04/2009)
CY049308	(A/Singapore/ON402/2009)	CY057646	(A/Wisconsin/629-D02342/2009)	GQ392029	(A/Italy/127/2009)
CY049316	(A/Singapore/ON439/2009)	CY057654	(A/Wisconsin/629-D00544/2009)	GQ396732	(A/Utah/10/2009)
CY049324	(A/Singapore/ON478/2009)	CY057662	(A/Wisconsin/629-D00099/2009)	GQ397278	(A/Yamaguchi/22/2009)
CY049332	(A/Singapore/ON479/2009)	CY057670	(A/Wisconsin/629-D00132/2009)	GQ402187	(A/Canada-MB/RV2023/2009)
CY049340	(A/Singapore/ON582/2009)	CY057678	(A/Wisconsin/629-S1384/2009)	GQ402188	(A/Mexico/InDRE4115/2009)
CY049348	(A/Singapore/ON593/2009)	CY057686	(A/Wisconsin/629-S1388/2009)	GQ402189	(A/Mexico/InDRE13494/2009)
CY049356	(A/Singapore/ON368/2009)	CY057694	(A/Wisconsin/629-S1398/2009)	GQ402190	(A/Mexico/InDRE13495/2009)
CY049364	(A/Singapore/ON313/2009)	CY057702	(A/Wisconsin/629-S1397/2009)	GQ402191	(A/Mexico/InDRE13547/2009)
CY049372	(A/Singapore/ON355/2009)	CY057710	(A/Wisconsin/629-S1407/2009)	GQ402192	(A/Mexico/InDRE13551/2009)
CY049380	(A/Singapore/ON442/2009)	CY057718	(A/Wisconsin/629-D02317/2009)	GQ402193	(A/Mexico/InDRE13555/2009)
CY049388	(A/Singapore/ON496/2009)	CY057726	(A/Wisconsin/629-D01915/2009)	GQ402194	(A/Canada-QC/RV1595/2009)
CY049396	(A/Singapore/ON506/2009)	CY057734	(A/Wisconsin/629-D01140/2009)	GQ402195	(A/Canada-QC/RV1759/2009)

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CY049404	(A/Singapore/ON575/2009)	CY057742	(A/Wisconsin/629-D00151/2009)	GQ402196	(A/Canada-SK/RV1767/2009)
CY049419	(A/Singapore/ON903/2009)	CY057750	(A/Wisconsin/629-D01570/2009)	GQ402197	(A/Canada-SK/RV1793/2009)
CY049427	(A/Singapore/ON905/2009)	CY057758	(A/Wisconsin/629-D02370/2009)	GQ402198	(A/Canada-SK/RV1798/2009)
CY049435	(A/Singapore/ON907/2009)	CY057766	(A/Wisconsin/629-D01346/2009)	GQ402199	(A/Canada-QC/RV1954/2009)
CY049443	(A/Singapore/ON912/2009)	CY057774	(A/Wisconsin/629-D00802/2009)	GQ402200	(A/Canada-MB/RV1964/2009)
CY049451	(A/Singapore/ON921/2009)	CY057782	(A/Wisconsin/629-D01014/2009)	GQ402201	(A/Canada-MB/RV1975/2009)
CY049459	(A/Singapore/ON925/2009)	CY057790	(A/Wisconsin/629-D01369/2009)	GQ402202	(A/Canada-MB/RV1977/2009)
CY049467	(A/Singapore/ON1050/2009)	CY057798	(A/Wisconsin/629-D01466/2009)	GQ402203	(A/Canada-MB/RV1982/2009)
CY049475	(A/Singapore/ON1060/2009)	CY057806	(A/Wisconsin/629-D02392/2009)	GQ402204	(A/Canada-MB/RV2013/2009)
CY049483	(A/Singapore/ON1067/2009)	CY057814	(A/Wisconsin/629-D01826/2009)	GQ402205	(A/Canada-MB/RV2018/2009)
CY049491	(A/Singapore/ON1072/2009)	CY057822	(A/Wisconsin/629-D00965/2009)	GQ402206	(A/Canada-MB/RV2020/2009)
CY049499	(A/Singapore/ON1087/2009)	CY057830	(A/Wisconsin/629-D00911/2009)	GQ411897	(A/Toronto/T5308/2009)
CY049507	(A/Singapore/ON1093/2009)	CY057838	(A/Wisconsin/629-D00128/2009)	GQ411907	(A/Shanghai/143T/2009)
CY049515	(A/Singapore/ON1099/2009)	CY057846	(A/Wisconsin/629-D02060/2009)	GQ411908	(A/Shanghai/60T/2009)
CY049523	(A/Singapore/ON1105/2009)	CY057854	(A/Wisconsin/629-D00295/2009)	GQ414764	(A/Sao Paulo/2056/2009)
CY049531	(A/Singapore/ON1113/2009)	CY057862	(A/Wisconsin/629-D00936/2009)	GQ414765	(A/Sao Paulo/2193/2009)
CY049539	(A/Singapore/ON1118/2009)	CY057870	(A/Wisconsin/629-D01661/2009)	GQ414766	(A/Sao Paulo/2261/2009)
CY049547	(A/Singapore/ON1126/2009)	CY057878	(A/Wisconsin/629-D01987/2009)	GQ414767	(A/Sao Paulo/2275/2009)
CY049555	(A/Singapore/ON1138/2009)	CY057886	(A/Wisconsin/629-D00533/2009)	GQ414768	(A/Sao Paulo/43812/2009)
CY049563	(A/Singapore/ON1144/2009)	CY057894	(A/Wisconsin/629-D00908/2009)	GQ421199	(A/Ancona/01/2009)
CY049571	(A/Singapore/ON1156/2009)	CY057902	(A/Wisconsin/629-D02448/2009)	GQ421200	(A/Ancona/02/2009)
CY049579	(A/Singapore/ON1163/2009)	CY057910	(A/Wisconsin/629-D00134/2009)	GQ421201	(A/Ancona/04/2009)
CY049587	(A/Singapore/ON1168/2009)	CY057918	(A/Wisconsin/629-D01330/2009)	GQ421203	(A/Ancona/05/2009)
CY049595	(A/Singapore/ON1177/2009)	CY057926	(A/Wisconsin/629-D01190/2009)	GQ426218	(A/Tomsk/01/2009)
CY049603	(A/Singapore/ON1187/2009)	CY057934	(A/Wisconsin/629-D00968/2009)	GQ455032	(A/Nanjing/2/2009)
CY049611	(A/Singapore/ON1194/2009)	CY057942	(A/Wisconsin/629-D00629/2009)	GQ457465	(A/Utah/05/2009)
CY049619	(A/Singapore/GP2312/2009)	CY057950	(A/Wisconsin/629-D00050/2009)	GQ457470	(A/Utah/11/2009)
CY049627	(A/Singapore/GP2316/2009)	CY057958	(A/Wisconsin/629-D00970/2009)	GQ457479	(A/Utah/07/2009)
CY049635	(A/Singapore/GP2641/2009)	CY057966	(A/Wisconsin/629-D01528/2009)	GQ457482	(A/Nevada/03/2009)
CY049643	(A/Singapore/GP2651/2009)	CY057974	(A/Wisconsin/629-D01434/2009)	GQ457487	(A/Texas/05/2009)
CY049651	(A/Singapore/ON2081/2009)	CY057982	(A/Wisconsin/629-D01412/2009)	GQ457497	(A/New York/15/2009)
CY049659	(A/Singapore/GP2686/2009)	CY057990	(A/Wisconsin/629-D00935/2009)	GQ457501	(A/Texas/30/2009)
CY049667	(A/Singapore/GP2687/2009)	CY057998	(A/Wisconsin/629-D02299/2009)	GQ457506	(A/New York/18/2009)
CY049675	(A/Singapore/GP2695/2009)	CY058006	(A/Wisconsin/629-D01473/2009)	GQ457511	(A/Montana/06/2009)
CY049683	(A/Singapore/GP2703/2009)	CY058014	(A/Wisconsin/629-D00672/2009)	GQ457514	(A/California/25/2009)
CY049691	(A/Singapore/GP2711/2009)	CY058022	(A/Wisconsin/629-D00401/2009)	GQ457517	(A/California/27/2009)
CY049699	(A/Singapore/GP2715/2009)	CY058030	(A/Wisconsin/629-D00636/2009)	GQ457519	(A/Changsha/78/2009)
CY049820	(A/Craven/WR0019/2009)	CY058038	(A/Texas/46172731/2009)	GQ463200	(A/Hunan/SWL3/2009)
CY049828	(A/Cherry Point/WR0080/2009)	CY058046	(A/Texas/46172734/2009)	GQ464408	(A/Catalonia/63/2009)
CY049836	(A/Bogota/WR0090N/2009)	CY058054	(A/Texas/46181235/2009)	GQ465672	(A/Canada-SK/RV2486/2009)
CY049843	(A/Craven/WR0093/2009)	CY058062	(A/Texas/46181292/2009)	GQ465673	(A/Canada-AB/RV1531/2009)
CY049851	(A/La Paz/WR0096T/2009)	CY058076	(A/Managua/171.01/2009)	GQ465674	(A/Canada-NS/RV1551/2009)
CY049859	(A/Cherry Point/WR0100/2009)	CY058084	(A/Managua/1455.01/2009)	GQ465675	(A/Canada-NS/RV1554/2009)
CY049867	(A/Cherry Point/WR0101/2009)	CY058092	(A/Managua/655.02/2009)	GQ465676	(A/Canada-NS/RV1565/2009)
CY049875	(A/Cherry Point/WR0102/2009)	CY058100	(A/Managua/168.02/2009)	GQ465677	(A/Canada-PQ/RV1586/2009)

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CY049883	(A/San Salvador/WR0167N/2009)	CY058108	(A/Managua/2152.01/2009)	GQ465678	(A/Canada-ON/RV1589/2009)
CY049891	(A/San Salvador/0169T/2009)	CY058116	(A/Managua/1637.01/2009)	GQ465679	(A/Canada-AB/RV1644/2009)
CY049899	(A/Moscow/0253T/2009)	CY058124	(A/Managua/5453.01/2009)	GQ465680	(A/Canada-PQ/RV1758/2009)
CY049907	(A/Santo Domingo/0574/2009)	CY058132	(A/Managua/516.01/2009)	GQ465681	(A/Canada-SK/RV1788/2009)
CY049915	(A/Santo Domingo/0574T/2009)	CY058140	(A/Managua/5665.01/2009)	GQ465682	(A/Canada-SK/RV1794/2009)
CY049923	(A/New Bern/WR0670/2009)	CY058148	(A/Managua/4085.02/2009)	GQ465683	(A/Canada-SK/RV1797/2009)
CY049931	(A/Craven/WR1001/2009)	CY058156	(A/Managua/2330.02/2009)	GQ485656	(A/Ekaterinburg/01/2009)
CY049939	(A/Santo Domingo/WR1056T/2009)	CY058164	(A/Managua/4016.02/2009)	GQ485661	(A/Almati/01/2009)
CY049947	(A/Santo Domingo/WR1057N/2009)	CY058172	(A/Managua/792.01/2009)	GQ494354	(A/Moscow/IIV05/2009)
CY049955	(A/Santo Domingo/WR1058N/2009)	CY058180	(A/Managua/3189.01/2009)	GQ496142	(A/Vladivostok/IIV17/2009)
CY049963	(A/Santo Domingo/WR1059N/2009)	CY058188	(A/Managua/5586.01/2009)	GQ496149	(A/Vladivostok/IIV18/2009)
CY049971	(A/Santo Domingo/1066N/2009)	CY058196	(A/Managua/1127.02/2009)	GQ499334	(A/Washington/29/2009)
CY049979	(A/Santo Domingo/WR1068N/2009)	CY058204	(A/Managua/791.03/2009)	GQ499336	(A/Washington/28/2009)
CY049987	(A/Mexico City/WR1087T/2009)	CY058212	(A/Managua/578.01/2009)	GQ502906	(A/Toronto/R8557/2009)
CY049995	(A/Mexico City/WR1100N/2009)	CY058220	(A/Managua/5221.03/2009)	GQ505853	(A/Irkutsk/02/2009)
CY050003	(A/Mexico City/WR1297N/2009)	CY058228	(A/Managua/5363.02/2009)	GQ527163	(A/Singapore/TLL53/2009)
CY050011	(A/Mexico City/WR1301N/2009)	CY058236	(A/Managua/473.02/2009)	GQ527164	(A/Singapore/TLL54/2009)
CY050019	(A/Mexico City/WR1306N/2009)	CY058244	(A/Managua/3275.01/2009)	GQ527165	(A/Singapore/TLL51/2009)
CY050027	(A/Mexico City/WR1307N/2009)	CY058252	(A/Managua/3244.01/2009)	GQ527166	(A/Singapore/TLL52/2009)
CY050035	(A/Mexico City/WR1308T/2009)	CY058260	(A/Managua/164.01/2009)	GQ527167	(A/Omsk/01/2009)
CY050043	(A/Mexico City/WR1310N/2009)	CY058268	(A/New York/5620/2009)	GQ866928	(A/Thailand/CU-H106/2009)
CY050051	(A/Mexico City/WR1311T/2009)	CY058276	(A/Wisconsin/629-D01015/2009)	GQ866929	(A/Thailand/CU-H276/2009)
CY050059	(A/Mexico City/WR1312N/2009)	CY058284	(A/Wisconsin/629-D01102/2009)	GQ866931	(A/Thailand/CU-B938/2009)
CY050067	(A/Cherry Point/WR1355/2009)	CY058292	(A/Wisconsin/629-D02100/2009)	GQ866951	(A/Thailand/CU-B5/2009)
CY050075	(A/Japan/PR1070/2009)	CY058300	(A/Wisconsin/629-D02018/2009)	GQ866959	(A/Thailand/CU-H9/2009)
CY050083	(A/Taiwan/T0826/2009)	CY058308	(A/Wisconsin/629-S1417/2009)	GQ894806	(A/Florida/17/2009)
CY050142	(A/Wisconsin/629-D01058/2009)	CY058316	(A/Wisconsin/629-S1414/2009)	GQ894808	(A/New York/80/2009)
CY050150	(A/Wisconsin/629-D00117/2009)	CY058324	(A/Wisconsin/629-S1416/2009)	GQ894816	(A/Illinois/07/2009)
CY050158	(A/New York/4095/2009)	CY058332	(A/Wisconsin/629-D01347/2009)	GQ894821	(A/Nevada/05/2009)
CY050166	(A/Mexico City/008/2009)	CY058340	(A/Wisconsin/629-D00503/2009)	GQ894825	(A/Massachusetts/10/2009)
CY050174	(A/Mexico City/015/2009)	CY058348	(A/Wisconsin/629-D01582/2009)	GQ894827	(A/Florida/12/2009)
CY050182	(A/New York/4438/2009)	CY058356	(A/Wisconsin/629-D02489/2009)	GQ894828	(A/Florida/16/2009)
CY050190	(A/New York/4576/2009)	CY058364	(A/Wisconsin/629-D00689/2009)	GQ894830	(A/Rhode Island/08/2009)
CY050198	(A/Mexico City/001/2009)	CY058372	(A/Wisconsin/629-D01244/2009)	GQ894839	(A/Pennsylvania/06/2009)
CY050206	(A/Mexico City/002/2009)	CY058380	(A/Wisconsin/629-D00780/2009)	GQ894841	(A/Utah/06/2009)
CY050214	(A/Mexico City/003/2009)	CY058388	(A/Wisconsin/629-D00147/2009)	GQ894842	(A/Georgia/02/2009)
CY050222	(A/Mexico City/004/2009)	CY058396	(A/Wisconsin/629-D01591/2009)	GQ894845	(A/Georgia/08/2009)
CY050230	(A/Mexico City/006/2009)	CY058404	(A/Wisconsin/629-D01038/2009)	GQ894849	(A/Georgia/15/2009)
CY050238	(A/Mexico City/010/2009)	CY058412	(A/Wisconsin/629-D00459/2009)	GQ894862	(A/Florida/10/2009)
CY050246	(A/Mexico City/011/2009)	CY058420	(A/Wisconsin/629-D01904/2009)	GQ894865	(A/Indiana/17/2009)
CY050254	(A/Mexico City/012/2009)	CY058428	(A/Wisconsin/629-D01752/2009)	GQ894869	(A/Louisiana/07/2009)
CY050328	(A/Wisconsin/629-D01851/2009)	CY058436	(A/Wisconsin/629-D01556/2009)	GQ894898	(A/Missouri/01/2009)
CY050339	(A/Singapore/9061364/2009)	CY058444	(A/Wisconsin/629-D02073/2009)	GQ894899	(A/Pennsylvania/14/2009)
CY050347	(A/Singapore/9061365/2009)	CY058452	(A/Wisconsin/629-D01846/2009)	GQ894905	(A/Texas/29/2009)
CY050355	(A/Singapore/9061366/2009)	CY058460	(A/Wisconsin/629-D00996/2009)	GQ894906	(A/Florida/08/2009)

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CY050363	(A/Singapore/279M/2009)	CY058468	(A/Wisconsin/629-D00337/2009)	GQ894907	(A/Idaho/03/2009)
CY050372	(A/Wisconsin/629-D01154/2009)	CY058476	(A/Wisconsin/629-D02424/2009)	GQ894911	(A/Oregon/20/2009)
CY050380	(A/Wisconsin/629-D01295/2009)	CY058524	(A/Managua/4905.02/2009)	GQ894913	(A/Rhode Island/07/2009)
CY050388	(A/Wisconsin/629-D01839/2009)	CY058532	(A/Managua/4514.03/2009)	GQ894920	(A/Texas/47/2009)
CY050396	(A/Wisconsin/629-D00989/2009)	CY058540	(A/Managua/462.01/2009)	GQ894922	(A/Washington/37/2009)
CY050404	(A/Wisconsin/629-D00451/2009)	CY058548	(A/Managua/4935.03/2009)	GQ894929	(A/Alabama/02/2009)
CY050412	(A/Wisconsin/629-D00752/2009)	CY058556	(A/Managua/2093.01/2009)	GQ894934	(A/Georgia/03/2009)
CY050420	(A/Wisconsin/629-D02206/2009)	CY058564	(A/Managua/4218.01/2009)	GQ894935	(A/Michigan/06/2009)
CY050428	(A/Wisconsin/629-D02324/2009)	CY058572	(A/Managua/4757.02/2009)	GQ915017	(A/Sao Paulo/53206/2009)
CY050436	(A/Wisconsin/629-D01886/2009)	CY058580	(A/Managua/989.01/2009)	GQ915018	(A/Sao Paulo/53225/2009)
CY050444	(A/Wisconsin/629-D01482/2009)	CY058588	(A/Managua/65.02/2009)	GQ915019	(A/Sao Paulo/53823/2009)
CY050844	(A/Ulaanbaatar/5882/2009)	CY058596	(A/Managua/3435.01/2009)	GQ915020	(A/Sao Paulo/53838/2009)
CY050845	(A/Ulaanbaatar/6266/2009)	CY058604	(A/Managua/5747.02/2009)	GQ915021	(A/Sao Paulo/53845/2009)
CY050846	(A/Ulaanbaatar/6133/2009)	CY058612	(A/Managua/2323.02/2009)	GQ915022	(A/Sao Paulo/54392/2009)
CY050847	(A/Mexico City/007/2009)	CY058620	(A/Wisconsin/629-S1433/2009)	GQ915023	(A/Sao Paulo/55312/2009)
CY050855	(A/Mexico City/009/2009)	CY058628	(A/Wisconsin/629-S1431/2009)	GQ915024	(A/Sao Paulo/55115/2009)
CY050863	(A/Mexico City/013/2009)	CY058636	(A/Wisconsin/629-S1425/2009)	GQ915025	(A/Sao Paulo/57831/2009)
CY050871	(A/Mexico City/017/2009)	CY058644	(A/Wisconsin/629-D02329/2009)	GQ915076	(A/Singapore/TLL10/2009)
CY050879	(A/Mexico City/005/2009)	CY058652	(A/Wisconsin/629-D02002/2009)	GU014748	(A/Gifu-C/67/2009)
CY050887	(A/Mexico City/018/2009)	CY058660	(A/Wisconsin/629-D01913/2009)	GU014750	(A/Hiroshima/201/2009)
CY050895	(A/Wisconsin/629-D00949/2009)	CY058668	(A/Wisconsin/629-D00193/2009)	GU014752	(A/Mie/41/2009)
CY050903	(A/Wisconsin/629-D01779/2009)	CY058676	(A/Wisconsin/629-D00938/2009)	GU014754	(A/Mie/52/2009)
CY050911	(A/Wisconsin/629-D01262/2009)	CY058684	(A/Texas/46182018/2009)	GU014756	(A/Myanmar/JP90/2009)
CY050919	(A/Wisconsin/629-D02213/2009)	CY058692	(A/Texas/461917783/2009)	GU014758	(A/Myanmar/JP101/2009)
CY050927	(A/Wisconsin/629-D00426/2009)	CY058700	(A/Texas/46192760/2009)	GU014760	(A/Myanmar/JP131/2009)
CY050935	(A/Wisconsin/629-D01847/2009)	CY058708	(A/Texas/46193311/2009)	GU014762	(A/Myanmar/JP133/2009)
CY050943	(A/Wisconsin/629-D00374/2009)	CY058716	(A/Texas/JMS375/2009)	GU014764	(A/Niigata/700/2009)
CY050951	(A/Wisconsin/629-D00724/2009)	CY058724	(A/Texas/JMS376/2009)	GU014766	(A/Niigata/749/2009)
CY050959	(A/Wisconsin/629-D00941/2009)	CY058732	(A/Texas/JMS377/2009)	GU014768	(A/Saitama/85/2009)
CY050967	(A/Wisconsin/629-D01725/2009)	CY058740	(A/Texas/JMS378/2009)	GU014770	(A/Wakayama/57/2009)
CY050975	(A/Wisconsin/629-D00367/2009)	CY058820	(A/Guangdong/1331/2009)	GU014772	(A/Aichi/198/2009)
CY050983	(A/Wisconsin/629-D00592/2009)	CY058822	(A/Guangdong/1748/2009)	GU014774	(A/Aichi/202/2009)
CY050991	(A/Wisconsin/629-D01903/2009)	CY058824	(A/Guangdong/1759/2009)	GU014776	(A/Chiba-C/48/2009)
CY050999	(A/Wisconsin/629-D00665/2009)	CY058826	(A/Guangdong/1782/2009)	GU014778	(A/Chiba-C/51/2009)
CY051007	(A/Wisconsin/629-D01619/2009)	CY058828	(A/Guangdong/1998/2009)	GU014780	(A/Hiroshima/200/2009)
CY051015	(A/Wisconsin/629-D00453/2009)	CY058830	(A/Guangdong/2221/2009)	GU014782	(A/Hiroshima/207/2009)
CY051023	(A/Wisconsin/629-D00017/2009)	CY058832	(A/Guangdong/2281/2009)	GU014784	(A/Hiroshima/216/2009)
CY051031	(A/Wisconsin/629-D00658/2009)	CY058834	(A/Guangdong/2282/2009)	GU014786	(A/Hiroshima/220/2009)
CY051039	(A/Wisconsin/629-D00725/2009)	CY058836	(A/Guangdong/2361/2009)	GU014788	(A/Hiroshima/230/2009)
CY051047	(A/Wisconsin/629-D00008/2009)	CY060444	(A/Bahia/12606/2009)	GU014790	(A/Iwate/3/2009)
CY051055	(A/Wisconsin/629-D02068/2009)	CY060445	(A/Bahia/15525/2009)	GU014792	(A/Kanagawa/137/2009)
CY051063	(A/Wisconsin/629-D00101/2009)	CY060446	(A/Minas Gerais/14602/2009)	GU014794	(A/Kanagawa/140/2009)
CY051071	(A/Wisconsin/629-D00579/2009)	CY060447	(A/Rio de Janeiro/14601/2009)	GU014796	(A/Myanmar/60/2009)
CY051079	(A/Wisconsin/629-D01326/2009)	CY060449	(A/Rio de Janeiro/7131/2009)	GU014798	(A/Niigata/690/2009)
CY051087	(A/Wisconsin/629-D01844/2009)	CY060450	(A/Rio de Janeiro/7455/2009)	GU014800	(A/Niigata/717/2009)

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CY051095	(A/Wisconsin/629-D00196/2009)	CY060451	(A/Rio Grande do Sul/9116/2009)	GU014802	(A/Shizuoka/793/2009)
CY051103	(A/Wisconsin/629-D01618/2009)	CY060452	(A/Santa Catarina/6235/2009)	GU014804	(A/Shizuoka-C/97/2009)
CY051111	(A/Wisconsin/629-D02263/2009)	CY060457	(A/Seoul/1785/2009)	GU014806	(A/Tokushima/2/2009)
CY051119	(A/Wisconsin/629-D00916/2009)	CY060460	(A/Gangwon/1805/2009)	GU014808	(A/Yamaguchi/21/2009)
CY051127	(A/Wisconsin/629-D00119/2009)	CY060463	(A/Gyeongnam/1819/2009)	GU014810	(A/Yamaguchi/23/2009)
CY051135	(A/Wisconsin/629-D01152/2009)	CY060466	(A/Gyeongnam/1820/2009)	GU045582	(A/Singapore/TLL38/2009)
CY051143	(A/Wisconsin/629-D01734/2009)	CY060469	(A/Seoul/2883/2009)	GU045583	(A/Singapore/TLL40/2009)
CY051151	(A/Wisconsin/629-D01147/2009)	CY060472	(A/Seoul/1829/2009)	GU045584	(A/Singapore/TLL42/2009)
CY051159	(A/Wisconsin/629-D00541/2009)	CY060475	(A/Daejeon/1840/2009)	GU057010	(A/Chengdu/03/2009)
CY051167	(A/Wisconsin/629-D02063/2009)	CY060478	(A/Daejeon/1841/2009)	GU057011	(A/Chengdu/04/2009)
CY051175	(A/Wisconsin/629-D00428/2009)	CY060481	(A/Daegu/1853/2009)	GU057012	(A/Chengdu/06/2009)
CY051183	(A/Wisconsin/629-D02220/2009)	CY060484	(A/Daegu/1854/2009)	GU057013	(A/Chengdu/14/2009)
CY051191	(A/Wisconsin/629-D00496/2009)	CY060487	(A/Daegu/1855/2009)	GU057014	(A/Chengdu/18/2009)
CY051199	(A/Wisconsin/629-D02024/2009)	CY060490	(A/Seoul/1870/2009)	GU057015	(A/Chengdu/21/2009)
CY051207	(A/Wisconsin/629-D01414/2009)	CY060493	(A/Daejeon/1871/2009)	GU057016	(A/Chengdu/31/2009)
CY051215	(A/Wisconsin/629-D02292/2009)	CY060496	(A/Daegu/1873/2009)	GU057017	(A/Chengdu/33/2009)
CY051223	(A/Wisconsin/629-D00022/2009)	CY060502	(A/Ontario/10016/2009)	GU057018	(A/Chengdu/39/2009)
CY051231	(A/Wisconsin/629-D01664/2009)	CY060510	(A/Ontario/10296/2009)	GU057019	(A/Chengdu/40/2009)
CY051239	(A/Wisconsin/629-D01199/2009)	CY060518	(A/Ontario/222656/2009)	GU057020	(A/Chengdu/47/2009)
CY051247	(A/Wisconsin/629-S0035/2009)	CY060526	(A/Ontario/235657/2009)	GU057021	(A/Chengdu/54/2009)
CY051255	(A/Wisconsin/629-S0086/2009)	CY060534	(A/Ontario/237882/2009)	GU057022	(A/Jiangyin/01/2009)
CY051263	(A/Wisconsin/629-S0143/2009)	CY060542	(A/Ontario/25389/2009)	GU057023	(A/Jiangyin/02/2009)
CY051271	(A/Wisconsin/629-S0146/2009)	CY060550	(A/Ontario/25913/2009)	GU057024	(A/Jiangyin/15/2009)
CY051279	(A/Wisconsin/629-S0148/2009)	CY060558	(A/Ontario/26184/2009)	GU057025	(A/Jiangyin/16/2009)
CY051287	(A/Wisconsin/629-S0173/2009)	CY060566	(A/Ontario/296008/2009)	GU057026	(A/Jiangyin/17/2009)
CY051295	(A/Wisconsin/629-S0186/2009)	CY060574	(A/Ontario/29801/2009)	GU057027	(A/Jiangyin/34/2009)
CY051303	(A/Wisconsin/629-S0197/2009)	CY060582	(A/Ontario/304434/2009)	GU057028	(A/Jiangyin/47/2009)
CY051311	(A/Wisconsin/629-S0201/2009)	CY060590	(A/Ontario/305139/2009)	GU057029	(A/Jiangyin/48/2009)
CY051319	(A/Wisconsin/629-S0202/2009)	CY060598	(A/Ontario/305598/2009)	GU057030	(A/Jiangyin/68/2009)
CY051327	(A/Wisconsin/629-S0203/2009)	CY060606	(A/Ontario/308054/2009)	GU057031	(A/Jiangyin/69/2009)
CY051335	(A/Wisconsin/629-S0220/2009)	CY060614	(A/Ontario/309862/2009)	GU108486	(A/Zhejiang-Yiwu/11/2009)
CY051343	(A/Wisconsin/629-S0222/2009)	CY060622	(A/Ontario/313762/2009)	GU112090	(A/Zhejiang/DTID-ZJU02/2009)
CY051351	(A/Wisconsin/629-S0226/2009)	CY060630	(A/Ontario/314095/2009)	GU117765	(A/Nagasaki/I01/2009)
CY051359	(A/Wisconsin/629-S0245/2009)	CY060638	(A/Ontario/314137/2009)	GU189640	(A/swine/Singapore-Q/M168/2009)
CY051367	(A/Wisconsin/629-S0248/2009)	CY060646	(A/Ontario/314603/2009)	GU189649	(A/Zhejiang/DTID-ZJU03/2009)
CY051375	(A/Wisconsin/629-S0247/2009)	CY060654	(A/Ontario/315003/2009)	GU198201	(A/Nanjing/3/2009)
CY051383	(A/Wisconsin/629-S0254/2009)	CY060662	(A/Ontario/315015/2009)	GU211219	(A/Vladivostok/01/2009)
CY051391	(A/Wisconsin/629-S0255/2009)	CY060670	(A/Ontario/315047/2009)	GU211227	(A/Russia/01/2009)
CY051399	(A/Wisconsin/629-S0252/2009)	CY060678	(A/Ontario/315107/2009)	GU211235	(A/Omsk/02/2009)
CY051407	(A/Wisconsin/629-S0269/2009)	CY060686	(A/Ontario/315181/2009)	GU211243	(A/Tomsk/02/2009)
CY051415	(A/Wisconsin/629-S0280/2009)	CY060694	(A/Ontario/315187/2009)	GU214058	(A/Serbia/3547/2009)
CY051423	(A/Wisconsin/629-S0279/2009)	CY060702	(A/Ontario/315613/2009)	GU220604	(A/Serbia/3761/2009)
CY051431	(A/Wisconsin/629-S0293/2009)	CY060710	(A/Ontario/315637/2009)	GU226570	(A/Ghom/1550/2009)
CY051439	(A/Wisconsin/629-S0319/2009)	CY060718	(A/Ontario/320266/2009)	GU226571	(A/Khorasan/1583/2009)
CY051447	(A/Wisconsin/629-S0345/2009)	CY060726	(A/Ontario/328474/2009)	GU226572	(A/Lorestan/1599/2009)

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CY051455	(A/Wisconsin/629-S0339/2009)	CY060734	(A/Ontario/35273/2009)	GU271944	(A/Chita/01/2009)
CY051463	(A/Wisconsin/629-S0314/2009)	CY060742	(A/Ontario/9698/2009)	GU290047	(A/Prague/197-81395/2009)
CY051471	(A/Wisconsin/629-S0435/2009)	CY060750	(A/Ontario/9739/2009)	GU290055	(A/Prague/196-81511/2009)
CY051479	(A/Wisconsin/629-S0410/2009)	CY060755	(A/Texas/46193632/2009)	GU290188	(A/Utah/42/2009)
CY051487	(A/Wisconsin/629-S0464/2009)	CY060763	(A/Texas/46201823/2009)	GU290190	(A/Utah/42/2009)
CY051495	(A/Wisconsin/629-S0189/2009)	CY060771	(A/Texas/46214103/2009)	GU292341	(A/Finland/614/2009)
CY051503	(A/Wisconsin/629-S0206/2009)	CY060779	(A/Texas/46221665/2009)	GU292344	(A/Pune/NIV10278/2009)
CY051511	(A/Wisconsin/629-S0208/2009)	CY060787	(A/Texas/46222134/2009)	GU292345	(A/Pune/NIV10604/2009)
CY051519	(A/Wisconsin/629-S0229/2009)	CY060795	(A/Texas/46223444/2009)	GU292346	(A/Blore/NIV236/2009)
CY051527	(A/New York/4400/2009)	CY060803	(A/Texas/46223582/2009)	GU292347	(A/Blore/NIV310/2009)
CY051535	(A/New York/4402/2009)	CY060811	(A/Texas/46224042/2009)	GU292348	(A/Delhi/NIV3610/2009)
CY051543	(A/New York/4403/2009)	CY060819	(A/Texas/46233104/2009)	GU292349	(A/Delhi/NIV3704/2009)
CY051551	(A/New York/4434/2009)	CY060827	(A/Texas/46240925/2009)	GU292350	(A/Hyd/NIV51/2009)
CY051559	(A/New York/4459/2009)	CY060835	(A/Texas/46241654/2009)	GU292351	(A/Mum/NIV5442/2009)
CY051567	(A/New York/4476/2009)	CY060843	(A/Texas/JMS356/2009)	GU292352	(A/Pune/NIV6196/2009)
CY051575	(A/New York/4500/2009)	CY060851	(A/Texas/JMS358/2009)	GU292353	(A/Pune/NIV6447/2009)
CY051583	(A/New York/4556/2009)	CY060859	(A/Texas/JMS359/2009)	GU292354	(A/Pune/NIV8489/2009)
CY051591	(A/New York/4565/2009)	CY060867	(A/Texas/JMS361/2009)	GU292355	(A/Pune/NIV9355/2009)
CY051599	(A/New York/4566/2009)	CY060875	(A/Texas/JMS362/2009)	GU292356	(A/Mum/NIV9945/2009)
CY051607	(A/New York/4567/2009)	CY060883	(A/Texas/JMS363/2009)	GU323343	(A/Lishui/02w/2009)
CY051615	(A/New York/4568/2009)	CY060891	(A/Texas/JMS364/2009)	GU324344	(A/swine/Taiwan/TD-4119B2/2009)
CY051623	(A/New York/4607/2009)	CY060899	(A/Texas/JMS365/2009)	GU332630	(A/cat/IA/26991/2009)
CY051631	(A/New York/4620/2009)	CY060907	(A/Texas/JMS369/2009)	GU332633	(A/ferret/OR/27004/2009)
CY051639	(A/New York/4677/2009)	CY060915	(A/Texas/JMS370/2009)	GU338362	(A/Landstuhl/5950/2009)
CY051647	(A/New York/4691/2009)	CY060923	(A/Texas/JMS371/2009)	GU338363	(A/Kuwait/6379/2009)
CY051655	(A/New York/4728/2009)	CY060931	(A/Texas/JMS372/2009)	GU367315	(A/Abakan/02/2009)
CY051663	(A/New York/4735/2009)	CY060939	(A/Texas/JMS373/2009)	GU367317	(A/Tomsk/07/2009)
CY051671	(A/New York/4738/2009)	CY060947	(A/Texas/JMS379/2009)	GU367325	(A/Novgorod/01/2009)
CY051679	(A/New York/4747/2009)	CY060955	(A/Texas/JMS380/2009)	GU367327	(A/Salekhard/01/2009)
CY051687	(A/New York/4761/2009)	CY060963	(A/Texas/JMS381/2009)	GU369646	(A/Ankara/03/2009)
CY051695	(A/New York/4777/2009)	CY060971	(A/Texas/JMS382/2009)	GU369647	(A/Ankara/04/2009)
CY051703	(A/New York/4780/2009)	CY060979	(A/Texas/JMS383/2009)	GU369648	(A/Ankara/05/2009)
CY051711	(A/New York/4787/2009)	CY060987	(A/Texas/JMS384/2009)	GU369650	(A/Ankara/06/2009)
CY051719	(A/New York/4789/2009)	CY060995	(A/Texas/JMS385/2009)	GU369652	(A/Ankara/08/2009)
CY051727	(A/New York/4790/2009)	CY061003	(A/Texas/JMS386/2009)	GU369654	(A/Ankara/10/2009)
CY051735	(A/New York/4791/2009)	CY061011	(A/Texas/JMS387/2009)	GU369655	(A/Ankara/11/2009)
CY051743	(A/New York/4810/2009)	CY061019	(A/Texas/JMS388/2009)	GU369656	(A/Ankara/12/2009)
CY051751	(A/New York/4820/2009)	CY061027	(A/Texas/JMS389/2009)	GU369657	(A/Ankara/13/2009)
CY051759	(A/New York/4823/2009)	CY061035	(A/Texas/JMS390/2009)	GU369660	(A/Ankara/16/2009)
CY051767	(A/New York/4824/2009)	CY061043	(A/Texas/JMS391/2009)	GU369662	(A/Ankara/18/2009)
CY051775	(A/New York/4841/2009)	CY061051	(A/Texas/JMS392/2009)	GU369663	(A/Ankara/19/2009)
CY051783	(A/New York/4844/2009)	CY061059	(A/Texas/JMS393/2009)	GU369664	(A/Ankara/20/2009)
CY051791	(A/New York/4856/2009)	CY061067	(A/Texas/JMS394/2009)	GU369665	(A/Ankara/21/2009)
CY051799	(A/New York/4866/2009)	CY061075	(A/Texas/JMS395/2009)	GU369666	(A/Ankara/22/2009)
CY051807	(A/New York/4870/2009)	CY061083	(A/Texas/JMS397/2009)	GU369671	(A/Ankara/27/2009)

ACCESSION #	VIRUS NAME	ACCESSION #	VIRUS NAME	ACCESSION #	VIRUS NAME
CY051815	(A/Texas/42152486/2009)	CY061091	(A/Texas/JMS398/2009)	GU369672	(A/Ankara/28/2009)
CY051823	(A/Texas/43242018/2009)	CY061099	(A/Texas/JMS399/2009)	GU369673	(A/Ankara/29/2009)
CY051831	(A/Texas/43011033/2009)	CY061211	(A/New York/6771/2009)	GU369674	(A/Ankara/30/2009)
CY051839	(A/Texas/42123701/2009)	CY061219	(A/New York/6772/2009)	GU371256	(A/Orenburg/IIV2974/2009)
CY051847	(A/Texas/42191653/2009)	CY061227	(A/San Diego/INS101/2009)	GU371263	(A/Bryansk/IIV2971/2009)
CY051855	(A/Texas/42122969/2009)	CY061235	(A/San Diego/INS102/2009)	GU371270	(A/Hunan Kaifu/SWL4142/2009)
CY051863	(A/Texas/42201824/2009)	CY061243	(A/San Diego/INS103/2009)	GU371271	(A/Hunan Changsha/SWL4346/2009)
CY051871	(A/Texas/42173957/2009)	CY061251	(A/San Diego/INS104/2009)	GU371272	(A/Hunan Furong/SWL4224/2009)
CY051879	(A/Texas/42113095/2009)	CY061259	(A/San Diego/INS105/2009)	GU433025	(A/Tomsk/03/2009)
CY051887	(A/Texas/42114261/2009)	CY061267	(A/Brussels/INS106/2009)	GU433033	(A/Novosibirsk/02/2009)
CY051895	(A/Texas/45062633/2009)	CY061275	(A/Pensacola/INS107/2009)	GU451254	(A/Tver/IIV2969/2009)
CY051903	(A/Houston/1OS/2009)	CY061283	(A/Pensacola/INS108/2009)	GU470879	(A/swine/Indiana/27007/2009)
CY051911	(A/Houston/2H/2009)	CY061547	(A/swine/Italy/85437/2009)	GU471688	(A/cat/OR/29573/2009)
CY051919	(A/Houston/9OS/2009)	CY061554	(A/Texas/JMS366/2009)	GU480922	(A/swine/IL/32974/2009)
CY051984	(A/Norway/1359/2009)	CY061562	(A/Texas/JMS367/2009)	GU480925	(A/swine/NC/34543/2009)
CY051985	(A/Norway/1573/2009)	CY061570	(A/Texas/JMS400/2009)	GU480928	(A/swine/NC/34752/2009)
CY051986	(A/Norway/2674/2009)	CY061594	(A/New York/6806/2009)	GU480938	(A/Tomsk/08/2009)
CY051987	(A/Norway/2690/2009)	CY061725	(A/swine/Hong Kong/NS1583/2009)	GU480939	(A/Habarovsk/01/2009)
CY051988	(A/Norway/2917/2009)	CY061733	(A/swine/Hong Kong/2299/2009)	GU480943	(A/Kurgan/01/2009)
CY051989	(A/Norway/2924/2009)	CY061749	(A/swine/Hong Kong/NS1809/2009)	GU560008	(A/Tomsk/05/2009)
CY051990	(A/Norway/3036/2009)	CY061757	(A/swine/Hong Kong/NS1810/2009)	GU560016	(A/Tomsk/06/2009)
CY051991	(A/Norway/3059/2009)	CY061765	(A/swine/Hong Kong/2885/2009)	GU560024	(A/Taraz/01/2009)
CY051992	(A/Norway/3214/2009)	CY061773	(A/swine/Hong Kong/2886/2009)	GU560025	(A/Astana/830/2009)
CY051993	(A/Norway/3273/2009)	CY061781	(A/swine/Hong Kong/2894/2009)	GU560026	(A/Astana/818/2009)
CY051994	(A/Norway/3278/2009)	CY061789	(A/swine/Hong Kong/2974/2009)	GU562450	(A/Perm/01/2009)
CY051998	(A/Norway/3364-2/2009)	CY061797	(A/swine/Hong Kong/2995/2009)	GU576500	(A/Ancona/10/2009)
CY052003	(A/Norway/3370/2009)	CY061906	(A/New York/6903/2009)	GU576501	(A/Ancona/11/2009)
CY052004	(A/Norway/3371/2009)	CY061914	(A/New York/6907/2009)	GU576502	(A/Ancona/15/2009)
CY052005	(A/Norway/3433/2009)	CY061922	(A/New York/6937/2009)	GU576504	(A/Ancona/16/2009)
CY052006	(A/Norway/3440/2009)	CY061930	(A/New York/6939/2009)	GU576506	(A/Ancona/17/2009)
CY052007	(A/Norway/3478/2009)	CY061938	(A/New York/6941/2009)	GU576508	(A/Ancona/56/2009)
CY052008	(A/Norway/3569/2009)	CY061946	(A/New York/6943/2009)	GU576510	(A/Ancona/60/2009)
CY052009	(A/Norway/3689/2009)	CY061954	(A/New York/6945/2009)	GU576512	(A/Ancona/61/2009)
CY052010	(A/Norway/3779/2009)	CY061962	(A/New York/6949/2009)	GU576514	(A/Ancona/66/2009)
CY052011	(A/Norway/3797/2009)	CY061970	(A/New York/6976/2009)	GU576515	(A/Ancona/68/2009)
CY052012	(A/Norway/3855/2009)	CY061978	(A/New York/6977/2009)	GU576517	(A/Ancona/69/2009)
CY052013	(A/Norway/4020/2009)	CY061986	(A/New York/7019/2009)	GU576519	(A/Ancona/75/2009)
CY052014	(A/Norway/4021/2009)	CY061994	(A/New York/7020/2009)	GU576521	(A/Ancona/80/2009)
CY052015	(A/Norway/4023/2009)	CY062002	(A/New York/7036/2009)	GU576522	(A/Ancona/86/2009)
CY052019	(A/Norway/3206-3/2009)	CY062010	(A/New York/7107/2009)	GU576524	(A/Ancona/97/2009)
CY052045	(A/Parana/2529/2009)	CY062018	(A/New York/7216/2009)	GU576540	(A/Ancona/508/2009)
CY052046	(A/Rio de Janeiro/2459/2009)	CY062026	(A/New York/7236/2009)	GU592889	(A/Barnaul/04/2009)
CY052048	(A/Rio Grande do Sul/4509/2009)	CY062034	(A/New York/0259/2009)	GU592897	(A/Bishkek/03/2009)
CY052049	(A/Rio Grande do Sul/4772/2009)	CY062042	(A/New York/0352/2009)	GU592905	(A/Magadan/02/2009)
CY052050	(A/Rio Grande do Sul/4782/2009)	CY062050	(A/New York/0357/2009)	GU595065	(A/Sulaimani/05/2009)

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CY052098	(A/New York/4238/2009)	CY062058	(A/New York/0461/2009)	GU727573	(A/Stockholm/091120-2/2009)
CY052106	(A/Wisconsin/629-D00739/2009)	CY062194	(A/California/VRDL79/2009)	GU727825	(A/IIV-Anadyr/177/2009)
CY052114	(A/Wisconsin/629-D01973/2009)	CY062202	(A/California/VRDL80/2009)	GU953235	(A/ferret/OR/23775/2009)
CY052122	(A/New York/3969/2009)	CY062210	(A/California/VRDL81/2009)	GU968907	(A/Beijing/22808/2009)
CY052130	(A/New York/3976/2009)	CY062218	(A/California/VRDL82/2009)	GU968908	(A/Beijing/22811/2009)
CY052138	(A/New York/3980/2009)	CY062226	(A/California/VRDL83/2009)	GU968909	(A/Beijing/SE931/2009)
CY052146	(A/New York/4398/2009)	CY062234	(A/California/VRDL84/2009)	GU968910	(A/Beijing/SE1099/2009)
CY052154	(A/New York/4401/2009)	CY062242	(A/California/VRDL85/2009)	GU968911	(A/Beijing/SE1113/2009)
CY052162	(A/New York/4788/2009)	CY062250	(A/California/VRDL86/2009)	GU968912	(A/Beijing/SE1510/2009)
CY052170	(A/New York/4855/2009)	CY062300	(A/swine/Thailand/CU-RA29/2009)	GU968913	(A/Beijing/SE1547/2009)
CY052178	(A/New York/4881/2009)	CY062308	(A/swine/Thailand/CU-RA4/2009)	GU968914	(A/Beijing/SE1609/2009)
CY052186	(A/Texas/42281289/2009)	CY062324	(A/swine/Thailand/CU-RA9/2009)	GU968915	(A/Beijing/SE2365/2009)
CY052194	(A/Texas/42121926/2009)	CY062354	(A/Egypt/N10305/2009)	GU968916	(A/Beijing/SE2449/2009)
CY052202	(A/Texas/42303371/2009)	CY062355	(A/Egypt/N10306/2009)	GU968917	(A/Beijing/SE2577/2009)
CY052210	(A/Texas/42163291/2009)	CY062356	(A/Egypt/N10477/2009)	GU968918	(A/Beijing/SE2649/2009)
CY052218	(A/Texas/44301765/2009)	CY062357	(A/Egypt/N10296/2009)	GU968919	(A/Beijing/SE2733/2009)
CY052226	(A/Texas/44302551/2009)	CY062358	(A/Egypt/N10297/2009)	GU968920	(A/Beijing/SE2849/2009)
CY052234	(A/Texas/42191647/2009)	CY062359	(A/Egypt/N11635/2009)	GU968921	(A/Beijing/SE3182/2009)
CY052242	(A/Texas/42201798/2009)	CY062360	(A/Egypt/N11640/2009)	GU979208	(A/ferret/OR/27004-3/2009)
CY052250	(A/Texas/43143450/2009)	CY062361	(A/Egypt/N11643/2009)	GU984387	(A/cat/PA/30187/2009)
CY052258	(A/Texas/42221280/2009)	CY062362	(A/Egypt/N11649/2009)	GU984390	(A/swine/IA/35572/2009)
CY052266	(A/Texas/42102708/2009)	CY062363	(A/Egypt/N11651/2009)	GU984393	(A/swine/IA/35573/2009)
CY052274	(A/Texas/42151049/2009)	CY062364	(A/Egypt/N11652/2009)	GU984396	(A/swine/IL/10-001550/2009)
CY052282	(A/Texas/43292238/2009)	CY062365	(A/Egypt/N14644/2009)	GU984399	(A/swine/IL/10-001551-1/2009)
CY052290	(A/Texas/42091791/2009)	CY062366	(A/Egypt/N14645/2009)	GU984402	(A/swine/IL/10-001551-2/2009)
CY052298	(A/Texas/42103399/2009)	CY062367	(A/Egypt/N14648/2009)	HM006714	(A/Xian/001/2009)
CY052306	(A/Texas/42254309/2009)	CY062368	(A/Ghana/N12975/2009)	HM006715	(A/Xian/002/2009)
CY052314	(A/Texas/42132413/2009)	CY062369	(A/Ghana/N12979/2009)	HM006716	(A/Xian/004/2009)
CY052322	(A/Texas/42202026/2009)	CY062370	(A/Ghana/N12981/2009)	HM006717	(A/Xian/006/2009)
CY052330	(A/Texas/42211898/2009)	CY062371	(A/Ghana/N12984/2009)	HM006718	(A/Xian/009/2009)
CY052338	(A/Texas/44312415/2009)	CY062372	(A/Ghana/N12987/2009)	HM006719	(A/Xian/010/2009)
CY052346	(A/Parana/4597/2009)	CY062373	(A/Kuwait/N05050/2009)	HM006720	(A/Xian/017/2009)
CY052347	(A/Rio Grande do Sul/5395/2009)	CY062374	(A/Kuwait/N05051/2009)	HM012479	(A/cheetah/CA/30954/2009)
CY052348	(A/Rio Grande do Sul/7019/2009)	CY062375	(A/Kuwait/N05052/2009)	HM014332	(A/Guangzhou/GIRD07/2009)
CY052349	(A/Santa Catarina/423/2009)	CY062376	(A/Kuwait/N05053/2009)	HM101145	(A/Tver/IIV-183/2009)
CY052350	(A/Santa Catarina/460/2009)	CY062377	(A/Afghanistan/N09787/2009)	HM104477	(A/Yaroslavl/IIV-198/2009)
CY052366	(A/Zavkhan/8299/2009)	CY062378	(A/Afghanistan/N09795/2009)	HM138491	(A/Germany-MV/HGW4/2009)
CY052367	(A/Texas/43272683/2009)	CY062379	(A/Afghanistan/N09800/2009)	HM138493	(A/Germany-MV/HGW6/2009)
CY052375	(A/Texas/43200999/2009)	CY062380	(A/Afghanistan/N09817/2009)	HM138501	(A/Germany-BY/74/2009)
CY052383	(A/Texas/42163295/2009)	CY062381	(A/Afghanistan/N09821/2009)	HM157254	(A/Yaroslavl/IIV-196/2009)
CY052391	(A/Texas/42142537/2009)	CY062382	(A/Afghanistan/N09827/2009)	HM173599	(A/Blagovechensk/01/2009)
CY052399	(A/Texas/42291877/2009)	CY062383	(A/Afghanistan/N09828/2009)	HM204566	(A/Delhi/NIV57/2009)
CY052407	(A/Texas/43132503/2009)	CY062384	(A/Afghanistan/N09831/2009)	HM204567	(A/Mum/NIV261/2009)
CY052415	(A/Texas/42192947/2009)	CY062385	(A/Afghanistan/N09833/2009)	HM204568	(A/Pune/NIV807/2009)
CY052423	(A/Texas/43122467/2009)	CY062386	(A/Afghanistan/N09836/2009)	HM204569	(A/Che/NIV658/2009)

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CY052431	(A/Texas/45120922/2009)	CY062387	(A/Afghanistan/N09840/2009)	HM204570	(A/Mum/NIV968/2009)
CY052439	(A/Texas/45122538/2009)	CY062388	(A/Kuwait/N10035/2009)	HM204571	(A/Blore/NIV1189/2009)
CY052447	(A/Texas/45130742/2009)	CY062389	(A/Afghanistan/N10725/2009)	HM204572	(A/Dhule/NIV9433/2009)
CY052455	(A/Texas/45122369/2009)	CY062390	(A/Afghanistan/N10731/2009)	HM204573	(A/Jalna/NIV9436/2009)
CY052463	(A/Texas/45121606/2009)	CY062391	(A/Afghanistan/N10734/2009)	HM204574	(A/Ytml/NIV9438/2009)
CY052471	(A/Texas/45122033/2009)	CY062392	(A/Afghanistan/N10736/2009)	HM204575	(A/Mum/NIV9312/2009)
CY052479	(A/Texas/45122282/2009)	CY062393	(A/Afghanistan/N10749/2009)	HM204576	(A/Nsk/NIV10348/2009)
CY052487	(A/Texas/45122036/2009)	CY062394	(A/Afghanistan/N10757/2009)	HM204577	(A/Pune/NIV20007/2009)
CY052495	(A/Texas/45113371/2009)	CY062395	(A/Afghanistan/N10760/2009)	HM204578	(A/Pune/NIV21115/2009)
CY052503	(A/Texas/45104026/2009)	CY062396	(A/Afghanistan/N10765/2009)	HM204579	(A/Pune/NIV21123/2009)
CY052511	(A/Texas/45103737/2009)	CY062397	(A/Afghanistan/N10767/2009)	HM214472	(A/Hangzhou/04/2009)
CY052519	(A/Texas/45104048/2009)	CY062398	(A/Afghanistan/N10771/2009)	HM214474	(A/Hangzhou/06/2009)
CY052527	(A/Texas/45103998/2009)	CY062399	(A/Afghanistan/N10782/2009)	HM214478	(A/Hangzhou/10/2009)
CY052535	(A/Texas/45113882/2009)	CY062400	(A/Afghanistan/N10786/2009)	AB551871	(A/Nagasaki/HA-10-1/2010)
CY052543	(A/Texas/45132214/2009)	CY062401	(A/Afghanistan/N10788/2009)	AB551872	(A/Nagasaki/HA-10-2/2010)
CY052551	(A/Texas/45122774/2009)	CY062402	(A/Afghanistan/N10790/2009)	AB551873	(A/Nagasaki/HA-10-3/2010)
CY052559	(A/Texas/45122722/2009)	CY062403	(A/Afghanistan/N10974/2009)	AB551874	(A/Nagasaki/HA-10-4/2010)
CY052567	(A/Texas/45132788/2009)	CY062404	(A/Djibouti/N11092/2009)	AB551875	(A/Nagasaki/HA-10-5/2010)
CY052575	(A/Texas/45131774/2009)	CY062405	(A/Afghanistan/N11215/2009)	AB551876	(A/Nagasaki/HA-10-6/2010)
CY052583	(A/Texas/45132647/2009)	CY062406	(A/Afghanistan/N11216/2009)	AB551877	(A/Nagasaki/HA-10-7/2010)
CY052591	(A/Texas/45033774/2009)	CY062407	(A/Afghanistan/N11219/2009)	AB551878	(A/Nagasaki/HA-10-9/2010)
CY052599	(A/Texas/45033567/2009)	CY062408	(A/Bahrain/N11659/2009)	AB551879	(A/Nagasaki/HA-10-10/2010)
CY052607	(A/Texas/45034157/2009)	CY062409	(A/Bahrain/N11660/2009)	AB551880	(A/Nagasaki/HA-10-11/2010)
CY052615	(A/Texas/44302533/2009)	CY062410	(A/Bahrain/N11661/2009)	AB551881	(A/Nagasaki/HA-10-12/2010)
CY052623	(A/Texas/44302167/2009)	CY062411	(A/Bahrain/N11890/2009)	AB551882	(A/Nagasaki/HA-10-13/2010)
CY052631	(A/Texas/45061670/2009)	CY062412	(A/Bahrain/N11892/2009)	AB551883	(A/Nagasaki/HA-10-69/2010)
CY052639	(A/Texas/45062584/2009)	CY062413	(A/Kuwait/N12988/2009)	AB558537	(A/Nagasaki/HA-10-14/2010)
CY052647	(A/Texas/45103259/2009)	CY062414	(A/Kuwait/N12991/2009)	AB558538	(A/Nagasaki/HA-10-15/2010)
CY052655	(A/Texas/45093846/2009)	CY062415	(A/Kuwait/N13002/2009)	AB558539	(A/Nagasaki/HA-10-17/2010)
CY052663	(A/Texas/45093670/2009)	CY062416	(A/Kuwait/N13003/2009)	AB558540	(A/Nagasaki/HA-10-18/2010)
CY052671	(A/Texas/44313703/2009)	CY062417	(A/Kuwait/N13012/2009)	AB558541	(A/Nagasaki/HA-10-19/2010)
CY052679	(A/Texas/45010998/2009)	CY062418	(A/Kuwait/N13013/2009)	AB558542	(A/Nagasaki/HA-10-20/2010)
CY052687	(A/Texas/45071524/2009)	CY062419	(A/Kuwait/N13020/2009)	AB558543	(A/Nagasaki/HA-10-21/2010)
CY052695	(A/Texas/45083819/2009)	CY062420	(A/Kuwait/N13028/2009)	AB558544	(A/Nagasaki/HA-10-22/2010)
CY052703	(A/Texas/45093214/2009)	CY062421	(A/Kuwait/N13039/2009)	AB558545	(A/Nagasaki/HA-10-24/2010)
CY052711	(A/Texas/45140902/2009)	CY062422	(A/Kuwait/N13041/2009)	AB558546	(A/Nagasaki/HA-10-25/2010)
CY052719	(A/Texas/45091402/2009)	CY062423	(A/Kuwait/N13053/2009)	AB558547	(A/Nagasaki/HA-10-26/2010)
CY052727	(A/Texas/45091405/2009)	CY062424	(A/Kuwait/N13055/2009)	AB558548	(A/Nagasaki/HA-10-27/2010)
CY052735	(A/Texas/45091417/2009)	CY062425	(A/Kuwait/N13060/2009)	AB558549	(A/Nagasaki/HA-10-28/2010)
CY052743	(A/Texas/45101424/2009)	CY062426	(A/Kuwait/N13066/2009)	AB558550	(A/Nagasaki/HA-10-30/2010)
CY052751	(A/Texas/45103759/2009)	CY062427	(A/Kuwait/N13070/2009)	CY056294	(A/Henan/1/2010)
CY052759	(A/Texas/45101422/2009)	CY062428	(A/Kuwait/N13081/2009)	CY060454	(A/Seoul/7/2010)
CY052767	(A/Texas/44282651/2009)	CY062429	(A/Kuwait/N13085/2009)	CY061107	(A/Texas/JMS402/2009)
CY052775	(A/Texas/45021632/2009)	CY062430	(A/Kuwait/N13093/2009)	CY061115	(A/Texas/JMS404/2009)
CY052783	(A/Texas/45043852/2009)	CY062431	(A/Kuwait/N13111/2009)	CY061123	(A/Texas/JMS405/2009)

ACCESSION #	VIRUS NAME	ACCESSION #	VIRUS NAME	ACCESSION #	VIRUS NAME
CY052791	(A/Texas/45072273/2009)	CY062432	(A/Djibouti/N13142/2009)	CY061131	(A/Texas/JMS406/2009)
CY052799	(A/Texas/45131576/2009)	CY062491	(A/Mexico city/CIA1/2009)	CY061139	(A/Texas/JMS407/2009)
CY052807	(A/Texas/45071344/2009)	CY062498	(A/Mexico city/CIA2/2009)	CY061147	(A/Texas/JMS408/2009)
CY052815	(A/Texas/45072656/2009)	CY062505	(A/Mexico city/CIA3/2009)	CY061155	(A/Texas/JMS409/2009)
CY052823	(A/Texas/45072128/2009)	CY062511	(A/Mexico city/CIA4/2009)	CY061163	(A/Texas/JMS410/2009)
CY052831	(A/Texas/45131305/2009)	CY062517	(A/Mexico city/CIA5/2009)	CY061171	(A/Texas/JMS411/2009)
CY052839	(A/Texas/45132202/2009)	CY062522	(A/Mexico city/CIA6/2009)	CY061179	(A/Texas/JMS412/2009)
CY052847	(A/Texas/44152535/2009)	CY062529	(A/Mexico city/CIA7/2009)	CY061187	(A/Texas/JMS413/2009)
CY052855	(A/Texas/45023717/2009)	CY062540	(A/Mexico city/CIA9/2009)	CY061195	(A/Texas/JMS414/2009)
CY052863	(A/Texas/45042604/2009)	CY062635	(A/Mexico City/014/2009)	CY061203	(A/Texas/JMS415/2009)
CY052871	(A/Texas/44151841/2009)	CY062643	(A/District of Columbia/INS45/2009)	CY061578	(A/Texas/JMS401/2009)
CY052879	(A/Texas/45024243/2009)	CY062651	(A/San Diego/INS74/2009)	CY061586	(A/Texas/JMS403/2009)
CY052887	(A/Texas/45062346/2009)	CY062659	(A/Athens/INS87/2009)	CY061805	(A/swine/Hong Kong/189/2010)
CY052895	(A/Texas/45102952/2009)	CY062667	(A/Pensacola/INS109/2009)	CY062066	(A/New York/1680/2010)
CY052903	(A/Texas/45032708/2009)	CY062675	(A/Madrid/INS113/2009)	CY062074	(A/New York/1796/2010)
CY052911	(A/Texas/45113911/2009)	CY062683	(A/District of Columbia/INS114/2009)	CY062082	(A/New York/1998/2010)
CY052919	(A/Texas/45052569/2009)	CY062691	(A/Aarhus/INS116/2009)	CY062090	(A/New York/1999/2010)
CY052927	(A/Texas/45121004/2009)	CY062699	(A/Aarhus/INS118/2009)	CY062098	(A/New York/2175/2010)
CY052935	(A/Texas/45032753/2009)	CY062707	(A/Athens/INS123/2009)	CY062106	(A/New York/2372/2010)
CY052943	(A/Texas/45122886/2009)	CY062715	(A/Athens/INS124/2009)	CY062114	(A/New York/2598/2010)
CY052951	(A/Texas/45061755/2009)	CY062723	(A/Athens/INS125/2009)	CY062122	(A/New York/2648/2010)
CY052959	(A/Houston/1H/2009)	CY062731	(A/Athens/INS126/2009)	CY062130	(A/New York/2876/2010)
CY052967	(A/Houston/2OS/2009)	CY062739	(A/Bonn/INS127/2009)	CY062138	(A/New York/2960/2010)
CY052975	(A/Houston/2OS/2009)	CY062747	(A/Madrid/INS129/2009)	CY062146	(A/New York/2963/2010)
CY052983	(A/Houston/3OS/2009)	CY062755	(A/Madrid/INS131/2009)	CY062154	(A/New York/2971/2010)
CY052991	(A/Houston/3H/2009)	CY062763	(A/Madrid/INS134/2009)	CY062162	(A/New York/3230/2010)
CY052999	(A/Houston/5OS/2009)	CY062771	(A/Madrid/INS135/2009)	CY062170	(A/New York/3236/2010)
CY053007	(A/Houston/5H/2009)	CY062779	(A/Tessenderlo/INS138/2009)	CY062178	(A/New York/3250/2010)
CY053015	(A/Houston/6OS/2009)	CY062787	(A/Hvidovre/INS139/2009)	CY062186	(A/New York/3251/2010)
CY053023	(A/Houston/6H/2009)	CY062795	(A/Hvidovre/INS141/2009)	CY062268	(A/swine/Thailand/CU-RA114/2010)
CY053031	(A/Houston/7OS/2009)	CY062803	(A/Vienna/INS142/2009)	CY062276	(A/swine/Thailand/CU-RA15/2010)
CY053039	(A/Houston/7H/2009)	CY062811	(A/Odense/INS143/2009)	CY062316	(A/swine/Thailand/CU-RA75/2010)
CY053047	(A/Houston/9H/2009)	CY062819	(A/Copenhagen/INS144/2009)	CY062979	(A/Bonn/INS178/2010)
CY053055	(A/Houston/10OS/2009)	CY062827	(A/Warsaw/INS146/2009)	CY062987	(A/Vienna/INS179/2010)
CY053063	(A/Houston/10H/2009)	CY062835	(A/Athens/INS155/2009)	CY063003	(A/Tallinn/INS182/2010)
CY053071	(A/Houston/13OS/2009)	CY062843	(A/Athens/INS156/2009)	CY063011	(A/Tallinn/INS183/2010)
CY053079	(A/Houston/14OS/2009)	CY062851	(A/Athens/INS158/2009)	CY063179	(A/California/VRDL10/2010)
CY053087	(A/Houston/14H/2009)	CY062859	(A/Athens/INS159/2009)	CY063187	(A/California/VRDL11/2010)
CY053095	(A/Houston/15OS/2009)	CY062867	(A/Athens/INS160/2009)	CY063195	(A/California/VRDL12/2010)
CY053103	(A/Houston/15H/2009)	CY062875	(A/Athens/INS161/2009)	CY063203	(A/California/VRDL13/2010)
CY053111	(A/Houston/16OS/2009)	CY062883	(A/Athens/INS162/2009)	CY063211	(A/California/VRDL14/2010)
CY053119	(A/Houston/17OS/2009)	CY062891	(A/Athens/INS163/2009)	GU562458	(A/Karasuk/01/2010)
CY053127	(A/Houston/20OS/2009)	CY062899	(A/Athens/INS164/2009)	GU576542	(A/Ancona/01/2010)
CY053135	(A/Houston/20H/2009)	CY062907	(A/Athens/INS165/2009)	GU946680	(A/swine/Minnesota/02976/2010)
CY053142	(A/Houston/22OS/2009)	CY062915	(A/Athens/INS166/2009)	GU953238	(A/swine/IL/3910/2010)

ACCESSION #	VIRUS NAME	ACCESSION #	VIRUS NAME	ACCESSION #	VIRUS NAME
CY053150	(A/Houston/22H/2009)	CY062923	(A/Athens/INS167/2009)	GU984405	(A/swine/IL/5265-1/2010)
CY053158	(A/Houston/23H/2009)	CY062931	(A/Berlin/INS171/2009)	GU984408	(A/swine/IL/5265-2/2010)
CY053166	(A/Houston/24OS/2009)	CY062939	(A/Terrassa/INS172/2009)	GU984411	(A/swine/MN/8761/2010)
CY053174	(A/Brownsville/26OS/2009)	CY062947	(A/Terrassa/INS173/2009)	GU984414	(A/swine/MN/8762-1/2010)
CY053182	(A/Brownsville/27OS/2009)	CY062955	(A/Terrassa/INS174/2009)	GU984417	(A/swine/MN/8762-2/2010)
CY053190	(A/Brownsville/29OS/2009)	CY062963	(A/Terrassa/INS175/2009)	HM124383	(A/Orenburg/IIV-13/2010)
CY053198	(A/Brownsville/30OS/2009)	CY062971	(A/Odense/INS177/2009)	HM165185	(A/Haishu/SWL110/2010)
CY053206	(A/Brownsville/31OS/2009)	CY062995	(A/Tallinn/INS181/2009)	HM219618	(A/swine/IL/12660/2010)
CY053214	(A/Brownsville/31H/2009)	CY063019	(A/Madrid/INS184/2009)	HM219621	(A/swine/NC/13598/2010)
CY053222	(A/Brownsville/34OS/2009)	CY063027	(A/Madrid/INS185/2009)	HM219624	(A/swine/MO/15534/2010)
CY053230	(A/Brownsville/34H/2009)	CY063035	(A/Madrid/INS186/2009)	HM219627	(A/swine/IN/17311/2010)
CY053238	(A/Brownsville/35OS/2009)	CY063043	(A/Bochum/INS187/2009)	HM219630	(A/swine/MO/17314/2010)
CY053246	(A/Brownsville/35H/2009)	CY063051	(A/Tessenderlo/INS191/2009)	HM219633	(A/swine/IL/17315-1/2010)
CY053254	(A/Brownsville/36H/2009)	CY063059	(A/Tessenderlo/INS192/2009)	HM219636	(A/swine/IL/17315-3/2010)
CY053261	(A/Brownsville/37H/2009)	CY063067	(A/California/VRDL87/2009)	HM219639	(A/swine/NC/19646/2010)
CY053269	(A/Brownsville/39OS/2009)	CY063075	(A/California/VRDL88/2009)		

Appendix B

Data Set of Publicly Available Pandemic Influenza 2009 H1N1 (Segment 6) Sequences Considered

ACCESSION #	VIRUS NAME	ACCESSION #	VIRUS NAME	ACCESSION #	VIRUS NAME
AB514228	(A/Saitama/43/2009)	CY053738	(A/Russia/178/2009)	FJ969534	(A/Ohio/07/2009)
AB514229	(A/Saitama/55/2009)	CY053746	(A/Russia/190/2009)	FJ969541	(A/New York/20/2009)
AB531445	(A/swine/Osaka/1/2009)	CY053754	(A/Russia/200/2009)	FJ971075	(A/California/06/2009)
AB537490	(A/Nagasaki/HA-58/2009)	CY053786	(A/Norway/2924/2009)	FJ973552	(A/Auckland/3/2009)
AB538391	(A/Nagano/RC1/2009)	CY053898	(A/Argentina/HNRG13/2009)	FJ973555	(A/Auckland/1/2009)
CY039528	(A/Netherlands/602/2009)	CY053902	(A/Argentina/HNRG14/2009)	FJ981614	(A/Texas/04/2009)
CY039895	(A/New York/1669/2009)	CY053905	(A/Argentina/HNRG15/2009)	FJ982431	(A/Denmark/513/2009)
CY039903	(A/New York/1682/2009)	CY053917	(A/Argentina/HNRG20/2009)	FJ984335	(A/New York/12/2009)
CY039988	(A/Nonthaburi/102/2009)	CY053920	(A/Argentina/HNRG21/2009)	FJ984340	(A/New York/06/2009)
CY040001	(A/New York/3008/2009)	CY053930	(A/Argentina/HNRG3/2009)	FJ984344	(A/New York/11/2009)
CY040009	(A/New York/3012/2009)	CY053940	(A/Argentina/HNRG32/2009)	FJ984350	(A/New York/18/2009)
CY040017	(A/New York/3014/2009)	CY053943	(A/Argentina/HNRG33/2009)	FJ984357	(A/New York/31/2009)
CY040025	(A/New York/3049/2009)	CY053951	(A/Argentina/HNRG39/2009)	FJ984362	(A/New York/23/2009)
CY040033	(A/New York/3099/2009)	CY053954	(A/Argentina/HNRG40/2009)	FJ984371	(A/New York/10/2009)
CY040044	(A/New York/3007/2009)	CY053957	(A/Argentina/HNRG41/2009)	FJ984378	(A/New York/15/2009)
CY040458	(A/Tennessee/1-560/2009)	CY053960	(A/Argentina/HNRG42/2009)	FJ984383	(A/Texas/06/2009)
CY040607	(A/New York/3219/2009)	CY053963	(A/Argentina/HNRG44/2009)	FJ984386	(A/California/07/2009)
CY040615	(A/New York/3220/2009)	CY053966	(A/Argentina/HNRG45/2009)	FJ984390	(A/New York/19/2009)
CY040623	(A/New York/3221/2009)	CY053969	(A/Argentina/HNRG48/2009)	FJ998213	(A/Canada-NS/RV1535/2009)
CY040631	(A/New York/3234/2009)	CY053972	(A/Argentina/HNRG5/2009)	FJ998214	(A/Mexico/InDRE4487/2009)
CY040639	(A/New York/3191/2009)	CY053975	(A/Argentina/HNRG8/2009)	FJ998215	(A/Canada-ON/RV1527/2009)
CY040647	(A/New York/3194/2009)	CY054297	(A/Mexico City/MCIG01/2009)	FN401575	(A/Regensburg/D6/2009)
CY040655	(A/New York/3201/2009)	CY054632	(A/Russia/4/2009)	FN423714	(A/Luxembourg/43/2009)
CY040663	(A/New York/3202/2009)	CY054640	(A/Russia/12/2009)	FN434445	(A/Quebec/147023/2009)
CY040671	(A/New York/3218/2009)	CY054648	(A/Russia/19/2009)	FN434454	(A/Quebec/147365/2009)
CY040679	(A/New York/3222/2009)	CY054656	(A/Russia/61/2009)	FN434459	(A/Quebec/144147/2009)
CY040687	(A/New York/3223/2009)	CY054664	(A/Russia/100/2009)	FN434470	(A/Quebec/144180/2009)
CY040695	(A/New York/3232/2009)	CY054672	(A/Russia/171/2009)	GQ117022	(A/New York/22/2009)
CY040703	(A/New York/3235/2009)	CY054680	(A/Russia/180/2009)	GQ117028	(A/Texas/09/2009)
CY040711	(A/New York/3237/2009)	CY054685	(A/Wisconsin/629-D00589/2009)	GQ117036	(A/California/14/2009)
CY040719	(A/New York/3238/2009)	CY054693	(A/Managua/4467.05/2009)	GQ117042	(A/Massachusetts/06/2009)
CY040727	(A/New York/3239/2009)	CY054709	(A/California/VRDL4/2009)	GQ117048	(A/Texas/08/2009)
CY040736	(A/New York/3240/2009)	CY054717	(A/California/VRDL5/2009)	GQ117053	(A/South Carolina/09/2009)
CY040744	(A/New York/3242/2009)	CY054725	(A/California/VRDL6/2009)	GQ117058	(A/Kansas/02/2009)
CY040752	(A/New York/3243/2009)	CY054733	(A/California/VRDL7/2009)	GQ117064	(A/Arizona/01/2009)
CY040760	(A/New York/3244/2009)	CY054741	(A/California/VRDL8/2009)	GQ117071	(A/Minnesota/02/2009)
CY040768	(A/New York/3245/2009)	CY054749	(A/California/VRDL9/2009)	GQ117077	(A/Arizona/02/2009)
CY040776	(A/New York/3246/2009)	CY054757	(A/California/VRDL19/2009)	GQ117081	(A/New York/20/2009)

ACCESSION #	VIRUS NAME	ACCESSION #	VIRUS NAME	ACCESSION #	VIRUS NAME
CY040784	(A/New York/3252/2009)	CY054765	(A/California/VRDL20/2009)	GQ117084	(A/New York/20/2009)
CY040792	(A/New York/3253/2009)	CY054773	(A/California/VRDL21/2009)	GQ117094	(A/Indiana/09/2009)
CY040800	(A/New York/3255/2009)	CY054781	(A/California/VRDL22/2009)	GQ117099	(A/Ohio/07/2009)
CY040808	(A/New York/3257/2009)	CY054789	(A/California/VRDL23/2009)	GQ117102	(A/Massachusetts/07/2009)
CY040816	(A/New York/3259/2009)	CY054797	(A/California/VRDL25/2009)	GQ117105	(A/Nebraska/02/2009)
CY040824	(A/New York/3260/2009)	CY054805	(A/California/VRDL26/2009)	GQ117108	(A/Michigan/02/2009)
CY040832	(A/New York/3261/2009)	CY054813	(A/California/VRDL27/2009)	GQ117114	(A/New York/13/2009)
CY040840	(A/New York/3262/2009)	CY054821	(A/California/VRDL28/2009)	GQ117118	(A/Colorado/03/2009)
CY040848	(A/New York/3263/2009)	CY054829	(A/California/VRDL29/2009)	GQ122096	(A/Texas/15/2009)
CY040856	(A/New York/3264/2009)	CY054837	(A/California/VRDL30/2009)	GQ122098	(A/Christchurch/2/2009)
CY040864	(A/New York/3265/2009)	CY054845	(A/California/VRDL31/2009)	GQ122104	(A/Stockholm/28/2009)
CY040874	(A/Norway/1168/2009)	CY054853	(A/California/VRDL32/2009)	GQ132154	(A/Canada-NS/RV1538/2009)
CY040882	(A/Norway/1177/2009)	CY054861	(A/California/VRDL33/2009)	GQ132155	(A/Mexico/InDRE4114/2009)
CY040890	(A/Mexico/47N/2009)	CY054869	(A/California/VRDL34/2009)	GQ132156	(A/Canada-AB/RV1532/2009)
CY041052	(A/New York/3166/2009)	CY054877	(A/California/VRDL35/2009)	GQ132157	(A/Canada-ON/RV1529/2009)
CY041060	(A/New York/3168/2009)	CY054885	(A/California/VRDL36/2009)	GQ132158	(A/Canada-NS/RV1536/2009)
CY041068	(A/New York/3169/2009)	CY054893	(A/California/VRDL38/2009)	GQ132159	(A/Canada-ON/RV1526/2009)
CY041076	(A/New York/3170/2009)	CY054901	(A/California/VRDL39/2009)	GQ132185	(A/Korea/01/2009)
CY041084	(A/New York/3172/2009)	CY054909	(A/California/VRDL40/2009)	GQ149622	(A/Mexico/4486/2009)
CY041092	(A/New York/3173/2009)	CY054917	(A/California/VRDL41/2009)	GQ149631	(A/Mexico/4604/2009)
CY041100	(A/New York/3176/2009)	CY054925	(A/California/VRDL43/2009)	GQ149640	(A/Mexico/4603/2009)
CY041108	(A/New York/3178/2009)	CY054933	(A/California/VRDL45/2009)	GQ149644	(A/Mexico/4486/2009)
CY041116	(A/New York/3193/2009)	CY054941	(A/California/VRDL48/2009)	GQ149650	(A/Mexico/4108/2009)
CY041124	(A/New York/3214/2009)	CY054949	(A/California/VRDL50/2009)	GQ149656	(A/Mexico/4108/2009)
CY041132	(A/New York/3215/2009)	CY054957	(A/California/VRDL51/2009)	GQ149659	(A/Mexico/4108/2009)
CY041140	(A/New York/3258/2009)	CY054965	(A/California/VRDL52/2009)	GQ149664	(A/Mexico/4486/2009)
CY041148	(A/New York/3181/2009)	CY054973	(A/California/VRDL53/2009)	GQ149666	(A/Mexico/4108/2009)
CY041156	(A/New York/3183/2009)	CY054981	(A/California/VRDL55/2009)	GQ149670	(A/Mexico/4482/2009)
CY041164	(A/New York/3185/2009)	CY054989	(A/California/VRDL58/2009)	GQ149672	(A/Mexico/4482/2009)
CY041172	(A/New York/3186/2009)	CY054997	(A/California/VRDL61/2009)	GQ149681	(A/Mexico/4603/2009)
CY041180	(A/New York/3187/2009)	CY055005	(A/California/VRDL64/2009)	GQ149688	(A/Mexico/4108/2009)
CY041188	(A/New York/3188/2009)	CY055013	(A/California/VRDL65/2009)	GQ149691	(A/Mexico/4115/2009)
CY041196	(A/New York/3190/2009)	CY055021	(A/California/VRDL67/2009)	GQ150330	(A/swine/Alberta/OTH-33-8/2009)
CY041204	(A/New York/3199/2009)	CY055029	(A/California/VRDL68/2009)	GQ150333	(A/Christchurch/2/2009)
CY041484	(A/New York/3189/2009)	CY055037	(A/California/VRDL69/2009)	GQ150336	(A/Auckland/4/2009)
CY041492	(A/New York/3184/2009)	CY055045	(A/California/VRDL70/2009)	GQ150343	(A/Nonthaburi/102/2009)
CY041500	(A/New York/3195/2009)	CY055053	(A/California/VRDL71/2009)	GQ160524	(A/Florida/04/2009)
CY041508	(A/New York/3196/2009)	CY055061	(A/Australia/3/2009)	GQ160529	(A/Tennessee/05/2009)
CY041516	(A/New York/3203/2009)	CY055069	(A/Australia/4/2009)	GQ160533	(A/New Jersey/01/2009)
CY041524	(A/New York/3204/2009)	CY055077	(A/Australia/6/2009)	GQ160536	(A/New Mexico/04/2009)
CY041532	(A/New York/3205/2009)	CY055170	(A/Dundgobi/9746/2009)	GQ160540	(A/Delaware/03/2009)
CY041543	(A/New York/3209/2009)	CY055197	(A/Malaysia/3758/2009)	GQ160547	(A/Texas/23/2009)
CY041551	(A/New York/3210/2009)	CY055199	(A/Malaysia/4038/2009)	GQ160554	(A/New Jersey/04/2009)
CY041559	(A/New York/3211/2009)	CY055201	(A/Malaysia/4039/2009)	GQ160558	(A/New Jersey/02/2009)
CY041567	(A/New York/3225/2009)	CY055203	(A/Malaysia/4737/2009)	GQ160571	(A/Texas/22/2009)

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CY041575	(A/New York/3227/2009)	CY055205	(A/Malaysia/4847/2009)	GQ160581	(A/New Hampshire/02/2009)
CY041583	(A/New York/3230/2009)	CY055207	(A/Malaysia/5027/2009)	GQ160585	(A/North Carolina/05/2009)
CY041591	(A/New York/3236/2009)	CY055209	(A/Malaysia/5057/2009)	GQ160589	(A/Virginia/04/2009)
CY041599	(A/New York/3177/2009)	CY055211	(A/Malaysia/5103/2009)	GQ160593	(A/Delaware/02/2009)
CY041607	(A/New York/3207/2009)	CY055213	(A/Malaysia/5112/2009)	GQ160610	(A/Brisbane/17/2009)
CY041615	(A/New York/3002/2009)	CY055215	(A/Malaysia/5162/2009)	GQ160612	(A/Auckland/1/2009)
CY041623	(A/New York/3100/2009)	CY055217	(A/Malaysia/5163/2009)	GQ162169	(A/Mexico/4108/2009)
CY041631	(A/New York/3149/2009)	CY055219	(A/Malaysia/5175/2009)	GQ162171	(A/Mexico/4269/2009)
CY041639	(A/New York/3307/2009)	CY055221	(A/Malaysia/5192/2009)	GQ162173	(A/Mexico/4593/2009)
CY041647	(A/New York/3313/2009)	CY055223	(A/Malaysia/5193/2009)	GQ162181	(A/Mexico/4176/2009)
CY041728	(A/New York/3247/2009)	CY055225	(A/Malaysia/5218/2009)	GQ162187	(A/Mexico/4486/2009)
CY041736	(A/New York/3206/2009)	CY055227	(A/Malaysia/5225/2009)	GQ162189	(A/Mexico/4482/2009)
CY041744	(A/New York/3231/2009)	CY055229	(A/Malaysia/5234/2009)	GQ162193	(A/Mexico/3955/2009)
CY041752	(A/New York/3323/2009)	CY055231	(A/Malaysia/5237/2009)	GQ162196	(A/Mexico/4575/2009)
CY041760	(A/New York/3413/2009)	CY055233	(A/Malaysia/5258/2009)	GQ162201	(A/Mexico/4486/2009)
CY041768	(A/New York/3354/2009)	CY055235	(A/Malaysia/5262/2009)	GQ166204	(A/Narita/1/2009)
CY041776	(A/New York/3532/2009)	CY055237	(A/Malaysia/5270/2009)	GQ166205	(A/Narita/1/2009)
CY041784	(A/New York/3337/2009)	CY055239	(A/Malaysia/5272/2009)	GQ166216	(A/Bayern/63/2009)
CY041792	(A/New York/3463/2009)	CY055241	(A/Malaysia/5277/2009)	GQ166217	(A/Hamburg/4/2009)
CY041800	(A/New York/3468/2009)	CY055243	(A/Malaysia/5283/2009)	GQ166224	(A/Sichuan/1/2009)
CY041808	(A/New York/3408/2009)	CY055245	(A/Malaysia/5286/2009)	GQ166659	(A/England/195/2009)
CY041816	(A/New York/3351/2009)	CY055247	(A/Malaysia/5670/2009)	GQ166750	(A/Lisboa/26/2009)
CY041824	(A/New York/3352/2009)	CY055249	(A/Malaysia/8860/2009)	GQ166759	(A/Israel/644/2009)
CY041832	(A/New York/3348/2009)	CY055251	(A/Malaysia/9117/2009)	GQ168627	(A/New York/23/2009)
CY041962	(A/Santo Domingo/572N/2009)	CY055253	(A/Malaysia/9118/2009)	GQ168632	(A/Texas/08/2009)
CY041970	(A/Israel/276/2009)	CY055255	(A/Malaysia/9131/2009)	GQ168643	(A/Kansas/03/2009)
CY041977	(A/Israel/70/2009)	CY055257	(A/Malaysia/9147/2009)	GQ168648	(A/New York/08/2009)
CY041985	(A/Santo Domingo/0573N/2009)	CY055259	(A/Malaysia/9237/2009)	GQ168651	(A/New York/11/2009)
CY043080	(A/Japan/1070/2009)	CY055261	(A/Malaysia/9254/2009)	GQ168654	(A/New York/09/2009)
CY043088	(A/Brawley/40081/2009)	CY055263	(A/Malaysia/9343/2009)	GQ168656	(A/New York/14/2009)
CY043096	(A/Brawley/40082/2009)	CY055265	(A/Malaysia/9451/2009)	GQ168658	(A/New York/27/2009)
CY043104	(A/Santo Domingo/565T/2009)	CY055267	(A/Malaysia/9541/2009)	GQ168660	(A/New York/31/2009)
CY043112	(A/Santo Domingo/568T/2009)	CY055273	(A/Malaysia/10226/2009)	GQ168666	(A/New York/13/2009)
CY043120	(A/Bethesda/SP508/2009)	CY055281	(A/Malaysia/12617/2009)	GQ168669	(A/New York/24/2009)
CY043125	(A/New York/3389/2009)	CY055289	(A/Malaysia/5259/2009)	GQ168670	(A/Texas/09/2009)
CY043133	(A/New York/3514/2009)	CY055297	(A/Malaysia/5259/2009)	GQ168672	(A/New York/12/2009)
CY043141	(A/New York/3529/2009)	CY055305	(A/Singapore/GN285/2009)	GQ169381	(A/Thailand/104/2009)
CY043149	(A/New York/3551/2009)	CY055323	(A/Rome/623/2009)	GQ179931	(A/Nonthaburi/104/2009)
CY043157	(A/New York/3418/2009)	CY055325	(A/Rome/624/2009)	GQ179932	(A/Nonthaburi/102/2009)
CY043165	(A/New York/3454/2009)	CY055328	(A/Rome/625/2009)	GQ183619	(A/Beijing/01/2009)
CY043173	(A/New York/3460/2009)	CY055330	(A/Rome/626/2009)	GQ183627	(A/Beijing/02/2009)
CY043181	(A/New York/3488/2009)	CY055332	(A/Rome/627/2009)	GQ183634	(A/Finland/553/2009)
CY043189	(A/New York/3499/2009)	CY055335	(A/Rome/628/2009)	GQ184628	(A/Moscow/01/2009)
CY043197	(A/New York/3324/2009)	CY055341	(A/Rome/630/2009)	GQ200218	(A/Minnesota/03/2009)
CY043205	(A/New York/3338/2009)	CY055343	(A/Rome/631/2009)	GQ200238	(A/Georgia/01/2009)

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CY043213	(A/New York/3420/2009)	CY055345	(A/Rome/632/2009)	GQ200251	(A/New York/21/2009)
CY043221	(A/New York/3455/2009)	CY055347	(A/Rome/633/2009)	GQ200288	(A/Shandong/1/2009)
CY043229	(A/New York/3501/2009)	CY055352	(A/Rome/636/2009)	GQ205435	(A/Auckland/1/2009)
CY043237	(A/New York/3502/2009)	CY055356	(A/Rome/639/2009)	GQ205437	(A/Auckland/3/2009)
CY043245	(A/New York/3509/2009)	CY055359	(A/Rome/641/2009)	GQ205439	(A/Auckland/3/2009)
CY043253	(A/New York/3545/2009)	CY055363	(A/Rome/644/2009)	GQ214140	(A/Paris/2590/2009)
CY043261	(A/New York/3552/2009)	CY055365	(A/Rome/645/2009)	GQ214146	(A/Paris/2580/2009)
CY043269	(A/New York/3563/2009)	CY055368	(A/Rome/648/2009)	GQ214152	(A/Paris/2573/2009)
CY043277	(A/New York/3651/2009)	CY055371	(A/Rome/649/2009)	GQ219585	(A/Moscow/IIV01/2009)
CY043285	(A/New York/3449/2009)	CY055373	(A/Rome/650/2009)	GQ219779	(A/Poland/37/2009)
CY043293	(A/New York/3469/2009)	CY055375	(A/Rome/651/2009)	GQ220729	(A/Amagasaki/2/2009)
CY043301	(A/New York/3498/2009)	CY055377	(A/Rome/653/2009)	GQ220730	(A/Amagasaki/1/2009)
CY043309	(A/New York/3534/2009)	CY055379	(A/Rome/652/2009)	GQ220731	(A/Hyogo/1/2009)
CY043336	(A/Denmark/523/2009)	CY055381	(A/Rome/654/2009)	GQ220732	(A/Hyogo/2/2009)
CY043344	(A/Denmark/524/2009)	CY055384	(A/Rome/656/2009)	GQ220733	(A/Kobe/1/2009)
CY043352	(A/Denmark/528/2009)	CY055388	(A/Rome/658/2009)	GQ220734	(A/Osaka/1/2009)
CY044050	(A/New York/3566/2009)	CY055390	(A/Rome/659/2009)	GQ220735	(A/Osaka/2/2009)
CY044058	(A/New York/3567/2009)	CY055397	(A/Rome/662/2009)	GQ220736	(A/Osaka-C/1/2009)
CY044066	(A/New York/3568/2009)	CY055401	(A/Rome/664/2009)	GQ220737	(A/Osaka-C/2/2009)
CY044074	(A/New York/3702/2009)	CY055403	(A/Rome/665/2009)	GQ221696	(A/GuangzhouSB/01/2009)
CY044082	(A/New York/3715/2009)	CY055405	(A/Rome/666/2009)	GQ221787	(A/New York/19/2009)
CY044090	(A/New York/3740/2009)	CY055407	(A/Rome/667/2009)	GQ221789	(A/Arizona/02/2009)
CY044098	(A/New York/3895/2009)	CY055409	(A/Rome/668/2009)	GQ221795	(A/South Carolina/09/2009)
CY044106	(A/New York/3898/2009)	CY055411	(A/Rome/669/2009)	GQ221799	(A/Texas/04/2009)
CY044114	(A/New York/3992/2009)	CY055413	(A/Rome/670/2009)	GQ221802	(A/Nebraska/02/2009)
CY044122	(A/New York/4197/2009)	CY055425	(A/New York/4887/2009)	GQ221804	(A/New York/17/2009)
CY044130	(A/New York/3516/2009)	CY055433	(A/New York/4977/2009)	GQ221806	(A/Arizona/03/2009)
CY044138	(A/New York/3528/2009)	CY055441	(A/New York/4979/2009)	GQ221810	(A/Arizona/04/2009)
CY044149	(A/Bogota/0466N/2009)	CY055449	(A/California/VRDL11/2009)	GQ221813	(A/Colorado/03/2009)
CY044157	(A/Managua/0536N/2009)	CY055457	(A/California/VRDL12/2009)	GQ221815	(A/New York/16/2009)
CY044165	(A/Mexico/48N/2009)	CY055465	(A/California/VRDL14/2009)	GQ221819	(A/California/11/2009)
CY044173	(A/Bethesda/SP506/2009)	CY055473	(A/California/VRDL18/2009)	GQ221821	(A/Colorado/04/2009)
CY044181	(A/Silver Spring/SP509/2009)	CY055488	(A/California/VRDL73/2009)	GQ221824	(A/Delaware/05/2009)
CY044189	(A/Silver Spring/SP510/2009)	CY055496	(A/California/VRDL74/2009)	GQ221827	(A/Idaho/02/2009)
CY044198	(A/Taiwan/T0724/2009)	CY055504	(A/California/VRDL75/2009)	GQ222423	(A/Paris/2592/2009)
CY044206	(A/Taiwan/T1338/2009)	CY055512	(A/California/VRDL76/2009)	GQ223113	(A/Mexico/4108/2009)
CY044214	(A/Taiwan/T1339/2009)	CY055520	(A/California/VRDL78/2009)	GQ223415	(A/Beijing/501/2009)
CY044222	(A/Taiwan/T1773/2009)	CY055528	(A/Australia/1/2009)	GQ223436	(A/Guangdong/05/2009)
CY044230	(A/Taiwan/T1821/2009)	CY055536	(A/Australia/7/2009)	GQ223445	(A/GuangzhouSB/01/2009)
CY044237	(A/San Antonio/PR921/2009)	CY055544	(A/Australia/9/2009)	GQ225351	(A/Zhejiang/1/2009)
CY044245	(A/San Antonio/PR922/2009)	CY055552	(A/Australia/10/2009)	GQ225359	(A/Shanghai/1/2009)
CY044253	(A/San Antonio/PR923/2009)	CY055567	(A/Australia/12/2009)	GQ225367	(A/Fujian/1/2009)
CY044258	(A/swine/Argentina/SAGiles-31215/2009)	CY055575	(A/Australia/13/2009)	GQ225375	(A/Beijing/01/2009)
CY044863	(A/New York/3726/2009)	CY055583	(A/Australia/14/2009)	GQ225383	(A/Beijing/3/2009)
CY044871	(A/New York/3571/2009)	CY055591	(A/Australia/15/2009)	GQ227546	(A/Stockholm/29/2009)

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CY044879	(A/New York/3573/2009)	CY055599	(A/Australia/16/2009)	GQ231980	(A/South Carolina/10/2009)
CY044887	(A/New York/3580/2009)	CY055607	(A/Australia/20/2009)	GQ232005	(A/Vermont/03/2009)
CY044895	(A/New York/3582/2009)	CY055615	(A/Australia/21/2009)	GQ232025	(A/Illinois/01/2009)
CY044903	(A/New York/3611/2009)	CY055623	(A/Australia/23/2009)	GQ232041	(A/Rhode Island/02/2009)
CY044911	(A/New York/3612/2009)	CY055631	(A/Australia/24/2009)	GQ232087	(A/Guangdong/02/2009)
CY044919	(A/New York/3613/2009)	CY055639	(A/Australia/25/2009)	GQ232095	(A/Beijing/4/2009)
CY044927	(A/New York/3617/2009)	CY055647	(A/Australia/26/2009)	GQ243750	(A/Philippines/2009/2009)
CY044935	(A/New York/3623/2009)	CY055655	(A/Australia/27/2009)	GQ243752	(A/Victoria/2001/2009)
CY044943	(A/New York/3625/2009)	CY055663	(A/Australia/28/2009)	GQ243754	(A/Philippines/2001/2009)
CY044951	(A/New York/3627/2009)	CY055670	(A/Australia/29/2009)	GQ243756	(A/Perth/29/2009)
CY044959	(A/New York/3629/2009)	CY055678	(A/Australia/31/2009)	GQ243758	(A/Darwin/2001/2009)
CY044967	(A/New York/3653/2009)	CY055686	(A/Australia/32/2009)	GQ243762	(A/Victoria/2004/2009)
CY044975	(A/New York/3744/2009)	CY055694	(A/Australia/35/2009)	GQ247727	(A/Moscow/IIV02/2009)
CY044983	(A/New York/3747/2009)	CY055702	(A/Australia/36/2009)	GQ250162	(A/Guangdong/03/2009)
CY044991	(A/New York/3751/2009)	CY055710	(A/Australia/37/2009)	GQ251037	(A/Italy/05/2009)
CY044999	(A/New York/3828/2009)	CY055718	(A/Australia/39/2009)	GQ253495	(A/Shanghai/37T/2009)
CY045007	(A/New York/3709/2009)	CY055726	(A/Australia/40/2009)	GQ253504	(A/Shanghai/71T/2009)
CY045015	(A/New York/3796/2009)	CY055734	(A/Australia/42/2009)	GQ254710	(A/Paris/2591/2009)
CY045023	(A/New York/3803/2009)	CY055742	(A/Australia/43/2009)	GQ254714	(A/Paris/2629/2009)
CY045031	(A/New York/3812/2009)	CY055750	(A/Australia/44/2009)	GQ255898	(A/Kaluga/01/2009)
CY045039	(A/New York/3967/2009)	CY055758	(A/Australia/45/2009)	GQ258463	(A/South Australia/2001/2009)
CY045047	(A/New York/4006/2009)	CY055766	(A/Australia/47/2009)	GQ261273	(A/Himeji/1/2009)
CY045055	(A/New York/4052/2009)	CY055774	(A/Australia/48/2009)	GQ261274	(A/Sakai/1/2009)
CY045063	(A/New York/4099/2009)	CY055782	(A/Australia/51/2009)	GQ261276	(A/Sakai/2/2009)
CY045071	(A/New York/4290/2009)	CY055790	(A/Australia/53/2009)	GQ261278	(A/Shiga/1/2009)
CY045079	(A/New York/4072/2009)	CY055798	(A/Australia/54/2009)	GQ283481	(A/Italy/49/2009)
CY045087	(A/New York/3574/2009)	CY055806	(A/Australia/56/2009)	GQ283487	(A/Finland/554/2009)
CY045095	(A/New York/3614/2009)	CY055814	(A/Australia/57/2009)	GQ283492	(A/Finland/555/2009)
CY045145	(A/New York/3577/2009)	CY055822	(A/Australia/58/2009)	GQ287620	(A/Fukuoka-C/1/2009)
CY045153	(A/New York/3655/2009)	CY055830	(A/Australia/59/2009)	GQ287622	(A/Shiga/2/2009)
CY045161	(A/New York/3818/2009)	CY055838	(A/Australia/60/2009)	GQ287624	(A/Shiga/3/2009)
CY045169	(A/New York/3819/2009)	CY055846	(A/Australia/61/2009)	GQ287626	(A/Tokushima/1/2009)
CY045177	(A/New York/3959/2009)	CY055854	(A/Australia/63/2009)	GQ287628	(A/Yokohama/1/2009)
CY045185	(A/New York/3960/2009)	CY055862	(A/Australia/64/2009)	GQ288374	(A/Fuzhou/01/2009)
CY045193	(A/New York/4014/2009)	CY055870	(A/Australia/65/2009)	GQ290107	(A/Beijing/502/2009)
CY045201	(A/New York/4048/2009)	CY055878	(A/Australia/66/2009)	GQ293078	(A/Zhejiang/2/2009)
CY045209	(A/New York/4057/2009)	CY055886	(A/Australia/69/2009)	GQ323441	(A/Missouri/01/2009)
CY045217	(A/New York/4074/2009)	CY055894	(A/Australia/70/2009)	GQ323442	(A/Florida/11/2009)
CY045228	(A/Taiwan/115/2009)	CY055902	(A/Australia/72/2009)	GQ323445	(A/Maine/03/2009)
CY045236	(A/Taiwan/126/2009)	CY055910	(A/Australia/73/2009)	GQ323448	(A/Massachusetts/11/2009)
CY045244	(A/Taiwan/137/2009)	CY055918	(A/Australia/79/2009)	GQ323450	(A/Rhode Island/03/2009)
CY045484	(A/Sachsen-Anhalt/101/2009)	CY055926	(A/Australia/80/2009)	GQ323453	(A/Texas/33/2009)
CY045492	(A/Sachsen-Anhalt/97/2009)	CY055934	(A/Australia/81/2009)	GQ323456	(A/Texas/32/2009)
CY045497	(A/Baden-Wurttemberg/448/2009)	CY055942	(A/Australia/82/2009)	GQ323458	(A/South Dakota/04/2009)
CY045505	(A/Bayern/66/2009)	CY055950	(A/San Diego/INS01/2009)	GQ323459	(A/Ohio/09/2009)

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CY045513	(A/Toronto/R8564/2009)	CY055958	(A/San Diego/INS02/2009)	GQ323460	(A/New York/35/2009)
CY045932	(A/Toronto/3184/2009)	CY055966	(A/San Diego/INS03/2009)	GQ323461	(A/Florida/08/2009)
CY045940	(A/Toronto/C0270/2009)	CY055974	(A/San Diego/INS04/2009)	GQ323468	(A/Kentucky/07/2009)
CY045948	(A/Toronto/C2781/2009)	CY055982	(A/San Diego/INS05/2009)	GQ323472	(A/Louisiana/05/2009)
CY045956	(A/Toronto/T0106/2009)	CY055990	(A/San Diego/INS06/2009)	GQ323475	(A/Massachusetts/09/2009)
CY045964	(A/Toronto/T5294/2009)	CY055998	(A/San Diego/INS09/2009)	GQ323477	(A/Utah/03/2009)
CY045972	(A/Toronto/T5362/2009)	CY056006	(A/San Diego/INS10/2009)	GQ323478	(A/Kansas/03/2009)
CY045980	(A/Toronto/T9842/2009)	CY056014	(A/San Diego/INS11/2009)	GQ323479	(A/Ohio/07/2009)
CY046189	(A/Wisconsin/629-D01793/2009)	CY056022	(A/San Diego/INS12/2009)	GQ323480	(A/Alabama/02/2009)
CY046197	(A/Wisconsin/629-D02312/2009)	CY056030	(A/San Diego/INS16/2009)	GQ323481	(A/New York/34/2009)
CY046205	(A/Wisconsin/629-D02408/2009)	CY056038	(A/District of Columbia/INS17/2009)	GQ323482	(A/New York/37/2009)
CY046213	(A/Wisconsin/629-D00869/2009)	CY056046	(A/District of Columbia/INS18/2009)	GQ323488	(A/Arizona/09/2009)
CY046221	(A/Wisconsin/629-D01251/2009)	CY056054	(A/District of Columbia/INS19/2009)	GQ323493	(A/Arkansas/03/2009)
CY046229	(A/Wisconsin/629-D01296/2009)	CY056062	(A/District of Columbia/INS20/2009)	GQ323497	(A/Georgia/03/2009)
CY046237	(A/Wisconsin/629-D01735/2009)	CY056070	(A/District of Columbia/INS21/2009)	GQ323507	(A/Washington/14/2009)
CY046245	(A/Wisconsin/629-D01606/2009)	CY056078	(A/District of Columbia/INS24/2009)	GQ323512	(A/Texas/05/2009)
CY046253	(A/Wisconsin/629-D02432/2009)	CY056086	(A/District of Columbia/INS25/2009)	GQ323513	(A/Texas/10/2009)
CY046261	(A/Wisconsin/629-D01773/2009)	CY056094	(A/District of Columbia/INS27/2009)	GQ323515	(A/Kentucky/05/2009)
CY046269	(A/Wisconsin/629-D00933/2009)	CY056102	(A/District of Columbia/INS28/2009)	GQ323519	(A/Michigan/05/2009)
CY046277	(A/Wisconsin/629-D01092/2009)	CY056110	(A/District of Columbia/INS29/2009)	GQ323521	(A/Maryland/05/2009)
CY046285	(A/Wisconsin/629-D02473/2009)	CY056118	(A/District of Columbia/INS31/2009)	GQ323523	(A/California/13/2009)
CY046293	(A/Wisconsin/629-D01817/2009)	CY056126	(A/District of Columbia/INS33/2009)	GQ323524	(A/Texas/28/2009)
CY046301	(A/Wisconsin/629-D01486/2009)	CY056134	(A/San Diego/INS34/2009)	GQ323525	(A/New York/39/2009)
CY046309	(A/Wisconsin/629-D01642/2009)	CY056142	(A/San Diego/INS35/2009)	GQ323526	(A/Texas/17/2009)
CY046317	(A/Wisconsin/629-D01308/2009)	CY056150	(A/Pensacola/INS37/2009)	GQ323529	(A/Illinois/04/2009)
CY046325	(A/Wisconsin/629-D01810/2009)	CY056158	(A/Pensacola/INS38/2009)	GQ323532	(A/Massachusetts/10/2009)
CY046333	(A/Wisconsin/629-D01505/2009)	CY056166	(A/Pensacola/INS40/2009)	GQ323540	(A/Texas/35/2009)
CY046341	(A/Wisconsin/629-D02455/2009)	CY056174	(A/San Diego/INS42/2009)	GQ323542	(A/Texas/07/2009)
CY046349	(A/Wisconsin/629-D01017/2009)	CY056182	(A/District of Columbia/INS43/2009)	GQ323543	(A/Washington/09/2009)
CY046357	(A/Wisconsin/629-D01529/2009)	CY056190	(A/District of Columbia/INS46/2009)	GQ323544	(A/Pennsylvania/06/2009)
CY046365	(A/Wisconsin/629-D00790/2009)	CY056198	(A/San Diego/INS48/2009)	GQ323545	(A/District of Columbia/01/2009)
CY046373	(A/Wisconsin/629-D01705/2009)	CY056206	(A/San Diego/INS52/2009)	GQ323546	(A/Arizona/07/2009)
CY046381	(A/Wisconsin/629-D01980/2009)	CY056214	(A/San Diego/INS53/2009)	GQ323547	(A/Louisiana/04/2009)
CY046389	(A/Wisconsin/629-D00750/2009)	CY056222	(A/San Diego/INS68/2009)	GQ323548	(A/Wisconsin/11/2009)
CY046397	(A/Wisconsin/629-D01189/2009)	CY056230	(A/San Diego/INS69/2009)	GQ323549	(A/Georgia/02/2009)
CY046405	(A/Wisconsin/629-D00807/2009)	CY056238	(A/San Diego/INS70/2009)	GQ323553	(A/Texas/30/2009)
CY046413	(A/Wisconsin/629-D00447/2009)	CY056244	(A/California/VRDL72/2009)	GQ323554	(A/Arizona/06/2009)
CY046421	(A/Wisconsin/629-D00767/2009)	CY056245	(A/Australia/11/2009)	GQ323555	(A/California/17/2009)
CY046429	(A/Wisconsin/629-D00677/2009)	CY056247	(A/Malaysia/15110/2009)	GQ323556	(A/Ohio/10/2009)
CY046437	(A/Wisconsin/629-D02262/2009)	CY056248	(A/Malaysia/15192/2009)	GQ323557	(A/South Dakota/05/2009)
CY046445	(A/Wisconsin/629-D01226/2009)	CY056249	(A/Malaysia/15294/2009)	GQ323559	(A/Florida/09/2009)
CY046453	(A/Wisconsin/629-D01558/2009)	CY056250	(A/Malaysia/15326/2009)	GQ323562	(A/Florida/10/2009)
CY046461	(A/Wisconsin/629-D01861/2009)	CY056251	(A/Malaysia/15332/2009)	GQ323565	(A/New York/09/2009)
CY046469	(A/Wisconsin/629-D01962/2009)	CY056252	(A/Malaysia/15369/2009)	GQ323566	(A/Nebraska/03/2009)
CY046477	(A/Wisconsin/629-D00015/2009)	CY056253	(A/Malaysia/15431/2009)	GQ323567	(A/Ohio/07/2009)

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CY046485	(A/Wisconsin/629-D00349/2009)	CY056254	(A/Malaysia/9112/2009)	GQ323568	(A/Delaware/08/2009)
CY046493	(A/Wisconsin/629-D02028/2009)	CY056255	(A/Malaysia/9368/2009)	GQ323569	(A/North Dakota/04/2009)
CY046501	(A/Wisconsin/629-D00378/2009)	CY056284	(A/Malaysia/15263/2009)	GQ323570	(A/Louisiana/03/2009)
CY046509	(A/Wisconsin/629-D02425/2009)	CY056285	(A/Malaysia/15333/2009)	GQ323571	(A/Missouri/03/2009)
CY046517	(A/Wisconsin/629-D02141/2009)	CY056286	(A/Malaysia/15395/2009)	GQ323572	(A/Wisconsin/10/2009)
CY046525	(A/Wisconsin/629-D00183/2009)	CY056287	(A/Malaysia/15473/2009)	GQ323573	(A/Texas/11/2009)
CY046533	(A/Wisconsin/629-D00714/2009)	CY056288	(A/Malaysia/15483/2009)	GQ323575	(A/Texas/34/2009)
CY046541	(A/Wisconsin/629-D01313/2009)	CY056289	(A/Malaysia/15504/2009)	GQ328767	(A/Athens/968/2009)
CY046549	(A/Wisconsin/629-D00179/2009)	CY056290	(A/Malaysia/15547/2009)	GQ328768	(A/Athens/992/2009)
CY046557	(A/Wisconsin/629-D00228/2009)	CY056291	(A/Malaysia/15653/2009)	GQ329072	(A/Caen/2716/2009)
CY046565	(A/Wisconsin/629-D01919/2009)	CY056292	(A/Malaysia/15763/2009)	GQ329084	(A/Paris/2670/2009)
CY046573	(A/Wisconsin/629-D00905/2009)	CY056293	(A/Malaysia/15815/2009)	GQ329090	(A/Strasbourg/2611/2009)
CY046581	(A/Wisconsin/629-D01909/2009)	CY056389	(A/Managua/3119.01/2009)	GQ329102	(A/Paris/2650/2009)
CY046589	(A/Wisconsin/629-D02452/2009)	CY056397	(A/New York/4925/2009)	GQ329108	(A/Strasbourg/2609/2009)
CY046597	(A/Wisconsin/629-D01482/2009)	CY056405	(A/New York/4944/2009)	GQ330646	(A/Moscow/IIV03/2009)
CY046605	(A/Wisconsin/629-D00487/2009)	CY056413	(A/New York/4945/2009)	GQ334332	(A/Fukuoka-C/2/2009)
CY046613	(A/Wisconsin/629-D01055/2009)	CY056421	(A/New York/4947/2009)	GQ334340	(A/Fukuoka-C/3/2009)
CY046621	(A/Wisconsin/629-D00575/2009)	CY056429	(A/New York/4981/2009)	GQ334348	(A/Shizuoka/759/2009)
CY046629	(A/Wisconsin/629-D01839/2009)	CY056437	(A/New York/4984/2009)	GQ334357	(A/Utsunomiya/1/2009)
CY046637	(A/Wisconsin/629-D00967/2009)	CY056445	(A/New York/4985/2009)	GQ338330	(A/Missouri/02/2009)
CY046645	(A/Wisconsin/629-D02227/2009)	CY056453	(A/New York/4986/2009)	GQ338333	(A/Louisiana/01/2009)
CY046653	(A/Wisconsin/629-D01837/2009)	CY056461	(A/New York/4987/2009)	GQ338336	(A/New York/58/2009)
CY046661	(A/Wisconsin/629-D00997/2009)	CY056469	(A/New York/4988/2009)	GQ338341	(A/Louisiana/02/2009)
CY046669	(A/Wisconsin/629-D00064/2009)	CY056477	(A/New York/4990/2009)	GQ338342	(A/Texas/29/2009)
CY046677	(A/Wisconsin/629-D01305/2009)	CY056485	(A/New York/4995/2009)	GQ338348	(A/New York/33/2009)
CY046685	(A/Wisconsin/629-D00978/2009)	CY056493	(A/New York/5074/2009)	GQ338351	(A/Pennsylvania/08/2009)
CY046693	(A/Wisconsin/629-D00434/2009)	CY056501	(A/New York/5079/2009)	GQ338357	(A/Delaware/07/2009)
CY046701	(A/Wisconsin/629-D01445/2009)	CY056509	(A/New York/5083/2009)	GQ338360	(A/Hawaii/09/2009)
CY046709	(A/Wisconsin/629-D01787/2009)	CY056517	(A/New York/5086/2009)	GQ338362	(A/Wisconsin/12/2009)
CY046717	(A/Wisconsin/629-D00752/2009)	CY056525	(A/New York/5130/2009)	GQ338370	(A/Ohio/08/2009)
CY046725	(A/Wisconsin/629-D02427/2009)	CY056533	(A/New York/5141/2009)	GQ338371	(A/Washington/10/2009)
CY046733	(A/Wisconsin/629-D01521/2009)	CY056541	(A/New York/5150/2009)	GQ338374	(A/Nevada/04/2009)
CY046741	(A/Wisconsin/629-D00084/2009)	CY056549	(A/New York/5173/2009)	GQ338377	(A/Texas/36/2009)
CY046749	(A/Wisconsin/629-D02064/2009)	CY056557	(A/New York/5199/2009)	GQ338380	(A/Oklahoma/03/2009)
CY046757	(A/Wisconsin/629-D00160/2009)	CY056565	(A/New York/5227/2009)	GQ338384	(A/Rhode Island/04/2009)
CY046765	(A/Wisconsin/629-D02298/2009)	CY056573	(A/New York/5755/2009)	GQ338387	(A/New Jersey/03/2009)
CY046773	(A/Wisconsin/629-D00722/2009)	CY056581	(A/New York/5782/2009)	GQ338393	(A/Washington/08/2009)
CY046781	(A/Wisconsin/629-D01894/2009)	CY056589	(A/New York/5886/2009)	GQ338396	(A/Delaware/06/2009)
CY046789	(A/Wisconsin/629-D02276/2009)	CY056597	(A/New York/5916/2009)	GQ338401	(A/Pennsylvania/10/2009)
CY046797	(A/Wisconsin/629-D01026/2009)	CY056605	(A/New York/5931/2009)	GQ338404	(A/Pennsylvania/09/2009)
CY046805	(A/Wisconsin/629-D00223/2009)	CY056613	(A/New York/5976/2009)	GQ338406	(A/New York/57/2009)
CY046813	(A/Wisconsin/629-D00698/2009)	CY056621	(A/New York/5988/2009)	GQ338411	(A/Texas/37/2009)
CY046821	(A/Wisconsin/629-D02013/2009)	CY056629	(A/New York/6018/2009)	GQ338413	(A/Tennessee/06/2009)
CY046829	(A/Wisconsin/629-D02144/2009)	CY056637	(A/New York/6019/2009)	GQ338415	(A/Wisconsin/07/2009)
CY046837	(A/Wisconsin/629-D01883/2009)	CY056645	(A/New York/6079/2009)	GQ338418	(A/Indiana/12/2009)

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CY046845	(A/Wisconsin/629-D02361/2009)	CY056653	(A/New York/6110/2009)	GQ340060	(A/Shanghai/60T/2009)
CY046853	(A/Wisconsin/629-D00244/2009)	CY056661	(A/New York/6182/2009)	GQ351292	(A/Italy/85/2009)
CY046861	(A/Wisconsin/629-D01415/2009)	CY056669	(A/New York/6213/2009)	GQ351316	(A/Hong Kong/2369/2009)
CY046869	(A/Wisconsin/629-D02272/2009)	CY056677	(A/New York/6214/2009)	GQ351320	(A/Firenze/10/2009)
CY046877	(A/Wisconsin/629-D00396/2009)	CY056685	(A/New York/6257/2009)	GQ359760	(A/Zhejiang/DTID-ZJU01/2009)
CY046885	(A/Wisconsin/629-D00498/2009)	CY056693	(A/New York/6292/2009)	GQ359766	(A/Stockholm/31/2009)
CY046893	(A/Wisconsin/629-D01880/2009)	CY056701	(A/New York/6293/2009)	GQ359769	(A/Stockholm/30/2009)
CY046901	(A/Wisconsin/629-D00829/2009)	CY056709	(A/New York/6300/2009)	GQ360062	(A/Stockholm/33/2009)
CY046909	(A/Wisconsin/629-D01083/2009)	CY056717	(A/New York/6346/2009)	GQ360064	(A/Stockholm/32/2009)
CY046917	(A/Wisconsin/629-D01764/2009)	CY056725	(A/New York/6473/2009)	GQ365363	(A/Stockholm/42/2009)
CY046947	(A/Norway/1613/2009)	CY056733	(A/New York/6546/2009)	GQ365366	(A/Stockholm/36/2009)
CY046953	(A/Norway/2010/2009)	CY056741	(A/New York/6571/2009)	GQ365370	(A/Stockholm/35/2009)
CY046957	(A/New York/3654/2009)	CY056749	(A/New York/6607/2009)	GQ365412	(A/Akita/1/2009)
CY046965	(A/New York/3576/2009)	CY056757	(A/New York/6663/2009)	GQ365420	(A/Fukushima/1/2009)
CY046973	(A/New York/3443/2009)	CY056765	(A/New York/6668/2009)	GQ365427	(A/Iwate/1/2009)
CY047312	(A/New York/3074/2009)	CY056773	(A/New York/6669/2009)	GQ365430	(A/Iwate/2/2009)
CY047320	(A/New York/3124/2009)	CY056781	(A/New York/6675/2009)	GQ365438	(A/Kagoshima/1/2009)
CY047328	(A/New York/3167/2009)	CY056789	(A/New York/6775/2009)	GQ365445	(A/Osaka/180/2009)
CY047336	(A/New York/3364/2009)	CY056797	(A/New York/6776/2009)	GQ365448	(A/Sapporo/1/2009)
CY047344	(A/New York/3345/2009)	CY056805	(A/New York/6808/2009)	GQ365457	(A/Utsunomiya/2/2009)
CY047352	(A/New York/3365/2009)	CY056813	(A/New York/6809/2009)	GQ365660	(A/Bayern/62/2009)
CY047360	(A/New York/3741/2009)	CY056821	(A/New York/6810/2009)	GQ365668	(A/Brandenburg/19/2009)
CY047368	(A/New York/3795/2009)	CY056829	(A/New York/6846/2009)	GQ365676	(A/Brandenburg/20/2009)
CY047376	(A/New York/3753/2009)	CY056837	(A/New York/6864/2009)	GQ365680	(A/Stockholm/38/2009)
CY047384	(A/New York/4100/2009)	CY056845	(A/New York/6868/2009)	GQ365682	(A/Stockholm/40/2009)
CY047746	(A/Taiwan/526/2009)	CY056853	(A/New York/6909/2009)	GQ365685	(A/Stockholm/44/2009)
CY048927	(A/Malaysia/820/2009)	CY056861	(A/San Diego/INS15/2009)	GQ365688	(A/Stockholm/39/2009)
CY048935	(A/Malaysia/854/2009)	CY056869	(A/District of Columbia/INS44/2009)	GQ367304	(A/Stockholm/43/2009)
CY049062	(A/Singapore/ON305/2009)	CY056877	(A/San Diego/INS51/2009)	GQ367490	(A/Sao Paulo/2303/2009)
CY049070	(A/Singapore/ON129/2009)	CY056885	(A/San Diego/INS54/2009)	GQ368663	(A/Sao Paulo/1454/2009)
CY049078	(A/Singapore/ON141/2009)	CY056893	(A/San Diego/INS55/2009)	GQ368666	(A/Mato Grosso/2329/2009)
CY049086	(A/Singapore/ON279/2009)	CY056901	(A/San Diego/INS57/2009)	GQ368668	(A/Distrito Federal/2611/2009)
CY049094	(A/Singapore/ON354/2009)	CY056909	(A/San Diego/INS60/2009)	GQ369275	(A/Stockholm/37/2009)
CY049102	(A/Singapore/ON511/2009)	CY056917	(A/San Diego/INS61/2009)	GQ369279	(A/Stockholm/41/2009)
CY049110	(A/Singapore/ON581/2009)	CY056925	(A/San Diego/INS63/2009)	GQ369404	(A/swine/Alberta/OTH-33-1/2009)
CY049118	(A/Singapore/ON923/2009)	CY056933	(A/San Diego/INS65/2009)	GQ369407	(A/swine/Alberta/OTH-33-2/2009)
CY049126	(A/Singapore/ON193/2009)	CY056941	(A/Brussels/INS71/2009)	GQ369410	(A/swine/Alberta/OTH-33-3/2009)
CY049134	(A/Singapore/ON226/2009)	CY056949	(A/Aarhus/INS82/2009)	GQ369413	(A/swine/Alberta/OTH-33-7/2009)
CY049142	(A/Singapore/ON304/2009)	CY056957	(A/Athens/INS85/2009)	GQ369415	(A/swine/Alberta/OTH-33-14/2009)
CY049150	(A/Singapore/ON504/2009)	CY056965	(A/Copenhagen/INS95/2009)	GQ369418	(A/swine/Alberta/OTH-33-21/2009)
CY049158	(A/Singapore/ON507/2009)	CY056973	(A/Copenhagen/INS96/2009)	GQ369420	(A/swine/Alberta/OTH-33-22/2009)
CY049166	(A/Singapore/ON584/2009)	CY056981	(A/Copenhagen/INS98/2009)	GQ369423	(A/swine/Alberta/OTH-33-23/2009)
CY049174	(A/Singapore/ON588/2009)	CY056989	(A/Warsaw/INS100/2009)	GQ369426	(A/swine/Alberta/OTH-33-24/2009)
CY049182	(A/Singapore/ON590/2009)	CY056997	(A/Wisconsin/629-D00734/2009)	GQ369428	(A/swine/Alberta/OTH-33-25/2009)
CY049190	(A/Singapore/ON594/2009)	CY057005	(A/Wisconsin/629-D02367/2009)	GQ373263	(A/Toronto/3141/2009)

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CY049198	(A/Singapore/ON621/2009)	CY057013	(A/Wisconsin/629-D02041/2009)	GQ375286	(A/Moscow/03/2009)
CY049206	(A/Singapore/ON628/2009)	CY057021	(A/Wisconsin/629-D02133/2009)	GQ377033	(A/Alaska/04/2009)
CY049214	(A/Singapore/ON635/2009)	CY057029	(A/Wisconsin/629-D00357/2009)	GQ377036	(A/Illinois/02/2009)
CY049222	(A/Singapore/ON639/2009)	CY057080	(A/swine/Italy/85429/2009)	GQ377037	(A/Ohio/11/2009)
CY049230	(A/Singapore/ON894/2009)	CY057208	(A/Managua/167.01/2009)	GQ377040	(A/Montana/07/2009)
CY049238	(A/Singapore/ON896/2009)	CY057216	(A/Managua/109.01/2009)	GQ377044	(A/Tennessee/07/2009)
CY049246	(A/Singapore/ON899/2009)	CY057224	(A/Managua/611.01/2009)	GQ377046	(A/Texas/39/2009)
CY049254	(A/Singapore/ON901/2009)	CY057232	(A/New York/5045/2009)	GQ377048	(A/Washington/17/2009)
CY049262	(A/Singapore/ON975/2009)	CY057240	(A/New York/5158/2009)	GQ377050	(A/California/08/2009)
CY049270	(A/Singapore/ON978/2009)	CY057248	(A/New York/5161/2009)	GQ377057	(A/Arizona/05/2009)
CY049278	(A/Singapore/ON980/2009)	CY057256	(A/New York/5186/2009)	GQ377059	(A/Illinois/03/2009)
CY049286	(A/Singapore/ON981/2009)	CY057264	(A/New York/5196/2009)	GQ377060	(A/Texas/20/2009)
CY049294	(A/Singapore/ON380/2009)	CY057272	(A/New York/5217/2009)	GQ377063	(A/Virginia/05/2009)
CY049302	(A/Singapore/ON384/2009)	CY057280	(A/New York/5221/2009)	GQ377067	(A/New York/59/2009)
CY049310	(A/Singapore/ON402/2009)	CY057288	(A/New York/5271/2009)	GQ377071	(A/Texas/04/2009)
CY049318	(A/Singapore/ON439/2009)	CY057296	(A/New York/5276/2009)	GQ377074	(A/Washington/18/2009)
CY049326	(A/Singapore/ON478/2009)	CY057304	(A/New York/5297/2009)	GQ377077	(A/South Carolina/13/2009)
CY049334	(A/Singapore/ON479/2009)	CY057312	(A/New York/5447/2009)	GQ377078	(A/California/07/2009)
CY049342	(A/Singapore/ON582/2009)	CY057320	(A/New York/5667/2009)	GQ377079	(A/California/08/2009)
CY049350	(A/Singapore/ON593/2009)	CY057328	(A/New York/6072/2009)	GQ377084	(A/California/20/2009)
CY049358	(A/Singapore/ON368/2009)	CY057336	(A/San Diego/INS08/2009)	GQ377086	(A/Oregon/07/2009)
CY049366	(A/Singapore/ON313/2009)	CY057344	(A/San Diego/INS75/2009)	GQ377092	(A/California/12/2009)
CY049374	(A/Singapore/ON355/2009)	CY057352	(A/Hamburg/INS92/2009)	GQ377100	(A/California/19/2009)
CY049382	(A/Singapore/ON442/2009)	CY057360	(A/Wisconsin/629-D02485/2009)	GQ377102	(A/New York/45/2009)
CY049390	(A/Singapore/ON496/2009)	CY057368	(A/Wisconsin/629-D00643/2009)	GQ377105	(A/Utah/04/2009)
CY049398	(A/Singapore/ON506/2009)	CY057376	(A/Wisconsin/629-D01850/2009)	GQ379820	(A/Mexico/4482/2009)
CY049406	(A/Singapore/ON575/2009)	CY057384	(A/Wisconsin/629-D02192/2009)	GQ385302	(A/Toronto/0462/2009)
CY049421	(A/Singapore/ON903/2009)	CY057392	(A/Wisconsin/629-D00036/2009)	GQ392023	(A/Moscow/IIV04/2009)
CY049429	(A/Singapore/ON905/2009)	CY057400	(A/Wisconsin/629-D01469/2009)	GQ392031	(A/Italy/127/2009)
CY049437	(A/Singapore/ON907/2009)	CY057408	(A/Wisconsin/629-D00832/2009)	GQ396511	(A/Changsha/05/2009)
CY049445	(A/Singapore/ON912/2009)	CY057416	(A/Wisconsin/629-D01802/2009)	GQ396731	(A/Utah/10/2009)
CY049453	(A/Singapore/ON921/2009)	CY057424	(A/Wisconsin/629-D00485/2009)	GQ396735	(A/Michigan/10/2009)
CY049461	(A/Singapore/ON925/2009)	CY057432	(A/Wisconsin/629-D01935/2009)	GQ396740	(A/Iowa/04/2009)
CY049469	(A/Singapore/ON1050/2009)	CY057440	(A/Wisconsin/629-D01522/2009)	GQ396745	(A/New York/25/2009)
CY049477	(A/Singapore/ON1060/2009)	CY057448	(A/Wisconsin/629-D01355/2009)	GQ397116	(A/Mexico/4595/2009)
CY049485	(A/Singapore/ON1067/2009)	CY057456	(A/Wisconsin/629-D00748/2009)	GQ397117	(A/Mexico/4635/2009)
CY049493	(A/Singapore/ON1072/2009)	CY057464	(A/Wisconsin/629-D00839/2009)	GQ397120	(A/Mexico/4646/2009)
CY049501	(A/Singapore/ON1087/2009)	CY057472	(A/Wisconsin/629-D00402/2009)	GQ397279	(A/Yamaguchi/22/2009)
CY049509	(A/Singapore/ON1093/2009)	CY057480	(A/Wisconsin/629-D01237/2009)	GQ402227	(A/Canada-MB/RV2023/2009)
CY049517	(A/Singapore/ON1099/2009)	CY057488	(A/Wisconsin/629-D00346/2009)	GQ402228	(A/Mexico/InDRE4115/2009)
CY049525	(A/Singapore/ON1105/2009)	CY057496	(A/Wisconsin/629-D00287/2009)	GQ402229	(A/Mexico/InDRE13494/2009)
CY049533	(A/Singapore/ON1113/2009)	CY057504	(A/Wisconsin/629-D00565/2009)	GQ402230	(A/Mexico/InDRE13495/2009)
CY049541	(A/Singapore/ON1118/2009)	CY057512	(A/Wisconsin/629-D00410/2009)	GQ402231	(A/Mexico/InDRE13547/2009)
CY049549	(A/Singapore/ON1126/2009)	CY057520	(A/Wisconsin/629-D00891/2009)	GQ402232	(A/Mexico/InDRE13551/2009)
CY049557	(A/Singapore/ON1138/2009)	CY057528	(A/Wisconsin/629-D01391/2009)	GQ402233	(A/Mexico/InDRE13555/2009)

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CY049565	(A/Singapore/ON1144/2009)	CY057536	(A/Wisconsin/629-D00250/2009)	GQ402234	(A/Canada-QC/RV1595/2009)
CY049573	(A/Singapore/ON1156/2009)	CY057544	(A/Wisconsin/629-D00853/2009)	GQ402235	(A/Canada-QC/RV1759/2009)
CY049581	(A/Singapore/ON1163/2009)	CY057552	(A/Wisconsin/629-D02337/2009)	GQ402236	(A/Canada-SK/RV1767/2009)
CY049589	(A/Singapore/ON1168/2009)	CY057560	(A/Wisconsin/629-D00690/2009)	GQ402237	(A/Canada-SK/RV1793/2009)
CY049597	(A/Singapore/ON1177/2009)	CY057568	(A/Wisconsin/629-D00834/2009)	GQ402238	(A/Canada-SK/RV1798/2009)
CY049605	(A/Singapore/ON1187/2009)	CY057576	(A/Wisconsin/629-S1252/2009)	GQ402239	(A/Canada-QC/RV1954/2009)
CY049613	(A/Singapore/ON1194/2009)	CY057584	(A/Wisconsin/629-D01749/2009)	GQ402240	(A/Canada-MB/RV1964/2009)
CY049621	(A/Singapore/GP2312/2009)	CY057592	(A/Wisconsin/629-D02090/2009)	GQ402241	(A/Canada-MB/RV1975/2009)
CY049629	(A/Singapore/GP2316/2009)	CY057600	(A/Wisconsin/629-D01080/2009)	GQ402242	(A/Canada-MB/RV1977/2009)
CY049637	(A/Singapore/GP2641/2009)	CY057608	(A/Wisconsin/629-D00557/2009)	GQ402243	(A/Canada-MB/RV1982/2009)
CY049645	(A/Singapore/GP2651/2009)	CY057616	(A/Wisconsin/629-S1309/2009)	GQ402244	(A/Canada-MB/RV2013/2009)
CY049653	(A/Singapore/ON2081/2009)	CY057624	(A/Wisconsin/629-S1313/2009)	GQ402245	(A/Canada-MB/RV2018/2009)
CY049661	(A/Singapore/GP2686/2009)	CY057632	(A/Wisconsin/629-S1348/2009)	GQ402246	(A/Canada-MB/RV2020/2009)
CY049669	(A/Singapore/GP2687/2009)	CY057640	(A/Wisconsin/629-S1350/2009)	GQ411899	(A/Toronto/T5308/2009)
CY049677	(A/Singapore/GP2695/2009)	CY057648	(A/Wisconsin/629-D02342/2009)	GQ411905	(A/Shanghai/143T/2009)
CY049685	(A/Singapore/GP2703/2009)	CY057656	(A/Wisconsin/629-D00544/2009)	GQ421202	(A/Ancona/04/2009)
CY049693	(A/Singapore/GP2711/2009)	CY057664	(A/Wisconsin/629-D00099/2009)	GQ421204	(A/Ancona/05/2009)
CY049701	(A/Singapore/GP2715/2009)	CY057672	(A/Wisconsin/629-D00132/2009)	GQ426220	(A/Tomsk/01/2009)
CY049822	(A/Craven/WR0019/2009)	CY057680	(A/Wisconsin/629-S1384/2009)	GQ433898	(A/Jiangsu/1/2009)
CY049830	(A/Cherry Point/WR0080/2009)	CY057688	(A/Wisconsin/629-S1388/2009)	GQ455034	(A/Nanjing/2/2009)
CY049845	(A/Craven/WR0093/2009)	CY057696	(A/Wisconsin/629-S1398/2009)	GQ457464	(A/Utah/05/2009)
CY049853	(A/La Paz/WR0096T/2009)	CY057704	(A/Wisconsin/629-S1397/2009)	GQ457469	(A/Utah/11/2009)
CY049861	(A/Cherry Point/WR0100/2009)	CY057712	(A/Wisconsin/629-S1407/2009)	GQ457481	(A/Nevada/03/2009)
CY049869	(A/Cherry Point/WR0101/2009)	CY057720	(A/Wisconsin/629-D02317/2009)	GQ457483	(A/New York/15/2009)
CY049877	(A/Cherry Point/WR0102/2009)	CY057728	(A/Wisconsin/629-D01915/2009)	GQ457486	(A/Texas/05/2009)
CY049885	(A/San Salvador/WR0167N/2009)	CY057736	(A/Wisconsin/629-D01140/2009)	GQ457505	(A/New York/18/2009)
CY049893	(A/San Salvador/0169T/2009)	CY057744	(A/Wisconsin/629-D00151/2009)	GQ457510	(A/Montana/06/2009)
CY049901	(A/Moscow/0253T/2009)	CY057752	(A/Wisconsin/629-D01570/2009)	GQ457516	(A/California/27/2009)
CY049909	(A/Santo Domingo/0574/2009)	CY057760	(A/Wisconsin/629-D02370/2009)	GQ463202	(A/Hunan/SWL3/2009)
CY049917	(A/Santo Domingo/0574T/2009)	CY057768	(A/Wisconsin/629-D01346/2009)	GQ463958	(A/Changsha/78/2009)
CY049925	(A/New Bern/WR0670/2009)	CY057776	(A/Wisconsin/629-D00802/2009)	GQ465696	(A/Canada-SK/RV2486/2009)
CY049933	(A/Craven/WR1001/2009)	CY057784	(A/Wisconsin/629-D01014/2009)	GQ465697	(A/Canada-AB/RV1531/2009)
CY049941	(A/Santo Domingo/WR1056T/2009)	CY057792	(A/Wisconsin/629-D01369/2009)	GQ465698	(A/Canada-NS/RV1551/2009)
CY049949	(A/Santo Domingo/WR1057N/2009)	CY057800	(A/Wisconsin/629-D01466/2009)	GQ465699	(A/Canada-NS/RV1554/2009)
CY049957	(A/Santo Domingo/WR1058N/2009)	CY057808	(A/Wisconsin/629-D02392/2009)	GQ465700	(A/Canada-PQ/RV1586/2009)
CY049965	(A/Santo Domingo/WR1059N/2009)	CY057816	(A/Wisconsin/629-D01826/2009)	GQ465701	(A/Canada-ON/RV1589/2009)
CY049973	(A/Santo Domingo/1066N/2009)	CY057824	(A/Wisconsin/629-D00965/2009)	GQ465702	(A/Canada-AB/RV1644/2009)
CY049981	(A/Santo Domingo/WR1068N/2009)	CY057832	(A/Wisconsin/629-D00911/2009)	GQ465703	(A/Canada-PQ/RV1758/2009)
CY049989	(A/Mexico City/WR1087T/2009)	CY057840	(A/Wisconsin/629-D00128/2009)	GQ465704	(A/Canada-SK/RV1788/2009)
CY049997	(A/Mexico City/WR1100N/2009)	CY057848	(A/Wisconsin/629-D02060/2009)	GQ465705	(A/Canada-SK/RV1794/2009)
CY050005	(A/Mexico City/WR1297N/2009)	CY057856	(A/Wisconsin/629-D00295/2009)	GQ465706	(A/Canada-SK/RV1797/2009)
CY050013	(A/Mexico City/WR1301N/2009)	CY057864	(A/Wisconsin/629-D00936/2009)	GQ465707	(A/Canada-NS/RV1565/2009)
CY050021	(A/Mexico City/WR1306N/2009)	CY057872	(A/Wisconsin/629-D01661/2009)	GQ485658	(A/Ekaterinburg/01/2009)
CY050029	(A/Mexico City/WR1307N/2009)	CY057880	(A/Wisconsin/629-D01987/2009)	GQ485663	(A/Almati/01/2009)
CY050037	(A/Mexico City/WR1308T/2009)	CY057888	(A/Wisconsin/629-D00533/2009)	GQ494353	(A/Moscow/IIV05/2009)

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CY050045	(A/Mexico City/WR1310N/2009)	CY057896	(A/Wisconsin/629-D00908/2009)	GQ496143	(A/Vladivostok/IIV17/2009)
CY050053	(A/Mexico City/WR1311T/2009)	CY057904	(A/Wisconsin/629-D02448/2009)	GQ496148	(A/Vladivostok/IIV18/2009)
CY050061	(A/Mexico City/WR1312N/2009)	CY057912	(A/Wisconsin/629-D00134/2009)	GQ497278	(A/Poland/282/2009)
CY050069	(A/Cherry Point/WR1355/2009)	CY057920	(A/Wisconsin/629-D01330/2009)	GQ497279	(A/Poland/303/2009)
CY050077	(A/Japan/PR1070/2009)	CY057928	(A/Wisconsin/629-D01190/2009)	GQ499335	(A/Washington/29/2009)
CY050085	(A/Taiwan/T0826/2009)	CY057936	(A/Wisconsin/629-D00968/2009)	GQ499337	(A/Washington/28/2009)
CY050088	(A/Bogota/WR0090N/2009)	CY057944	(A/Wisconsin/629-D00629/2009)	GQ502908	(A/Toronto/R8557/2009)
CY050144	(A/Wisconsin/629-D01058/2009)	CY057952	(A/Wisconsin/629-D00050/2009)	GQ504753	(A/Nanjing/1/2009)
CY050152	(A/Wisconsin/629-D00117/2009)	CY057960	(A/Wisconsin/629-D00970/2009)	GQ505855	(A/Irkutsk/02/2009)
CY050160	(A/New York/4095/2009)	CY057968	(A/Wisconsin/629-D01528/2009)	GQ527169	(A/Omsk/01/2009)
CY050168	(A/Mexico City/008/2009)	CY057976	(A/Wisconsin/629-D01434/2009)	GQ866226	(A/turkey/Chile/28317-6504-3/2009)
CY050176	(A/Mexico City/015/2009)	CY057984	(A/Wisconsin/629-D01412/2009)	GQ866936	(A/Thailand/CU-H106/2009)
CY050184	(A/New York/4438/2009)	CY057992	(A/Wisconsin/629-D00935/2009)	GQ866937	(A/Thailand/CU-H276/2009)
CY050192	(A/New York/4576/2009)	CY058000	(A/Wisconsin/629-D02299/2009)	GQ866938	(A/Thailand/CU-H340/2009)
CY050200	(A/Mexico City/001/2009)	CY058008	(A/Wisconsin/629-D01473/2009)	GQ866939	(A/Thailand/CU-B938/2009)
CY050208	(A/Mexico City/002/2009)	CY058016	(A/Wisconsin/629-D00672/2009)	GQ866953	(A/Thailand/CU-B5/2009)
CY050216	(A/Mexico City/003/2009)	CY058024	(A/Wisconsin/629-D00401/2009)	GQ866961	(A/Thailand/CU-H9/2009)
CY050224	(A/Mexico City/004/2009)	CY058032	(A/Wisconsin/629-D00636/2009)	GQ894807	(A/Florida/17/2009)
CY050232	(A/Mexico City/006/2009)	CY058040	(A/Texas/46172731/2009)	GQ894809	(A/New York/80/2009)
CY050240	(A/Mexico City/010/2009)	CY058048	(A/Texas/46172734/2009)	GQ894810	(A/Delaware/04/2009)
CY050248	(A/Mexico City/011/2009)	CY058056	(A/Texas/46181235/2009)	GQ894811	(A/Oregon/04/2009)
CY050256	(A/Mexico City/012/2009)	CY058064	(A/Texas/46181292/2009)	GQ894817	(A/Illinois/07/2009)
CY050330	(A/Wisconsin/629-D01851/2009)	CY058078	(A/Managua/171.01/2009)	GQ894819	(A/New York/30/2009)
CY050341	(A/Singapore/9061364/2009)	CY058086	(A/Managua/1455.01/2009)	GQ894822	(A/Nevada/05/2009)
CY050349	(A/Singapore/9061365/2009)	CY058094	(A/Managua/655.02/2009)	GQ894823	(A/Oklahoma/02/2009)
CY050357	(A/Singapore/9061366/2009)	CY058102	(A/Managua/168.02/2009)	GQ894829	(A/Florida/16/2009)
CY050365	(A/Singapore/279M/2009)	CY058110	(A/Managua/2152.01/2009)	GQ894831	(A/Rhode Island/08/2009)
CY050374	(A/Wisconsin/629-D01154/2009)	CY058118	(A/Managua/1637.01/2009)	GQ894838	(A/Washington/12/2009)
CY050382	(A/Wisconsin/629-D01295/2009)	CY058126	(A/Managua/5453.01/2009)	GQ894843	(A/Massachusetts/08/2009)
CY050390	(A/Wisconsin/629-D01839/2009)	CY058134	(A/Managua/516.01/2009)	GQ894846	(A/Georgia/08/2009)
CY050398	(A/Wisconsin/629-D00989/2009)	CY058142	(A/Managua/5665.01/2009)	GQ894850	(A/Georgia/15/2009)
CY050406	(A/Wisconsin/629-D00451/2009)	CY058150	(A/Managua/4085.02/2009)	GQ894852	(A/New Hampshire/11/2009)
CY050414	(A/Wisconsin/629-D00752/2009)	CY058158	(A/Managua/2330.02/2009)	GQ894853	(A/California/11/2009)
CY050422	(A/Wisconsin/629-D02206/2009)	CY058166	(A/Managua/4016.02/2009)	GQ894858	(A/District of Columbia/03/2009)
CY050430	(A/Wisconsin/629-D02324/2009)	CY058174	(A/Managua/792.01/2009)	GQ894863	(A/Utah/02/2009)
CY050438	(A/Wisconsin/629-D01886/2009)	CY058182	(A/Managua/3189.01/2009)	GQ894866	(A/Indiana/17/2009)
CY050446	(A/Wisconsin/629-D01482/2009)	CY058190	(A/Managua/5586.01/2009)	GQ894870	(A/Louisiana/07/2009)
CY050849	(A/Mexico City/007/2009)	CY058198	(A/Managua/1127.02/2009)	GQ894876	(A/New York/24/2009)
CY050857	(A/Mexico City/009/2009)	CY058206	(A/Managua/791.03/2009)	GQ894877	(A/Wisconsin/08/2009)
CY050865	(A/Mexico City/013/2009)	CY058214	(A/Managua/578.01/2009)	GQ894878	(A/California/12/2009)
CY050873	(A/Mexico City/017/2009)	CY058222	(A/Managua/5221.03/2009)	GQ894880	(A/California/13/2009)
CY050881	(A/Mexico City/005/2009)	CY058230	(A/Managua/5363.02/2009)	GQ894882	(A/Oregon/05/2009)
CY050889	(A/Mexico City/018/2009)	CY058238	(A/Managua/473.02/2009)	GQ894883	(A/Washington/11/2009)
CY050897	(A/Wisconsin/629-D00949/2009)	CY058246	(A/Managua/3275.01/2009)	GQ894886	(A/Wisconsin/09/2009)
CY050905	(A/Wisconsin/629-D01779/2009)	CY058254	(A/Managua/3244.01/2009)	GQ894888	(A/West Virginia/01/2009)

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CY050913	(A/Wisconsin/629-D01262/2009)	CY058262	(A/Managua/164.01/2009)	GQ894893	(A/New York/37/2009)
CY050921	(A/Wisconsin/629-D02213/2009)	CY058270	(A/New York/5620/2009)	GQ894896	(A/Texas/19/2009)
CY050929	(A/Wisconsin/629-D00426/2009)	CY058278	(A/Wisconsin/629-D01015/2009)	GQ894897	(A/Oregon/06/2009)
CY050937	(A/Wisconsin/629-D01847/2009)	CY058286	(A/Wisconsin/629-D01102/2009)	GQ894900	(A/Pennsylvania/14/2009)
CY050945	(A/Wisconsin/629-D00374/2009)	CY058294	(A/Wisconsin/629-D02100/2009)	GQ894901	(A/Washington/07/2009)
CY050953	(A/Wisconsin/629-D00724/2009)	CY058302	(A/Wisconsin/629-D02018/2009)	GQ894902	(A/Oklahoma/01/2009)
CY050961	(A/Wisconsin/629-D00941/2009)	CY058310	(A/Wisconsin/629-S1417/2009)	GQ894904	(A/Texas/12/2009)
CY050969	(A/Wisconsin/629-D01725/2009)	CY058318	(A/Wisconsin/629-S1414/2009)	GQ894908	(A/Idaho/03/2009)
CY050977	(A/Wisconsin/629-D00367/2009)	CY058326	(A/Wisconsin/629-S1416/2009)	GQ894909	(A/Kentucky/06/2009)
CY050985	(A/Wisconsin/629-D00592/2009)	CY058334	(A/Wisconsin/629-D01347/2009)	GQ894912	(A/Oregon/20/2009)
CY050993	(A/Wisconsin/629-D01903/2009)	CY058342	(A/Wisconsin/629-D00503/2009)	GQ894914	(A/Rhode Island/07/2009)
CY051001	(A/Wisconsin/629-D00665/2009)	CY058350	(A/Wisconsin/629-D01582/2009)	GQ894921	(A/Texas/47/2009)
CY051009	(A/Wisconsin/629-D01619/2009)	CY058358	(A/Wisconsin/629-D02489/2009)	GQ894923	(A/Washington/37/2009)
CY051017	(A/Wisconsin/629-D00453/2009)	CY058366	(A/Wisconsin/629-D00689/2009)	GQ894927	(A/New York/35/2009)
CY051025	(A/Wisconsin/629-D00017/2009)	CY058374	(A/Wisconsin/629-D01244/2009)	GQ894932	(A/District of Columbia/02/2009)
CY051033	(A/Wisconsin/629-D00658/2009)	CY058382	(A/Wisconsin/629-D00780/2009)	GQ894933	(A/North Carolina/06/2009)
CY051041	(A/Wisconsin/629-D00725/2009)	CY058390	(A/Wisconsin/629-D00147/2009)	GQ894936	(A/Michigan/06/2009)
CY051049	(A/Wisconsin/629-D00008/2009)	CY058398	(A/Wisconsin/629-D01591/2009)	GQ894939	(A/Mexico/4627/2009)
CY051057	(A/Wisconsin/629-D02068/2009)	CY058406	(A/Wisconsin/629-D01038/2009)	GQ906584	(A/Stockholm/49/2009)
CY051065	(A/Wisconsin/629-D00101/2009)	CY058414	(A/Wisconsin/629-D00459/2009)	GU012634	(A/Poland/192/2009)
CY051073	(A/Wisconsin/629-D00579/2009)	CY058422	(A/Wisconsin/629-D01904/2009)	GU012635	(A/Poland/193/2009)
CY051081	(A/Wisconsin/629-D01326/2009)	CY058430	(A/Wisconsin/629-D01752/2009)	GU012636	(A/Poland/195/2009)
CY051089	(A/Wisconsin/629-D01844/2009)	CY058438	(A/Wisconsin/629-D01556/2009)	GU014749	(A/Gifu-C/67/2009)
CY051097	(A/Wisconsin/629-D00196/2009)	CY058446	(A/Wisconsin/629-D02073/2009)	GU014751	(A/Hiroshima/201/2009)
CY051105	(A/Wisconsin/629-D01618/2009)	CY058454	(A/Wisconsin/629-D01846/2009)	GU014753	(A/Mie/41/2009)
CY051113	(A/Wisconsin/629-D02263/2009)	CY058462	(A/Wisconsin/629-D00996/2009)	GU014755	(A/Mie/52/2009)
CY051121	(A/Wisconsin/629-D00916/2009)	CY058470	(A/Wisconsin/629-D00337/2009)	GU014757	(A/Myanmar/JP90/2009)
CY051129	(A/Wisconsin/629-D00119/2009)	CY058478	(A/Wisconsin/629-D02424/2009)	GU014759	(A/Myanmar/JP101/2009)
CY051137	(A/Wisconsin/629-D01152/2009)	CY058526	(A/Managua/4905.02/2009)	GU014761	(A/Myanmar/JP131/2009)
CY051145	(A/Wisconsin/629-D01734/2009)	CY058534	(A/Managua/4514.03/2009)	GU014763	(A/Myanmar/JP133/2009)
CY051153	(A/Wisconsin/629-D01147/2009)	CY058542	(A/Managua/462.01/2009)	GU014765	(A/Niigata/700/2009)
CY051161	(A/Wisconsin/629-D00541/2009)	CY058550	(A/Managua/4935.03/2009)	GU014767	(A/Niigata/749/2009)
CY051169	(A/Wisconsin/629-D02063/2009)	CY058558	(A/Managua/2093.01/2009)	GU014769	(A/Saitama/85/2009)
CY051177	(A/Wisconsin/629-D00428/2009)	CY058566	(A/Managua/4218.01/2009)	GU014771	(A/Wakayama/57/2009)
CY051185	(A/Wisconsin/629-D02220/2009)	CY058574	(A/Managua/4757.02/2009)	GU014773	(A/Aichi/198/2009)
CY051193	(A/Wisconsin/629-D00496/2009)	CY058582	(A/Managua/989.01/2009)	GU014775	(A/Aichi/202/2009)
CY051201	(A/Wisconsin/629-D02024/2009)	CY058590	(A/Managua/65.02/2009)	GU014777	(A/Chiba-C/48/2009)
CY051209	(A/Wisconsin/629-D01414/2009)	CY058598	(A/Managua/3435.01/2009)	GU014779	(A/Chiba-C/51/2009)
CY051217	(A/Wisconsin/629-D02292/2009)	CY058606	(A/Managua/5747.02/2009)	GU014781	(A/Hiroshima/200/2009)
CY051225	(A/Wisconsin/629-D00022/2009)	CY058614	(A/Managua/2323.02/2009)	GU014783	(A/Hiroshima/207/2009)
CY051233	(A/Wisconsin/629-D01664/2009)	CY058622	(A/Wisconsin/629-S1433/2009)	GU014785	(A/Hiroshima/216/2009)
CY051241	(A/Wisconsin/629-D01199/2009)	CY058630	(A/Wisconsin/629-S1431/2009)	GU014787	(A/Hiroshima/220/2009)
CY051249	(A/Wisconsin/629-S0035/2009)	CY058638	(A/Wisconsin/629-S1425/2009)	GU014789	(A/Hiroshima/230/2009)
CY051257	(A/Wisconsin/629-S0086/2009)	CY058646	(A/Wisconsin/629-D02329/2009)	GU014791	(A/Iwate/3/2009)
CY051265	(A/Wisconsin/629-S0143/2009)	CY058654	(A/Wisconsin/629-D02002/2009)	GU014793	(A/Kanagawa/137/2009)

ACCESSION #	VIRUS NAME	ACCESSION #	VIRUS NAME	ACCESSION #	VIRUS NAME
CY051273	(A/Wisconsin/629-S0146/2009)	CY058662	(A/Wisconsin/629-D01913/2009)	GU014795	(A/Kanagawa/140/2009)
CY051281	(A/Wisconsin/629-S0148/2009)	CY058670	(A/Wisconsin/629-D00193/2009)	GU014797	(A/Myanmar/60/2009)
CY051289	(A/Wisconsin/629-S0173/2009)	CY058678	(A/Wisconsin/629-D00938/2009)	GU014799	(A/Niigata/690/2009)
CY051297	(A/Wisconsin/629-S0186/2009)	CY058686	(A/Texas/46182018/2009)	GU014801	(A/Niigata/717/2009)
CY051305	(A/Wisconsin/629-S0197/2009)	CY058694	(A/Texas/461917783/2009)	GU014803	(A/Shizuoka/793/2009)
CY051313	(A/Wisconsin/629-S0201/2009)	CY058702	(A/Texas/46192760/2009)	GU014805	(A/Shizuoka-C/97/2009)
CY051321	(A/Wisconsin/629-S0202/2009)	CY058710	(A/Texas/46193311/2009)	GU014807	(A/Tokushima/2/2009)
CY051329	(A/Wisconsin/629-S0203/2009)	CY058718	(A/Texas/JMS375/2009)	GU014809	(A/Yamaguchi/21/2009)
CY051337	(A/Wisconsin/629-S0220/2009)	CY058726	(A/Texas/JMS376/2009)	GU014811	(A/Yamaguchi/23/2009)
CY051345	(A/Wisconsin/629-S0222/2009)	CY058734	(A/Texas/JMS377/2009)	GU065289	(A/Poland/169/2009)
CY051353	(A/Wisconsin/629-S0226/2009)	CY058742	(A/Texas/JMS378/2009)	GU065290	(A/Poland/304/2009)
CY051361	(A/Wisconsin/629-S0245/2009)	CY058821	(A/Guangdong/1331/2009)	GU065291	(A/Poland/253/2009)
CY051369	(A/Wisconsin/629-S0248/2009)	CY058823	(A/Guangdong/1748/2009)	GU065292	(A/Poland/266/2009)
CY051377	(A/Wisconsin/629-S0247/2009)	CY058825	(A/Guangdong/1759/2009)	GU071974	(A/Ghom/1550/2009)
CY051385	(A/Wisconsin/629-S0254/2009)	CY058827	(A/Guangdong/1782/2009)	GU071975	(A/Khorasan/1583/2009)
CY051393	(A/Wisconsin/629-S0255/2009)	CY058829	(A/Guangdong/1998/2009)	GU071976	(A/Lorestan/1599/2009)
CY051401	(A/Wisconsin/629-S0252/2009)	CY058831	(A/Guangdong/2221/2009)	GU108488	(A/Zhejiang-Yiwu/11/2009)
CY051409	(A/Wisconsin/629-S0269/2009)	CY058833	(A/Guangdong/2281/2009)	GU112092	(A/Zhejiang/DTID-ZJU02/2009)
CY051417	(A/Wisconsin/629-S0280/2009)	CY058835	(A/Guangdong/2282/2009)	GU112751	(A/Poland/274/2009)
CY051425	(A/Wisconsin/629-S0279/2009)	CY058837	(A/Guangdong/2361/2009)	GU112752	(A/Poland/295/2009)
CY051433	(A/Wisconsin/629-S0293/2009)	CY060458	(A/Seoul/1785/2009)	GU123901	(A/Italy/134/2009)
CY051441	(A/Wisconsin/629-S0319/2009)	CY060461	(A/Gangwon/1805/2009)	GU123902	(A/Italy/135/2009)
CY051449	(A/Wisconsin/629-S0345/2009)	CY060491	(A/Seoul/1870/2009)	GU123903	(A/Italy/136/2009)
CY051457	(A/Wisconsin/629-S0339/2009)	CY060504	(A/Ontario/10016/2009)	GU123904	(A/Italy/137/2009)
CY051465	(A/Wisconsin/629-S0314/2009)	CY060512	(A/Ontario/10296/2009)	GU123905	(A/Italy/138/2009)
CY051473	(A/Wisconsin/629-S0435/2009)	CY060520	(A/Ontario/222656/2009)	GU123907	(A/Italy/140/2009)
CY051481	(A/Wisconsin/629-S0410/2009)	CY060528	(A/Ontario/235657/2009)	GU123908	(A/Italy/141/2009)
CY051489	(A/Wisconsin/629-S0464/2009)	CY060536	(A/Ontario/237882/2009)	GU123909	(A/Italy/142/2009)
CY051497	(A/Wisconsin/629-S0189/2009)	CY060544	(A/Ontario/25389/2009)	GU123910	(A/Italy/143/2009)
CY051505	(A/Wisconsin/629-S0206/2009)	CY060552	(A/Ontario/25913/2009)	GU123911	(A/Italy/144/2009)
CY051513	(A/Wisconsin/629-S0208/2009)	CY060560	(A/Ontario/26184/2009)	GU123912	(A/Italy/158/2009)
CY051521	(A/Wisconsin/629-S0229/2009)	CY060568	(A/Ontario/296008/2009)	GU123913	(A/Italy/146/2009)
CY051529	(A/New York/4400/2009)	CY060576	(A/Ontario/29801/2009)	GU123914	(A/Italy/147/2009)
CY051537	(A/New York/4402/2009)	CY060584	(A/Ontario/304434/2009)	GU123915	(A/Italy/148/2009)
CY051545	(A/New York/4403/2009)	CY060592	(A/Ontario/305139/2009)	GU123918	(A/Italy/151/2009)
CY051553	(A/New York/4434/2009)	CY060600	(A/Ontario/305598/2009)	GU123919	(A/Italy/152/2009)
CY051561	(A/New York/4459/2009)	CY060608	(A/Ontario/308054/2009)	GU123920	(A/Italy/153/2009)
CY051569	(A/New York/4476/2009)	CY060616	(A/Ontario/309862/2009)	GU123921	(A/Italy/154/2009)
CY051577	(A/New York/4500/2009)	CY060624	(A/Ontario/313762/2009)	GU123922	(A/Italy/155/2009)
CY051585	(A/New York/4556/2009)	CY060632	(A/Ontario/314095/2009)	GU123923	(A/Italy/156/2009)
CY051593	(A/New York/4565/2009)	CY060640	(A/Ontario/314137/2009)	GU123924	(A/Italy/157/2009)
CY051601	(A/New York/4566/2009)	CY060648	(A/Ontario/314603/2009)	GU134712	(A/Italy/159/2009)
CY051609	(A/New York/4567/2009)	CY060656	(A/Ontario/315003/2009)	GU134713	(A/Italy/160/2009)
CY051617	(A/New York/4568/2009)	CY060664	(A/Ontario/315015/2009)	GU134714	(A/Italy/161/2009)
CY051625	(A/New York/4607/2009)	CY060672	(A/Ontario/315047/2009)	GU134715	(A/Italy/162/2009)

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CY051633	(A/New York/4620/2009)	CY060680	(A/Ontario/315107/2009)	GU134716	(A/Italy/163/2009)
CY051641	(A/New York/4677/2009)	CY060688	(A/Ontario/315181/2009)	GU134717	(A/Italy/164/2009)
CY051649	(A/New York/4691/2009)	CY060696	(A/Ontario/315187/2009)	GU134718	(A/Italy/165/2009)
CY051657	(A/New York/4728/2009)	CY060704	(A/Ontario/315613/2009)	GU134720	(A/Italy/167/2009)
CY051665	(A/New York/4735/2009)	CY060712	(A/Ontario/315637/2009)	GU134721	(A/Italy/168/2009)
CY051673	(A/New York/4738/2009)	CY060720	(A/Ontario/320266/2009)	GU134722	(A/Italy/169/2009)
CY051681	(A/New York/4747/2009)	CY060728	(A/Ontario/328474/2009)	GU134724	(A/Italy/171/2009)
CY051689	(A/New York/4761/2009)	CY060736	(A/Ontario/35273/2009)	GU134726	(A/Italy/173/2009)
CY051697	(A/New York/4777/2009)	CY060744	(A/Ontario/9698/2009)	GU134727	(A/Italy/174/2009)
CY051705	(A/New York/4780/2009)	CY060752	(A/Ontario/9739/2009)	GU134728	(A/Italy/175/2009)
CY051713	(A/New York/4787/2009)	CY060757	(A/Texas/46193632/2009)	GU134731	(A/Italy/178/2009)
CY051721	(A/New York/4789/2009)	CY060765	(A/Texas/46201823/2009)	GU134732	(A/Italy/179/2009)
CY051729	(A/New York/4790/2009)	CY060773	(A/Texas/46214103/2009)	GU134733	(A/Italy/180/2009)
CY051737	(A/New York/4791/2009)	CY060781	(A/Texas/46221665/2009)	GU134734	(A/Italy/181/2009)
CY051745	(A/New York/4810/2009)	CY060789	(A/Texas/46222134/2009)	GU189642	(A/swine/Singapore-Q/M168/2009)
CY051753	(A/New York/4820/2009)	CY060797	(A/Texas/46223444/2009)	GU189651	(A/Zhejiang/DTID-ZJU03/2009)
CY051761	(A/New York/4823/2009)	CY060805	(A/Texas/46223582/2009)	GU198203	(A/Nanjing/3/2009)
CY051769	(A/New York/4824/2009)	CY060813	(A/Texas/46224042/2009)	GU211221	(A/Vladivostok/01/2009)
CY051777	(A/New York/4841/2009)	CY060821	(A/Texas/46233104/2009)	GU211229	(A/Russia/01/2009)
CY051785	(A/New York/4844/2009)	CY060829	(A/Texas/46240925/2009)	GU211237	(A/Omsk/02/2009)
CY051793	(A/New York/4856/2009)	CY060837	(A/Texas/46241654/2009)	GU211245	(A/Tomsk/02/2009)
CY051801	(A/New York/4866/2009)	CY060845	(A/Texas/JMS356/2009)	GU216651	(A/Pavia/21/2009)
CY051809	(A/New York/4870/2009)	CY060853	(A/Texas/JMS358/2009)	GU234175	(A/Chita/01/2009)
CY051817	(A/Texas/42152486/2009)	CY060861	(A/Texas/JMS359/2009)	GU290049	(A/Prague/197-81395/2009)
CY051825	(A/Texas/43242018/2009)	CY060869	(A/Texas/JMS361/2009)	GU290057	(A/Prague/196-81511/2009)
CY051833	(A/Texas/43011033/2009)	CY060877	(A/Texas/JMS362/2009)	GU290191	(A/Utah/42/2009)
CY051841	(A/Texas/42123701/2009)	CY060885	(A/Texas/JMS363/2009)	GU292381	(A/Blore/NIV236/2009)
CY051849	(A/Texas/42191653/2009)	CY060893	(A/Texas/JMS364/2009)	GU292382	(A/Blore/NIV310/2009)
CY051857	(A/Texas/42122969/2009)	CY060901	(A/Texas/JMS365/2009)	GU292383	(A/Hyd/NIV51/2009)
CY051865	(A/Texas/42201824/2009)	CY060909	(A/Texas/JMS369/2009)	GU292384	(A/Pune/NIV6196/2009)
CY051873	(A/Texas/42173957/2009)	CY060917	(A/Texas/JMS370/2009)	GU292385	(A/Pune/NIV6447/2009)
CY051881	(A/Texas/42113095/2009)	CY060925	(A/Texas/JMS371/2009)	GU292386	(A/Pune/NIV8489/2009)
CY051889	(A/Texas/42114261/2009)	CY060933	(A/Texas/JMS372/2009)	GU324339	(A/swine/Taiwan/TD-4119B2/2009)
CY051897	(A/Texas/45062633/2009)	CY060941	(A/Texas/JMS373/2009)	GU332632	(A/cat/IA/26991/2009)
CY051905	(A/Houston/1OS/2009)	CY060949	(A/Texas/JMS379/2009)	GU332635	(A/ferret/OR/27004/2009)
CY051913	(A/Houston/2H/2009)	CY060957	(A/Texas/JMS380/2009)	GU361110	(A/Stockholm/091120-2/2009)
CY051921	(A/Houston/9OS/2009)	CY060965	(A/Texas/JMS381/2009)	GU367316	(A/Abakan/02/2009)
CY052000	(A/Norway/3364-2/2009)	CY060973	(A/Texas/JMS382/2009)	GU367319	(A/Tomsk/07/2009)
CY052021	(A/Norway/3206-3/2009)	CY060981	(A/Texas/JMS383/2009)	GU367326	(A/Novgorod/01/2009)
CY052085	(A/Italy/226/2009)	CY060989	(A/Texas/JMS384/2009)	GU367329	(A/Salekhard/01/2009)
CY052087	(A/Italy/228/2009)	CY060997	(A/Texas/JMS385/2009)	GU371257	(A/Orenburg/IIV2974/2009)
CY052100	(A/New York/4238/2009)	CY061005	(A/Texas/JMS386/2009)	GU433027	(A/Tomsk/03/2009)
CY052108	(A/Wisconsin/629-D00739/2009)	CY061013	(A/Texas/JMS387/2009)	GU433035	(A/Novosibirsk/02/2009)
CY052116	(A/Wisconsin/629-D01973/2009)	CY061021	(A/Texas/JMS388/2009)	GU451256	(A/Tver/IIV2969/2009)
CY052124	(A/New York/3969/2009)	CY061029	(A/Texas/JMS389/2009)	GU470881	(A/swine/Indiana/27007/2009)

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CY052132	(A/New York/3976/2009)	CY061037	(A/Texas/JMS390/2009)	GU471690	(A/cat/OR/29573/2009)
CY052140	(A/New York/3980/2009)	CY061045	(A/Texas/JMS391/2009)	GU471691	(A/Guangdong/801/2009)
CY052148	(A/New York/4398/2009)	CY061053	(A/Texas/JMS392/2009)	GU471692	(A/Guangdong/1104/2009)
CY052156	(A/New York/4401/2009)	CY061061	(A/Texas/JMS393/2009)	GU471693	(A/Guangdong/1103/2009)
CY052164	(A/New York/4788/2009)	CY061069	(A/Texas/JMS394/2009)	GU471694	(A/Guangdong/1106/2009)
CY052172	(A/New York/4855/2009)	CY061077	(A/Texas/JMS395/2009)	GU471695	(A/Guangdong/1105/2009)
CY052180	(A/New York/4881/2009)	CY061085	(A/Texas/JMS397/2009)	GU480924	(A/swine/IL/32974/2009)
CY052188	(A/Texas/42281289/2009)	CY061093	(A/Texas/JMS398/2009)	GU480927	(A/swine/NC/34543/2009)
CY052196	(A/Texas/42121926/2009)	CY061101	(A/Texas/JMS399/2009)	GU480930	(A/swine/NC/34752/2009)
CY052204	(A/Texas/42303371/2009)	CY061213	(A/New York/6771/2009)	GU480937	(A/Tomsk/08/2009)
CY052212	(A/Texas/42163291/2009)	CY061221	(A/New York/6772/2009)	GU480940	(A/Habarovsk/01/2009)
CY052220	(A/Texas/44301765/2009)	CY061229	(A/San Diego/INS101/2009)	GU480945	(A/Kurgan/01/2009)
CY052228	(A/Texas/44302551/2009)	CY061237	(A/San Diego/INS102/2009)	GU560010	(A/Tomsk/05/2009)
CY052236	(A/Texas/42191647/2009)	CY061245	(A/San Diego/INS103/2009)	GU560018	(A/Tomsk/06/2009)
CY052244	(A/Texas/42201798/2009)	CY061253	(A/San Diego/INS104/2009)	GU562452	(A/Perm/01/2009)
CY052252	(A/Texas/43143450/2009)	CY061261	(A/San Diego/INS105/2009)	GU562466	(A/Guangdong/1101/2009)
CY052260	(A/Texas/42221280/2009)	CY061269	(A/Brussels/INS106/2009)	GU562467	(A/Guangdong/1102/2009)
CY052268	(A/Texas/42102708/2009)	CY061277	(A/Pensacola/INS107/2009)	GU562468	(A/Guangdong/12012/2009)
CY052276	(A/Texas/42151049/2009)	CY061285	(A/Pensacola/INS108/2009)	GU562469	(A/Guangdong/1202/2009)
CY052284	(A/Texas/43292238/2009)	CY061549	(A/swine/Italy/85437/2009)	GU571152	(A/Bethesda/NIH107-D0/2009)
CY052292	(A/Texas/42091791/2009)	CY061556	(A/Texas/JMS366/2009)	GU571153	(A/Bethesda/NIH107-D31/2009)
CY052300	(A/Texas/42103399/2009)	CY061564	(A/Texas/JMS367/2009)	GU571154	(A/Bethesda/NIH106-D0/2009)
CY052308	(A/Texas/42254309/2009)	CY061572	(A/Texas/JMS400/2009)	GU571155	(A/Bethesda/NIH106-D14/2009)
CY052316	(A/Texas/42132413/2009)	CY061596	(A/New York/6806/2009)	GU571156	(A/Bethesda/NIH106-D32/2009)
CY052324	(A/Texas/42202026/2009)	CY061727	(A/swine/Hong Kong/NS1583/2009)	GU576503	(A/Ancona/15/2009)
CY052332	(A/Texas/42211898/2009)	CY061735	(A/swine/Hong Kong/2299/2009)	GU576505	(A/Ancona/16/2009)
CY052340	(A/Texas/44312415/2009)	CY061751	(A/swine/Hong Kong/NS1809/2009)	GU576507	(A/Ancona/17/2009)
CY052369	(A/Texas/43272683/2009)	CY061759	(A/swine/Hong Kong/NS1810/2009)	GU576509	(A/Ancona/56/2009)
CY052377	(A/Texas/43200999/2009)	CY061767	(A/swine/Hong Kong/2885/2009)	GU576511	(A/Ancona/60/2009)
CY052385	(A/Texas/42163295/2009)	CY061775	(A/swine/Hong Kong/2886/2009)	GU576513	(A/Ancona/61/2009)
CY052393	(A/Texas/42142537/2009)	CY061783	(A/swine/Hong Kong/2894/2009)	GU576516	(A/Ancona/68/2009)
CY052401	(A/Texas/42291877/2009)	CY061791	(A/swine/Hong Kong/2974/2009)	GU576518	(A/Ancona/69/2009)
CY052409	(A/Texas/43132503/2009)	CY061799	(A/swine/Hong Kong/2995/2009)	GU576520	(A/Ancona/75/2009)
CY052417	(A/Texas/42192947/2009)	CY061908	(A/New York/6903/2009)	GU576523	(A/Ancona/86/2009)
CY052425	(A/Texas/43122467/2009)	CY061916	(A/New York/6907/2009)	GU576525	(A/Ancona/97/2009)
CY052433	(A/Texas/45120922/2009)	CY061924	(A/New York/6937/2009)	GU576528	(A/Ancona/263/2009)
CY052441	(A/Texas/45122538/2009)	CY061932	(A/New York/6939/2009)	GU576530	(A/Ancona/274/2009)
CY052449	(A/Texas/45130742/2009)	CY061940	(A/New York/6941/2009)	GU576533	(A/Ancona/310/2009)
CY052457	(A/Texas/45122369/2009)	CY061948	(A/New York/6943/2009)	GU576535	(A/Ancona/348/2009)
CY052465	(A/Texas/45121606/2009)	CY061956	(A/New York/6945/2009)	GU576541	(A/Ancona/508/2009)
CY052473	(A/Texas/45122033/2009)	CY061964	(A/New York/6949/2009)	GU576544	(A/Ancona/254/2009)
CY052481	(A/Texas/45122282/2009)	CY061972	(A/New York/6976/2009)	GU576545	(A/Ancona/337/2009)
CY052489	(A/Texas/45122036/2009)	CY061980	(A/New York/6977/2009)	GU592891	(A/Barnaul/04/2009)
CY052497	(A/Texas/45113371/2009)	CY061988	(A/New York/7019/2009)	GU592899	(A/Bishkek/03/2009)
CY052505	(A/Texas/45104026/2009)	CY061996	(A/New York/7020/2009)	GU592907	(A/Magadan/02/2009)

ACCESSION #	VIRUS NAME	ACCESSION #	VIRUS NAME	ACCESSION #	VIRUS NAME
CY052513	(A/Texas/45103737/2009)	CY062004	(A/New York/7036/2009)	GU727826	(A/IIV-Anadyr/177/2009)
CY052521	(A/Texas/45104048/2009)	CY062012	(A/New York/7107/2009)	GU936491	(A/Roma/ISS1941/2009)
CY052529	(A/Texas/45103998/2009)	CY062020	(A/New York/7216/2009)	GU953237	(A/ferret/OR/23775/2009)
CY052537	(A/Texas/45113882/2009)	CY062028	(A/New York/7236/2009)	GU979210	(A/ferret/OR/27004-3/2009)
CY052545	(A/Texas/45132214/2009)	CY062036	(A/New York/0259/2009)	GU984388	(A/cat/PA/30187/2009)
CY052553	(A/Texas/45122774/2009)	CY062044	(A/New York/0352/2009)	GU984391	(A/swine/IA/35572/2009)
CY052561	(A/Texas/45122722/2009)	CY062052	(A/New York/0357/2009)	GU984394	(A/swine/IA/35573/2009)
CY052569	(A/Texas/45132788/2009)	CY062060	(A/New York/0461/2009)	GU984397	(A/swine/IL/10-001550/2009)
CY052577	(A/Texas/45131774/2009)	CY062196	(A/California/VRDL79/2009)	GU984400	(A/swine/IL/10-001551-1/2009)
CY052585	(A/Texas/45132647/2009)	CY062204	(A/California/VRDL80/2009)	GU984403	(A/swine/IL/10-001551-2/2009)
CY052593	(A/Texas/45033774/2009)	CY062212	(A/California/VRDL81/2009)	HM006721	(A/Xian/001/2009)
CY052601	(A/Texas/45033567/2009)	CY062220	(A/California/VRDL82/2009)	HM006722	(A/Xian/002/2009)
CY052609	(A/Texas/45034157/2009)	CY062228	(A/California/VRDL83/2009)	HM006723	(A/Xian/004/2009)
CY052617	(A/Texas/44302533/2009)	CY062236	(A/California/VRDL84/2009)	HM006724	(A/Xian/006/2009)
CY052625	(A/Texas/44302167/2009)	CY062244	(A/California/VRDL85/2009)	HM006725	(A/Xian/009/2009)
CY052633	(A/Texas/45061670/2009)	CY062252	(A/California/VRDL86/2009)	HM006726	(A/Xian/010/2009)
CY052641	(A/Texas/45062584/2009)	CY062258	(A/Malaysia/15506/2009)	HM006727	(A/Xian/017/2009)
CY052649	(A/Texas/45103259/2009)	CY062259	(A/Malaysia/15521/2009)	HM012480	(A/cheetah/CA/30954/2009)
CY052657	(A/Texas/45093846/2009)	CY062260	(A/Malaysia/15636/2009)	HM014326	(A/Guangzhou/GIRD07/2009)
CY052665	(A/Texas/45093670/2009)	CY062261	(A/Malaysia/15710/2009)	HM051341	(A/Guangdong/SWL28/2009)
CY052673	(A/Texas/44313703/2009)	CY062262	(A/Malaysia/4969/2009)	HM051349	(A/Sichuan-Wenjiang/SWL456/2009)
CY052681	(A/Texas/45010998/2009)	CY062263	(A/Malaysia/9407/2009)	HM064504	(A/cat/Italy/304678-1/2009)
CY052689	(A/Texas/45071524/2009)	CY062264	(A/Malaysia/9538/2009)	HM064505	(A/cat/Italy/304678-2/2009)
CY052697	(A/Texas/45083819/2009)	CY062302	(A/swine/Thailand/CU-RA29/2009)	HM101150	(A/Tver/IIV-183/2009)
CY052705	(A/Texas/45093214/2009)	CY062310	(A/swine/Thailand/CU-RA4/2009)	HM104437	(A/Santiago/21579/2009)
CY052713	(A/Texas/45140902/2009)	CY062326	(A/swine/Thailand/CU-RA9/2009)	HM104478	(A/Yaroslavl/IIV-198/2009)
CY052721	(A/Texas/45091402/2009)	CY062492	(A/Mexico city/CIA1/2009)	HM138490	(A/Germany-MV/HGW4/2009)
CY052729	(A/Texas/45091405/2009)	CY062499	(A/Mexico city/CIA2/2009)	HM138492	(A/Germany-MV/HGW6/2009)
CY052737	(A/Texas/45091417/2009)	CY062506	(A/Mexico city/CIA3/2009)	HM138500	(A/Germany-BY/74/2009)
CY052745	(A/Texas/45101424/2009)	CY062518	(A/Mexico city/CIA5/2009)	HM138502	(A/California/07/2009)
CY052753	(A/Texas/45103759/2009)	CY062523	(A/Mexico city/CIA6/2009)	HM157259	(A/Yaroslavl/IIV-196/2009)
CY052761	(A/Texas/45101422/2009)	CY062530	(A/Mexico city/CIA7/2009)	HM159391	(A/Habana/3383/2009)
CY052769	(A/Texas/44282651/2009)	CY062542	(A/Mexico city/CIA9/2009)	HM159392	(A/Habana/3391/2009)
CY052777	(A/Texas/45021632/2009)	CY062637	(A/Mexico City/014/2009)	HM159393	(A/Habana/3599/2009)
CY052785	(A/Texas/45043852/2009)	CY062645	(A/District of Columbia/INS45/2009)	HM159394	(A/Habana/3617/2009)
CY052793	(A/Texas/45072273/2009)	CY062653	(A/San Diego/INS74/2009)	HM159395	(A/Habana/3619/2009)
CY052801	(A/Texas/45131576/2009)	CY062661	(A/Athens/INS87/2009)	HM159396	(A/Habana/3620/2009)
CY052809	(A/Texas/45071344/2009)	CY062669	(A/Pensacola/INS109/2009)	HM159397	(A/Habana/3626/2009)
CY052817	(A/Texas/45072656/2009)	CY062677	(A/Madrid/INS113/2009)	HM159398	(A/Habana/4613/2009)
CY052825	(A/Texas/45072128/2009)	CY062685	(A/District of Columbia/INS114/2009)	HM159399	(A/Habana/4622/2009)
CY052833	(A/Texas/45131305/2009)	CY062693	(A/Aarhus/INS116/2009)	HM159400	(A/Habana/4677/2009)
CY052841	(A/Texas/45132202/2009)	CY062701	(A/Aarhus/INS118/2009)	HM159401	(A/Habana/4683/2009)
CY052849	(A/Texas/44152535/2009)	CY062709	(A/Athens/INS123/2009)	HM159402	(A/Habana/4714/2009)
CY052857	(A/Texas/45023717/2009)	CY062717	(A/Athens/INS124/2009)	HM159403	(A/Habana/4725/2009)
CY052865	(A/Texas/45042604/2009)	CY062725	(A/Athens/INS125/2009)	HM159404	(A/Habana/4743/2009)

ACCESSION #	VIRUS NAME	ACCESSION #	VIRUS NAME	ACCESSION #	VIRUS NAME
CY052873	(A/Texas/44151841/2009)	CY062733	(A/Athens/INS126/2009)	HM159405	(A/Habana/5470/2009)
CY052881	(A/Texas/45024243/2009)	CY062741	(A/Bonn/INS127/2009)	HM159406	(A/Habana/5483/2009)
CY052889	(A/Texas/45062346/2009)	CY062749	(A/Madrid/INS129/2009)	HM159407	(A/Habana/5546/2009)
CY052897	(A/Texas/45102952/2009)	CY062757	(A/Madrid/INS131/2009)	HM159408	(A/Habana/5553/2009)
CY052905	(A/Texas/45032708/2009)	CY062765	(A/Madrid/INS134/2009)	HM173601	(A/Blagovechensk/01/2009)
CY052913	(A/Texas/45113911/2009)	CY062773	(A/Madrid/INS135/2009)	CY056295	(A/Henan/1/2010)
CY052921	(A/Texas/45052569/2009)	CY062781	(A/Tessenderlo/INS138/2009)	CY057074	(A/Mexico/InDRE797/2010)
CY052929	(A/Texas/45121004/2009)	CY062789	(A/Hvidovre/INS139/2009)	CY061109	(A/Texas/JMS402/2009)
CY052937	(A/Texas/45032753/2009)	CY062797	(A/Hvidovre/INS141/2009)	CY061117	(A/Texas/JMS404/2009)
CY052945	(A/Texas/45122886/2009)	CY062805	(A/Vienna/INS142/2009)	CY061125	(A/Texas/JMS405/2009)
CY052953	(A/Texas/45061755/2009)	CY062813	(A/Odense/INS143/2009)	CY061133	(A/Texas/JMS406/2009)
CY052961	(A/Houston/1H/2009)	CY062821	(A/Copenhagen/INS144/2009)	CY061141	(A/Texas/JMS407/2009)
CY052969	(A/Houston/2OS/2009)	CY062829	(A/Warsaw/INS146/2009)	CY061149	(A/Texas/JMS408/2009)
CY052977	(A/Houston/2OS/2009)	CY062837	(A/Athens/INS155/2009)	CY061157	(A/Texas/JMS409/2009)
CY052985	(A/Houston/3OS/2009)	CY062845	(A/Athens/INS156/2009)	CY061165	(A/Texas/JMS410/2009)
CY052993	(A/Houston/3H/2009)	CY062853	(A/Athens/INS158/2009)	CY061173	(A/Texas/JMS411/2009)
CY053001	(A/Houston/5OS/2009)	CY062861	(A/Athens/INS159/2009)	CY061181	(A/Texas/JMS412/2009)
CY053009	(A/Houston/5H/2009)	CY062869	(A/Athens/INS160/2009)	CY061189	(A/Texas/JMS413/2009)
CY053017	(A/Houston/6OS/2009)	CY062877	(A/Athens/INS161/2009)	CY061197	(A/Texas/JMS414/2009)
CY053025	(A/Houston/6H/2009)	CY062885	(A/Athens/INS162/2009)	CY061205	(A/Texas/JMS415/2009)
CY053033	(A/Houston/7OS/2009)	CY062893	(A/Athens/INS163/2009)	CY061580	(A/Texas/JMS401/2009)
CY053041	(A/Houston/7H/2009)	CY062901	(A/Athens/INS164/2009)	CY061588	(A/Texas/JMS403/2009)
CY053049	(A/Houston/9H/2009)	CY062909	(A/Athens/INS165/2009)	CY061807	(A/swine/Hong Kong/189/2010)
CY053057	(A/Houston/10OS/2009)	CY062917	(A/Athens/INS166/2009)	CY062068	(A/New York/1680/2010)
CY053065	(A/Houston/10H/2009)	CY062925	(A/Athens/INS167/2009)	CY062076	(A/New York/1796/2010)
CY053073	(A/Houston/13OS/2009)	CY062933	(A/Berlin/INS171/2009)	CY062084	(A/New York/1998/2010)
CY053081	(A/Houston/14OS/2009)	CY062941	(A/Terrassa/INS172/2009)	CY062092	(A/New York/1999/2010)
CY053089	(A/Houston/14H/2009)	CY062949	(A/Terrassa/INS173/2009)	CY062100	(A/New York/2175/2010)
CY053097	(A/Houston/15OS/2009)	CY062957	(A/Terrassa/INS174/2009)	CY062108	(A/New York/2372/2010)
CY053105	(A/Houston/15H/2009)	CY062965	(A/Terrassa/INS175/2009)	CY062116	(A/New York/2598/2010)
CY053113	(A/Houston/16OS/2009)	CY062973	(A/Odense/INS177/2009)	CY062124	(A/New York/2648/2010)
CY053121	(A/Houston/17OS/2009)	CY062997	(A/Tallinn/INS181/2009)	CY062132	(A/New York/2876/2010)
CY053129	(A/Houston/20OS/2009)	CY063021	(A/Madrid/INS184/2009)	CY062140	(A/New York/2960/2010)
CY053137	(A/Houston/20H/2009)	CY063029	(A/Madrid/INS185/2009)	CY062148	(A/New York/2963/2010)
CY053144	(A/Houston/22OS/2009)	CY063037	(A/Madrid/INS186/2009)	CY062156	(A/New York/2971/2010)
CY053152	(A/Houston/22H/2009)	CY063045	(A/Bochum/INS187/2009)	CY062164	(A/New York/3230/2010)
CY053160	(A/Houston/23H/2009)	CY063053	(A/Tessenderlo/INS191/2009)	CY062172	(A/New York/3236/2010)
CY053168	(A/Houston/24OS/2009)	CY063061	(A/Tessenderlo/INS192/2009)	CY062180	(A/New York/3250/2010)
CY053176	(A/Brownsville/26OS/2009)	CY063069	(A/California/VRDL87/2009)	CY062188	(A/New York/3251/2010)
CY053184	(A/Brownsville/27OS/2009)	CY063077	(A/California/VRDL88/2009)	CY062270	(A/swine/Thailand/CU-RA114/2010)
CY053192	(A/Brownsville/29OS/2009)	CY063085	(A/California/VRDL89/2009)	CY062278	(A/swine/Thailand/CU-RA15/2010)
CY053200	(A/Brownsville/30OS/2009)	CY063093	(A/California/VRDL90/2009)	CY062318	(A/swine/Thailand/CU-RA75/2010)
CY053208	(A/Brownsville/31OS/2009)	CY063101	(A/California/VRDL91/2009)	CY062981	(A/Bonn/INS178/2010)
CY053216	(A/Brownsville/31H/2009)	CY063109	(A/California/VRDL92/2009)	CY062989	(A/Vienna/INS179/2010)
CY053224	(A/Brownsville/34OS/2009)	CY063117	(A/California/VRDL93/2009)	CY063005	(A/Tallinn/INS182/2010)

ACCESSION #	VIRUS NAME	ACCESSION #	VIRUS NAME	ACCESSION #	VIRUS NAME
CY053232	(A/Brownsville/34H/2009)	CY063125	(A/California/VRDL96/2009)	CY063013	(A/Tallinn/INS183/2010)
CY053240	(A/Brownsville/35OS/2009)	CY063133	(A/California/VRDL97/2009)	CY063181	(A/California/VRDL10/2010)
CY053248	(A/Brownsville/35H/2009)	CY063141	(A/California/VRDL98/2009)	CY063189	(A/California/VRDL11/2010)
CY053256	(A/Brownsville/36H/2009)	CY063149	(A/California/VRDL99/2009)	CY063197	(A/California/VRDL12/2010)
CY053263	(A/Brownsville/37H/2009)	CY063157	(A/California/VRDL100/2009)	CY063205	(A/California/VRDL13/2010)
CY053271	(A/Brownsville/39OS/2009)	CY063165	(A/California/VRDL101/2009)	CY063213	(A/California/VRDL14/2010)
CY053279	(A/Brownsville/39H/2009)	CY063173	(A/California/VRDL102/2009)	GU562460	(A/Karasuk/01/2010)
CY053287	(A/Brownsville/40OS/2009)	CY063221	(A/Wisconsin/629-D01351/2009)	GU576543	(A/Ancona/01/2010)
CY053295	(A/Brownsville/43OS/2009)	CY063229	(A/Wisconsin/629-D00675/2009)	GU953240	(A/swine/IL/3910/2010)
CY053303	(A/Brownsville/43H/2009)	CY063237	(A/Wisconsin/629-D02442/2009)	GU984406	(A/swine/IL/5265-1/2010)
CY053311	(A/Brownsville/37OS/2009)	CY063245	(A/Wisconsin/629-D00830/2009)	GU984409	(A/swine/IL/5265-2/2010)
CY053340	(A/Beijing/718/2009)	CY063253	(A/Wisconsin/629-D00692/2009)	GU984412	(A/swine/MN/8761/2010)
CY053344	(A/Beijing/719/2009)	CY063261	(A/Wisconsin/629-D00740/2009)	GU984415	(A/swine/MN/8762-1/2010)
CY053350	(A/Beijing/720/2009)	CY063269	(A/Wisconsin/629-D02082/2009)	GU984418	(A/swine/MN/8762-2/2010)
CY053418	(A/Russia/149/2009)	CY063277	(A/Wisconsin/629-D00888/2009)	HM124385	(A/Orenburg/IIV-13/2010)
CY053476	(A/Taiwan/143/2009)	CY063285	(A/Wisconsin/629-D02008/2009)	HM145748	(A/Haishu/SWL110/2010)
CY053484	(A/Taiwan/156/2009)	CY063293	(A/Wisconsin/629-D00292/2009)	HM219619	(A/swine/IL/12660/2010)
CY053492	(A/Taiwan/167/2009)	CY063301	(A/Wisconsin/629-D00859/2009)	HM219622	(A/swine/NC/13598/2010)
CY053500	(A/Taiwan/177/2009)	CY063309	(A/Wisconsin/629-D01572/2009)	HM219625	(A/swine/MO/15534/2010)
CY053508	(A/Taiwan/206/2009)	FJ966084	(A/California/04/2009)	HM219628	(A/swine/IN/17311/2010)
CY053621	(A/swine/Italy/290271/2009)	FJ966956	(A/California/05/2009)	HM219631	(A/swine/MO/17314/2010)
CY053629	(A/Russia/165/2009)	FJ966969	(A/Texas/05/2009)	HM219634	(A/swine/IL/17315-1/2010)
CY053647	(A/swine/4/Mexico/2009)	FJ966973	(A/California/09/2009)	HM219637	(A/swine/IL/17315-3/2010)
CY053683	(A/Russia/14/2009)	FJ966981	(A/Texas/04/2009)	HM219640	(A/swine/NC/19646/2010)
CY053691	(A/Russia/191/2009)	FJ969517	(A/California/04/2009)		
CY053730	(A/Russia/74/2009)	FJ969520	(A/Ohio/07/2009)		

Appendix C

Number of Host-blind (All Influenza Sequences Excluding 2009 H1N1) N-mers 0, 1, 2, OR 3+ Changes Away Present in each Pandemic Influenza 2009 H1N1 (Segment 4) Sequences Considered

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
AB505440.1	1271	393	37	0	1223	430	47	1	1177	466	53	5	1133	501	60	7	1089	534	68	10
AB514226.1	1263	405	33	0	1213	445	42	1	1166	483	47	5	1121	517	56	7	1076	549	68	8
AB514227.1	1282	386	33	0	1234	424	42	1	1188	462	46	5	1144	496	54	7	1100	528	65	8
AB530161.1	1247	419	35	0	1191	464	45	1	1138	507	51	5	1087	546	61	7	1037	581	75	8
AB530249.1	1272	396	33	0	1222	436	42	1	1174	476	46	5	1128	512	54	7	1082	546	65	8
AB530461.1	1255	413	33	0	1204	454	42	1	1154	496	46	5	1106	534	54	7	1058	570	65	8
AB530462.1	1231	437	33	0	1178	480	42	1	1128	521	47	5	1082	554	58	7	1036	585	72	8
AB530463.1	1231	437	33	0	1177	481	42	1	1126	523	47	5	1078	559	57	7	1030	593	70	8
AB530464.1	1240	428	33	0	1188	470	42	1	1139	510	47	5	1093	544	57	7	1047	576	70	8
AB530465.1	1231	437	33	0	1177	481	42	1	1126	523	47	5	1078	559	57	7	1030	593	70	8
AB530466.1	1225	436	40	0	1173	475	52	1	1124	512	60	5	1078	544	72	7	1032	575	86	8
AB530467.1	1231	437	33	0	1177	481	42	1	1126	523	47	5	1078	559	57	7	1030	593	70	8
AB530468.1	1240	428	33	0	1188	470	42	1	1139	510	47	5	1093	544	57	7	1047	576	70	8
AB530469.1	1251	417	33	0	1200	458	42	1	1152	497	47	5	1108	528	58	7	1064	557	72	8
AB530470.1	1231	435	35	0	1174	481	45	1	1121	523	52	5	1071	559	64	7	1022	591	80	8
AB530471.1	1240	428	33	0	1188	470	42	1	1139	510	47	5	1093	544	57	7	1047	576	70	8
AB530472.1	1247	419	35	0	1191	464	45	1	1139	505	52	5	1090	540	64	7	1042	571	80	8
AB530473.1	1247	419	35	0	1191	464	45	1	1138	507	51	5	1087	546	61	7	1037	581	75	8
AB530474.1	1231	437	33	0	1177	481	42	1	1126	523	47	5	1078	559	57	7	1030	593	70	8
AB530475.1	1240	428	33	0	1188	470	42	1	1139	510	47	5	1093	544	57	7	1047	576	70	8
AB530476.1	1256	412	33	0	1205	453	42	1	1156	494	46	5	1109	531	54	7	1062	566	65	8
AB530477.1	1231	437	33	0	1177	481	42	1	1126	523	47	5	1078	559	57	7	1030	593	70	8
AB530478.1	1231	437	33	0	1177	481	42	1	1126	523	47	5	1078	559	57	7	1030	593	70	8
AB530479.1	1231	437	33	0	1177	481	42	1	1126	523	47	5	1078	559	57	7	1030	593	70	8
AB530480.1	1231	437	33	0	1177	481	42	1	1126	523	47	5	1078	559	57	7	1030	593	70	8
AB530481.1	1231	437	33	0	1177	481	42	1	1126	523	47	5	1078	559	57	7	1030	593	70	8
AB530482.1	1231	437	33	0	1177	481	42	1	1126	523	47	5	1078	559	57	7	1030	593	70	8
AB530483.1	1231	437	33	0	1177	481	42	1	1126	523	47	5	1078	559	57	7	1030	593	70	8
AB530484.1	1231	437	33	0	1177	481	42	1	1126	523	47	5	1078	559	57	7	1030	593	70	8
AB530485.1	1231	437	33	0	1177	481	42	1	1126	523	47	5	1078	559	57	7	1030	593	70	8
AB530486.1	1230	438	33	0	1175	483	42	1	1123	526	47	5	1074	563	57	7	1025	598	70	8
AB530487.1	1231	437	33	0	1177	481	42	1	1126	523	47	5	1078	559	57	7	1030	593	70	8
AB530488.1	1233	434	34	0	1181	475	44	1	1131	516	49	5	1082	554	58	7	1033	589	71	8
AB530489.1	1237	426	38	0	1186	464	50	1	1137	503	55	6	1090	538	64	9	1044	568	78	11

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
AB531444.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1066	562	65	8
AB535738.1	1231	437	33	0	1177	481	42	1	1126	523	47	5	1078	559	57	7	1030	593	70	8
AB535739.1	1231	437	33	0	1177	481	42	1	1126	523	47	5	1078	559	57	7	1030	593	70	8
AB535740.1	1231	437	33	0	1177	481	42	1	1126	523	47	5	1078	559	57	7	1030	593	70	8
AB535741.1	1235	430	36	0	1184	468	48	1	1135	507	53	6	1089	541	62	9	1044	570	76	11
AB535742.1	1230	438	33	0	1175	483	42	1	1123	526	47	5	1074	563	57	7	1025	598	70	8
AB535743.1	1251	414	36	0	1200	453	47	1	1151	493	51	6	1104	529	59	9	1058	560	72	11
AB535744.1	1233	434	34	0	1181	475	44	1	1131	516	49	5	1081	556	57	7	1031	593	69	8
AB535745.1	1231	435	35	0	1178	475	47	1	1128	513	55	5	1079	550	65	7	1030	585	78	8
AB535746.1	1265	400	36	0	1216	441	42	2	1169	480	43	9	1124	515	50	12	1078	549	60	13
AB535747.1	1240	428	33	0	1188	470	42	1	1139	510	47	5	1093	544	57	7	1047	576	70	8
AB535748.1	1252	416	33	0	1201	457	42	1	1152	498	46	5	1105	535	54	7	1057	571	65	8
AB536768.1	1243	425	33	0	1190	468	42	1	1139	511	46	5	1091	548	55	7	1042	584	67	8
AB536769.1	1219	444	38	0	1164	488	48	1	1112	530	54	5	1063	566	65	7	1015	598	80	8
AB536770.1	1254	409	38	0	1202	448	50	1	1153	489	50	9	1105	525	58	13	1058	556	71	16
AB538389.2	1269	437	36	0	1218	478	45	1	1168	521	47	6	1120	560	53	9	1071	598	62	11
AB538394.1	1257	449	36	0	1205	491	45	1	1155	533	48	6	1106	572	55	9	1056	610	65	11
AB539046.1	1256	409	36	0	1205	452	42	2	1156	493	43	9	1110	528	51	12	1063	562	62	13
AB539047.1	1240	428	33	0	1187	471	42	1	1137	512	47	5	1090	547	57	7	1043	580	70	8
AB539048.1	1251	414	36	0	1200	453	47	1	1151	493	51	6	1104	529	59	9	1058	560	72	11
AB540654.1	1258	410	33	0	1206	452	42	1	1156	494	46	5	1109	530	55	7	1062	564	67	8
AB551871.1	1235	430	36	0	1182	470	48	1	1131	511	53	6	1084	546	62	9	1038	576	76	11
AB551872.1	1248	417	36	0	1197	456	47	1	1148	496	51	6	1103	530	59	9	1059	559	72	11
AB551873.1	1257	411	33	0	1204	454	42	1	1154	496	46	5	1106	534	54	7	1058	570	65	8
AB551874.1	1201	459	41	0	1142	507	51	1	1086	553	57	5	1033	593	68	7	982	627	84	8
AB551875.1	1223	441	37	0	1166	483	51	1	1112	525	59	5	1060	564	68	9	1008	603	77	13
AB551876.1	1230	435	36	0	1179	471	50	1	1130	510	55	6	1084	543	64	10	1039	573	75	14
AB551877.1	1249	401	50	1	1198	436	64	3	1149	473	68	11	1102	507	75	17	1056	538	85	22
AB551878.1	1250	415	36	0	1198	456	45	2	1148	497	47	9	1102	530	56	13	1055	564	65	16
AB551879.1	1225	443	33	0	1167	491	42	1	1112	537	47	5	1060	577	57	7	1008	615	70	8
AB551880.1	1256	409	36	0	1205	452	42	2	1156	493	43	9	1110	528	51	12	1063	562	62	13
AB551881.1	1248	413	40	0	1197	452	51	1	1148	491	56	6	1102	526	63	10	1057	557	73	14
AB551882.1	1245	418	37	1	1192	459	47	3	1140	501	50	10	1091	538	57	15	1041	575	66	19
AB551883.1	1205	458	38	0	1153	496	51	1	1103	535	57	6	1057	567	68	9	1012	595	82	12
AB558535.1	1250	412	39	0	1198	452	50	1	1147	495	54	5	1098	531	65	7	1051	562	80	8
AB558536.1	1251	414	36	0	1200	453	47	1	1151	493	51	6	1105	528	59	9	1060	558	72	11
AB558537.1	1256	409	36	0	1205	452	42	2	1156	493	43	9	1110	528	51	12	1063	562	62	13
AB558538.1	1249	401	50	1	1198	436	64	3	1149	473	68	11	1102	507	75	17	1056	538	85	22
AB558539.1	1234	409	57	1	1183	441	74	3	1134	475	81	11	1087	507	90	17	1041	537	101	22
AB558540.1	1232	421	47	1	1181	454	63	3	1132	489	69	11	1087	519	78	17	1043	547	88	23
AB558541.1	1255	397	49	0	1202	436	62	1	1152	473	71	5	1104	507	83	7	1056	541	96	8
AB558542.1	1238	421	42	0	1188	458	54	1	1140	494	62	5	1094	526	74	7	1048	557	88	8
AB558543.1	1236	424	40	1	1185	460	53	3	1136	498	56	11	1091	530	63	17	1047	559	72	23
AB558544.1	1235	429	37	0	1180	473	47	1	1128	516	52	5	1080	552	62	7	1032	585	76	8

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
AB558545.1	1227	430	44	0	1177	462	61	1	1129	492	75	5	1084	520	90	7	1039	549	104	9
AB558546.1	1225	435	40	1	1174	471	53	3	1125	509	56	11	1079	542	63	17	1034	572	72	23
AB558547.1	1231	433	37	0	1181	468	51	1	1133	501	62	5	1088	531	75	7	1043	561	88	9
AB558548.1	1205	457	39	0	1150	498	52	1	1097	540	58	6	1049	575	68	9	1003	604	83	11
AB558549.1	1257	407	37	0	1205	445	50	1	1155	483	58	5	1108	518	68	7	1061	552	79	9
AB558550.1	1205	457	39	0	1150	498	52	1	1097	540	58	6	1049	575	68	9	1003	604	83	11
CY039527.2	1330	411	36	0	1280	450	46	1	1232	489	51	5	1186	524	60	7	1140	557	72	8
CY039893.1	1312	392	33	0	1264	430	42	1	1218	468	46	5	1174	502	54	7	1130	534	65	8
CY039901.1	1316	374	45	0	1268	410	56	1	1222	447	61	5	1178	481	69	7	1134	513	80	8
CY039986.1	1309	418	42	1	1256	461	48	5	1205	504	51	10	1156	543	57	13	1107	580	67	15
CY039999.1	1293	410	33	0	1241	452	42	1	1191	494	46	5	1143	532	54	7	1095	568	65	8
CY040007.1	1283	408	33	0	1231	450	42	1	1181	492	46	5	1133	530	54	7	1085	566	65	8
CY040015.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY040023.1	1292	408	33	0	1240	450	42	1	1190	492	46	5	1142	530	54	7	1094	566	65	8
CY040031.1	1315	383	38	0	1265	422	48	1	1218	460	53	5	1174	493	62	7	1130	524	74	8
CY040042.1	1277	421	34	0	1225	462	44	1	1175	503	49	5	1127	540	58	7	1079	575	70	8
CY040457.1	1271	411	36	0	1219	452	46	1	1169	493	51	5	1122	529	60	7	1075	563	72	8
CY040605.1	1285	408	33	0	1233	450	42	1	1183	492	46	5	1135	530	54	7	1087	566	65	8
CY040613.1	1277	405	33	0	1225	447	42	1	1175	489	46	5	1127	527	54	7	1079	563	65	8
CY040621.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY040629.1	1281	405	33	0	1229	447	42	1	1179	489	46	5	1131	527	54	7	1083	563	65	8
CY040637.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
CY040645.1	1281	408	33	0	1229	450	42	1	1179	492	46	5	1131	530	54	7	1083	566	65	8
CY040653.1	1280	411	33	0	1228	453	42	1	1178	495	46	5	1130	533	54	7	1082	569	65	8
CY040661.2	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY040669.2	1274	405	33	0	1222	447	42	1	1172	489	46	5	1124	527	54	7	1076	563	65	8
CY040677.2	1282	410	33	0	1230	452	42	1	1180	494	46	5	1132	532	54	7	1084	568	65	8
CY040685.1	1272	405	33	0	1220	447	42	1	1170	489	46	5	1122	527	54	7	1074	563	65	8
CY040693.2	1274	408	33	0	1222	450	42	1	1172	492	46	5	1124	530	54	7	1076	566	65	8
CY040701.1	1287	405	33	0	1235	447	42	1	1185	489	46	5	1137	527	54	7	1089	563	65	8
CY040709.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY040717.2	1269	405	33	0	1217	447	42	1	1167	489	46	5	1119	527	54	7	1071	563	65	8
CY040725.1	1279	405	33	0	1227	447	42	1	1177	489	46	5	1129	527	54	7	1081	563	65	8
CY040734.2	1274	405	33	0	1225	444	42	1	1178	483	46	5	1134	516	55	7	1089	548	67	8
CY040742.1	1269	405	33	0	1217	447	42	1	1167	489	46	5	1119	527	54	7	1071	563	65	8
CY040750.1	1278	405	33	0	1226	447	42	1	1176	489	46	5	1128	527	54	7	1080	563	65	8
CY040758.1	1291	408	33	0	1239	450	42	1	1189	492	46	5	1141	530	54	7	1093	566	65	8
CY040766.1	1281	411	33	0	1229	453	42	1	1179	495	46	5	1131	533	54	7	1083	569	65	8
CY040774.1	1277	413	39	0	1225	454	49	1	1175	496	53	5	1127	535	57	10	1079	572	64	14
CY040782.2	1271	405	33	0	1219	447	42	1	1169	489	46	5	1121	527	54	7	1073	563	65	8
CY040790.1	1285	408	33	0	1233	450	42	1	1183	492	46	5	1135	530	54	7	1087	566	65	8
CY040798.1	1291	408	33	0	1239	450	42	1	1189	492	46	5	1141	530	54	7	1093	566	65	8
CY040806.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY040814.1	1282	405	33	0	1230	447	42	1	1180	489	46	5	1132	527	54	7	1084	563	65	8

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY040822.1	1280	405	33	0	1228	447	42	1	1178	489	46	5	1130	527	54	7	1082	563	65	8
CY040830.1	1283	408	33	0	1231	450	42	1	1181	492	46	5	1133	530	54	7	1085	566	65	8
CY040838.1	1273	401	33	0	1222	442	42	1	1173	483	46	5	1126	520	54	7	1079	555	65	8
CY040846.2	1291	411	33	0	1239	453	42	1	1189	495	46	5	1141	533	54	7	1093	569	65	8
CY040854.1	1280	406	33	0	1228	448	42	1	1178	490	46	5	1130	528	54	7	1082	564	65	8
CY040862.2	1272	405	33	0	1220	447	42	1	1170	489	46	5	1122	527	54	7	1074	563	65	8
CY040880.1	1249	399	35	0	1201	435	46	1	1155	471	52	5	1111	503	62	7	1067	533	75	8
CY040888.1	1264	402	35	0	1216	438	46	1	1170	474	52	5	1126	506	62	7	1082	536	75	8
CY041050.1	1291	411	33	0	1239	453	42	1	1189	495	46	5	1141	533	54	7	1093	569	65	8
CY041058.1	1283	411	33	0	1231	453	42	1	1181	495	46	5	1133	533	54	7	1085	569	65	8
CY041066.1	1283	411	33	0	1231	453	42	1	1181	495	46	5	1133	533	54	7	1085	569	65	8
CY041074.1	1292	411	33	0	1240	453	42	1	1190	495	46	5	1142	533	54	7	1094	569	65	8
CY041082.1	1289	411	33	0	1237	453	42	1	1187	495	46	5	1139	533	54	7	1091	569	65	8
CY041090.1	1292	407	33	0	1240	449	42	1	1190	491	46	5	1142	529	54	7	1094	565	65	8
CY041098.1	1291	411	33	0	1239	453	42	1	1189	495	46	5	1141	533	54	7	1093	569	65	8
CY041106.1	1310	388	33	0	1262	426	42	1	1216	464	46	5	1172	498	54	7	1128	530	65	8
CY041114.1	1280	408	33	0	1228	450	42	1	1178	492	46	5	1130	530	54	7	1082	566	65	8
CY041122.1	1277	391	33	0	1227	431	42	1	1179	471	46	5	1132	509	53	7	1085	545	63	8
CY041130.1	1267	405	33	0	1215	447	42	1	1165	489	46	5	1117	527	54	7	1069	563	65	8
CY041138.1	1289	411	33	0	1237	453	42	1	1187	495	46	5	1139	533	54	7	1091	569	65	8
CY041146.1	1292	404	35	0	1244	441	45	1	1198	478	50	5	1154	511	59	7	1110	542	71	8
CY041154.1	1317	376	45	0	1269	412	56	1	1223	449	61	5	1179	483	69	7	1135	515	80	8
CY041162.1	1287	411	33	0	1235	453	42	1	1185	495	46	5	1137	533	54	7	1089	569	65	8
CY041170.1	1281	408	33	0	1229	450	42	1	1179	492	46	5	1131	530	54	7	1083	566	65	8
CY041178.1	1285	411	33	0	1233	453	42	1	1183	495	46	5	1135	533	54	7	1087	569	65	8
CY041186.1	1283	411	33	0	1231	453	42	1	1181	495	46	5	1133	533	54	7	1085	569	65	8
CY041194.1	1285	411	33	0	1233	453	42	1	1183	495	46	5	1135	533	54	7	1087	569	65	8
CY041202.1	1276	427	33	0	1223	470	42	1	1172	513	46	5	1123	552	54	7	1074	589	65	8
CY041482.1	1254	419	33	0	1201	462	42	1	1150	505	46	5	1101	544	54	7	1052	581	65	8
CY041490.1	1292	411	33	0	1240	453	42	1	1190	495	46	5	1142	533	54	7	1094	569	65	8
CY041498.1	1276	424	33	0	1223	467	42	1	1172	510	46	5	1123	549	54	7	1074	586	65	8
CY041506.1	1285	411	33	0	1233	453	42	1	1183	495	46	5	1135	533	54	7	1087	569	65	8
CY041514.1	1286	411	33	0	1234	453	42	1	1184	495	46	5	1136	533	54	7	1088	569	65	8
CY041522.1	1280	411	33	0	1228	453	42	1	1178	495	46	5	1130	533	54	7	1082	569	65	8
CY041530.1	1285	411	33	0	1233	453	42	1	1183	495	46	5	1135	533	54	7	1087	569	65	8
CY041541.1	1293	411	33	0	1241	453	42	1	1191	495	46	5	1143	533	54	7	1095	569	65	8
CY041549.1	1292	411	33	0	1240	453	42	1	1190	495	46	5	1142	533	54	7	1094	569	65	8
CY041557.1	1293	411	33	0	1241	453	42	1	1191	495	46	5	1143	533	54	7	1095	569	65	8
CY041565.1	1291	411	33	0	1239	453	42	1	1189	495	46	5	1141	533	54	7	1093	569	65	8
CY041573.1	1292	411	33	0	1240	453	42	1	1190	495	46	5	1142	533	54	7	1094	569	65	8
CY041581.1	1291	411	33	0	1239	453	42	1	1189	495	46	5	1141	533	54	7	1093	569	65	8
CY041589.1	1286	411	33	0	1234	453	42	1	1184	495	46	5	1136	533	54	7	1088	569	65	8
CY041597.1	1292	401	35	0	1244	438	45	1	1198	475	50	5	1154	508	59	7	1110	539	71	8
CY041605.1	1280	411	33	0	1228	453	42	1	1178	495	46	5	1130	533	54	7	1082	569	65	8

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY041613.1	1284	410	33	0	1232	452	42	1	1182	494	46	5	1134	532	54	7	1086	568	65	8
CY041621.1	1316	375	45	0	1268	411	56	1	1222	448	61	5	1178	482	69	7	1134	514	80	8
CY041629.1	1293	410	33	0	1241	452	42	1	1191	494	46	5	1143	532	54	7	1095	568	65	8
CY041637.1	1298	403	35	0	1249	441	45	1	1201	480	50	5	1155	515	59	7	1109	547	72	8
CY041645.1	1292	410	33	0	1240	452	42	1	1190	494	46	5	1142	532	54	7	1094	568	65	8
CY041726.1	1280	411	33	0	1228	453	42	1	1178	495	46	5	1130	533	54	7	1082	569	65	8
CY041734.1	1287	408	33	0	1235	450	42	1	1185	492	46	5	1137	530	54	7	1089	566	65	8
CY041742.1	1281	405	33	0	1229	447	42	1	1179	489	46	5	1131	527	54	7	1083	563	65	8
CY041750.1	1302	392	33	0	1254	430	42	1	1208	468	46	5	1164	502	54	7	1120	534	65	8
CY041758.1	1284	405	33	0	1232	447	42	1	1182	489	46	5	1134	527	54	7	1086	563	65	8
CY041766.1	1291	408	33	0	1239	450	42	1	1189	492	46	5	1141	530	54	7	1093	566	65	8
CY041774.1	1292	406	35	0	1237	450	45	1	1185	492	51	5	1135	530	61	7	1086	564	75	8
CY041782.1	1276	423	33	0	1225	464	42	1	1176	505	46	5	1129	542	54	7	1082	577	65	8
CY041790.1	1283	415	35	0	1231	453	48	1	1181	493	54	5	1133	530	63	7	1085	565	75	8
CY041798.1	1291	407	33	0	1239	449	42	1	1189	491	46	5	1141	529	54	7	1093	565	65	8
CY041806.1	1293	407	33	0	1241	449	42	1	1191	491	46	5	1143	529	54	7	1095	565	65	8
CY041814.1	1285	413	35	0	1235	451	46	1	1187	491	49	6	1141	527	56	9	1096	560	66	11
CY041822.1	1277	423	33	0	1225	465	42	1	1176	506	46	5	1129	543	54	7	1082	578	65	8
CY041830.1	1276	423	33	0	1225	464	42	1	1176	505	46	5	1129	542	54	7	1082	577	65	8
CY041960.2	1252	406	43	0	1203	443	54	1	1156	480	60	5	1111	513	70	7	1066	544	83	8
CY041968.1	1304	416	42	0	1255	453	53	1	1208	490	59	5	1163	523	69	7	1118	554	82	8
CY041973.1	1236	401	42	0	1188	437	53	1	1142	473	59	5	1098	505	69	7	1054	535	82	8
CY041976.1	1259	396	33	0	1209	436	42	1	1161	476	46	5	1115	512	54	7	1069	546	65	8
CY041983.1	1252	406	43	0	1203	443	54	1	1156	480	60	5	1111	513	70	7	1066	544	83	8
CY043078.1	1250	415	36	0	1198	456	46	1	1148	497	51	5	1100	534	60	7	1052	569	72	8
CY043086.1	1276	391	34	0	1228	428	44	1	1182	465	49	5	1136	500	58	7	1090	533	70	8
CY043094.1	1281	377	43	0	1233	413	54	1	1187	449	60	5	1143	481	70	7	1099	511	83	8
CY043102.1	1252	406	43	0	1203	443	54	1	1156	480	60	5	1111	513	70	7	1066	544	83	8
CY043110.1	1252	406	43	0	1203	443	54	1	1156	480	60	5	1111	513	70	7	1066	544	83	8
CY043118.1	1249	416	36	0	1194	459	47	1	1142	502	52	5	1093	539	62	7	1044	574	75	8
CY043123.1	1277	426	33	0	1225	468	42	1	1176	509	46	5	1129	546	54	7	1082	581	65	8
CY043131.1	1276	423	33	0	1225	464	42	1	1176	505	46	5	1129	542	54	7	1082	577	65	8
CY043139.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY043147.1	1292	408	33	0	1240	450	42	1	1190	492	46	5	1142	530	54	7	1094	566	65	8
CY043155.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY043163.1	1312	389	33	0	1264	427	42	1	1218	465	46	5	1174	499	54	7	1130	531	65	8
CY043171.1	1312	389	33	0	1264	426	43	1	1218	463	48	5	1174	496	57	7	1130	527	69	8
CY043179.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY043187.1	1277	424	33	0	1225	466	42	1	1176	507	46	5	1129	544	54	7	1082	579	65	8
CY043195.1	1276	418	33	0	1225	459	42	1	1176	500	46	5	1129	537	54	7	1082	572	65	8
CY043203.1	1277	424	33	0	1225	466	42	1	1176	507	46	5	1129	544	54	7	1082	579	65	8
CY043211.1	1292	407	33	0	1240	449	42	1	1190	491	46	5	1142	529	54	7	1094	565	65	8
CY043219.1	1300	386	33	0	1252	424	42	1	1206	462	46	5	1162	496	54	7	1118	528	65	8
CY043227.1	1292	407	33	0	1240	449	42	1	1190	491	46	5	1142	529	54	7	1094	565	65	8

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY043235.1	1293	409	31	0	1241	452	39	1	1191	495	42	5	1143	534	49	7	1095	571	59	8
CY043243.1	1292	408	33	0	1240	450	42	1	1190	492	46	5	1142	530	54	7	1094	566	65	8
CY043251.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY043259.1	1293	407	33	0	1241	449	42	1	1191	491	46	5	1143	529	54	7	1095	565	65	8
CY043267.1	1281	405	33	0	1229	447	42	1	1179	489	46	5	1131	527	54	7	1083	563	65	8
CY043275.1	1282	418	33	0	1229	461	42	1	1179	503	46	5	1132	538	56	7	1085	571	69	8
CY043283.1	1276	418	33	0	1225	459	42	1	1176	500	46	5	1129	537	54	7	1082	572	65	8
CY043291.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY043299.1	1277	424	33	0	1225	466	42	1	1176	507	46	5	1129	544	54	7	1082	579	65	8
CY043307.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY043334.1	1271	419	43	0	1219	459	54	1	1169	500	59	5	1121	537	68	7	1073	572	80	8
CY043342.1	1280	417	36	0	1228	458	46	1	1178	500	50	5	1130	538	58	7	1082	574	69	8
CY043350.1	1280	417	36	0	1228	458	46	1	1178	500	50	5	1130	538	58	7	1082	574	69	8
CY044048.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1142	531	54	7	1093	568	65	8
CY044056.1	1288	403	42	0	1235	445	52	1	1185	485	58	5	1137	521	68	7	1089	556	80	8
CY044064.1	1289	403	42	0	1236	445	52	1	1186	485	58	5	1138	521	68	7	1090	556	80	8
CY044072.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY044080.1	1291	408	33	0	1239	450	42	1	1189	492	46	5	1141	530	54	7	1093	566	65	8
CY044088.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY044096.1	1278	420	34	0	1226	461	44	1	1176	502	49	5	1128	539	58	7	1080	574	70	8
CY044104.1	1292	408	33	0	1240	450	42	1	1190	492	46	5	1142	530	54	7	1094	566	65	8
CY044112.1	1277	422	34	0	1226	461	45	1	1177	500	51	5	1129	537	60	7	1081	572	72	8
CY044120.1	1271	421	42	0	1219	462	52	1	1170	502	57	5	1123	538	66	7	1076	572	78	8
CY044128.1	1293	407	33	0	1241	449	42	1	1191	491	46	5	1143	529	54	7	1095	565	65	8
CY044136.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY044147.1	1259	406	36	0	1206	447	47	1	1155	488	53	5	1107	524	63	7	1060	557	76	8
CY044155.1	1268	398	35	0	1220	435	45	1	1174	472	50	5	1130	505	59	7	1086	536	71	8
CY044163.1	1264	402	35	0	1216	438	46	1	1170	474	52	5	1126	506	62	7	1082	536	75	8
CY044171.1	1237	425	39	0	1183	466	51	1	1132	508	55	6	1084	544	64	9	1037	576	77	11
CY044179.1	1232	421	46	5	1180	459	53	12	1130	499	52	18	1082	535	60	14	1034	570	69	15
CY044187.1	1249	410	42	0	1198	450	52	1	1149	490	57	5	1102	526	66	7	1056	558	79	8
CY044196.1	1250	418	33	0	1197	461	42	1	1146	504	46	5	1097	543	54	7	1049	578	66	8
CY044204.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
CY044212.1	1221	438	43	2	1167	479	50	8	1115	521	53	11	1065	560	59	13	1014	598	69	13
CY044220.1	1235	419	44	6	1182	461	49	12	1131	503	50	18	1083	540	57	16	1035	574	68	14
CY044228.1	1263	405	33	0	1211	446	43	1	1161	487	48	5	1113	524	57	7	1065	559	69	8
CY044235.1	1277	389	35	0	1228	427	45	1	1181	466	49	5	1137	501	56	7	1093	533	67	8
CY044243.1	1262	404	35	0	1211	444	45	1	1163	484	49	5	1118	520	56	7	1074	552	67	8
CY044251.1	1254	396	48	3	1204	431	58	8	1156	470	53	21	1111	505	59	16	1066	537	70	12
CY044256.1	1298	400	33	0	1247	441	42	1	1197	483	46	5	1149	521	54	7	1100	558	65	8
CY044861.1	1277	424	33	0	1224	467	42	1	1173	510	46	5	1124	549	54	7	1075	586	65	8
CY044869.1	1293	407	33	0	1241	449	42	1	1191	491	46	5	1143	529	54	7	1095	565	65	8
CY044877.1	1266	430	38	0	1215	469	49	1	1167	508	53	6	1121	543	61	9	1076	574	73	11
CY044885.1	1292	408	33	0	1240	450	42	1	1190	492	46	5	1142	530	54	7	1094	566	65	8

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY044893.1	1280	408	33	0	1228	450	42	1	1178	492	46	5	1130	530	54	7	1082	566	65	8
CY044901.1	1283	408	33	0	1231	450	42	1	1181	492	46	5	1133	530	54	7	1085	566	65	8
CY044909.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY044917.1	1293	407	33	0	1241	449	42	1	1191	491	46	5	1143	529	54	7	1095	565	65	8
CY044925.1	1276	424	33	0	1223	467	42	1	1172	510	46	5	1123	549	54	7	1074	586	65	8
CY044933.1	1288	409	36	0	1235	451	46	1	1184	493	51	5	1136	530	60	7	1088	565	72	8
CY044941.1	1291	408	33	0	1239	450	42	1	1189	492	46	5	1141	530	54	7	1093	566	65	8
CY044949.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY044957.1	1259	429	33	0	1205	473	42	1	1153	517	46	5	1104	556	54	7	1055	593	65	8
CY044965.1	1273	414	33	0	1222	455	42	1	1173	496	46	5	1126	533	54	7	1079	568	65	8
CY044973.1	1265	424	32	0	1214	464	42	1	1165	504	47	5	1117	542	55	7	1069	578	66	8
CY044981.1	1288	400	33	0	1237	441	42	1	1187	483	46	5	1139	521	54	7	1091	557	65	8
CY044989.1	1277	424	33	0	1225	466	42	1	1176	507	46	5	1129	544	54	7	1082	579	65	8
CY044997.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY045005.1	1289	403	42	0	1241	439	53	1	1195	475	59	5	1151	507	69	7	1107	537	82	8
CY045013.1	1289	403	42	0	1237	444	52	1	1187	485	57	5	1139	522	66	7	1091	557	78	8
CY045021.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY045029.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY045037.1	1280	405	35	0	1230	444	45	1	1182	483	50	5	1136	518	59	7	1090	551	71	8
CY045045.1	1293	407	33	0	1241	449	42	1	1191	491	46	5	1143	529	54	7	1095	565	65	8
CY045053.1	1258	426	37	0	1204	467	49	1	1152	509	55	5	1103	546	65	7	1056	578	79	8
CY045061.1	1282	421	35	0	1230	463	44	1	1181	503	49	5	1133	540	58	7	1084	576	70	8
CY045069.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY045077.1	1283	416	34	0	1231	457	44	1	1181	499	48	5	1133	537	56	7	1085	573	67	8
CY045085.1	1333	368	33	0	1288	403	42	1	1244	439	46	5	1202	471	54	7	1161	500	65	8
CY045093.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY045143.1	1269	429	36	0	1219	467	47	1	1171	505	53	5	1126	538	63	7	1081	569	76	8
CY045151.1	1280	408	33	0	1228	450	42	1	1178	492	46	5	1130	530	54	7	1082	566	65	8
CY045159.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY045167.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY045175.1	1282	415	37	0	1231	453	49	1	1182	492	55	5	1135	527	65	7	1088	560	78	8
CY045183.1	1282	413	37	0	1231	451	49	1	1182	490	55	5	1135	525	65	7	1088	558	78	8
CY045191.1	1262	421	38	0	1212	459	49	1	1164	498	53	6	1118	533	61	9	1073	564	73	11
CY045199.1	1269	416	36	0	1216	457	47	1	1166	498	52	5	1119	533	62	7	1072	566	75	8
CY045207.1	1280	408	33	0	1228	450	42	1	1178	492	46	5	1130	530	54	7	1082	566	65	8
CY045215.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY045226.2	1265	443	58	0	1211	481	67	7	1159	521	70	16	1110	554	83	15	1061	585	100	12
CY045234.1	1266	439	43	0	1212	480	54	2	1160	522	55	11	1109	562	59	17	1059	599	68	19
CY045242.1	1259	442	34	0	1206	484	44	1	1155	526	49	5	1106	564	58	7	1057	600	70	8
CY045482.1	1311	388	43	0	1263	424	54	1	1217	460	60	5	1173	492	70	7	1129	522	83	8
CY045490.1	1315	401	43	0	1266	438	54	1	1219	475	60	5	1174	508	70	7	1129	539	83	8
CY045495.1	1299	415	38	0	1243	459	49	1	1190	501	56	5	1139	539	67	7	1089	573	82	8
CY045503.1	1293	428	33	0	1241	470	42	1	1191	512	46	5	1143	550	54	7	1095	586	65	8
CY045511.2	1307	404	33	0	1257	444	42	1	1209	484	46	5	1164	519	54	7	1119	552	65	8

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY045938.1	1292	412	37	0	1244	448	48	1	1198	484	54	5	1154	516	64	7	1111	545	77	8
CY045946.2	1303	394	33	0	1255	432	42	1	1209	470	46	5	1165	504	54	7	1121	536	65	8
CY045954.1	1294	435	36	0	1240	477	46	2	1188	519	52	6	1137	560	59	9	1086	599	69	11
CY045962.2	1296	415	33	0	1247	454	42	1	1200	493	46	5	1155	528	54	7	1110	561	65	8
CY045970.2	1233	474	37	0	1180	515	48	1	1130	554	55	5	1082	589	66	7	1034	622	80	8
CY045978.2	1248	460	36	0	1195	502	46	1	1145	542	52	5	1097	578	62	7	1049	612	75	8
CY046061.1	1259	413	29	0	1208	453	39	1	1159	493	44	5	1111	532	50	8	1063	569	59	10
CY046062.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
CY046063.1	1272	396	33	0	1222	436	42	1	1174	476	46	5	1128	512	54	7	1082	546	65	8
CY046064.1	1266	402	33	0	1214	444	42	1	1164	486	46	5	1115	525	54	7	1067	561	65	8
CY046065.1	1250	418	33	0	1197	461	42	1	1146	504	46	5	1097	543	54	7	1048	580	65	8
CY046066.1	1255	413	33	0	1204	454	42	1	1154	496	46	5	1106	534	54	7	1058	570	65	8
CY046187.1	1301	399	33	0	1251	439	42	1	1203	479	46	5	1157	515	54	7	1111	549	65	8
CY046195.1	1286	407	38	1	1238	443	48	3	1192	480	52	8	1147	515	59	11	1102	548	69	13
CY046203.1	1300	399	33	0	1250	439	42	1	1202	479	46	5	1156	515	54	7	1110	549	65	8
CY046211.1	1301	398	33	0	1251	438	42	1	1203	478	46	5	1157	514	54	7	1111	548	65	8
CY046219.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY046227.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY046235.1	1301	399	33	0	1251	439	42	1	1203	479	46	5	1157	515	54	7	1111	549	65	8
CY046243.1	1282	412	39	1	1234	447	50	3	1188	483	55	8	1143	517	63	11	1099	548	74	13
CY046251.1	1278	396	33	0	1228	436	42	1	1180	476	46	5	1134	512	54	7	1088	546	65	8
CY046259.1	1258	410	33	0	1207	451	42	1	1158	492	46	5	1110	530	54	7	1062	566	65	8
CY046267.1	1289	398	33	0	1239	438	42	1	1191	478	46	5	1145	514	54	7	1099	548	65	8
CY046275.1	1277	405	37	0	1226	444	48	1	1177	484	53	5	1130	520	62	7	1083	554	74	8
CY046283.1	1282	386	33	0	1234	424	42	1	1188	462	46	5	1144	496	54	7	1100	528	65	8
CY046291.1	1302	398	33	0	1252	438	42	1	1204	478	46	5	1158	514	54	7	1112	548	65	8
CY046299.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY046307.1	1305	396	33	0	1255	436	42	1	1206	477	46	5	1159	514	54	7	1112	549	65	8
CY046315.1	1284	398	33	0	1236	436	42	1	1190	474	46	5	1145	509	54	7	1100	542	65	8
CY046323.1	1318	385	31	0	1269	425	39	1	1222	465	42	5	1178	500	49	7	1133	534	59	8
CY046331.1	1301	398	33	0	1251	438	42	1	1203	478	46	5	1157	514	54	7	1111	548	65	8
CY046339.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY046347.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY046355.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY046363.1	1288	407	38	1	1240	443	48	3	1194	480	52	8	1149	515	59	11	1104	548	69	13
CY046371.1	1311	387	33	0	1262	426	42	1	1215	465	46	5	1170	500	54	7	1125	533	65	8
CY046379.1	1301	398	33	0	1251	438	42	1	1203	478	46	5	1157	514	54	7	1111	548	65	8
CY046387.1	1304	396	33	0	1254	436	42	1	1206	476	46	5	1159	513	54	7	1113	547	65	8
CY046395.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY046403.1	1302	400	33	0	1252	440	42	1	1204	480	46	5	1158	516	54	7	1112	550	65	8
CY046411.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY046419.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY046427.1	1291	396	33	0	1241	436	42	1	1193	476	46	5	1147	512	54	7	1101	546	65	8
CY046435.1	1302	398	33	0	1252	438	42	1	1204	478	46	5	1158	514	54	7	1112	548	65	8

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY046443.1	1288	407	38	1	1240	443	48	3	1194	480	52	8	1149	515	59	11	1104	548	69	13
CY046451.1	1302	401	33	0	1252	441	42	1	1204	481	46	5	1158	517	54	7	1112	551	65	8
CY046459.1	1302	398	33	0	1252	438	42	1	1204	478	46	5	1158	514	54	7	1112	548	65	8
CY046467.1	1302	398	33	0	1252	438	42	1	1204	478	46	5	1158	514	54	7	1112	548	65	8
CY046475.1	1302	397	35	0	1249	439	45	1	1199	479	51	5	1151	515	61	7	1104	547	75	8
CY046483.1	1289	396	35	0	1236	438	45	1	1186	478	51	5	1138	514	61	7	1091	546	75	8
CY046491.1	1289	398	33	0	1239	438	42	1	1191	478	46	5	1145	514	54	7	1099	548	65	8
CY046499.1	1289	399	33	0	1239	439	42	1	1191	479	46	5	1145	515	54	7	1099	549	65	8
CY046507.1	1289	399	33	0	1239	439	42	1	1191	479	46	5	1145	515	54	7	1099	549	65	8
CY046515.1	1278	396	33	0	1228	436	42	1	1180	476	46	5	1134	512	54	7	1088	546	65	8
CY046523.1	1295	406	33	0	1244	447	42	1	1195	486	48	5	1149	517	61	7	1103	548	75	8
CY046531.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY046539.1	1298	401	35	0	1250	438	45	1	1204	475	50	5	1160	508	59	7	1116	539	71	8
CY046547.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY046555.1	1293	386	33	0	1244	425	42	1	1197	464	46	5	1152	499	54	7	1107	532	65	8
CY046563.1	1288	400	33	0	1237	441	42	1	1188	482	46	5	1141	519	54	7	1094	554	65	8
CY046571.1	1273	414	33	0	1222	455	42	1	1174	494	47	5	1128	529	56	7	1082	562	68	8
CY046579.1	1289	399	33	0	1239	439	42	1	1191	479	46	5	1145	515	54	7	1099	549	65	8
CY046587.1	1275	406	38	1	1227	442	48	3	1181	479	52	8	1136	514	59	11	1091	547	69	13
CY046595.1	1289	399	33	0	1239	439	42	1	1191	479	46	5	1145	515	54	7	1099	549	65	8
CY046603.1	1300	397	33	0	1250	437	42	1	1202	477	46	5	1156	513	54	7	1110	547	65	8
CY046611.1	1283	406	37	0	1232	445	48	1	1183	485	53	5	1136	521	62	7	1089	555	74	8
CY046619.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY046627.1	1295	399	33	0	1245	439	42	1	1197	479	46	5	1151	515	54	7	1105	549	65	8
CY046635.1	1296	399	33	0	1246	439	42	1	1198	479	46	5	1152	515	54	7	1106	549	65	8
CY046643.1	1290	406	37	0	1239	445	48	1	1190	485	53	5	1143	521	62	7	1096	555	74	8
CY046651.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY046659.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY046667.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY046675.1	1288	400	33	0	1237	441	42	1	1188	482	46	5	1141	519	54	7	1094	554	65	8
CY046683.1	1289	399	33	0	1239	439	42	1	1191	479	46	5	1145	515	54	7	1099	549	65	8
CY046691.1	1289	398	33	0	1239	438	42	1	1191	478	46	5	1145	514	54	7	1099	548	65	8
CY046699.1	1279	418	29	0	1228	458	39	1	1179	498	44	5	1131	537	50	8	1083	574	59	10
CY046707.1	1289	402	33	0	1239	442	42	1	1191	482	46	5	1145	518	54	7	1099	552	65	8
CY046715.1	1289	399	33	0	1239	439	42	1	1191	479	46	5	1145	515	54	7	1099	549	65	8
CY046723.1	1302	398	33	0	1252	438	42	1	1204	478	46	5	1158	514	54	7	1112	548	65	8
CY046731.1	1284	403	33	0	1234	443	42	1	1186	483	46	5	1140	519	54	7	1094	553	65	8
CY046739.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY046747.1	1268	409	44	0	1219	445	56	1	1172	482	61	6	1127	515	70	9	1083	544	83	11
CY046755.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY046763.1	1289	399	33	0	1239	439	42	1	1191	479	46	5	1146	514	54	7	1101	547	65	8
CY046771.1	1288	407	38	1	1240	443	48	3	1194	480	52	8	1149	515	59	11	1104	548	69	13
CY046779.1	1279	409	33	0	1228	450	42	1	1181	488	47	5	1135	523	56	7	1089	556	68	8
CY046787.1	1275	421	38	0	1224	461	48	1	1176	499	54	5	1130	533	64	7	1084	565	77	8

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY046795.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY046803.1	1291	407	37	0	1241	445	48	1	1193	484	53	5	1147	519	62	7	1101	552	74	8
CY046811.1	1316	385	33	0	1268	423	42	1	1222	461	46	5	1177	496	54	7	1132	529	65	8
CY046819.1	1268	398	35	0	1220	435	45	1	1174	472	50	5	1130	505	59	7	1086	536	71	8
CY046827.1	1297	391	33	0	1248	430	42	1	1200	470	46	5	1154	506	54	7	1108	540	65	8
CY046835.1	1297	391	33	0	1248	430	42	1	1200	470	46	5	1154	506	54	7	1108	540	65	8
CY046843.1	1301	400	33	0	1252	439	42	1	1206	477	46	5	1160	513	54	7	1115	546	65	8
CY046851.1	1283	414	37	0	1231	455	47	1	1183	494	52	5	1138	527	62	7	1093	558	75	8
CY046859.1	1300	398	33	0	1250	438	42	1	1202	478	46	5	1156	514	54	7	1110	548	65	8
CY046867.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY046875.1	1279	414	33	0	1228	455	42	1	1180	494	47	5	1134	529	56	7	1088	562	68	8
CY046883.1	1301	398	33	0	1251	438	42	1	1203	478	46	5	1157	514	54	7	1111	548	65	8
CY046891.1	1300	399	33	0	1250	439	42	1	1202	479	46	5	1156	515	54	7	1110	549	65	8
CY046899.1	1308	391	33	0	1259	430	42	1	1211	470	46	5	1165	506	54	7	1119	540	65	8
CY046907.1	1276	424	33	0	1222	468	42	1	1171	510	47	5	1123	547	56	7	1075	582	68	8
CY046915.1	1301	398	33	0	1251	438	42	1	1203	478	46	5	1157	514	54	7	1111	548	65	8
CY046946.1	1289	422	33	0	1236	465	42	1	1186	507	46	5	1138	544	55	7	1090	580	64	10
CY046949.1	1286	423	35	0	1232	466	45	1	1181	507	51	5	1132	544	61	7	1084	577	75	8
CY046952.1	1287	423	34	0	1235	464	44	1	1185	505	49	5	1137	542	58	7	1089	577	70	8
CY046955.1	1244	434	38	0	1194	470	51	1	1147	506	57	6	1102	538	67	9	1058	565	82	11
CY046963.1	1266	430	38	0	1215	469	49	1	1167	508	53	6	1121	543	61	9	1076	574	73	11
CY046971.1	1311	389	33	0	1263	426	43	1	1217	463	48	5	1173	496	57	7	1129	527	69	8
CY047310.1	1312	389	33	0	1264	427	42	1	1218	465	46	5	1174	499	54	7	1130	531	65	8
CY047318.1	1292	407	33	0	1240	449	42	1	1190	491	46	5	1142	529	54	7	1094	565	65	8
CY047326.1	1286	408	33	0	1234	450	42	1	1184	492	46	5	1136	530	54	7	1088	566	65	8
CY047334.1	1293	407	33	0	1241	449	42	1	1191	491	46	5	1143	529	54	7	1095	565	65	8
CY047342.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY047350.1	1289	405	33	0	1237	447	42	1	1187	489	46	5	1139	527	54	7	1091	563	65	8
CY047358.1	1264	421	33	0	1211	464	42	1	1160	507	46	5	1111	546	54	7	1062	583	65	8
CY047366.1	1289	403	42	0	1237	444	52	1	1187	485	57	5	1139	522	66	7	1091	557	78	8
CY047374.1	1276	423	33	0	1225	464	42	1	1176	505	46	5	1129	542	54	7	1082	577	65	8
CY047382.1	1265	422	34	0	1213	463	44	1	1163	504	49	5	1116	539	59	7	1069	572	72	8
CY047712.1	1248	420	33	0	1195	463	42	1	1144	506	46	5	1095	545	54	7	1045	583	65	8
CY047713.1	1252	419	30	0	1200	457	43	1	1150	497	49	5	1102	535	55	9	1054	571	64	12
CY047714.1	1252	414	35	0	1200	457	41	3	1150	499	44	8	1101	538	51	11	1052	575	61	13
CY047744.1	1275	421	48	0	1222	460	61	1	1172	499	67	6	1124	536	75	9	1076	571	85	12
CY048925.1	1276	419	39	0	1223	460	50	1	1172	501	56	5	1124	538	64	8	1076	573	75	10
CY048933.1	1273	425	36	0	1219	468	46	1	1167	511	51	5	1118	549	60	7	1070	583	73	8
CY049060.1	1293	417	33	0	1241	459	42	1	1191	501	46	5	1143	539	54	7	1095	575	65	8
CY049068.1	1293	417	33	0	1241	459	42	1	1191	501	46	5	1143	539	54	7	1095	575	65	8
CY049076.1	1284	412	46	1	1230	453	57	3	1179	492	63	9	1129	528	74	12	1079	562	88	14
CY049084.1	1293	417	33	0	1241	459	42	1	1191	501	46	5	1143	539	54	7	1095	575	65	8
CY049092.1	1290	406	46	0	1239	445	57	1	1190	484	63	5	1143	519	73	7	1095	555	83	9
CY049100.1	1289	396	56	0	1238	433	69	1	1189	470	77	5	1142	503	89	7	1094	537	101	9

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY049108.1	1293	417	33	0	1241	459	42	1	1191	501	46	5	1143	539	54	7	1095	575	65	8
CY049116.1	1302	408	33	0	1252	448	42	1	1204	488	46	5	1158	524	54	7	1112	558	65	8
CY049124.1	1246	409	34	0	1196	448	44	1	1148	487	49	5	1102	522	58	7	1057	554	70	8
CY049132.1	1250	417	34	0	1201	455	44	1	1154	493	49	5	1110	526	58	7	1066	557	70	8
CY049140.1	1240	423	33	0	1187	466	42	1	1136	509	46	5	1087	548	54	7	1039	583	66	8
CY049148.1	1277	431	33	0	1224	474	42	1	1173	517	46	5	1124	556	54	7	1075	593	65	8
CY049156.1	1277	429	33	0	1224	472	42	1	1173	515	46	5	1124	554	54	7	1075	591	65	8
CY049164.1	1293	413	33	0	1241	455	42	1	1191	497	46	5	1143	535	54	7	1095	571	65	8
CY049172.1	1293	413	33	0	1241	455	42	1	1191	497	46	5	1143	535	54	7	1095	571	65	8
CY049180.1	1293	413	33	0	1241	455	42	1	1191	497	46	5	1143	535	54	7	1095	571	65	8
CY049188.1	1293	413	33	0	1241	455	42	1	1191	497	46	5	1143	535	54	7	1095	571	65	8
CY049196.1	1293	414	33	0	1241	456	42	1	1191	498	46	5	1143	536	54	7	1095	572	65	8
CY049204.1	1293	415	33	0	1241	457	42	1	1191	499	46	5	1143	537	54	7	1095	573	65	8
CY049212.1	1289	407	44	0	1238	446	55	1	1189	485	61	5	1142	520	71	7	1095	553	84	8
CY049220.1	1293	417	33	0	1241	459	42	1	1191	501	46	5	1143	539	54	7	1095	575	65	8
CY049228.1	1293	415	33	0	1241	457	42	1	1191	499	46	5	1143	537	54	7	1095	573	65	8
CY049236.1	1293	414	33	0	1241	456	42	1	1191	498	46	5	1143	536	54	7	1095	572	65	8
CY049244.1	1286	417	37	0	1235	456	48	1	1186	495	54	5	1139	530	64	7	1092	563	77	8
CY049252.1	1287	421	33	0	1234	464	42	1	1182	508	46	5	1133	546	55	7	1084	582	67	8
CY049260.1	1293	413	33	0	1241	455	42	1	1191	497	46	5	1143	535	54	7	1095	571	65	8
CY049268.1	1277	431	33	0	1224	474	42	1	1173	517	46	5	1124	556	54	7	1076	591	66	8
CY049276.1	1289	414	40	0	1233	458	51	1	1180	500	58	5	1130	539	67	7	1080	576	79	8
CY049284.1	1277	431	33	0	1223	475	42	1	1172	518	46	5	1123	557	54	7	1074	594	65	8
CY049292.1	1293	415	33	0	1241	457	42	1	1191	499	46	5	1143	537	54	7	1095	573	65	8
CY049300.1	1293	415	33	0	1241	457	42	1	1191	499	46	5	1143	537	54	7	1095	573	65	8
CY049308.1	1293	414	33	0	1241	456	42	1	1191	498	46	5	1143	536	54	7	1095	572	65	8
CY049316.1	1299	410	33	0	1249	450	42	1	1201	490	46	5	1155	526	54	7	1109	560	65	8
CY049324.1	1277	433	33	0	1224	476	42	1	1173	519	46	5	1124	558	54	7	1075	595	65	8
CY049332.1	1277	433	33	0	1224	476	42	1	1173	519	46	5	1124	558	54	7	1075	595	65	8
CY049340.1	1293	417	33	0	1241	459	42	1	1191	501	46	5	1143	539	54	7	1095	575	65	8
CY049348.1	1289	398	56	0	1238	435	69	1	1189	472	77	5	1142	505	89	7	1094	539	101	9
CY049356.1	1293	415	33	0	1241	457	42	1	1191	499	46	5	1143	537	54	7	1095	573	65	8
CY049364.1	1356	368	19	0	1317	402	24	0	1280	433	30	0	1244	462	37	0	1209	488	46	0
CY049372.1	1302	408	33	0	1252	448	42	1	1204	488	46	5	1158	524	54	7	1112	558	65	8
CY049380.1	1303	403	35	0	1252	442	46	1	1206	477	53	5	1162	510	62	7	1118	541	74	8
CY049388.1	1275	433	34	0	1223	474	44	1	1173	515	49	5	1126	550	59	7	1079	583	72	8
CY049396.1	1293	417	33	0	1241	459	42	1	1191	501	46	5	1143	539	54	7	1095	575	65	8
CY049404.1	1293	417	33	0	1241	459	42	1	1191	501	46	5	1143	539	54	7	1095	575	65	8
CY049419.1	1296	411	32	0	1246	450	42	1	1198	489	47	5	1151	525	56	7	1104	559	68	8
CY049427.1	1293	412	33	0	1241	454	42	1	1191	496	46	5	1143	534	54	7	1095	570	65	8
CY049435.1	1293	413	33	0	1241	455	42	1	1191	497	46	5	1143	535	54	7	1095	571	65	8
CY049443.1	1293	413	33	0	1241	455	42	1	1191	497	46	5	1143	535	54	7	1095	571	65	8
CY049451.1	1293	414	33	0	1241	456	42	1	1191	498	46	5	1143	536	54	7	1095	572	65	8
CY049459.1	1296	404	40	0	1248	441	50	1	1202	478	55	5	1158	511	64	7	1113	544	75	8

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY049467.1	1306	402	33	0	1256	442	42	1	1208	482	46	5	1162	518	54	7	1115	554	64	8
CY049475.1	1277	430	33	0	1224	473	42	1	1173	516	46	5	1124	555	54	7	1075	592	65	8
CY049483.1	1304	403	33	0	1253	444	42	1	1204	485	46	5	1157	522	54	7	1110	557	65	8
CY049491.1	1302	408	33	0	1252	448	42	1	1204	488	46	5	1158	524	54	7	1112	558	65	8
CY049499.1	1309	399	33	0	1260	438	42	1	1214	476	46	5	1168	513	53	7	1122	548	63	8
CY049507.1	1302	408	33	0	1252	448	42	1	1204	488	46	5	1158	524	54	7	1112	558	65	8
CY049515.1	1290	404	46	0	1239	443	57	1	1190	482	63	5	1143	517	73	7	1095	553	83	9
CY049523.1	1293	417	33	0	1241	459	42	1	1191	501	46	5	1143	539	54	7	1095	575	65	8
CY049531.1	1293	413	33	0	1241	455	42	1	1191	497	46	5	1143	535	54	7	1095	571	65	8
CY049539.1	1306	403	31	0	1256	444	39	1	1208	485	42	5	1162	522	49	7	1115	558	59	8
CY049547.1	1293	414	33	0	1241	456	42	1	1191	498	46	5	1143	536	54	7	1095	572	65	8
CY049555.1	1284	423	33	0	1230	464	45	1	1178	507	50	5	1130	542	60	8	1082	577	70	11
CY049563.1	1306	401	33	0	1256	441	42	1	1208	481	46	5	1162	517	54	7	1115	553	64	8
CY049571.1	1281	429	33	0	1228	471	43	1	1178	512	48	5	1130	548	58	7	1082	582	71	8
CY049579.1	1293	413	34	0	1242	452	45	1	1193	490	52	5	1146	524	63	7	1099	559	74	8
CY049587.1	1293	413	33	0	1241	455	42	1	1191	497	46	5	1143	535	54	7	1095	571	65	8
CY049595.1	1287	416	37	0	1234	457	48	1	1182	499	54	5	1133	534	66	7	1084	569	78	9
CY049603.1	1316	392	33	0	1271	427	42	1	1228	463	45	5	1185	499	50	7	1141	534	57	9
CY049611.1	1279	371	33	0	1232	408	42	1	1187	445	46	5	1144	478	54	7	1101	509	65	8
CY049619.1	1326	333	31	0	1287	363	39	1	1249	395	41	5	1214	422	47	7	1178	448	56	8
CY049627.1	1379	329	33	0	1343	358	39	1	1312	384	40	5	1282	407	45	7	1258	422	53	8
CY049635.1	1311	396	33	0	1263	434	42	1	1217	472	46	5	1172	508	53	7	1127	542	62	9
CY049643.1	1328	381	31	0	1284	416	39	1	1240	453	42	5	1197	487	49	7	1155	518	59	8
CY049651.1	1315	392	31	0	1268	430	39	1	1224	467	42	5	1181	501	49	7	1138	532	60	8
CY049659.1	1293	414	34	0	1244	452	44	1	1199	488	49	5	1155	523	56	7	1111	556	66	8
CY049667.1	1285	412	44	0	1235	450	55	1	1187	488	61	5	1140	524	70	7	1092	562	78	9
CY049675.1	1325	383	31	0	1277	422	39	1	1231	461	42	5	1187	496	49	7	1142	530	59	8
CY049683.1	1304	403	33	0	1253	444	42	1	1204	485	46	5	1157	522	54	7	1111	556	65	8
CY049691.1	1282	411	45	1	1228	455	52	4	1178	495	56	10	1130	531	65	13	1082	565	77	15
CY049699.1	1290	415	35	0	1238	458	43	1	1188	501	46	5	1140	539	54	7	1092	575	65	8
CY049820.1	1270	388	43	0	1220	426	54	1	1172	464	60	5	1127	497	70	7	1082	528	83	8
CY049828.1	1246	396	55	1	1196	433	61	8	1148	470	63	16	1102	503	72	14	1056	534	85	11
CY049836.1	1236	408	48	6	1182	449	53	14	1130	490	56	20	1081	526	66	17	1033	559	79	15
CY049843.1	1262	380	55	1	1213	416	61	8	1166	452	63	16	1121	484	72	14	1076	514	85	11
CY049851.1	1210	405	57	23	1159	442	60	29	1110	479	62	27	1063	513	69	25	1017	545	80	20
CY049859.1	1234	416	47	1	1181	458	50	9	1130	500	50	17	1081	538	57	17	1032	574	68	11
CY049867.1	1265	393	43	0	1216	430	54	1	1169	467	60	5	1124	500	70	7	1079	531	83	8
CY049875.1	1262	380	55	1	1213	416	61	8	1166	452	63	16	1121	484	72	14	1076	514	85	11
CY049883.1	1219	402	56	18	1168	441	54	30	1119	480	53	30	1071	517	58	24	1024	551	68	20
CY049891.1	1264	404	33	0	1213	445	42	1	1164	486	46	5	1117	523	54	7	1070	558	65	8
CY049899.1	1242	413	42	7	1187	457	45	15	1134	501	49	17	1085	538	58	14	1035	574	70	12
CY049907.1	1233	409	55	1	1183	446	61	8	1135	483	63	16	1089	516	72	14	1043	547	85	11
CY049915.1	1235	410	52	10	1185	447	58	17	1137	484	63	18	1091	517	73	16	1045	548	86	14
CY049923.1	1234	416	47	1	1181	458	50	9	1130	500	50	17	1081	538	57	17	1032	574	68	11

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY049931.1	1244	408	45	1	1191	450	49	8	1140	492	49	16	1091	530	56	14	1042	566	67	11
CY049939.1	1233	409	55	1	1183	446	61	8	1135	483	63	16	1089	516	72	14	1043	547	85	11
CY049947.1	1204	402	80	12	1156	433	85	23	1110	463	89	25	1065	492	100	16	1020	519	115	13
CY049955.1	1209	407	70	12	1160	441	73	23	1113	475	74	25	1067	507	83	16	1021	537	96	13
CY049963.1	1205	406	70	17	1156	440	72	29	1109	474	74	29	1063	506	84	19	1017	536	97	17
CY049971.1	1252	406	43	0	1203	443	54	1	1156	480	60	5	1111	513	70	7	1066	544	83	8
CY049979.1	1232	407	53	3	1182	442	62	9	1134	478	67	11	1088	510	76	14	1042	540	89	14
CY049987.1	1230	410	57	1	1179	448	63	8	1130	486	65	16	1082	521	74	14	1034	554	87	11
CY049995.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
CY050003.1	1229	404	53	12	1177	444	53	23	1127	484	51	25	1078	522	57	16	1029	558	67	13
CY050011.1	1214	411	63	7	1162	448	69	15	1113	483	75	21	1065	518	83	22	1019	549	96	18
CY050019.1	1197	430	61	7	1145	469	65	15	1093	511	67	21	1043	548	75	22	993	583	88	18
CY050027.1	1210	408	68	12	1159	443	72	23	1111	476	75	25	1063	511	83	16	1016	543	95	13
CY050035.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
CY050043.1	1225	403	53	17	1173	443	52	29	1123	483	51	29	1074	521	58	19	1025	557	68	17
CY050051.1	1229	404	53	12	1177	444	53	23	1127	484	51	25	1078	522	57	16	1029	558	67	13
CY050059.1	1244	408	45	1	1191	450	49	8	1140	492	49	16	1091	530	56	14	1042	566	67	11
CY050067.1	1242	395	55	6	1192	432	60	14	1144	469	63	20	1098	502	73	17	1052	533	86	15
CY050075.1	1257	411	33	0	1205	453	42	1	1155	495	46	5	1108	531	55	7	1061	563	69	8
CY050083.1	1239	411	44	7	1185	454	46	16	1133	497	48	18	1084	535	56	13	1035	571	67	11
CY050142.1	1302	403	33	0	1252	443	42	1	1204	483	46	5	1158	519	54	7	1112	553	65	8
CY050150.1	1289	416	33	0	1238	457	42	1	1189	498	46	5	1142	535	54	7	1095	570	65	8
CY050158.1	1285	408	41	0	1234	447	52	1	1186	484	59	5	1139	519	69	7	1092	552	82	8
CY050166.1	1286	414	33	0	1235	455	42	1	1187	494	47	5	1141	529	56	7	1095	562	68	8
CY050174.1	1298	400	35	0	1250	437	45	1	1204	474	50	5	1160	507	59	7	1116	538	71	8
CY050182.1	1284	408	41	0	1233	447	52	1	1185	484	59	5	1138	519	69	7	1091	552	82	8
CY050190.1	1281	417	35	0	1229	459	44	1	1180	499	49	5	1132	536	58	7	1083	572	70	8
CY050198.1	1287	409	37	0	1237	447	48	1	1189	485	54	5	1143	519	64	7	1097	551	77	8
CY050206.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY050214.1	1286	419	33	0	1235	460	42	1	1186	501	46	5	1139	538	54	7	1092	573	65	8
CY050222.1	1312	389	33	0	1264	427	42	1	1218	465	46	5	1174	499	54	7	1130	531	65	8
CY050230.1	1305	401	28	0	1255	438	40	1	1207	476	46	5	1161	512	53	8	1115	546	63	10
CY050238.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY050246.1	1292	409	33	0	1240	451	42	1	1189	493	47	5	1141	529	57	7	1094	562	70	8
CY050254.1	1296	404	33	0	1248	442	42	1	1201	481	46	5	1157	515	54	7	1111	549	65	8
CY050328.1	1305	395	33	0	1255	435	42	1	1206	476	46	5	1159	513	54	7	1112	548	65	8
CY050339.1	1251	417	33	0	1200	458	42	1	1151	499	46	5	1103	537	54	7	1055	574	64	8
CY050347.1	1257	411	33	0	1205	453	42	1	1155	495	46	5	1107	533	54	7	1059	569	65	8
CY050355.1	1251	417	33	0	1200	458	42	1	1151	499	46	5	1103	537	54	7	1055	574	64	8
CY050363.1	1271	397	33	0	1221	437	42	1	1173	477	46	5	1127	513	54	7	1082	546	65	8
CY050372.1	1279	415	38	1	1230	452	48	3	1184	489	52	8	1139	524	59	11	1094	557	69	13
CY050380.1	1290	402	33	0	1240	442	42	1	1192	482	46	5	1146	518	54	7	1100	552	65	8
CY050388.1	1302	398	33	0	1252	438	42	1	1204	478	46	5	1158	514	54	7	1112	548	65	8
CY050396.1	1302	398	33	0	1252	438	42	1	1204	478	46	5	1158	514	54	7	1112	548	65	8

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY050404.1	1302	398	33	0	1252	438	42	1	1204	478	46	5	1158	514	54	7	1112	548	65	8
CY050412.1	1297	396	33	0	1247	436	42	1	1199	476	46	5	1153	512	54	7	1107	546	65	8
CY050420.1	1277	416	40	0	1227	454	51	1	1179	493	55	6	1134	526	64	9	1089	557	76	11
CY050428.1	1302	398	33	0	1252	438	42	1	1204	478	46	5	1158	514	54	7	1112	548	65	8
CY050436.1	1302	398	33	0	1252	438	42	1	1204	478	46	5	1158	514	54	7	1112	548	65	8
CY050444.1	1302	398	33	0	1252	438	42	1	1204	478	46	5	1158	514	54	7	1112	548	65	8
CY050844.1	1249	417	35	0	1197	458	45	1	1147	500	49	5	1099	538	56	8	1051	574	66	10
CY050845.1	1249	405	47	0	1197	445	58	1	1147	486	63	5	1100	522	71	8	1053	556	82	10
CY050846.1	1251	414	36	0	1200	453	47	1	1151	493	51	6	1105	528	59	9	1060	558	72	11
CY050847.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY050855.1	1314	389	30	0	1265	426	41	1	1218	464	46	5	1174	498	54	7	1130	530	65	8
CY050863.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY050871.1	1292	407	34	0	1244	443	45	1	1198	479	51	5	1154	511	61	7	1110	541	74	8
CY050879.1	1311	382	46	0	1263	417	58	1	1217	454	63	5	1173	487	72	7	1129	518	84	8
CY050887.1	1316	375	42	0	1268	411	53	1	1221	449	58	5	1176	483	67	7	1130	516	79	8
CY050895.1	1302	398	33	0	1252	438	42	1	1204	478	46	5	1158	514	54	7	1112	548	65	8
CY050903.1	1302	400	31	0	1252	441	39	1	1204	482	42	5	1158	519	49	7	1112	554	59	8
CY050911.1	1287	409	37	0	1236	448	48	1	1187	488	53	5	1141	523	62	7	1095	556	74	8
CY050919.1	1263	421	33	0	1209	465	42	1	1158	507	47	5	1110	544	56	7	1062	579	68	8
CY050927.1	1302	398	33	0	1252	438	42	1	1204	478	46	5	1158	514	54	7	1112	548	65	8
CY050935.1	1293	400	40	0	1243	439	50	1	1195	478	55	5	1149	513	64	7	1103	546	76	8
CY050943.1	1302	398	33	0	1252	438	42	1	1204	478	46	5	1158	514	54	7	1112	548	65	8
CY050951.1	1282	414	37	0	1233	453	44	3	1186	491	48	8	1142	524	56	11	1098	554	68	13
CY050959.1	1286	417	33	0	1234	459	42	1	1184	501	46	5	1136	539	54	7	1088	575	65	8
CY050967.1	1289	414	33	0	1238	455	42	1	1189	496	46	5	1142	533	54	7	1095	568	65	8
CY050975.1	1286	415	33	0	1235	456	42	1	1186	497	46	5	1139	534	54	7	1092	569	65	8
CY050983.1	1302	399	33	0	1252	439	42	1	1203	480	46	5	1155	518	54	7	1107	554	65	8
CY050991.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY050999.1	1263	433	38	0	1212	471	50	1	1165	506	58	5	1121	535	71	7	1076	564	86	8
CY051007.1	1291	401	40	2	1243	438	49	4	1197	475	53	9	1153	509	59	13	1109	541	68	16
CY051015.1	1303	398	33	0	1253	438	42	1	1205	478	46	5	1158	515	54	7	1109	552	65	8
CY051023.1	1287	414	33	0	1237	454	42	1	1189	493	47	5	1143	528	56	7	1098	560	68	8
CY051031.1	1286	415	33	0	1235	456	42	1	1187	495	47	5	1141	530	56	7	1095	563	68	8
CY051039.1	1288	407	38	1	1240	443	48	3	1194	480	52	8	1149	515	59	11	1104	548	69	13
CY051047.1	1279	403	33	0	1228	444	42	1	1179	485	46	5	1132	522	54	7	1085	557	65	8
CY051055.1	1270	429	33	0	1218	471	42	1	1169	511	47	5	1122	547	56	7	1075	581	68	8
CY051063.1	1310	391	33	0	1261	430	42	1	1213	470	46	5	1167	506	54	7	1121	540	65	8
CY051071.1	1290	405	37	0	1239	444	48	1	1190	484	53	5	1143	520	62	7	1096	554	74	8
CY051079.1	1310	391	33	0	1261	430	42	1	1213	470	46	5	1167	506	54	7	1121	540	65	8
CY051087.1	1275	413	37	0	1227	449	48	1	1181	485	54	5	1138	515	65	7	1095	544	77	9
CY051095.1	1293	399	33	0	1243	439	42	1	1195	479	46	5	1149	515	54	7	1103	549	65	8
CY051103.1	1272	404	37	0	1221	443	48	1	1172	483	53	5	1125	519	62	7	1078	553	74	8
CY051111.1	1275	412	37	0	1226	451	44	3	1179	489	48	8	1135	522	56	11	1091	552	68	13
CY051119.1	1280	401	40	0	1230	440	50	1	1182	479	55	5	1136	514	64	7	1090	547	76	8

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY051127.1	1279	411	31	0	1228	453	39	1	1179	495	42	5	1132	533	49	7	1085	569	59	8
CY051135.1	1289	399	33	0	1239	439	42	1	1191	479	46	5	1145	515	54	7	1099	549	65	8
CY051143.1	1289	399	33	0	1239	439	42	1	1191	479	46	5	1145	515	54	7	1099	549	65	8
CY051151.1	1289	416	29	0	1238	456	39	1	1189	496	44	5	1141	535	50	8	1093	572	59	10
CY051159.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY051167.1	1295	406	33	0	1244	447	42	1	1195	488	46	5	1147	526	54	7	1097	564	65	8
CY051175.1	1284	409	41	0	1233	449	50	2	1184	488	55	7	1137	524	63	10	1091	556	76	11
CY051183.1	1291	408	35	0	1242	446	45	1	1195	482	52	5	1151	510	66	7	1107	538	81	8
CY051191.1	1290	408	36	0	1240	447	46	1	1192	486	51	5	1146	521	60	7	1100	554	72	8
CY051199.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY051207.1	1300	403	31	0	1249	445	39	1	1201	485	43	5	1155	521	51	7	1109	555	62	8
CY051215.1	1289	399	33	0	1239	439	42	1	1191	479	46	5	1145	515	54	7	1099	549	65	8
CY051223.1	1271	413	37	0	1223	449	48	1	1177	485	54	5	1134	515	65	7	1091	544	77	9
CY051231.1	1272	405	44	0	1222	442	56	1	1174	481	59	7	1128	516	66	11	1082	549	76	14
CY051239.1	1302	397	35	0	1252	436	45	1	1204	476	49	5	1158	513	56	7	1112	548	66	8
CY051247.1	1271	421	42	0	1223	457	51	3	1176	494	56	8	1133	524	66	11	1090	551	80	13
CY051255.1	1310	390	33	0	1261	429	42	1	1213	469	46	5	1167	505	54	7	1121	539	65	8
CY051263.1	1289	412	33	0	1238	453	42	1	1189	494	46	5	1142	531	54	7	1095	566	65	8
CY051271.1	1310	391	33	0	1261	430	42	1	1213	470	46	5	1167	506	54	7	1121	540	65	8
CY051279.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY051287.1	1310	391	33	0	1261	430	42	1	1213	470	46	5	1167	506	54	7	1121	540	65	8
CY051295.1	1295	406	33	0	1244	447	42	1	1195	486	48	5	1149	517	61	7	1103	548	75	8
CY051303.1	1302	398	33	0	1252	438	42	1	1204	478	46	5	1158	514	54	7	1112	548	65	8
CY051311.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY051319.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY051327.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY051335.1	1287	414	33	0	1237	454	42	1	1189	493	47	5	1143	528	56	7	1098	560	68	8
CY051343.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY051351.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY051359.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY051367.1	1310	391	33	0	1261	430	42	1	1213	470	46	5	1167	506	54	7	1121	540	65	8
CY051375.1	1300	391	33	0	1251	430	42	1	1203	470	46	5	1157	506	54	7	1111	540	65	8
CY051383.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY051391.1	1302	397	33	0	1252	437	42	1	1204	477	46	5	1158	513	54	7	1112	547	65	8
CY051399.1	1282	415	37	0	1233	454	44	3	1186	492	48	8	1142	525	56	11	1098	555	68	13
CY051407.1	1295	406	33	0	1244	447	42	1	1195	488	46	5	1147	526	54	7	1097	564	65	8
CY051415.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY051423.1	1299	393	42	0	1249	431	53	1	1201	469	59	5	1155	503	69	7	1109	535	82	8
CY051431.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY051439.1	1275	420	38	1	1224	459	48	3	1176	498	52	8	1132	531	60	11	1088	562	71	13
CY051447.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY051455.1	1294	399	41	0	1246	434	53	1	1200	469	60	5	1156	500	71	7	1111	532	82	9
CY051463.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY051471.1	1288	412	34	0	1237	452	44	1	1188	492	49	5	1141	528	58	7	1094	562	70	8

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY051479.1	1308	393	33	0	1258	433	42	1	1209	474	46	5	1161	512	54	7	1114	547	65	8
CY051487.1	1301	384	49	0	1251	418	62	3	1203	456	67	8	1157	491	74	12	1111	525	81	17
CY051495.1	1286	415	33	0	1235	456	42	1	1187	495	47	5	1141	530	56	7	1095	563	68	8
CY051503.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY051511.1	1297	404	33	0	1246	445	42	1	1197	486	46	5	1151	522	54	7	1105	556	65	8
CY051519.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY051527.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY051535.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY051543.1	1312	389	33	0	1264	427	42	1	1218	465	46	5	1174	499	54	7	1130	531	65	8
CY051551.1	1266	430	38	0	1215	469	49	1	1167	507	55	5	1120	544	62	8	1073	579	72	10
CY051559.1	1278	411	45	0	1225	450	58	1	1175	488	66	5	1128	522	77	7	1081	554	91	8
CY051567.1	1282	419	33	0	1227	464	42	1	1174	509	46	5	1124	548	55	7	1075	584	67	8
CY051575.1	1281	417	36	0	1229	457	47	1	1179	498	52	5	1131	535	61	7	1083	570	73	8
CY051583.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY051591.1	1301	397	35	1	1251	435	45	3	1203	474	47	10	1157	510	52	15	1111	545	59	19
CY051599.1	1278	420	36	0	1225	462	46	1	1175	503	51	5	1127	540	60	7	1079	575	72	8
CY051607.1	1269	428	37	0	1217	465	51	1	1167	504	58	5	1119	540	68	7	1071	574	81	8
CY051615.1	1277	414	43	0	1224	453	56	1	1173	493	63	5	1124	530	73	7	1076	565	84	9
CY051623.1	1285	415	34	0	1233	456	44	1	1183	497	49	5	1135	534	58	7	1087	569	70	8
CY051631.1	1295	400	39	0	1243	441	49	1	1194	480	55	5	1147	515	65	7	1100	548	78	8
CY051639.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY051647.1	1298	401	35	0	1250	438	45	1	1204	475	50	5	1160	508	59	7	1116	539	71	8
CY051655.1	1285	407	42	0	1233	446	54	1	1183	486	60	5	1135	522	70	7	1087	556	83	8
CY051663.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY051671.1	1277	422	35	0	1223	463	47	1	1172	502	55	5	1123	537	67	7	1076	566	84	8
CY051679.1	1280	418	36	0	1229	457	47	1	1180	496	53	5	1133	531	63	7	1086	564	76	8
CY051687.1	1290	397	47	0	1236	437	60	1	1186	474	69	5	1136	512	78	8	1087	546	91	10
CY051695.1	1279	420	35	0	1227	461	45	1	1177	503	49	5	1129	541	56	8	1081	577	66	10
CY051703.1	1289	414	31	0	1237	457	39	1	1187	500	42	5	1138	540	49	7	1088	579	59	8
CY051711.1	1289	414	31	0	1237	457	39	1	1187	500	42	5	1138	540	49	7	1088	579	59	8
CY051719.1	1289	414	31	0	1237	457	39	1	1187	500	42	5	1138	540	49	7	1088	579	59	8
CY051727.1	1283	413	38	0	1231	455	47	1	1181	497	51	5	1132	536	59	7	1082	574	70	8
CY051735.1	1283	413	38	0	1231	455	47	1	1181	497	51	5	1132	536	59	7	1082	574	70	8
CY051743.1	1283	411	38	0	1231	453	47	1	1181	495	51	5	1132	534	59	7	1082	572	70	8
CY051751.1	1249	457	26	2	1192	505	34	3	1138	550	42	4	1086	592	49	6	1036	629	61	4
CY051759.1	1283	418	33	0	1231	460	42	1	1181	502	46	5	1132	541	54	7	1084	577	65	8
CY051767.1	1268	432	34	0	1217	472	44	1	1168	512	49	5	1120	547	60	7	1073	579	74	8
CY051775.1	1283	418	33	0	1231	460	42	1	1181	502	46	5	1132	541	54	7	1084	577	65	8
CY051783.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY051791.1	1283	418	33	0	1231	460	42	1	1181	502	46	5	1132	541	54	7	1084	577	65	8
CY051799.1	1262	439	33	0	1206	485	42	1	1152	531	46	5	1101	572	54	7	1050	611	65	8
CY051807.1	1292	403	39	0	1242	441	50	1	1193	480	56	5	1145	517	64	8	1096	553	75	10
CY051815.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY051823.1	1301	396	37	0	1248	437	48	1	1197	478	54	5	1148	516	63	7	1099	552	75	8

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY051831.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY051839.1	1275	414	35	0	1227	450	46	1	1181	486	52	5	1137	518	62	7	1093	548	75	8
CY051847.1	1282	417	35	0	1234	453	46	1	1188	489	52	5	1144	521	62	7	1100	551	75	8
CY051855.1	1267	434	33	0	1217	473	43	1	1169	512	48	5	1124	545	58	7	1079	576	71	8
CY051863.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY051871.1	1277	424	33	0	1225	465	43	1	1175	506	48	5	1129	541	57	7	1083	574	69	8
CY051879.1	1312	389	33	0	1264	427	42	1	1218	465	46	5	1174	499	54	7	1130	531	65	8
CY051887.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY051895.1	1282	417	35	0	1229	459	45	1	1177	502	50	5	1129	538	60	7	1080	573	73	8
CY051903.1	1297	395	42	0	1249	431	53	1	1203	467	59	5	1160	497	70	7	1116	528	81	9
CY051911.1	1297	395	42	0	1249	431	53	1	1203	467	59	5	1160	497	70	7	1116	528	81	9
CY051919.1	1297	395	42	0	1249	431	53	1	1203	467	59	5	1160	497	70	7	1116	528	81	9
CY051984.1	1308	403	33	0	1259	442	42	1	1212	481	46	5	1166	517	54	7	1120	551	65	8
CY051985.1	1277	425	42	0	1224	465	54	1	1174	503	62	5	1125	539	73	7	1077	571	88	8
CY051986.1	1291	420	33	0	1240	461	42	1	1191	502	46	5	1143	540	54	7	1095	575	66	8
CY051987.1	1291	420	33	0	1240	461	42	1	1191	502	46	5	1143	540	54	7	1095	575	66	8
CY051988.1	1277	434	33	0	1225	476	42	1	1176	516	47	5	1129	552	56	7	1082	586	68	8
CY051989.1	1318	395	31	0	1268	436	39	1	1220	477	42	5	1174	514	49	7	1127	550	59	8
CY051990.1	1288	423	33	0	1235	466	42	1	1184	509	46	5	1136	547	54	7	1088	583	65	8
CY051991.1	1282	425	37	0	1231	465	47	1	1182	506	50	6	1134	544	57	9	1086	579	68	11
CY051992.1	1292	410	42	0	1239	452	52	1	1189	492	58	5	1140	529	68	7	1092	564	80	8
CY051993.1	1277	434	34	0	1224	477	43	1	1173	520	47	5	1124	559	55	7	1075	596	66	8
CY051994.1	1294	417	33	0	1241	460	42	1	1191	502	46	5	1143	540	54	7	1095	576	65	8
CY051998.1	1302	406	36	0	1252	445	46	1	1203	485	51	5	1156	522	59	7	1109	557	70	8
CY052003.1	1277	431	36	0	1224	473	46	1	1174	512	53	5	1126	549	61	8	1078	584	72	10
CY052004.1	1301	410	33	0	1250	451	42	1	1200	493	46	5	1152	531	54	7	1104	567	65	8
CY052005.1	1275	422	46	1	1220	466	54	4	1169	506	59	10	1120	542	69	13	1071	576	82	15
CY052006.1	1283	421	40	0	1231	458	54	1	1180	496	63	5	1131	532	74	7	1082	567	86	9
CY052007.1	1296	397	51	0	1248	430	65	1	1202	464	72	6	1156	498	80	10	1110	530	91	13
CY052008.1	1289	422	33	0	1237	465	41	1	1187	506	46	5	1138	543	56	7	1089	577	70	8
CY052009.1	1267	441	36	0	1213	484	46	1	1161	527	51	5	1112	566	58	8	1063	603	68	10
CY052010.1	1272	437	35	0	1220	477	46	1	1169	519	51	5	1120	557	60	7	1071	593	72	8
CY052011.1	1292	416	35	1	1240	456	45	3	1190	497	47	10	1142	535	52	15	1094	572	59	19
CY052012.1	1293	418	33	0	1241	460	42	1	1191	502	46	5	1143	540	54	7	1095	576	65	8
CY052013.1	1293	418	33	0	1241	460	42	1	1191	502	46	5	1143	540	54	7	1095	576	65	8
CY052014.1	1294	417	33	0	1242	459	42	1	1191	502	46	5	1142	541	54	7	1093	578	65	8
CY052015.1	1289	422	33	0	1239	462	42	1	1191	502	46	5	1143	540	54	7	1095	575	66	8
CY052019.1	1294	417	33	0	1243	458	42	1	1193	500	46	5	1144	539	54	7	1095	575	66	8
CY052045.1	1265	394	42	0	1215	434	50	2	1167	474	53	7	1121	510	60	10	1075	544	70	12
CY052046.1	1275	448	37	0	1222	487	50	1	1172	524	59	5	1124	559	70	7	1076	593	83	8
CY052048.1	1258	401	42	0	1205	444	50	2	1153	488	53	7	1103	528	60	10	1054	565	70	12
CY052049.1	1261	407	33	0	1210	448	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
CY052050.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
CY052098.1	1275	413	33	0	1221	457	42	1	1171	498	47	5	1123	534	57	7	1075	569	69	8

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY052106.1	1281	418	36	0	1231	454	49	1	1184	489	57	5	1137	525	65	8	1090	559	76	10
CY052114.1	1301	400	33	0	1252	438	43	1	1205	476	48	5	1160	510	57	7	1115	542	69	8
CY052122.1	1293	406	35	0	1243	445	45	1	1195	484	50	5	1149	519	59	7	1103	552	71	8
CY052130.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY052138.1	1293	410	33	0	1241	452	42	1	1191	494	46	5	1143	532	54	7	1095	568	65	8
CY052146.1	1286	405	33	0	1234	447	42	1	1184	489	46	5	1136	527	54	7	1088	563	65	8
CY052154.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY052162.1	1289	414	31	0	1237	457	39	1	1187	500	42	5	1138	540	49	7	1088	579	59	8
CY052170.1	1283	418	33	0	1231	460	42	1	1181	502	46	5	1132	541	54	7	1084	577	65	8
CY052178.1	1283	418	33	0	1231	460	42	1	1181	502	46	5	1132	541	54	7	1084	577	65	8
CY052186.1	1277	423	33	0	1224	466	42	1	1173	509	46	5	1124	548	54	7	1076	583	66	8
CY052194.1	1277	424	33	0	1224	467	42	1	1173	510	46	5	1124	549	54	7	1076	584	66	8
CY052202.1	1304	406	24	0	1253	448	32	1	1204	490	35	5	1157	529	41	7	1110	565	51	8
CY052210.1	1311	390	33	0	1263	428	42	1	1217	466	46	5	1173	500	54	7	1129	532	65	8
CY052218.1	1266	431	37	0	1213	472	48	1	1162	514	53	5	1113	552	62	7	1064	588	74	8
CY052226.1	1258	438	38	0	1206	478	49	1	1158	516	55	5	1113	548	66	7	1068	578	80	8
CY052234.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY052242.1	1277	424	33	0	1224	467	42	1	1173	510	46	5	1124	549	54	7	1076	584	66	8
CY052250.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY052258.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY052266.1	1280	421	33	0	1228	463	42	1	1178	505	46	5	1131	541	55	7	1083	576	67	8
CY052274.1	1277	424	33	0	1225	466	42	1	1176	507	46	5	1129	544	54	7	1082	579	65	8
CY052282.1	1301	397	36	0	1248	439	46	1	1197	481	51	5	1148	519	60	7	1099	555	72	8
CY052290.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY052298.1	1297	395	42	0	1249	431	53	1	1203	467	59	5	1160	497	70	7	1116	528	81	9
CY052306.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY052314.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY052322.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY052330.1	1277	424	33	0	1224	467	42	1	1173	510	46	5	1124	549	54	7	1076	584	66	8
CY052338.1	1293	406	35	0	1238	450	45	1	1186	492	51	5	1136	530	61	7	1087	564	75	8
CY052346.1	1245	419	37	0	1194	460	44	3	1145	501	47	8	1098	538	54	11	1051	573	64	13
CY052347.1	1267	401	33	0	1217	441	42	1	1169	481	46	5	1123	517	54	7	1077	551	65	8
CY052348.1	1256	412	33	0	1205	453	42	1	1156	494	46	5	1109	531	54	7	1062	566	65	8
CY052349.1	1256	412	33	0	1205	453	42	1	1156	494	46	5	1109	531	54	7	1062	566	65	8
CY052350.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
CY052366.1	1248	415	38	0	1194	456	50	1	1142	499	54	6	1094	537	61	9	1047	570	73	11
CY052367.1	1309	384	41	0	1260	422	51	1	1213	460	56	5	1168	494	65	7	1123	526	77	8
CY052375.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY052383.1	1277	424	33	0	1224	467	42	1	1173	510	46	5	1124	549	54	7	1076	584	66	8
CY052391.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY052399.1	1306	397	31	0	1256	438	39	1	1208	479	42	5	1162	516	49	7	1115	552	59	8
CY052407.1	1270	433	31	0	1219	475	39	1	1172	515	42	5	1125	553	49	7	1079	588	59	8
CY052415.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY052423.1	1275	423	35	0	1223	463	46	1	1173	503	52	5	1125	539	62	7	1077	573	75	8

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY052431.1	1281	422	31	0	1227	467	39	1	1176	511	42	5	1129	549	49	7	1082	585	59	8
CY052439.1	1290	403	41	0	1238	441	54	1	1189	478	62	5	1142	513	72	7	1095	546	85	8
CY052447.1	1273	424	36	1	1220	466	45	3	1170	508	48	8	1123	546	54	11	1076	582	63	13
CY052455.1	1277	424	33	0	1225	466	42	1	1176	507	46	5	1129	544	54	7	1082	579	65	8
CY052463.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY052471.1	1277	424	33	0	1225	466	42	1	1176	507	46	5	1129	544	54	7	1082	579	65	8
CY052479.1	1281	422	31	0	1227	467	39	1	1176	511	42	5	1129	549	49	7	1082	585	59	8
CY052487.1	1309	392	33	0	1259	432	42	1	1210	473	46	5	1163	510	54	7	1116	545	65	8
CY052495.1	1292	409	33	0	1239	452	42	1	1188	495	46	5	1139	534	54	7	1090	571	65	8
CY052503.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY052511.1	1297	396	41	0	1247	432	54	1	1199	470	60	5	1154	503	70	7	1109	534	83	8
CY052519.1	1288	402	44	0	1236	443	54	1	1186	484	59	5	1138	521	68	7	1090	556	80	8
CY052527.1	1266	428	39	1	1212	469	50	3	1160	511	53	10	1111	547	61	15	1063	581	71	19
CY052535.1	1281	422	31	0	1227	467	39	1	1176	511	42	5	1129	549	49	7	1082	585	59	8
CY052543.1	1282	417	35	0	1229	459	45	1	1177	502	50	5	1129	538	60	7	1080	573	73	8
CY052551.1	1289	403	42	0	1237	442	54	1	1187	482	60	5	1139	519	69	7	1091	554	81	8
CY052559.1	1285	413	36	0	1232	456	45	1	1180	500	49	5	1130	540	57	7	1080	578	68	8
CY052567.1	1281	422	31	0	1227	467	39	1	1176	511	42	5	1129	549	49	7	1082	585	59	8
CY052575.1	1284	410	40	0	1232	452	49	1	1183	492	54	5	1136	528	63	7	1089	561	76	8
CY052583.1	1285	416	33	0	1234	457	42	1	1186	497	46	5	1140	533	54	7	1094	567	65	8
CY052591.1	1263	431	40	0	1208	473	52	1	1156	513	60	5	1106	549	72	7	1057	584	85	8
CY052599.1	1290	410	36	0	1238	451	46	1	1188	492	51	5	1140	529	60	7	1092	564	72	8
CY052607.1	1236	461	37	0	1182	503	48	1	1130	545	54	5	1079	584	64	7	1028	620	78	8
CY052615.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY052623.1	1285	406	33	0	1232	449	42	1	1181	492	46	5	1132	531	54	7	1083	568	65	8
CY052631.1	1276	423	34	0	1225	463	44	1	1176	503	49	5	1128	540	58	7	1080	574	71	8
CY052639.1	1292	406	35	1	1240	446	45	3	1190	487	47	10	1142	525	52	15	1094	562	59	19
CY052647.1	1282	416	35	0	1229	458	45	1	1177	501	50	5	1129	537	60	7	1080	572	73	8
CY052655.1	1306	392	35	1	1256	430	45	3	1208	469	47	10	1160	508	51	15	1112	546	57	19
CY052663.1	1293	406	35	0	1238	450	45	1	1186	492	51	5	1136	530	61	7	1087	564	75	8
CY052671.1	1242	456	36	0	1186	499	48	1	1133	540	56	5	1082	577	68	7	1034	608	84	8
CY052679.1	1293	406	35	0	1238	450	45	1	1186	492	51	5	1136	530	61	7	1087	564	75	8
CY052687.1	1276	418	39	1	1223	458	50	3	1172	499	53	10	1123	537	59	15	1074	574	67	19
CY052695.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY052703.1	1280	419	33	0	1226	463	42	1	1174	507	46	5	1124	547	54	7	1075	584	65	8
CY052711.1	1280	421	33	0	1226	465	42	1	1174	509	46	5	1124	549	54	7	1075	586	65	8
CY052719.1	1282	418	34	0	1228	461	44	1	1176	503	50	5	1126	541	60	7	1075	578	73	8
CY052727.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY052735.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY052743.1	1273	422	39	0	1221	462	50	1	1171	502	56	5	1123	539	64	8	1074	575	75	10
CY052751.1	1277	422	33	0	1224	465	42	1	1173	508	46	5	1124	547	54	7	1075	584	65	8
CY052759.1	1277	424	33	0	1224	467	42	1	1173	510	46	5	1124	549	54	7	1075	586	65	8
CY052767.1	1246	453	35	0	1194	489	48	3	1145	523	57	9	1099	549	72	12	1053	576	90	8
CY052775.1	1284	412	38	0	1232	453	48	1	1182	495	52	5	1134	533	59	8	1086	569	69	10

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY052783.1	1277	422	33	0	1224	465	42	1	1173	508	46	5	1124	547	54	7	1075	584	65	8
CY052791.1	1275	422	37	0	1224	462	47	1	1174	504	50	6	1125	543	57	9	1076	580	67	11
CY052799.1	1277	424	33	0	1224	467	42	1	1173	510	46	5	1124	549	54	7	1075	586	65	8
CY052807.1	1286	407	41	0	1235	444	54	1	1187	482	60	5	1143	512	72	7	1100	539	87	8
CY052815.1	1258	438	38	0	1206	478	49	1	1158	516	55	5	1113	548	66	7	1068	578	80	8
CY052823.1	1279	414	41	0	1226	453	54	1	1176	492	61	5	1129	526	72	7	1082	558	86	8
CY052831.1	1290	408	36	0	1238	449	46	1	1188	490	51	5	1140	527	60	7	1092	562	72	8
CY052839.1	1261	440	33	0	1207	484	42	1	1156	526	47	5	1107	564	56	7	1057	601	68	8
CY052847.1	1284	404	46	0	1233	443	57	1	1184	483	62	5	1137	519	71	7	1091	554	80	9
CY052855.1	1272	429	33	0	1218	473	42	1	1166	517	46	5	1117	556	54	7	1068	593	65	8
CY052863.1	1285	417	32	0	1232	462	39	1	1182	506	41	5	1135	544	48	7	1088	580	58	8
CY052871.1	1292	407	33	0	1239	450	42	1	1188	493	46	5	1139	532	54	7	1090	569	65	8
CY052879.1	1307	394	33	0	1257	434	42	1	1209	474	46	5	1161	513	53	7	1113	550	63	8
CY052887.1	1293	404	36	0	1241	445	46	1	1191	486	51	5	1143	523	60	7	1095	558	72	8
CY052895.1	1292	409	33	0	1239	452	42	1	1188	495	46	5	1139	534	54	7	1090	571	65	8
CY052903.1	1245	454	35	0	1193	495	45	1	1144	534	51	5	1097	569	61	7	1049	603	74	8
CY052911.1	1283	414	37	0	1231	455	47	1	1181	497	50	6	1132	536	57	9	1083	573	67	11
CY052919.1	1312	389	33	0	1262	429	42	1	1212	471	46	5	1164	509	54	7	1117	544	65	8
CY052927.1	1285	416	33	0	1234	457	42	1	1186	497	46	5	1140	533	54	7	1094	567	65	8
CY052935.1	1258	432	42	2	1205	474	51	4	1158	511	56	9	1111	545	66	12	1064	577	79	14
CY052943.1	1279	412	41	0	1226	451	54	1	1176	490	61	5	1129	524	72	7	1082	556	86	8
CY052951.1	1276	424	34	0	1225	464	44	1	1176	504	49	5	1128	541	58	7	1080	575	71	8
CY052959.1	1303	395	36	0	1254	432	47	1	1209	466	54	5	1166	496	65	7	1123	524	79	8
CY052967.1	1297	395	42	0	1249	431	53	1	1203	467	59	5	1160	497	70	7	1116	528	81	9
CY052975.1	1297	395	42	0	1249	431	53	1	1203	467	59	5	1160	497	70	7	1116	528	81	9
CY052983.1	1297	395	42	0	1249	431	53	1	1203	467	59	5	1160	497	70	7	1116	528	81	9
CY052991.1	1297	395	42	0	1249	431	53	1	1203	467	59	5	1160	497	70	7	1116	528	81	9
CY052999.1	1297	395	42	0	1249	431	53	1	1203	467	59	5	1160	497	70	7	1116	528	81	9
CY053007.1	1297	395	42	0	1249	431	53	1	1203	467	59	5	1160	497	70	7	1116	528	81	9
CY053015.1	1297	395	42	0	1249	431	53	1	1203	467	59	5	1160	497	70	7	1116	528	81	9
CY053023.1	1297	395	42	0	1249	431	53	1	1203	467	59	5	1160	497	70	7	1116	528	81	9
CY053031.1	1297	395	42	0	1249	431	53	1	1203	467	59	5	1160	497	70	7	1116	528	81	9
CY053039.1	1302	390	42	0	1255	425	53	1	1210	460	59	5	1169	488	70	7	1127	517	81	9
CY053047.1	1290	392	42	0	1242	428	53	1	1196	464	59	5	1153	494	70	7	1109	525	81	9
CY053055.1	1290	392	42	0	1242	428	53	1	1196	464	59	5	1153	494	70	7	1109	525	81	9
CY053063.1	1297	395	42	0	1249	431	53	1	1203	467	59	5	1160	497	70	7	1116	528	81	9
CY053071.1	1312	389	33	0	1264	427	42	1	1217	465	47	5	1172	499	56	7	1127	531	68	8
CY053079.1	1307	394	33	0	1258	432	43	1	1211	470	48	5	1166	504	57	7	1121	536	69	8
CY053087.1	1307	394	33	0	1258	432	43	1	1211	470	48	5	1166	504	57	7	1121	536	69	8
CY053095.1	1312	389	33	0	1264	427	42	1	1218	465	46	5	1174	499	54	7	1130	531	65	8
CY053103.1	1312	389	33	0	1264	427	42	1	1218	465	46	5	1174	499	54	7	1130	531	65	8
CY053111.1	1281	412	41	0	1230	450	53	1	1181	489	59	5	1132	528	67	7	1083	565	78	8
CY053119.1	1281	412	41	0	1230	450	53	1	1181	489	59	5	1132	528	67	7	1083	565	78	8
CY053127.1	1299	402	33	0	1251	439	43	1	1205	476	48	5	1161	509	57	7	1117	540	69	8

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY053135.1	1299	402	33	0	1251	439	43	1	1205	476	48	5	1161	509	57	7	1117	540	69	8
CY053142.1	1312	389	33	0	1264	427	42	1	1218	465	46	5	1174	499	54	7	1130	531	65	8
CY053150.1	1312	389	33	0	1264	427	42	1	1218	465	46	5	1174	499	54	7	1130	531	65	8
CY053158.1	1277	424	33	0	1224	467	42	1	1173	510	46	5	1124	549	54	7	1076	584	66	8
CY053166.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY053174.1	1306	395	33	0	1256	435	42	1	1208	475	46	5	1160	513	54	7	1113	548	65	8
CY053182.1	1299	402	33	0	1251	439	43	1	1205	476	48	5	1161	509	57	7	1117	540	69	8
CY053190.1	1298	395	41	0	1248	434	51	1	1200	474	54	6	1152	512	61	9	1105	547	71	11
CY053198.1	1298	395	41	0	1248	434	51	1	1200	474	54	6	1152	512	61	9	1105	547	71	11
CY053206.1	1307	394	33	0	1258	432	43	1	1211	470	48	5	1166	504	57	7	1121	536	69	8
CY053214.1	1307	394	33	0	1258	432	43	1	1211	470	48	5	1166	504	57	7	1121	536	69	8
CY053222.1	1302	397	35	0	1252	436	45	1	1204	476	49	5	1158	513	56	7	1112	548	66	8
CY053230.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY053238.1	1293	408	33	0	1242	448	43	1	1193	488	48	5	1147	523	57	7	1101	556	69	8
CY053246.1	1309	392	33	0	1259	431	43	1	1211	470	48	5	1166	504	57	7	1121	536	69	8
CY053254.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY053261.1	1314	387	33	0	1265	426	42	1	1218	465	46	5	1173	500	54	7	1128	533	65	8
CY053269.1	1306	397	31	0	1256	438	39	1	1208	479	42	5	1160	518	49	7	1113	554	59	8
CY053277.1	1298	397	31	0	1248	438	39	1	1200	479	42	5	1152	518	49	7	1105	554	59	8
CY053285.1	1286	415	33	0	1236	454	43	1	1188	493	48	5	1141	529	57	7	1094	563	69	8
CY053293.1	1308	394	32	0	1258	436	39	1	1210	478	41	5	1163	516	48	7	1116	552	58	8
CY053301.1	1308	394	32	0	1258	436	39	1	1210	478	41	5	1163	516	48	7	1116	552	58	8
CY053309.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY053338.1	1212	445	67	0	1161	475	86	2	1111	511	95	7	1065	540	106	13	1019	566	122	17
CY053348.1	1200	454	67	1	1146	489	83	4	1093	527	93	8	1045	557	107	12	997	586	121	17
CY053353.1	1177	470	73	1	1122	507	88	4	1069	545	94	13	1020	579	100	22	972	608	111	29
CY053416.1	1281	439	43	0	1225	483	53	2	1169	529	59	6	1115	571	69	8	1062	610	82	9
CY053474.1	1307	415	35	1	1255	455	45	3	1205	496	47	10	1158	533	52	15	1111	569	59	19
CY053482.1	1313	426	38	1	1258	468	49	3	1205	511	52	10	1155	550	58	15	1105	588	66	19
CY053490.1	1300	425	38	1	1246	467	48	3	1194	510	50	10	1145	549	55	15	1096	587	62	19
CY053498.1	1300	422	35	1	1246	464	45	3	1194	507	47	10	1145	546	52	15	1096	584	59	19
CY053506.1	1300	422	35	1	1246	464	45	3	1194	507	47	10	1145	546	52	15	1096	584	59	19
CY053619.1	1260	399	41	1	1209	437	52	3	1159	477	55	10	1111	514	61	15	1063	550	69	19
CY053627.1	1319	441	54	15	1264	481	60	21	1210	521	66	22	1159	557	75	19	1107	593	87	18
CY053645.1	1260	405	36	0	1212	444	44	1	1168	481	47	5	1126	512	56	7	1082	543	68	8
CY053681.1	1319	431	61	15	1260	474	66	23	1203	517	71	25	1150	552	82	23	1097	586	95	22
CY053689.1	1305	441	52	7	1249	483	60	11	1195	524	67	13	1144	559	79	14	1093	593	94	14
CY053728.1	1319	429	57	12	1262	472	62	19	1206	515	68	21	1152	553	78	21	1097	592	89	20
CY053736.1	1303	418	31	1	1252	459	39	3	1204	495	51	3	1158	529	63	2	1111	563	75	3
CY053744.1	1274	435	37	1	1220	478	46	3	1169	516	59	3	1120	552	72	2	1070	588	85	3
CY053752.1	1320	425	47	1	1269	465	54	5	1220	504	59	10	1171	542	66	13	1121	580	74	17
CY053896.1	1282	405	33	0	1230	447	42	1	1180	489	46	5	1132	527	54	7	1084	563	65	8
CY053901.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
CY053904.2	1237	420	44	0	1187	455	58	1	1139	490	67	5	1092	525	75	9	1044	559	86	12

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY053907.1	1287	386	31	0	1236	428	39	1	1187	470	42	5	1140	508	49	7	1092	545	59	8
CY053910.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
CY053913.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
CY053919.1	1264	404	33	0	1213	445	42	1	1164	486	46	5	1117	523	54	7	1070	558	65	8
CY053922.1	1241	422	39	0	1188	463	50	1	1137	504	56	5	1089	541	64	8	1040	577	75	10
CY053928.1	1239	422	40	0	1187	462	51	1	1137	502	57	5	1089	538	67	7	1041	571	81	8
CY053936.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
CY053939.1	1278	408	33	0	1226	450	42	1	1176	492	46	5	1128	530	54	7	1080	566	65	8
CY053942.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
CY053945.1	1287	407	40	0	1235	448	50	1	1185	489	55	5	1137	526	64	7	1089	561	76	8
CY053947.1	1258	410	33	0	1204	454	42	1	1152	498	46	5	1102	538	54	7	1052	576	65	8
CY053950.1	1255	409	37	0	1204	446	50	1	1155	483	58	5	1108	518	68	7	1061	552	79	9
CY053953.1	1257	410	34	0	1205	451	44	1	1155	492	49	5	1106	530	58	7	1057	566	70	8
CY053956.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
CY053959.1	1249	401	51	0	1198	439	63	1	1149	477	70	5	1102	511	81	7	1055	543	95	8
CY053962.1	1251	415	35	0	1198	457	45	1	1147	499	50	5	1099	536	59	7	1051	571	71	8
CY053965.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
CY053968.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
CY053971.1	1275	393	33	0	1223	435	42	1	1173	477	46	5	1125	515	54	7	1077	551	65	8
CY054279.1	1265	405	31	0	1215	446	39	1	1167	487	42	5	1121	524	49	7	1075	559	59	8
CY054280.1	1268	402	31	0	1216	445	39	1	1166	488	42	5	1118	527	49	7	1069	565	59	8
CY054281.1	1232	412	33	0	1181	453	42	1	1132	494	46	5	1085	531	54	7	1038	566	65	8
CY054282.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
CY054283.1	1267	401	33	0	1216	442	42	1	1167	483	46	5	1120	520	54	7	1073	555	65	8
CY054296.1	1273	390	54	2	1224	426	56	13	1177	462	60	18	1132	495	68	18	1086	527	80	13
CY054546.1	1251	414	36	0	1200	453	47	1	1151	493	51	6	1105	528	59	9	1060	558	72	11
CY054548.1	1248	417	36	0	1198	453	49	1	1149	492	54	6	1103	526	63	9	1058	555	77	11
CY054590.1	1256	410	35	0	1203	451	46	1	1153	490	53	5	1105	527	62	7	1057	562	74	8
CY054591.1	1241	433	27	0	1188	476	36	1	1137	519	40	5	1087	560	47	7	1036	601	56	8
CY054592.1	1225	434	42	0	1175	472	53	1	1127	510	59	5	1080	545	69	7	1033	578	82	8
CY054593.1	1246	409	46	0	1195	440	65	1	1147	472	77	5	1100	503	91	7	1052	534	106	9
CY054594.1	1256	408	37	0	1200	451	49	1	1148	490	58	5	1098	527	69	7	1049	560	84	8
CY054595.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
CY054596.1	1236	431	34	0	1184	472	44	1	1134	513	49	5	1087	548	59	7	1039	582	72	8
CY054597.1	1233	434	34	0	1180	476	44	1	1129	518	49	5	1080	556	58	7	1031	592	70	8
CY054598.1	1225	441	35	0	1171	483	46	1	1117	527	52	5	1065	569	60	7	1015	606	72	8
CY054599.1	1245	421	35	0	1191	463	46	1	1140	503	53	5	1091	541	62	7	1042	577	74	8
CY054600.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
CY054601.1	1240	426	35	0	1186	468	46	1	1135	508	53	5	1086	546	62	7	1038	580	75	8
CY054602.1	1267	397	37	0	1214	436	50	1	1164	474	58	5	1116	509	69	7	1069	540	84	8
CY054603.1	1246	412	43	0	1195	450	55	1	1146	488	62	5	1099	522	73	7	1051	557	84	9
CY054604.1	1248	419	34	0	1196	461	43	1	1147	501	48	5	1100	537	57	7	1052	572	69	8
CY054605.1	1256	410	35	0	1203	451	46	1	1153	490	53	5	1105	527	62	7	1057	562	74	8
CY054606.1	1235	411	54	1	1185	443	70	3	1136	478	79	8	1089	509	92	11	1041	543	103	14

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY054607.1	1240	408	52	1	1189	445	64	3	1139	483	71	8	1091	516	83	11	1042	552	93	14
CY054608.1	1246	412	43	0	1195	450	55	1	1146	488	62	5	1099	522	73	7	1051	557	84	9
CY054609.1	1256	410	35	0	1203	451	46	1	1153	490	53	5	1105	527	62	7	1057	562	74	8
CY054610.1	1256	410	35	0	1203	451	46	1	1153	490	53	5	1104	528	62	7	1055	564	74	8
CY054611.1	1256	410	35	0	1203	451	46	1	1153	490	53	5	1105	527	62	7	1057	562	74	8
CY054612.1	1246	412	43	0	1195	450	55	1	1146	488	62	5	1099	522	73	7	1051	557	84	9
CY054613.1	1235	425	41	0	1182	467	51	1	1131	509	56	5	1082	546	66	7	1034	580	79	8
CY054614.1	1256	410	35	0	1203	451	46	1	1153	490	53	5	1104	528	62	7	1055	564	74	8
CY054615.1	1256	410	35	0	1203	451	46	1	1153	490	53	5	1104	528	62	7	1055	564	74	8
CY054616.1	1243	420	38	0	1190	460	50	1	1140	498	58	5	1091	535	68	7	1042	570	81	8
CY054617.1	1256	410	35	0	1203	451	46	1	1153	490	53	5	1105	527	62	7	1057	562	74	8
CY054618.1	1256	408	37	0	1200	451	49	1	1148	490	58	5	1098	527	69	7	1049	560	84	8
CY054619.1	1227	437	37	0	1174	476	50	1	1124	513	59	5	1076	548	70	7	1028	581	84	8
CY054620.1	1250	416	35	0	1197	457	46	1	1147	496	53	5	1100	531	63	7	1053	562	78	8
CY054621.1	1245	419	37	0	1190	461	49	1	1138	501	57	5	1089	535	70	7	1039	570	83	9
CY054622.1	1242	413	46	0	1188	451	61	1	1139	484	73	5	1092	518	84	7	1045	550	98	8
CY054623.1	1256	410	35	0	1203	451	46	1	1153	490	53	5	1105	527	62	7	1057	562	74	8
CY054624.1	1256	410	35	0	1203	451	46	1	1153	490	53	5	1104	528	62	7	1055	564	74	8
CY054625.1	1256	410	35	0	1203	451	46	1	1153	490	53	5	1105	527	62	7	1057	562	74	8
CY054626.1	1250	407	44	0	1197	446	57	1	1147	484	65	5	1099	520	75	7	1051	554	88	8
CY054630.1	1319	437	66	20	1261	478	71	27	1205	522	68	32	1152	560	76	25	1099	596	89	18
CY054638.1	1325	423	47	9	1272	465	52	13	1220	507	57	13	1170	545	67	11	1118	584	78	12
CY054646.1	1304	443	52	13	1250	484	57	19	1197	525	63	19	1146	561	74	16	1094	598	84	17
CY054654.1	1305	440	63	17	1249	483	67	22	1197	523	70	22	1146	558	80	18	1095	594	91	17
CY054662.1	1293	455	48	7	1239	498	53	11	1188	539	58	12	1138	576	67	13	1086	614	78	14
CY054670.1	1317	446	51	18	1262	488	54	24	1210	525	62	23	1160	561	74	15	1109	597	87	10
CY054678.1	1316	430	55	12	1260	471	64	16	1208	508	77	13	1158	543	91	8	1107	578	105	7
CY054683.1	1274	423	37	0	1222	463	48	1	1173	502	54	5	1126	537	64	7	1079	570	77	8
CY054691.1	1301	398	35	0	1253	435	45	1	1206	473	50	5	1161	507	59	7	1116	539	71	8
CY054707.1	1286	403	35	0	1231	447	45	1	1179	489	51	5	1129	527	61	7	1080	561	75	8
CY054715.1	1263	424	34	0	1212	464	44	1	1163	504	49	5	1115	541	58	7	1067	575	71	8
CY054723.1	1264	417	40	0	1213	455	52	1	1164	495	56	6	1116	532	64	9	1068	567	75	11
CY054731.1	1302	401	29	0	1249	446	36	1	1199	490	38	5	1151	529	45	7	1102	567	55	8
CY054739.1	1280	408	33	0	1228	450	42	1	1178	492	46	5	1130	530	54	7	1082	566	65	8
CY054747.1	1292	409	33	0	1240	450	43	1	1190	491	48	5	1142	528	57	7	1094	563	69	8
CY054755.1	1274	413	34	0	1222	454	44	1	1172	495	49	5	1124	532	58	7	1076	567	70	8
CY054763.1	1254	440	42	0	1202	479	53	2	1152	518	59	7	1105	553	66	12	1057	587	77	15
CY054771.1	1294	397	33	0	1243	438	42	1	1194	479	46	5	1147	516	54	7	1100	551	65	8
CY054779.1	1283	405	33	0	1231	447	42	1	1181	489	46	5	1133	527	54	7	1085	563	65	8
CY054787.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY054795.1	1296	405	33	0	1244	447	42	1	1194	489	46	5	1146	527	54	7	1098	563	65	8
CY054803.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY054811.1	1278	419	37	0	1226	460	47	1	1176	501	52	5	1128	539	59	8	1078	577	69	10
CY054819.1	1287	412	35	0	1236	452	45	1	1187	492	50	5	1140	528	59	7	1093	562	71	8

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY054827.1	1279	409	33	0	1233	444	43	1	1188	479	49	5	1145	510	59	7	1102	540	71	8
CY054835.1	1280	408	33	0	1226	452	42	1	1174	496	46	5	1127	532	55	7	1079	567	67	8
CY054843.1	1307	386	31	0	1258	426	39	1	1211	466	42	5	1166	502	49	7	1120	537	59	8
CY054851.1	1276	424	34	0	1225	464	44	1	1176	504	49	5	1128	541	58	7	1080	575	71	8
CY054859.1	1275	426	33	0	1223	468	42	1	1173	510	46	5	1124	549	54	7	1075	585	66	8
CY054867.1	1312	387	35	0	1259	429	45	1	1209	469	51	5	1161	505	61	7	1113	538	75	8
CY054875.1	1284	417	33	0	1231	460	42	1	1180	503	46	5	1131	541	55	7	1083	576	67	8
CY054883.1	1279	409	35	1	1225	451	45	3	1172	495	47	10	1123	533	53	15	1074	570	61	19
CY054891.1	1276	424	34	0	1225	464	44	1	1176	504	49	5	1128	541	58	7	1080	575	71	8
CY054899.1	1273	430	31	0	1222	467	42	3	1174	505	46	9	1127	541	52	12	1080	574	65	8
CY054907.1	1306	388	40	0	1257	426	50	1	1210	464	55	5	1167	495	65	7	1124	524	78	8
CY054915.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY054923.1	1292	409	33	0	1239	452	42	1	1188	495	46	5	1139	534	54	7	1090	571	65	8
CY054931.1	1276	424	34	0	1225	464	44	1	1176	504	49	5	1128	541	58	7	1080	575	71	8
CY054939.1	1269	431	34	0	1217	472	44	1	1167	513	49	5	1119	550	58	7	1071	584	71	8
CY054947.1	1283	418	33	0	1228	463	42	1	1176	507	46	5	1126	547	54	7	1077	584	65	8
CY054955.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY054963.1	1296	405	33	0	1244	447	42	1	1194	489	46	5	1146	527	54	7	1098	563	65	8
CY054971.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1142	531	54	7	1093	568	65	8
CY054979.1	1249	436	36	0	1198	475	47	1	1149	514	53	5	1101	550	63	7	1053	583	77	8
CY054987.1	1256	421	43	1	1203	461	54	3	1152	502	57	10	1104	538	64	15	1056	573	73	19
CY054995.1	1292	406	35	1	1240	446	45	3	1190	487	47	10	1142	525	52	15	1094	562	59	19
CY055003.1	1279	406	35	1	1227	446	45	3	1177	487	47	10	1129	525	52	15	1081	562	59	19
CY055011.1	1297	397	40	0	1242	440	51	1	1189	482	58	5	1140	519	68	7	1090	555	81	8
CY055019.1	1292	406	35	1	1240	446	45	3	1190	487	47	10	1142	525	52	15	1094	562	59	19
CY055027.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY055035.1	1278	421	35	0	1224	463	46	1	1172	506	51	5	1122	545	60	7	1072	582	72	8
CY055043.1	1292	406	35	1	1240	446	45	3	1190	487	47	10	1142	525	52	15	1094	562	59	19
CY055051.1	1274	427	33	0	1220	471	42	1	1168	515	46	5	1118	555	54	7	1068	593	65	8
CY055059.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY055067.1	1282	406	45	1	1228	450	52	4	1178	490	56	10	1130	526	65	13	1082	560	77	15
CY055075.1	1272	416	45	1	1215	463	52	4	1162	506	56	10	1111	545	65	13	1060	582	77	15
CY055169.1	1251	414	36	0	1200	453	47	1	1151	493	51	6	1105	528	59	9	1060	558	72	11
CY055196.1	1253	414	34	0	1202	454	44	1	1153	494	49	5	1105	532	57	7	1057	568	68	8
CY055198.1	1241	425	35	0	1190	465	45	1	1140	506	50	5	1092	543	59	7	1044	578	71	8
CY055200.1	1253	414	34	0	1202	454	44	1	1153	494	49	5	1107	529	58	7	1061	562	70	8
CY055202.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
CY055204.1	1245	422	34	0	1192	464	44	1	1141	506	49	5	1094	542	58	7	1045	578	70	8
CY055206.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
CY055208.1	1256	412	33	0	1202	456	42	1	1150	500	46	5	1100	540	54	7	1051	576	66	8
CY055210.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
CY055212.2	1228	434	39	0	1173	476	51	1	1121	517	58	5	1072	553	69	7	1023	588	82	8
CY055214.1	1268	402	31	0	1218	443	39	1	1170	484	42	5	1124	521	49	7	1078	556	60	7
CY055216.1	1274	394	33	0	1224	434	42	1	1176	474	46	5	1130	510	54	7	1084	544	65	8

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY055218.1	1270	398	33	0	1219	439	42	1	1171	479	46	5	1123	519	52	7	1076	555	62	8
CY055220.1	1223	431	47	0	1173	467	60	1	1124	505	67	5	1076	543	71	11	1028	580	76	17
CY055222.2	1236	421	44	0	1186	458	56	1	1138	496	62	5	1091	534	65	11	1044	570	71	16
CY055224.1	1244	424	33	0	1191	467	42	1	1140	510	46	5	1091	549	54	7	1042	586	65	8
CY055226.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
CY055228.1	1247	421	33	0	1195	463	42	1	1145	505	46	5	1097	543	54	7	1049	579	65	8
CY055230.1	1247	421	33	0	1195	463	42	1	1145	505	46	5	1097	543	54	7	1049	579	65	8
CY055232.1	1247	421	33	0	1195	463	42	1	1145	505	46	5	1097	543	54	7	1049	579	65	8
CY055234.1	1251	417	33	0	1200	458	42	1	1150	500	46	5	1102	538	54	7	1054	574	65	8
CY055236.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
CY055238.1	1247	421	33	0	1194	464	42	1	1143	507	46	5	1094	546	54	7	1045	583	65	8
CY055240.1	1258	410	33	0	1207	451	42	1	1158	492	46	5	1111	529	54	7	1064	564	65	8
CY055242.1	1240	419	42	0	1189	459	52	1	1139	500	57	5	1091	537	66	7	1043	572	78	8
CY055244.1	1253	414	34	0	1202	454	44	1	1153	494	49	5	1105	532	57	7	1057	568	68	8
CY055246.1	1247	421	33	0	1195	463	42	1	1145	505	46	5	1097	543	54	7	1049	579	65	8
CY055248.1	1264	406	31	0	1212	449	39	1	1163	490	43	5	1115	528	51	7	1066	565	62	8
CY055250.1	1238	430	33	0	1187	470	43	1	1137	511	48	5	1089	548	57	7	1041	582	70	8
CY055252.2	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
CY055254.1	1255	413	33	0	1204	453	43	1	1154	494	48	5	1106	531	57	7	1058	566	69	8
CY055256.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
CY055258.1	1239	429	33	0	1187	471	42	1	1136	514	46	5	1087	553	54	7	1038	590	65	8
CY055260.1	1246	419	35	1	1193	460	45	3	1143	500	48	10	1094	538	54	15	1045	575	62	19
CY055262.2	1247	421	33	0	1195	463	42	1	1145	505	46	5	1097	543	54	7	1049	579	65	8
CY055264.1	1247	416	38	0	1198	452	50	1	1150	489	57	5	1104	522	68	7	1057	555	81	8
CY055266.1	1247	421	33	0	1195	463	42	1	1145	505	46	5	1097	542	55	7	1049	577	67	8
CY055271.2	1260	408	33	0	1208	450	42	1	1158	492	46	5	1110	530	54	7	1062	566	65	8
CY055279.2	1255	413	33	0	1204	454	42	1	1154	496	46	5	1106	534	54	7	1058	570	65	8
CY055287.2	1274	395	32	0	1223	438	39	1	1174	481	41	5	1126	520	48	7	1078	557	58	8
CY055295.1	1274	395	32	0	1223	438	39	1	1174	481	41	5	1126	520	48	7	1078	557	58	8
CY055303.1	1312	430	36	0	1258	473	46	1	1206	516	51	5	1156	555	60	7	1106	592	72	8
CY055423.1	1283	418	33	0	1231	460	42	1	1181	502	46	5	1132	541	54	7	1084	577	65	8
CY055431.1	1282	407	31	0	1230	450	39	1	1180	493	42	5	1132	532	49	7	1083	570	59	8
CY055439.1	1283	415	36	0	1231	456	46	1	1181	497	51	5	1132	535	60	7	1084	570	72	8
CY055447.1	1286	415	33	0	1236	454	43	1	1189	491	49	5	1144	524	59	7	1099	555	72	8
CY055455.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY055463.1	1283	418	33	0	1228	463	42	1	1176	507	46	5	1126	547	54	7	1077	584	65	8
CY055471.1	1280	407	33	0	1228	449	42	1	1178	491	46	5	1130	529	54	7	1082	565	65	8
CY055479.1	1279	406	35	1	1227	446	45	3	1177	487	47	10	1129	525	52	15	1081	562	59	19
CY055486.1	1266	413	42	0	1212	456	52	1	1162	497	57	5	1114	534	66	7	1066	569	78	8
CY055494.1	1254	434	33	0	1198	480	42	1	1145	525	46	5	1095	564	55	7	1046	600	67	8
CY055502.1	1246	440	35	0	1188	486	46	1	1133	532	51	5	1082	571	61	7	1033	606	74	8
CY055510.1	1291	407	35	1	1238	448	45	3	1187	490	47	10	1139	528	52	15	1090	566	59	19
CY055518.1	1279	406	35	1	1227	446	45	3	1177	487	47	10	1129	525	52	15	1081	562	59	19
CY055526.1	1262	413	45	1	1207	458	52	4	1156	499	56	10	1107	536	65	13	1058	571	77	15

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY055534.1	1269	419	45	1	1215	463	52	4	1165	503	56	10	1118	537	66	13	1070	570	79	15
CY055542.1	1262	423	48	1	1207	467	56	4	1156	508	59	11	1106	546	67	15	1056	582	78	18
CY055550.1	1282	406	45	1	1228	450	52	4	1178	490	56	10	1130	526	65	13	1082	560	77	15
CY055558.1	1279	421	34	0	1227	462	44	1	1177	503	49	5	1128	541	58	7	1079	577	70	8
CY055565.1	1274	421	39	0	1220	462	51	1	1169	502	58	5	1121	537	69	7	1073	571	82	8
CY055573.1	1275	417	42	0	1223	456	54	1	1173	496	60	5	1125	532	70	7	1078	564	84	8
CY055581.1	1282	406	45	1	1228	450	52	4	1178	490	56	10	1130	526	65	13	1082	560	77	15
CY055589.1	1266	434	34	0	1214	475	44	1	1164	516	49	5	1117	551	59	7	1069	585	72	8
CY055597.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY055605.1	1287	393	53	1	1234	433	63	4	1185	470	69	10	1138	503	80	13	1091	535	93	15
CY055613.1	1282	406	45	1	1228	450	52	4	1178	490	56	10	1130	526	65	13	1082	560	77	15
CY055621.1	1282	406	45	1	1228	450	52	4	1178	490	56	10	1130	526	65	13	1082	560	77	15
CY055629.1	1250	450	34	0	1197	492	44	1	1146	534	49	5	1098	570	59	7	1049	605	72	8
CY055637.1	1275	413	45	1	1220	458	52	4	1169	499	56	10	1120	536	65	13	1071	571	77	15
CY055645.1	1279	408	33	0	1226	451	42	1	1175	494	46	5	1126	533	54	7	1077	570	65	8
CY055653.1	1282	406	45	1	1228	450	52	4	1178	490	56	10	1130	526	65	13	1082	560	77	15
CY055661.1	1282	406	45	1	1228	450	52	4	1178	490	56	10	1130	526	65	13	1082	560	77	15
CY055668.1	1282	406	45	1	1228	450	52	4	1178	490	56	10	1130	526	65	13	1082	560	77	15
CY055676.1	1282	406	45	1	1228	450	52	4	1178	490	56	10	1130	526	65	13	1082	560	77	15
CY055684.1	1274	421	39	0	1220	462	51	1	1169	502	58	5	1121	537	69	7	1073	571	82	8
CY055692.1	1277	411	45	1	1223	455	52	4	1173	495	56	10	1124	532	65	13	1075	567	77	15
CY055700.1	1277	404	52	1	1223	444	64	3	1173	481	73	7	1126	513	83	12	1079	544	95	13
CY055708.1	1277	404	52	1	1223	444	64	3	1173	481	73	7	1126	513	83	12	1079	544	95	13
CY055716.1	1268	420	45	1	1212	466	52	4	1160	508	56	10	1110	546	65	13	1060	582	77	15
CY055724.1	1286	399	48	1	1230	445	55	4	1178	487	59	10	1130	521	70	13	1082	555	81	16
CY055732.1	1275	413	45	1	1220	458	52	4	1169	499	56	10	1120	536	65	13	1071	571	77	15
CY055740.1	1279	401	53	1	1228	441	61	4	1181	477	66	10	1135	509	77	13	1090	538	91	15
CY055748.1	1266	434	34	0	1214	475	44	1	1164	516	49	5	1117	551	59	7	1069	585	72	8
CY055756.1	1266	414	53	1	1212	457	61	4	1162	496	66	10	1114	530	77	13	1067	561	91	15
CY055764.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY055772.1	1279	421	34	0	1227	462	44	1	1177	503	49	5	1129	540	58	7	1081	575	70	8
CY055780.1	1282	406	45	1	1228	450	52	4	1178	490	56	10	1130	526	65	13	1082	560	77	15
CY055788.1	1275	413	45	1	1220	458	52	4	1169	499	56	10	1120	536	65	13	1071	571	77	15
CY055796.1	1276	406	51	1	1222	449	59	4	1172	488	64	10	1124	523	74	13	1076	556	87	15
CY055804.1	1261	439	34	0	1207	482	44	1	1155	525	49	5	1109	559	59	7	1062	592	72	8
CY055812.1	1282	406	45	1	1228	450	52	4	1178	490	56	10	1130	526	65	13	1082	560	77	15
CY055820.1	1274	416	44	0	1221	458	54	1	1171	499	55	9	1123	535	63	13	1075	569	75	15
CY055828.1	1269	406	45	1	1215	450	52	4	1165	490	56	10	1117	526	65	13	1069	560	77	15
CY055836.1	1283	405	45	1	1228	450	52	4	1178	490	56	10	1130	526	65	13	1082	560	77	15
CY055844.1	1282	419	33	0	1229	461	43	1	1178	503	48	5	1129	541	57	7	1080	577	69	8
CY055852.1	1273	415	34	0	1221	456	44	1	1171	497	49	5	1123	534	58	7	1076	568	70	8
CY055860.1	1273	410	50	1	1219	453	58	4	1169	492	63	10	1121	527	73	13	1073	559	87	15
CY055868.1	1273	410	50	1	1219	453	58	4	1169	492	63	10	1121	527	73	13	1073	559	87	15
CY055876.1	1270	418	45	1	1215	463	52	4	1162	506	56	10	1111	545	65	13	1060	582	77	15

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY055884.1	1282	406	45	1	1228	450	52	4	1178	490	56	10	1130	526	65	13	1082	560	77	15
CY055892.1	1282	406	45	1	1228	450	52	4	1178	490	56	10	1130	526	65	13	1082	560	77	15
CY055900.1	1282	406	45	1	1228	450	52	4	1178	490	56	10	1130	526	65	13	1082	560	77	15
CY055908.1	1269	419	45	1	1215	463	52	4	1165	503	56	10	1118	537	66	13	1070	570	79	15
CY055916.1	1277	424	33	0	1224	467	42	1	1173	510	46	5	1124	549	54	7	1075	586	65	8
CY055924.1	1247	441	45	1	1189	488	53	4	1133	533	58	10	1079	574	68	13	1026	612	81	15
CY055932.1	1282	406	45	1	1228	450	52	4	1178	490	56	10	1130	526	65	13	1082	560	77	15
CY055940.1	1282	406	45	1	1228	450	52	4	1178	490	56	10	1130	526	65	13	1082	560	77	15
CY055948.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY055956.1	1272	421	40	1	1220	460	51	3	1170	500	54	10	1122	537	60	15	1074	573	68	19
CY055964.1	1276	424	33	1	1224	464	43	3	1174	505	45	10	1126	543	50	15	1077	581	57	19
CY055972.1	1256	437	40	1	1204	475	52	3	1154	514	56	10	1106	550	63	15	1058	585	72	19
CY055980.1	1259	421	40	1	1207	460	51	3	1157	500	54	10	1109	537	60	15	1061	573	68	19
CY055988.1	1259	421	40	1	1207	460	51	3	1157	500	54	10	1109	537	60	15	1061	573	68	19
CY055996.1	1256	437	40	1	1203	477	51	3	1152	518	54	10	1103	556	60	15	1054	593	68	19
CY056004.1	1272	421	40	1	1220	460	51	3	1170	500	54	10	1122	537	60	15	1074	573	68	19
CY056012.1	1272	421	40	1	1219	461	51	3	1168	502	54	10	1119	540	60	15	1070	577	68	19
CY056020.1	1283	418	33	0	1228	463	42	1	1176	507	46	5	1126	547	54	7	1077	584	65	8
CY056028.1	1292	406	35	1	1240	446	45	3	1190	487	47	10	1142	525	52	15	1094	562	59	19
CY056036.1	1266	435	35	0	1212	478	45	1	1160	521	50	5	1110	560	59	7	1061	596	71	8
CY056044.1	1276	422	35	1	1223	463	45	3	1172	505	47	10	1123	544	52	15	1074	582	59	19
CY056052.1	1271	424	38	1	1219	463	49	3	1169	503	52	10	1122	538	59	15	1076	570	69	19
CY056060.1	1282	410	42	0	1231	450	50	3	1182	489	53	10	1134	525	61	14	1086	559	72	17
CY056068.1	1267	421	38	1	1215	460	49	3	1165	500	52	10	1118	535	59	15	1072	567	69	19
CY056076.1	1281	406	45	1	1229	445	56	3	1180	483	60	10	1132	518	68	15	1084	552	78	19
CY056084.1	1270	425	38	1	1219	463	49	3	1171	501	52	10	1124	536	59	15	1079	567	69	19
CY056092.1	1292	406	35	1	1240	446	45	3	1190	487	47	10	1141	526	52	15	1092	564	59	19
CY056100.1	1249	434	50	1	1196	470	65	3	1145	507	72	10	1099	536	84	15	1053	564	98	19
CY056108.1	1268	430	35	1	1215	471	45	3	1164	513	47	10	1115	552	52	15	1066	590	59	19
CY056116.1	1273	430	31	0	1220	469	42	3	1170	509	46	9	1123	544	53	12	1076	577	66	8
CY056124.1	1271	424	38	1	1219	463	49	3	1169	503	52	10	1122	538	59	15	1076	570	69	19
CY056132.1	1271	413	35	1	1218	454	45	3	1167	496	47	10	1118	535	52	15	1069	573	59	19
CY056140.1	1256	412	53	0	1208	444	68	1	1163	475	78	5	1120	502	92	7	1075	530	108	8
CY056148.1	1246	435	39	1	1192	476	50	3	1141	517	53	10	1091	556	59	15	1041	594	67	19
CY056156.1	1270	429	38	1	1217	469	49	3	1166	510	52	10	1116	549	58	15	1066	587	66	19
CY056164.1	1272	407	54	1	1218	448	64	4	1167	489	68	10	1118	527	75	14	1070	563	84	17
CY056172.1	1278	407	35	1	1227	446	45	3	1179	485	47	10	1131	523	52	15	1084	559	59	19
CY056180.1	1264	430	26	0	1209	476	34	1	1158	518	39	5	1110	555	45	10	1062	590	56	12
CY056188.1	1283	400	35	1	1229	442	45	3	1177	485	47	10	1129	523	52	15	1081	560	59	19
CY056196.1	1275	402	42	1	1223	439	55	3	1174	477	59	10	1127	512	66	15	1080	546	75	19
CY056204.1	1292	406	35	1	1240	446	45	3	1190	487	47	10	1142	525	52	15	1094	562	59	19
CY056212.1	1272	421	40	1	1220	460	51	3	1170	500	54	10	1122	537	60	15	1074	573	68	19
CY056220.1	1282	419	33	0	1230	460	43	1	1180	501	48	5	1132	538	57	7	1084	573	69	8
CY056228.1	1276	422	35	1	1224	460	47	3	1174	499	51	10	1126	535	58	15	1078	570	67	19

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY056236.1	1270	432	31	1	1214	476	41	3	1161	519	44	10	1111	556	52	15	1061	593	61	19
CY056294.1	1276	401	24	0	1226	442	32	1	1178	483	35	5	1132	521	41	7	1086	557	50	8
CY056387.1	1301	398	35	0	1253	435	45	1	1206	473	50	5	1161	507	59	7	1116	539	71	8
CY056395.1	1274	414	32	0	1222	455	43	0	1172	496	50	2	1124	534	56	6	1076	570	65	6
CY056403.1	1280	408	33	0	1228	450	42	1	1178	492	46	5	1130	530	54	7	1082	566	65	8
CY056411.1	1269	412	38	0	1217	453	48	1	1167	494	53	5	1119	531	62	7	1071	566	74	8
CY056419.1	1279	409	33	0	1226	452	42	1	1175	495	46	5	1126	534	54	7	1077	571	65	8
CY056427.1	1268	433	33	0	1214	477	42	1	1162	521	46	5	1111	562	54	7	1062	598	66	8
CY056435.1	1282	415	35	1	1229	455	46	3	1178	495	50	10	1129	533	56	15	1081	568	65	19
CY056443.1	1282	416	35	1	1229	456	46	3	1178	496	50	10	1129	534	56	15	1081	569	65	19
CY056451.1	1258	429	33	0	1205	472	42	1	1154	516	45	5	1105	556	52	7	1058	592	62	8
CY056459.1	1279	408	33	0	1226	451	42	1	1175	494	46	5	1126	533	54	7	1077	570	65	8
CY056467.1	1280	408	33	0	1228	450	42	1	1178	492	46	5	1130	530	54	7	1082	566	65	8
CY056475.1	1257	421	43	0	1203	463	54	1	1152	502	62	5	1105	536	73	7	1058	568	87	8
CY056483.1	1290	395	35	1	1239	434	45	3	1190	474	47	10	1144	510	52	15	1098	545	59	19
CY056491.1	1279	420	35	0	1226	462	45	1	1177	499	53	5	1130	533	64	7	1082	566	78	8
CY056499.1	1292	409	33	0	1239	452	42	1	1188	495	46	5	1139	534	54	7	1090	571	65	8
CY056507.1	1263	437	34	0	1208	479	46	1	1156	518	55	5	1107	554	65	8	1058	588	78	10
CY056515.1	1279	422	33	0	1226	465	42	1	1176	506	47	5	1128	544	52	10	1080	580	62	12
CY056523.1	1255	428	50	1	1202	466	63	3	1151	505	68	10	1103	539	77	15	1056	570	89	19
CY056531.1	1271	430	36	0	1219	470	47	1	1171	508	53	5	1123	545	62	7	1075	580	74	8
CY056539.1	1279	420	35	0	1226	462	45	1	1177	499	53	5	1130	533	64	7	1082	566	78	8
CY056547.1	1284	414	35	1	1232	454	45	3	1182	495	47	10	1135	531	53	15	1088	565	62	19
CY056555.1	1284	414	35	1	1232	454	45	3	1182	495	47	10	1134	533	52	15	1086	570	59	19
CY056563.1	1304	399	31	0	1253	441	39	1	1204	483	42	5	1157	521	49	7	1109	558	59	8
CY056571.1	1269	410	54	1	1216	448	66	4	1165	487	70	12	1116	524	76	17	1068	559	86	18
CY056579.1	1260	435	43	1	1208	473	55	3	1158	512	59	10	1112	544	68	15	1067	573	80	19
CY056587.1	1271	424	38	1	1219	463	49	3	1169	503	52	10	1122	538	59	15	1076	570	69	19
CY056595.1	1292	411	35	1	1240	451	45	3	1190	492	47	10	1142	530	52	15	1094	567	59	19
CY056603.1	1276	413	45	0	1224	453	56	1	1175	491	63	5	1128	526	70	10	1080	562	79	13
CY056611.1	1242	452	39	1	1189	490	52	3	1139	527	58	10	1092	560	67	15	1046	590	79	19
CY056619.1	1292	403	39	0	1242	441	50	1	1193	480	56	5	1145	517	64	8	1096	553	75	10
CY056627.1	1257	446	31	0	1205	484	42	3	1156	523	46	9	1110	557	53	12	1064	589	66	8
CY056635.1	1271	424	38	1	1219	463	49	3	1169	503	52	10	1122	538	59	15	1076	570	69	19
CY056643.1	1267	431	35	1	1214	471	46	3	1163	510	51	10	1114	547	58	15	1067	580	68	19
CY056651.1	1278	421	39	1	1224	462	50	3	1172	505	52	10	1123	544	57	15	1074	582	64	19
CY056659.1	1255	419	47	1	1203	457	59	3	1153	496	63	10	1106	530	71	15	1061	559	83	19
CY056667.1	1271	424	38	1	1219	463	49	3	1169	503	52	10	1122	538	59	15	1076	570	69	19
CY056675.1	1275	423	35	1	1223	463	45	3	1173	504	47	10	1125	541	53	15	1077	576	62	19
CY056683.1	1273	425	34	2	1219	468	40	7	1168	509	43	14	1119	547	49	19	1070	585	54	24
CY056691.1	1285	407	41	1	1233	444	54	3	1183	483	58	10	1136	519	64	15	1089	554	72	19
CY056699.1	1292	406	35	1	1240	446	45	3	1190	487	47	10	1142	525	52	15	1094	562	59	19
CY056707.1	1289	409	34	2	1237	450	40	7	1188	489	43	14	1141	525	49	19	1094	561	54	24
CY056715.1	1288	410	35	1	1235	451	45	3	1185	492	47	10	1137	530	52	15	1089	567	59	19

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY056723.1	1290	408	35	1	1237	449	45	3	1186	491	47	10	1137	530	52	15	1088	568	59	19
CY056731.1	1275	423	35	1	1223	463	45	3	1173	504	47	10	1125	541	53	15	1077	576	62	19
CY056739.1	1258	436	39	1	1206	473	52	3	1157	509	58	10	1111	541	67	15	1066	570	79	19
CY056747.1	1241	440	53	0	1189	475	69	1	1140	509	80	5	1095	537	95	7	1050	564	112	8
CY056755.1	1276	423	35	0	1222	466	45	1	1170	509	50	5	1120	548	59	7	1070	585	71	8
CY056763.1	1277	430	35	1	1221	474	45	3	1168	518	47	10	1116	560	52	15	1064	601	59	19
CY056771.1	1266	432	35	1	1215	470	46	3	1165	510	49	10	1117	547	55	15	1069	583	63	19
CY056779.1	1294	404	35	1	1239	447	45	3	1186	491	47	10	1136	531	52	15	1087	569	59	19
CY056787.1	1271	424	38	1	1219	463	49	3	1169	503	52	10	1122	538	59	15	1076	570	69	19
CY056795.1	1274	419	40	1	1219	460	52	3	1167	500	57	10	1118	535	66	15	1071	565	79	19
CY056803.1	1269	422	42	1	1217	461	53	3	1167	501	56	10	1118	538	63	15	1070	572	73	19
CY056811.1	1275	426	33	0	1220	471	42	1	1168	514	47	5	1120	551	56	7	1072	586	68	8
CY056819.1	1268	430	35	1	1215	471	45	3	1164	513	47	10	1115	551	53	15	1066	587	62	19
CY056827.1	1270	426	38	0	1219	462	52	1	1170	498	61	5	1123	532	72	7	1076	565	84	9
CY056835.1	1296	402	35	1	1242	444	45	3	1190	487	47	10	1142	525	52	15	1094	562	59	19
CY056843.1	1260	434	39	1	1207	473	51	3	1156	513	55	10	1108	548	63	15	1061	580	74	19
CY056851.1	1296	402	35	1	1242	444	45	3	1190	487	47	10	1142	525	52	15	1094	562	59	19
CY056859.1	1253	442	39	0	1201	481	49	3	1152	520	53	9	1105	554	63	12	1058	587	74	14
CY056867.1	1269	413	38	1	1218	451	49	3	1169	490	52	10	1123	524	59	15	1078	555	69	19
CY056875.1	1243	437	40	1	1190	477	51	3	1139	518	54	10	1090	556	60	15	1041	593	68	19
CY056883.1	1253	440	41	0	1201	478	52	3	1152	516	57	9	1105	549	68	12	1058	581	80	14
CY056891.1	1260	411	47	1	1207	449	60	3	1157	486	66	10	1109	522	73	15	1061	557	82	19
CY056899.1	1255	413	52	1	1203	451	64	3	1153	490	68	10	1105	526	75	15	1057	561	84	19
CY056907.1	1259	419	40	1	1207	458	51	3	1157	498	54	10	1109	535	60	15	1061	571	68	19
CY056915.1	1279	404	35	1	1227	444	45	3	1177	485	47	10	1129	523	52	15	1081	560	59	19
CY056923.1	1261	418	39	1	1209	456	51	3	1159	495	55	10	1112	529	63	15	1064	564	72	19
CY056931.1	1270	409	40	1	1218	448	51	3	1168	488	54	10	1120	525	60	15	1072	560	69	19
CY056939.1	1260	439	35	0	1206	482	45	1	1154	525	50	5	1105	562	60	7	1057	594	75	8
CY056947.1	1281	406	33	0	1229	448	42	1	1178	491	46	5	1129	530	54	7	1080	567	65	8
CY056955.1	1276	407	35	1	1223	447	46	3	1171	489	49	10	1122	526	56	15	1073	562	65	19
CY056963.1	1252	436	33	0	1198	480	42	1	1147	522	47	5	1099	560	52	10	1051	596	62	12
CY056971.1	1259	424	36	0	1206	466	46	1	1155	508	51	5	1106	547	58	8	1057	584	68	10
CY056979.1	1280	408	33	0	1228	450	42	1	1178	492	46	5	1130	530	54	7	1082	566	65	8
CY056987.1	1288	406	39	1	1237	444	50	3	1187	484	53	10	1139	521	59	15	1091	557	67	19
CY056995.1	1281	416	37	0	1229	457	47	1	1179	498	52	5	1130	536	61	7	1082	571	73	8
CY057003.1	1261	439	34	0	1208	481	44	1	1157	523	49	5	1106	563	58	7	1055	600	71	8
CY057011.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY057019.1	1292	406	35	1	1240	446	45	3	1190	487	47	10	1142	525	52	15	1094	562	59	19
CY057027.1	1295	406	33	0	1242	449	42	1	1190	493	46	5	1140	533	54	7	1091	570	65	8
CY057078.1	1245	421	35	0	1192	463	45	1	1141	505	50	5	1090	546	58	7	1038	586	69	8
CY057206.1	1301	398	35	0	1253	435	45	1	1206	473	50	5	1161	507	59	7	1116	539	71	8
CY057214.1	1292	406	36	0	1244	442	47	1	1198	478	53	5	1154	510	63	7	1110	540	76	8
CY057222.1	1298	401	35	0	1250	438	45	1	1204	475	50	5	1160	508	59	7	1116	539	71	8
CY057230.1	1280	405	36	0	1228	446	46	1	1178	487	51	5	1130	524	60	7	1082	559	72	8

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY057238.1	1288	410	36	0	1235	452	46	1	1184	494	51	5	1135	532	60	7	1086	568	72	8
CY057246.1	1292	406	35	1	1240	446	45	3	1190	487	47	10	1142	525	52	15	1094	562	59	19
CY057254.1	1280	401	53	0	1229	438	64	3	1180	476	69	9	1133	512	77	12	1085	548	87	14
CY057262.1	1307	392	35	0	1257	432	44	1	1209	472	48	5	1161	511	55	7	1113	548	65	8
CY057270.1	1292	409	33	0	1239	452	42	1	1188	495	46	5	1139	534	54	7	1090	571	65	8
CY057278.1	1271	424	38	1	1219	463	49	3	1169	503	52	10	1122	538	59	15	1076	570	69	19
CY057286.1	1292	408	33	1	1240	449	42	3	1190	491	43	10	1142	530	47	15	1093	569	53	19
CY057294.1	1269	428	36	1	1217	467	47	3	1167	507	50	10	1120	542	57	15	1073	576	66	19
CY057302.1	1292	409	33	0	1242	449	42	1	1194	489	46	5	1146	527	54	7	1097	563	66	8
CY057310.1	1268	413	53	0	1219	446	68	1	1173	478	78	5	1130	505	92	7	1086	532	108	8
CY057318.1	1276	422	34	2	1221	466	40	7	1170	507	43	14	1124	541	50	19	1078	575	56	24
CY057326.1	1276	408	34	2	1224	449	40	7	1175	488	43	14	1128	524	49	19	1081	560	54	24
CY057334.1	1272	421	40	1	1220	460	51	3	1170	500	54	10	1122	537	60	15	1074	573	68	19
CY057342.1	1256	416	36	0	1203	456	48	1	1154	492	57	5	1107	525	69	7	1059	558	80	11
CY057350.1	1266	416	38	1	1215	449	54	3	1166	485	60	10	1118	521	67	15	1070	556	76	19
CY057358.1	1259	441	34	0	1205	483	45	1	1153	524	52	5	1101	564	62	7	1050	599	77	8
CY057366.1	1289	412	33	0	1235	456	42	1	1183	500	46	5	1133	540	54	7	1083	578	65	8
CY057374.1	1295	406	33	0	1242	449	42	1	1190	493	46	5	1140	533	54	7	1091	570	65	8
CY057382.1	1295	406	33	0	1242	449	42	1	1190	493	46	5	1140	533	54	7	1091	570	65	8
CY057390.1	1297	400	37	0	1246	440	47	1	1197	480	52	5	1150	516	61	7	1103	550	73	8
CY057398.1	1277	424	33	0	1226	465	42	1	1177	504	48	5	1130	539	58	7	1083	572	71	8
CY057406.1	1277	424	33	0	1226	465	42	1	1177	504	48	5	1130	539	58	7	1083	572	71	8
CY057414.1	1281	418	35	0	1230	457	46	1	1180	495	54	5	1132	529	66	7	1084	561	81	8
CY057422.1	1277	424	33	0	1226	465	42	1	1177	504	48	5	1130	539	58	7	1083	572	71	8
CY057430.1	1265	434	35	0	1211	477	45	1	1159	519	47	9	1110	555	56	13	1061	591	68	13
CY057438.1	1289	412	33	0	1235	456	42	1	1183	500	46	5	1133	540	54	7	1083	578	65	8
CY057446.1	1296	405	33	0	1242	449	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY057454.1	1281	405	47	1	1230	441	60	3	1181	479	64	10	1133	516	70	15	1085	552	78	19
CY057462.1	1295	406	33	0	1242	449	42	1	1190	493	46	5	1140	533	54	7	1091	570	65	8
CY057470.1	1277	422	35	0	1223	465	45	1	1172	504	53	5	1123	539	65	7	1075	570	81	8
CY057478.1	1258	440	36	0	1206	481	46	1	1154	524	51	5	1104	561	62	7	1054	595	77	8
CY057486.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY057494.1	1273	425	36	0	1221	466	46	1	1171	505	53	5	1124	539	64	7	1077	571	78	8
CY057502.1	1277	424	33	0	1226	465	42	1	1177	504	48	5	1130	539	58	7	1083	572	71	8
CY057510.1	1296	405	33	0	1242	449	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY057518.1	1258	440	36	0	1206	481	46	1	1154	524	51	5	1104	561	62	7	1054	595	77	8
CY057526.1	1289	412	33	0	1235	456	42	1	1183	500	46	5	1133	540	54	7	1083	578	65	8
CY057534.1	1282	416	36	0	1229	457	47	1	1179	498	52	5	1132	533	62	7	1085	566	75	8
CY057542.1	1257	431	46	0	1202	474	57	1	1150	515	64	5	1102	551	71	10	1054	585	83	12
CY057550.1	1241	447	46	0	1185	491	57	1	1132	533	64	5	1083	570	71	10	1035	603	84	12
CY057558.1	1274	428	32	0	1220	468	43	3	1170	505	50	9	1122	539	59	12	1075	569	75	8
CY057566.1	1292	406	35	1	1240	446	45	3	1190	487	47	10	1142	525	52	15	1094	562	59	19
CY057574.1	1285	418	31	0	1233	461	39	1	1182	505	42	5	1133	545	49	7	1083	584	59	8
CY057582.1	1275	410	35	1	1222	451	45	3	1171	493	47	10	1121	533	52	15	1071	572	59	19

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY057590.1	1263	418	39	1	1210	458	50	3	1159	499	53	10	1110	536	60	15	1061	572	69	19
CY057598.1	1281	418	35	0	1230	457	46	1	1180	495	54	5	1132	529	66	7	1084	561	81	8
CY057606.1	1262	419	39	1	1207	461	50	3	1156	502	53	10	1107	539	60	15	1058	575	69	19
CY057614.1	1284	417	33	0	1230	461	42	1	1178	505	46	5	1127	546	54	7	1077	584	65	8
CY057622.1	1301	402	31	0	1250	444	39	1	1200	487	42	5	1152	526	49	7	1103	564	59	8
CY057630.1	1279	419	35	1	1224	462	45	3	1172	505	47	10	1121	546	52	15	1071	585	59	19
CY057638.1	1279	419	35	1	1224	462	45	3	1172	505	47	10	1121	546	52	15	1071	585	59	19
CY057646.1	1299	402	33	0	1248	443	42	1	1199	485	45	5	1152	523	52	7	1106	558	62	8
CY057654.1	1276	425	33	0	1223	468	42	1	1173	509	47	5	1125	547	52	10	1077	583	62	12
CY057662.1	1281	417	36	0	1230	455	48	1	1179	493	57	5	1130	527	70	7	1081	559	86	8
CY057670.1	1281	418	35	0	1230	457	46	1	1180	495	54	5	1132	529	66	7	1084	561	81	8
CY057678.1	1284	414	35	1	1232	454	45	3	1182	495	47	10	1134	533	52	15	1086	570	59	19
CY057686.1	1287	411	35	1	1235	451	45	3	1185	492	47	10	1137	530	52	15	1089	567	59	19
CY057694.1	1256	442	35	1	1203	483	45	3	1152	525	47	10	1102	566	51	15	1052	606	57	19
CY057702.1	1239	446	35	1	1185	488	45	3	1133	531	47	10	1083	571	52	15	1033	610	59	19
CY057710.1	1291	410	33	0	1240	451	42	1	1191	492	46	5	1143	530	54	7	1095	565	66	8
CY057718.1	1270	422	42	0	1218	462	53	1	1168	502	59	5	1120	538	69	7	1072	574	79	9
CY057726.1	1257	431	46	0	1202	474	57	1	1150	515	64	5	1102	551	71	10	1054	585	83	12
CY057734.1	1269	434	31	0	1218	474	41	1	1168	515	46	5	1120	552	55	7	1072	586	68	8
CY057742.1	1284	414	35	1	1232	454	45	3	1182	495	47	10	1134	533	52	15	1086	570	59	19
CY057750.1	1276	418	39	1	1223	458	50	3	1172	499	53	10	1123	536	60	15	1074	572	69	19
CY057758.1	1270	416	47	1	1218	453	60	3	1168	492	64	10	1119	530	70	15	1070	567	78	19
CY057766.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY057774.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY057782.1	1283	415	35	1	1229	457	45	3	1177	500	47	10	1127	540	52	15	1077	579	59	19
CY057790.1	1299	402	33	0	1246	445	42	1	1194	489	46	5	1142	531	54	7	1092	569	65	8
CY057798.1	1284	414	35	1	1232	454	45	3	1182	495	47	10	1134	533	52	15	1086	570	59	19
CY057806.1	1284	414	35	1	1232	454	45	3	1182	495	47	10	1134	533	52	15	1086	570	59	19
CY057814.1	1301	402	31	0	1250	444	39	1	1200	487	42	5	1152	526	49	7	1103	564	59	8
CY057822.1	1291	410	33	0	1240	451	42	1	1191	492	46	5	1143	530	54	7	1095	565	66	8
CY057830.1	1291	407	35	1	1238	448	45	3	1187	490	47	10	1137	530	52	15	1087	569	59	19
CY057838.1	1264	428	41	1	1210	471	49	4	1160	510	54	10	1111	548	61	14	1062	584	70	18
CY057846.1	1260	441	33	0	1206	485	42	1	1155	527	47	5	1106	566	52	10	1058	601	63	12
CY057854.1	1275	411	47	1	1221	451	59	3	1170	492	64	8	1120	531	72	11	1070	568	83	13
CY057862.1	1278	404	52	0	1227	443	63	1	1178	482	69	5	1130	518	79	7	1082	552	92	8
CY057870.1	1299	411	33	0	1246	454	42	1	1194	498	46	5	1142	540	54	7	1092	578	65	8
CY057878.1	1301	402	31	0	1250	444	39	1	1200	487	42	5	1152	526	49	7	1103	564	59	8
CY057886.1	1297	400	37	0	1246	440	47	1	1197	480	52	5	1150	516	61	7	1103	550	73	8
CY057894.1	1286	406	42	0	1235	445	53	1	1186	484	59	5	1139	519	69	7	1092	554	79	9
CY057902.1	1284	414	35	1	1232	454	45	3	1182	495	47	10	1134	533	52	15	1086	570	59	19
CY057910.1	1267	442	34	0	1217	481	44	1	1169	519	50	5	1122	555	56	10	1074	590	67	12
CY057918.1	1284	417	33	0	1234	457	42	1	1185	498	46	5	1137	536	54	7	1089	571	66	8
CY057926.1	1277	408	49	0	1226	446	61	1	1177	484	68	5	1130	518	79	7	1083	552	90	9
CY057934.1	1299	404	31	0	1246	448	39	1	1194	493	42	5	1146	531	50	7	1097	567	62	8

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY057942.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY057950.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY057958.1	1279	414	41	0	1225	457	51	1	1175	497	57	5	1126	534	66	8	1078	568	77	11
CY057966.1	1250	447	36	1	1197	487	47	3	1146	528	50	10	1096	567	56	15	1047	603	65	19
CY057974.1	1269	410	42	0	1216	450	54	1	1166	489	61	5	1119	521	74	7	1071	556	85	9
CY057982.1	1277	433	33	0	1224	476	42	1	1173	519	46	5	1125	556	55	7	1077	591	67	8
CY057990.1	1239	445	35	1	1185	487	45	3	1133	530	47	10	1083	570	52	15	1033	609	59	19
CY057998.1	1239	445	35	1	1185	487	45	3	1133	530	47	10	1083	570	52	15	1033	609	59	19
CY058006.1	1267	418	35	1	1215	458	45	3	1165	500	46	10	1116	540	50	15	1066	580	56	19
CY058014.1	1253	431	36	1	1201	470	47	3	1151	510	50	10	1102	548	56	15	1053	585	64	19
CY058022.1	1207	471	41	1	1150	513	54	3	1096	555	59	10	1045	591	69	15	996	623	82	19
CY058030.1	1247	438	49	0	1194	472	67	1	1144	507	78	5	1096	539	92	7	1048	569	109	8
CY058038.1	1257	419	43	2	1205	458	50	8	1155	498	55	13	1108	533	63	17	1061	566	75	16
CY058046.1	1280	421	33	0	1226	465	42	1	1174	509	46	5	1124	549	54	7	1075	586	65	8
CY058054.1	1264	410	46	0	1212	449	58	1	1162	490	62	6	1113	528	70	9	1064	564	81	11
CY058062.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY058076.1	1298	401	35	0	1250	438	45	1	1204	475	50	5	1160	508	59	7	1116	539	71	8
CY058084.1	1298	401	35	0	1250	438	45	1	1204	475	50	5	1160	508	59	7	1116	539	71	8
CY058092.1	1288	410	36	0	1240	446	47	1	1194	483	52	5	1150	516	61	7	1106	547	73	8
CY058100.1	1301	398	35	0	1253	435	45	1	1206	473	50	5	1161	507	59	7	1116	539	71	8
CY058108.1	1298	399	37	0	1247	438	48	1	1199	475	55	5	1153	508	66	7	1108	537	81	8
CY058116.1	1301	398	35	0	1253	435	45	1	1206	473	50	5	1161	507	59	7	1116	539	71	8
CY058124.1	1298	399	37	0	1247	438	48	1	1199	475	55	5	1153	508	66	7	1108	537	81	8
CY058132.1	1301	398	35	0	1253	435	45	1	1206	473	50	5	1161	507	59	7	1116	539	71	8
CY058140.1	1298	401	35	0	1250	438	45	1	1204	475	50	5	1160	508	59	7	1116	539	71	8
CY058148.1	1298	399	37	0	1247	438	48	1	1199	475	55	5	1153	508	66	7	1108	537	81	8
CY058156.1	1289	410	35	0	1241	446	46	1	1194	484	51	5	1149	518	60	7	1106	548	72	8
CY058164.1	1301	398	35	0	1253	435	45	1	1206	473	50	5	1161	507	59	7	1116	539	71	8
CY058172.1	1292	406	36	0	1244	442	47	1	1198	478	53	5	1154	510	63	7	1110	540	76	8
CY058180.1	1288	411	35	0	1240	448	45	1	1194	486	49	5	1150	520	57	7	1107	551	68	8
CY058188.1	1292	406	36	0	1244	442	47	1	1198	478	53	5	1154	510	63	7	1110	540	76	8
CY058196.1	1288	410	36	0	1240	446	47	1	1194	483	52	5	1150	516	61	7	1106	547	73	8
CY058204.1	1282	417	35	0	1233	455	45	1	1186	493	50	5	1141	527	59	7	1096	559	71	8
CY058212.1	1292	406	36	0	1244	442	47	1	1198	478	53	5	1154	510	63	7	1110	540	76	8
CY058220.1	1298	399	37	0	1247	438	48	1	1199	475	55	5	1153	508	66	7	1108	537	81	8
CY058228.1	1282	417	35	0	1233	455	45	1	1186	493	50	5	1141	527	59	7	1096	559	71	8
CY058236.1	1295	400	39	0	1247	435	51	1	1200	471	58	5	1155	502	70	7	1110	533	82	9
CY058244.1	1271	427	36	0	1222	465	46	1	1175	503	47	9	1130	537	54	13	1085	569	66	13
CY058252.1	1286	405	42	1	1234	444	53	3	1184	484	56	10	1136	521	62	15	1088	557	70	19
CY058260.1	1291	410	33	0	1238	453	42	1	1187	496	46	5	1138	535	54	7	1089	572	65	8
CY058268.1	1279	417	36	2	1226	460	44	4	1175	502	45	12	1128	538	52	16	1081	572	61	19
CY058276.1	1281	417	35	1	1227	459	45	3	1175	502	47	10	1124	543	52	15	1073	583	59	19
CY058284.1	1270	416	47	1	1218	453	60	3	1168	492	64	10	1119	530	70	15	1070	567	78	19
CY058292.1	1277	410	33	0	1224	453	42	1	1173	496	46	5	1126	532	55	7	1078	567	67	8

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY058300.1	1292	406	35	1	1241	445	45	3	1192	485	47	10	1145	522	52	15	1098	558	59	19
CY058308.1	1276	418	39	1	1223	458	50	3	1172	499	53	10	1123	536	60	15	1074	572	69	19
CY058316.1	1276	421	38	0	1221	465	48	1	1169	508	53	5	1119	547	62	7	1070	583	74	8
CY058324.1	1257	431	46	0	1202	474	57	1	1150	515	64	5	1102	551	71	10	1054	585	83	12
CY058332.1	1259	416	45	1	1203	462	52	4	1149	509	53	10	1097	551	60	13	1047	589	70	15
CY058340.1	1248	439	34	0	1195	481	44	1	1145	521	50	5	1097	558	56	10	1049	594	65	13
CY058348.1	1253	431	36	1	1201	470	47	3	1151	510	50	10	1102	548	56	15	1053	585	64	19
CY058356.1	1249	436	36	0	1195	475	50	1	1144	514	58	5	1095	550	69	7	1046	584	83	8
CY058364.1	1278	410	33	0	1227	451	42	1	1178	492	46	5	1130	530	54	7	1082	565	66	8
CY058372.1	1270	416	34	0	1218	457	44	1	1167	499	49	5	1120	535	57	8	1073	567	70	10
CY058380.1	1250	429	40	1	1199	465	53	3	1150	502	58	10	1105	533	67	15	1059	564	78	19
CY058388.1	1236	462	35	1	1181	505	45	3	1128	549	47	10	1077	590	52	15	1027	628	60	19
CY058396.1	1236	460	35	1	1181	503	45	3	1128	547	47	10	1077	588	52	15	1027	626	60	19
CY058404.1	1276	418	39	1	1223	458	50	3	1172	499	53	10	1123	536	60	15	1074	572	69	19
CY058412.1	1301	409	24	0	1247	455	31	1	1194	502	33	5	1141	547	39	7	1087	590	49	8
CY058420.1	1274	420	39	1	1220	460	51	3	1168	501	55	10	1118	538	63	15	1068	574	73	19
CY058428.1	1284	414	35	1	1232	454	45	3	1182	495	47	10	1133	534	52	15	1084	572	59	19
CY058436.1	1283	417	34	0	1231	458	44	1	1180	500	49	5	1133	536	57	8	1086	568	70	10
CY058444.1	1286	406	42	0	1235	445	53	1	1186	484	59	5	1139	519	69	7	1092	554	79	9
CY058452.1	1290	412	32	0	1237	455	41	1	1185	499	45	5	1136	537	54	7	1086	573	67	8
CY058460.1	1266	431	36	1	1214	470	47	3	1164	510	50	10	1115	548	56	15	1066	585	64	19
CY058468.1	1271	427	35	1	1219	466	46	3	1169	506	49	10	1121	542	56	15	1073	577	65	19
CY058476.1	1235	446	53	0	1182	480	71	1	1131	517	80	6	1081	551	93	9	1033	580	109	12
CY058524.1	1311	388	35	0	1264	424	45	1	1218	461	50	5	1174	494	59	7	1130	525	71	8
CY058532.1	1298	401	35	0	1250	438	45	1	1204	475	50	5	1160	508	59	7	1116	539	71	8
CY058540.1	1301	398	35	0	1253	435	45	1	1206	473	50	5	1161	507	59	7	1116	539	71	8
CY058548.1	1253	432	35	0	1203	471	45	1	1155	510	50	5	1109	545	59	7	1063	578	71	8
CY058556.1	1273	404	42	1	1221	443	53	3	1171	483	56	10	1123	520	62	15	1075	556	70	19
CY058564.1	1257	421	42	1	1204	461	53	3	1154	500	57	10	1106	536	64	15	1058	571	73	19
CY058572.1	1285	401	35	0	1237	438	45	1	1191	475	50	5	1147	508	59	7	1103	539	71	8
CY058580.1	1285	401	35	0	1237	438	45	1	1191	475	50	5	1147	508	59	7	1103	539	71	8
CY058588.1	1272	414	35	0	1223	452	45	1	1176	490	50	5	1130	525	59	7	1085	557	71	8
CY058596.1	1285	401	35	0	1237	438	45	1	1191	475	50	5	1147	508	59	7	1103	539	71	8
CY058604.1	1282	400	39	0	1234	435	51	1	1187	471	58	5	1142	502	70	7	1097	533	82	9
CY058612.1	1264	424	33	0	1211	467	42	1	1160	510	46	5	1111	549	54	7	1062	586	65	8
CY058620.1	1277	422	35	0	1223	465	45	1	1172	504	53	5	1123	539	65	7	1075	570	81	8
CY058628.1	1288	410	35	1	1235	451	45	3	1184	493	47	10	1134	533	52	15	1084	572	59	19
CY058636.1	1265	433	35	1	1212	473	46	3	1161	514	49	10	1112	552	55	15	1063	589	63	19
CY058644.1	1284	411	39	0	1230	456	45	3	1179	497	50	8	1130	535	58	11	1081	571	69	10
CY058652.1	1291	410	33	0	1240	451	42	1	1191	492	46	5	1143	530	54	7	1095	565	66	8
CY058660.1	1284	411	39	0	1230	456	45	3	1179	497	50	8	1130	535	58	11	1081	571	69	10
CY058668.1	1281	418	35	0	1230	457	46	1	1180	495	54	5	1132	529	66	7	1084	561	81	8
CY058676.1	1300	399	35	0	1244	441	48	1	1191	482	56	5	1142	520	61	11	1094	554	69	17
CY058684.1	1279	405	35	1	1227	445	45	3	1177	486	47	10	1129	524	52	15	1081	561	59	19

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY058692.1	1251	437	33	0	1196	482	42	1	1143	527	46	5	1092	568	54	7	1042	606	65	8
CY058700.1	1254	429	38	0	1203	468	49	1	1155	506	55	5	1110	538	66	7	1065	568	80	8
CY058708.1	1259	423	37	1	1206	463	48	3	1156	504	49	11	1109	538	56	17	1061	574	61	24
CY058716.1	1300	398	35	1	1249	437	45	3	1199	478	47	10	1150	517	52	15	1101	555	59	19
CY058724.1	1284	402	48	0	1232	442	59	1	1181	483	65	5	1135	515	77	7	1088	550	86	10
CY058732.1	1300	398	35	1	1249	437	45	3	1199	478	47	10	1151	516	52	15	1103	553	59	19
CY058740.1	1260	434	39	1	1205	475	51	3	1151	518	55	10	1099	557	63	15	1048	596	70	20
CY058820.1	1233	433	35	0	1180	475	45	1	1129	518	49	5	1080	557	56	8	1031	594	66	10
CY058822.1	1247	419	35	0	1194	461	45	1	1143	504	49	5	1092	545	56	8	1041	584	66	10
CY058824.1	1256	410	35	0	1205	450	45	1	1156	491	49	5	1109	528	56	8	1061	565	65	10
CY058826.1	1254	407	40	0	1202	448	50	1	1152	489	55	5	1104	526	64	7	1056	561	76	8
CY058828.1	1264	402	35	0	1215	442	41	3	1168	481	44	8	1120	519	51	11	1072	554	62	13
CY058830.1	1264	402	35	0	1215	442	41	3	1168	481	44	8	1120	519	51	11	1072	554	62	13
CY058832.1	1234	432	35	0	1180	475	45	1	1128	519	49	5	1079	558	56	8	1030	594	67	10
CY058834.1	1203	461	37	0	1151	499	50	1	1101	538	57	5	1053	572	68	8	1005	604	82	10
CY058836.1	1247	421	33	0	1194	464	42	1	1144	505	47	5	1096	542	56	7	1048	577	68	8
CY060444.1	1268	392	41	0	1216	431	53	1	1166	471	59	5	1116	510	68	7	1068	544	81	8
CY060445.1	1294	359	27	0	1248	397	34	1	1204	435	36	5	1162	468	43	7	1120	499	53	8
CY060446.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
CY060447.1	1261	409	31	0	1210	451	39	1	1161	493	42	5	1114	531	49	7	1066	568	59	8
CY060449.1	1257	411	31	0	1206	453	39	1	1157	495	42	5	1111	532	49	7	1065	567	59	8
CY060450.1	1243	424	33	0	1191	466	42	1	1141	508	46	5	1093	546	54	7	1044	583	65	8
CY060451.1	1250	396	33	0	1200	436	42	1	1152	476	46	5	1106	512	54	7	1060	546	65	8
CY060452.1	1266	415	33	0	1216	455	42	1	1168	495	46	5	1122	531	54	7	1076	565	65	8
CY060454.1	1229	446	26	0	1176	490	34	1	1125	534	37	5	1076	575	43	7	1027	615	51	8
CY060457.1	1227	440	34	0	1174	482	44	1	1125	522	49	5	1076	559	59	7	1026	595	72	8
CY060460.1	1251	411	39	0	1200	451	49	1	1150	493	53	5	1103	529	62	7	1056	563	74	8
CY060463.1	1266	402	33	0	1214	444	42	1	1164	486	46	5	1117	522	55	7	1070	556	67	8
CY060466.1	1256	412	33	0	1202	456	42	1	1150	500	46	5	1101	538	55	7	1052	574	67	8
CY060469.1	1240	426	35	0	1188	467	45	1	1139	507	50	5	1092	543	58	8	1044	578	69	10
CY060472.1	1231	435	35	0	1177	478	45	1	1126	520	50	5	1077	558	58	8	1027	595	69	10
CY060475.1	1249	417	35	0	1198	457	45	1	1149	498	49	5	1102	535	56	8	1056	569	66	10
CY060478.1	1256	410	35	0	1205	450	45	1	1157	490	49	5	1111	526	56	8	1066	559	66	10
CY060481.1	1220	445	36	0	1166	487	47	1	1115	527	54	5	1067	562	65	7	1019	595	79	8
CY060484.1	1220	445	36	0	1166	487	47	1	1115	527	54	5	1067	562	65	7	1019	595	79	8
CY060487.1	1220	445	36	0	1166	487	47	1	1115	527	54	5	1067	562	65	7	1019	595	79	8
CY060490.1	1240	425	36	0	1190	463	47	1	1142	501	53	5	1096	535	62	8	1051	565	75	10
CY060493.1	1222	444	35	0	1168	487	45	1	1116	528	52	5	1066	566	61	8	1017	602	72	10
CY060496.1	1236	411	54	0	1183	451	66	1	1133	490	73	5	1084	524	86	7	1036	556	101	8
CY060502.2	1279	434	31	0	1227	477	39	1	1178	518	43	5	1131	555	51	7	1084	590	62	8
CY060510.2	1268	443	33	0	1214	487	42	1	1163	529	47	5	1114	567	56	7	1065	603	68	8
CY060518.1	1302	423	37	0	1248	466	47	1	1196	509	52	5	1147	547	61	7	1098	583	73	8
CY060526.2	1277	434	33	0	1224	477	42	1	1173	520	46	5	1124	559	54	7	1075	596	65	8
CY060534.2	1286	416	42	0	1234	457	52	1	1184	498	57	5	1136	535	66	7	1089	568	79	8

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY060542.2	1268	443	33	0	1214	487	42	1	1163	529	47	5	1114	567	56	7	1065	603	68	8
CY060550.2	1253	460	31	0	1198	505	40	1	1147	547	45	5	1098	584	55	7	1049	619	68	8
CY060558.1	1307	422	37	0	1254	464	47	1	1203	506	52	5	1154	544	61	7	1105	580	73	8
CY060566.2	1278	431	35	0	1227	470	46	1	1177	508	54	5	1129	542	66	7	1080	575	81	8
CY060574.2	1293	418	33	0	1241	460	42	1	1191	502	46	5	1143	540	54	7	1095	576	65	8
CY060582.2	1286	425	33	0	1233	468	42	1	1181	512	46	5	1129	554	54	7	1077	593	66	8
CY060590.2	1286	425	33	0	1234	467	42	1	1183	510	46	5	1132	551	54	7	1081	589	66	8
CY060598.2	1273	438	33	0	1220	481	42	1	1168	525	46	5	1115	568	54	7	1062	608	66	8
CY060606.2	1286	425	33	0	1234	467	42	1	1183	510	46	5	1132	551	54	7	1081	589	66	8
CY060614.2	1281	428	35	0	1230	467	46	1	1180	505	54	5	1132	539	66	7	1084	571	81	8
CY060622.2	1286	425	33	0	1234	467	42	1	1183	510	46	5	1132	551	54	7	1081	589	66	8
CY060630.2	1276	430	38	0	1224	470	49	1	1172	510	57	5	1121	547	69	7	1070	582	84	8
CY060638.2	1281	428	35	0	1230	467	46	1	1180	505	54	5	1132	539	66	7	1084	571	81	8
CY060646.2	1281	428	35	0	1230	467	46	1	1180	505	54	5	1132	539	66	7	1084	571	81	8
CY060654.2	1281	428	35	0	1230	467	46	1	1180	505	54	5	1132	539	66	7	1084	571	81	8
CY060662.2	1286	425	33	0	1234	467	42	1	1183	510	46	5	1132	551	54	7	1081	589	66	8
CY060670.2	1286	425	33	0	1234	467	42	1	1183	510	46	5	1132	551	54	7	1081	589	66	8
CY060678.2	1292	417	35	0	1243	454	46	1	1195	490	54	5	1149	522	66	7	1103	553	80	8
CY060686.2	1281	428	35	0	1230	467	46	1	1180	505	54	5	1132	539	66	7	1084	571	81	8
CY060694.2	1286	423	35	0	1231	467	45	1	1178	510	51	5	1125	551	61	7	1073	587	76	8
CY060702.2	1286	425	33	0	1234	467	42	1	1183	510	46	5	1132	551	54	7	1081	589	66	8
CY060710.2	1286	425	33	0	1234	467	42	1	1183	510	46	5	1132	551	54	7	1081	589	66	8
CY060718.2	1281	428	35	0	1230	467	46	1	1180	505	54	5	1132	539	66	7	1084	571	81	8
CY060726.2	1292	416	35	1	1237	459	45	3	1185	501	48	10	1135	540	54	15	1085	577	63	19
CY060734.2	1299	412	33	0	1247	454	42	1	1197	496	46	5	1149	534	54	7	1101	570	65	8
CY060742.2	1248	460	36	0	1195	502	46	1	1145	542	52	5	1097	578	62	7	1049	612	75	8
CY060750.1	1247	455	39	0	1195	496	49	1	1145	537	54	5	1097	574	63	7	1049	609	75	8
CY060755.1	1281	417	35	1	1227	459	45	3	1175	502	47	10	1126	540	53	15	1076	578	61	19
CY060763.1	1263	438	33	0	1208	483	42	1	1154	529	46	5	1102	571	54	7	1052	608	66	8
CY060771.1	1297	404	33	0	1246	445	42	1	1198	485	46	5	1152	521	54	7	1106	555	65	8
CY060779.1	1292	406	35	1	1240	446	45	3	1190	487	47	10	1142	525	52	15	1094	562	59	19
CY060787.1	1292	408	33	1	1240	449	42	3	1190	491	43	10	1142	530	47	15	1093	569	53	19
CY060795.1	1255	434	44	1	1203	471	53	7	1153	510	54	17	1104	547	60	22	1055	583	68	25
CY060803.1	1283	418	33	0	1230	461	42	1	1178	505	46	5	1128	545	54	7	1078	583	65	8
CY060811.1	1279	421	34	0	1227	462	44	1	1176	504	49	5	1127	542	58	7	1078	578	70	8
CY060819.1	1263	431	40	0	1208	473	52	1	1156	513	60	5	1106	549	72	7	1057	584	85	8
CY060827.1	1277	419	38	0	1225	459	49	1	1175	500	53	6	1126	538	61	9	1077	574	72	11
CY060835.1	1280	414	39	1	1228	453	50	3	1178	493	53	10	1130	530	59	15	1082	566	67	19
CY060843.1	1299	402	33	0	1247	444	42	1	1199	484	46	5	1153	520	54	7	1106	555	65	8
CY060851.1	1295	390	35	1	1244	429	45	3	1195	469	47	10	1148	506	52	15	1101	542	59	19
CY060859.1	1280	421	33	0	1227	464	42	1	1176	507	46	5	1126	547	54	7	1076	585	65	8
CY060867.1	1283	418	33	0	1229	462	42	1	1178	505	46	5	1129	544	54	7	1080	581	65	8
CY060875.1	1276	423	35	0	1223	465	45	1	1174	502	53	5	1128	535	64	7	1081	567	78	8
CY060883.1	1271	430	33	0	1215	476	42	1	1162	521	46	5	1111	562	54	7	1062	599	65	8

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY060891.1	1280	421	33	0	1226	465	42	1	1174	509	46	5	1124	549	54	7	1075	586	65	8
CY060899.1	1296	404	34	0	1245	444	44	1	1197	481	51	5	1151	515	61	7	1105	548	73	8
CY060907.1	1260	437	36	1	1206	478	47	3	1154	519	51	10	1102	559	58	15	1051	598	66	19
CY060915.1	1280	421	33	0	1226	465	42	1	1174	509	46	5	1124	549	54	7	1075	586	65	8
CY060923.1	1289	414	31	0	1234	455	44	1	1182	496	51	5	1133	533	61	7	1084	568	74	8
CY060931.1	1241	447	46	0	1190	480	63	1	1141	513	75	5	1094	545	87	8	1046	577	100	11
CY060939.1	1282	419	33	0	1228	463	42	1	1176	508	45	5	1127	548	52	7	1079	585	62	8
CY060947.1	1260	434	39	1	1205	475	51	3	1151	518	55	10	1099	557	63	15	1048	596	70	20
CY060955.1	1280	421	33	0	1226	465	42	1	1174	509	46	5	1124	549	54	7	1075	586	65	8
CY060963.1	1273	425	36	0	1220	465	48	1	1169	504	54	7	1121	540	60	13	1073	575	69	17
CY060971.1	1273	425	36	0	1220	465	48	1	1169	504	54	7	1121	540	60	13	1073	575	69	17
CY060979.1	1280	421	33	0	1226	465	42	1	1174	509	46	5	1124	549	54	7	1075	586	65	8
CY060987.1	1300	398	35	1	1249	437	45	3	1199	478	47	10	1151	516	52	15	1103	553	59	19
CY060995.1	1287	412	35	0	1235	453	45	1	1183	495	51	5	1133	533	61	7	1084	568	74	8
CY061003.1	1266	431	37	0	1211	475	47	1	1159	517	53	5	1109	556	59	10	1059	593	70	12
CY061011.1	1260	424	50	0	1206	465	62	1	1155	505	69	5	1105	539	82	8	1058	569	97	10
CY061019.1	1271	424	38	1	1219	463	49	3	1169	503	52	10	1121	540	58	15	1073	577	64	20
CY061027.1	1271	418	44	1	1220	453	58	3	1170	489	65	10	1124	519	76	15	1077	549	89	19
CY061035.1	1289	412	33	0	1238	451	44	1	1188	490	51	5	1141	525	61	7	1096	555	75	8
CY061043.1	1260	434	40	0	1204	478	51	1	1150	523	56	5	1099	564	61	10	1049	602	69	14
CY061051.1	1276	422	35	1	1223	463	45	3	1172	505	47	10	1123	544	52	15	1074	582	59	19
CY061059.1	1266	426	42	0	1212	468	53	1	1160	510	59	5	1109	549	69	7	1060	583	83	8
CY061067.1	1277	426	31	0	1224	470	39	1	1173	514	42	5	1122	556	49	7	1072	594	60	8
CY061075.1	1277	426	31	0	1224	470	39	1	1173	514	42	5	1122	556	49	7	1072	594	60	8
CY061083.1	1288	406	39	1	1238	442	51	3	1190	479	55	10	1143	514	62	15	1095	550	70	19
CY061091.1	1288	406	39	1	1238	442	51	3	1190	479	55	10	1143	514	62	15	1095	550	70	19
CY061099.1	1288	406	39	1	1238	442	51	3	1190	479	55	10	1143	514	62	15	1095	550	70	19
CY061107.1	1274	420	39	1	1222	458	51	3	1172	497	55	10	1124	532	63	15	1075	568	72	19
CY061115.1	1275	426	33	0	1221	470	42	1	1169	514	46	5	1120	553	54	7	1071	590	65	8
CY061123.1	1261	421	51	1	1207	461	62	4	1155	502	64	13	1106	538	71	19	1056	575	78	25
CY061131.1	1256	426	51	1	1200	468	62	4	1146	511	64	13	1097	546	72	19	1046	583	80	25
CY061139.1	1279	419	36	0	1228	458	45	3	1180	496	49	9	1134	529	59	12	1088	561	70	14
CY061147.1	1230	442	48	1	1174	483	61	3	1120	524	67	10	1070	557	79	15	1022	583	97	19
CY061155.1	1266	417	37	1	1213	456	49	3	1162	497	52	10	1112	536	58	15	1063	573	66	19
CY061163.1	1254	424	42	1	1203	460	53	5	1154	497	56	14	1108	529	64	20	1059	564	74	23
CY061171.1	1224	457	39	1	1169	498	51	3	1116	540	51	14	1066	578	56	21	1016	615	65	24
CY061179.1	1236	466	36	1	1180	505	49	5	1128	545	52	14	1081	579	57	20	1033	613	67	19
CY061187.1	1268	432	34	0	1212	477	44	1	1158	522	49	5	1107	562	58	7	1057	599	70	8
CY061195.1	1264	428	42	0	1213	467	53	1	1163	507	59	5	1115	543	69	7	1067	578	80	9
CY061203.1	1271	424	38	1	1219	463	49	3	1169	503	52	10	1122	538	59	15	1076	570	69	19
CY061211.1	1271	424	38	1	1219	463	49	3	1169	503	52	10	1122	538	59	15	1076	570	69	19
CY061219.1	1292	406	35	1	1240	446	45	3	1190	487	47	10	1142	525	52	15	1094	562	59	19
CY061227.1	1275	423	36	0	1219	468	46	1	1166	512	51	5	1114	553	60	7	1064	590	72	8
CY061235.1	1292	406	35	1	1240	446	45	3	1190	487	47	10	1142	525	52	15	1094	562	59	19

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY061243.1	1256	437	40	1	1203	477	51	3	1152	518	54	10	1103	556	60	15	1054	593	68	19
CY061251.1	1292	406	35	1	1240	446	45	3	1190	487	47	10	1142	525	52	15	1094	562	59	19
CY061259.1	1276	425	33	0	1223	467	43	1	1173	506	50	5	1126	540	61	7	1079	573	74	8
CY061267.1	1294	407	33	0	1242	449	42	1	1191	492	46	5	1142	531	54	7	1093	568	65	8
CY061275.1	1294	405	35	0	1245	443	45	1	1198	481	50	5	1154	514	59	7	1110	545	71	8
CY061283.1	1270	428	35	1	1217	469	45	3	1166	511	47	10	1116	551	52	15	1066	590	59	19
CY061547.1	1259	409	33	0	1207	451	42	1	1157	493	46	5	1107	534	53	7	1056	574	63	8
CY061554.1	1285	416	33	0	1232	459	42	1	1180	503	46	5	1130	543	54	7	1080	581	65	8
CY061562.1	1245	450	39	0	1190	489	54	1	1139	527	63	5	1091	560	76	7	1044	590	92	8
CY061570.1	1288	407	39	1	1238	443	51	3	1190	480	55	10	1143	515	62	15	1095	551	70	19
CY061578.1	1278	420	35	1	1222	464	45	3	1168	509	47	10	1118	549	52	15	1068	588	59	19
CY061586.1	1274	420	39	1	1222	458	51	3	1172	497	55	10	1125	531	63	15	1077	566	72	19
CY061594.1	1292	406	35	1	1240	446	45	3	1190	487	47	10	1142	525	52	15	1094	562	59	19
CY061725.1	1305	406	42	2	1254	446	50	5	1205	486	54	10	1158	522	63	12	1111	556	75	13
CY061733.1	1305	406	42	2	1254	446	50	5	1205	486	54	10	1158	522	63	12	1111	556	75	13
CY061749.1	1275	442	32	0	1221	486	41	1	1169	529	46	5	1119	566	56	8	1069	603	67	10
CY061757.1	1275	428	45	0	1221	472	53	2	1169	516	56	7	1119	553	66	10	1069	590	77	12
CY061765.1	1293	422	34	0	1241	463	44	1	1191	504	49	5	1143	542	57	7	1095	578	68	8
CY061773.1	1293	422	34	0	1241	463	44	1	1191	504	49	5	1143	542	57	7	1095	578	68	8
CY061781.1	1293	421	34	0	1241	462	44	1	1191	504	48	5	1143	542	56	7	1095	578	67	8
CY061789.1	1293	422	34	0	1241	463	44	1	1191	504	49	5	1143	542	57	7	1095	578	68	8
CY061797.1	1293	422	34	0	1241	463	44	1	1191	504	49	5	1143	542	57	7	1095	578	68	8
CY061805.1	1277	445	36	0	1222	488	47	1	1170	531	52	5	1120	569	61	8	1070	605	73	10
CY061906.1	1271	424	38	1	1219	463	49	3	1168	504	52	10	1121	539	59	15	1075	571	69	19
CY061914.1	1271	424	38	1	1219	463	49	3	1169	503	52	10	1122	538	59	15	1076	570	69	19
CY061922.1	1292	404	38	0	1241	445	47	1	1192	483	54	5	1144	521	61	8	1096	557	71	10
CY061930.1	1284	397	53	0	1236	429	68	1	1191	460	78	5	1149	486	92	7	1106	512	108	8
CY061938.1	1264	417	53	0	1211	453	69	1	1160	491	78	5	1111	527	89	7	1062	561	103	8
CY061946.1	1295	397	42	0	1245	435	53	1	1197	474	58	5	1150	510	67	7	1103	545	78	8
CY061954.1	1261	433	40	0	1210	471	52	1	1160	510	59	5	1112	545	69	8	1063	579	82	10
CY061962.1	1257	437	39	1	1205	475	51	3	1155	514	55	10	1108	549	61	16	1061	582	70	21
CY061970.1	1257	437	39	1	1205	475	51	3	1155	514	55	10	1108	549	61	16	1061	582	70	21
CY061978.1	1271	424	38	1	1219	463	49	3	1169	503	52	10	1122	538	59	15	1076	570	69	19
CY061986.1	1286	422	26	0	1231	468	34	1	1179	512	38	5	1130	550	47	7	1081	586	59	8
CY061994.1	1276	409	35	1	1223	450	42	6	1172	492	42	15	1123	531	47	19	1073	570	54	22
CY062002.1	1276	409	35	1	1225	446	47	3	1175	486	50	10	1127	523	56	15	1079	559	64	19
CY062010.1	1251	431	38	1	1198	471	49	3	1147	512	52	10	1098	550	58	15	1049	587	66	19
CY062018.1	1255	428	38	0	1204	468	48	1	1154	508	54	5	1105	545	64	7	1055	580	78	8
CY062026.1	1254	428	38	1	1201	468	49	3	1150	509	52	10	1102	545	59	15	1055	578	69	19
CY062034.1	1248	434	38	1	1195	474	49	3	1145	514	52	10	1097	550	59	15	1050	583	69	19
CY062042.1	1266	417	37	1	1214	455	49	3	1164	495	52	10	1116	532	58	15	1068	568	66	19
CY062050.1	1284	414	35	1	1232	454	45	3	1182	495	47	10	1134	533	52	15	1086	570	59	19
CY062058.1	1248	442	31	0	1194	482	42	3	1142	524	46	9	1093	561	53	12	1045	595	66	8
CY062066.1	1271	414	35	1	1219	454	45	3	1169	495	47	10	1121	533	52	15	1073	570	59	19

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY062074.1	1276	419	39	1	1223	458	51	3	1172	497	56	10	1124	531	65	15	1076	563	77	19
CY062082.1	1265	420	35	1	1214	458	46	3	1165	497	49	10	1118	533	55	15	1070	569	63	19
CY062090.1	1235	454	31	0	1181	494	42	3	1130	535	46	9	1082	571	53	12	1034	605	66	8
CY062098.1	1271	414	35	1	1219	454	45	3	1169	495	47	10	1121	533	52	15	1073	570	59	19
CY062106.1	1262	425	34	0	1208	468	43	2	1156	511	46	8	1107	549	54	11	1057	584	67	13
CY062114.1	1271	414	35	1	1219	454	45	3	1169	495	47	10	1121	533	52	15	1073	570	59	19
CY062122.1	1269	410	41	1	1218	447	53	3	1169	485	57	10	1121	522	63	15	1073	558	71	19
CY062130.1	1271	423	39	1	1219	461	51	3	1169	500	55	10	1122	534	63	15	1076	565	74	19
CY062138.1	1274	421	38	1	1220	460	49	5	1168	502	51	13	1119	540	55	20	1070	578	58	28
CY062146.1	1252	446	35	1	1198	488	45	3	1146	531	47	10	1096	571	52	15	1046	610	59	19
CY062154.1	1284	414	35	1	1232	454	45	3	1182	495	47	10	1134	533	52	15	1086	570	59	19
CY062162.1	1249	447	37	1	1191	491	49	3	1135	534	55	10	1085	568	66	15	1035	603	77	19
CY062170.1	1284	414	35	1	1232	454	45	3	1182	495	47	10	1134	533	52	15	1086	570	59	19
CY062178.1	1308	390	35	1	1257	429	45	3	1208	469	47	10	1161	506	52	15	1114	542	59	19
CY062186.1	1308	390	35	1	1257	429	45	3	1208	469	47	10	1161	506	52	15	1114	542	59	19
CY062194.1	1232	450	52	0	1178	490	65	1	1126	529	74	5	1075	565	87	7	1023	602	100	9
CY062202.1	1292	406	35	1	1239	447	45	3	1189	488	47	10	1141	526	52	15	1093	563	59	19
CY062210.1	1302	392	48	1	1254	426	60	3	1209	461	62	11	1165	493	68	17	1123	521	77	22
CY062218.1	1278	423	33	0	1224	467	42	1	1173	510	46	5	1125	548	54	7	1077	584	65	8
CY062226.1	1255	443	36	0	1199	488	46	1	1146	532	51	5	1094	573	60	7	1044	610	72	8
CY062234.1	1258	423	53	0	1208	457	68	1	1160	491	78	5	1115	520	92	7	1069	549	108	8
CY062242.1	1272	421	40	1	1220	460	51	3	1170	500	54	10	1122	537	60	15	1074	573	68	19
CY062250.1	1266	426	41	1	1214	464	53	3	1164	503	57	10	1116	538	65	15	1068	572	75	19
CY062268.1	1222	404	52	0	1167	445	65	1	1115	485	73	5	1068	518	85	7	1020	551	98	9
CY062276.1	1223	410	43	0	1168	452	55	1	1116	493	62	5	1069	527	73	7	1021	562	84	9
CY062300.1	1232	426	44	0	1176	468	57	1	1122	510	65	5	1071	547	77	7	1020	584	89	9
CY062308.1	1225	405	72	1	1171	438	89	5	1121	472	92	18	1074	505	97	27	1026	539	106	32
CY062316.1	1222	415	55	0	1167	457	67	1	1115	498	74	5	1068	532	85	7	1020	567	96	9
CY062324.1	1247	412	43	0	1196	450	55	1	1147	488	62	5	1099	523	73	7	1051	558	84	9
CY062354.1	1256	412	33	0	1203	455	42	1	1152	498	46	5	1103	537	54	7	1054	574	65	8
CY062355.1	1256	412	33	0	1204	454	42	1	1154	495	47	5	1106	532	56	7	1058	566	69	8
CY062356.1	1256	412	33	0	1203	455	42	1	1152	498	46	5	1103	537	54	7	1054	574	65	8
CY062357.1	1253	415	33	0	1201	457	42	1	1150	500	46	5	1101	539	54	7	1052	576	65	8
CY062358.1	1247	421	33	0	1194	464	42	1	1142	508	46	5	1092	548	54	7	1042	586	65	8
CY062359.1	1239	428	34	0	1187	469	44	1	1137	510	49	5	1088	548	58	7	1039	583	71	8
CY062360.1	1265	403	33	0	1213	445	42	1	1161	489	46	5	1112	527	55	7	1063	563	67	8
CY062361.1	1235	432	34	0	1183	473	44	1	1133	514	49	5	1082	554	58	7	1031	591	71	8
CY062362.1	1245	414	42	0	1194	450	56	1	1145	488	63	5	1097	523	74	7	1049	555	89	8
CY062363.1	1246	421	34	0	1195	461	44	1	1146	501	49	5	1098	538	58	7	1050	572	71	8
CY062364.1	1246	421	34	0	1195	461	44	1	1146	501	49	5	1098	538	58	7	1050	572	71	8
CY062365.1	1246	421	34	0	1195	461	44	1	1146	501	49	5	1098	538	58	7	1050	572	71	8
CY062366.1	1252	409	39	1	1200	443	53	5	1151	478	58	14	1105	509	65	20	1059	541	75	19
CY062367.1	1249	419	33	0	1193	464	43	1	1140	508	48	5	1089	547	58	7	1039	581	73	8
CY062368.1	1269	399	33	0	1218	440	42	1	1169	481	46	5	1122	518	54	7	1075	553	65	8

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY062369.1	1261	407	33	0	1210	448	42	1	1161	489	46	5	1113	527	54	7	1065	562	66	8
CY062370.1	1251	414	35	1	1198	455	45	3	1148	496	47	10	1101	531	54	15	1054	565	63	19
CY062371.1	1262	406	33	0	1209	449	42	1	1158	492	46	5	1109	531	54	7	1060	568	65	8
CY062372.1	1236	421	44	0	1184	460	56	1	1134	499	63	5	1086	533	75	7	1038	566	89	8
CY062373.1	1288	380	33	0	1242	416	42	1	1197	453	46	5	1154	486	54	7	1111	517	65	8
CY062374.1	1288	380	33	0	1242	416	42	1	1197	453	46	5	1154	486	54	7	1111	517	65	8
CY062375.1	1288	380	33	0	1242	416	42	1	1197	453	46	5	1154	486	54	7	1111	517	65	8
CY062376.1	1288	380	33	0	1242	416	42	1	1197	453	46	5	1154	486	54	7	1111	517	65	8
CY062377.1	1267	400	34	0	1217	439	44	1	1169	479	48	5	1121	518	55	7	1073	555	65	8
CY062378.1	1267	393	41	0	1217	429	54	1	1169	467	60	5	1124	500	70	7	1080	530	83	8
CY062379.1	1267	393	41	0	1217	429	54	1	1169	467	60	5	1124	500	70	7	1080	530	83	8
CY062380.1	1267	393	41	0	1217	429	54	1	1169	467	60	5	1124	500	70	7	1080	530	83	8
CY062381.1	1267	393	41	0	1217	429	54	1	1169	467	60	5	1124	500	70	7	1080	530	83	8
CY062382.1	1267	393	41	0	1217	429	54	1	1169	467	60	5	1124	500	70	7	1080	530	83	8
CY062383.1	1267	393	41	0	1217	429	54	1	1169	467	60	5	1124	500	70	7	1080	530	83	8
CY062384.1	1267	393	41	0	1217	429	54	1	1169	467	60	5	1124	500	70	7	1080	530	83	8
CY062385.1	1257	404	40	0	1207	440	53	1	1159	479	58	5	1114	513	67	7	1070	544	79	8
CY062386.1	1267	393	41	0	1217	429	54	1	1169	467	60	5	1124	500	70	7	1080	530	83	8
CY062387.1	1252	408	41	0	1200	446	54	1	1151	485	60	5	1105	519	70	7	1060	550	83	8
CY062388.1	1267	393	41	0	1217	429	54	1	1169	467	60	5	1124	500	70	7	1079	531	83	8
CY062389.1	1252	407	42	0	1202	442	56	1	1154	479	63	5	1109	511	74	7	1065	540	88	8
CY062390.1	1267	393	41	0	1217	429	54	1	1169	467	60	5	1124	500	70	7	1080	530	83	8
CY062391.1	1267	393	41	0	1217	429	54	1	1169	467	60	5	1124	500	70	7	1080	530	83	8
CY062392.1	1251	397	51	2	1202	431	62	6	1155	467	66	13	1111	499	73	18	1068	528	85	18
CY062393.1	1267	393	41	0	1217	429	54	1	1169	467	60	5	1124	500	70	7	1080	530	83	8
CY062394.1	1267	393	41	0	1217	429	54	1	1169	467	60	5	1124	500	70	7	1080	530	83	8
CY062395.1	1273	394	34	0	1225	431	44	1	1178	470	48	5	1132	507	55	7	1086	542	65	8
CY062396.1	1269	399	33	0	1216	442	42	1	1164	486	46	5	1114	525	55	7	1063	563	67	8
CY062397.1	1231	427	42	1	1180	461	57	3	1131	497	63	10	1084	531	70	16	1036	565	79	21
CY062398.1	1267	393	41	0	1217	429	54	1	1169	467	60	5	1124	500	70	7	1080	530	83	8
CY062399.1	1267	393	41	0	1217	429	54	1	1169	467	60	5	1124	500	70	7	1080	530	83	8
CY062400.1	1267	400	34	0	1217	439	44	1	1169	479	48	5	1121	518	55	7	1073	555	65	8
CY062401.1	1267	393	41	0	1217	429	54	1	1169	467	60	5	1124	500	70	7	1080	530	83	8
CY062402.1	1267	393	41	0	1217	429	54	1	1169	467	60	5	1124	500	70	7	1080	530	83	8
CY062403.1	1231	427	42	1	1180	461	57	3	1131	497	63	10	1084	531	70	16	1036	565	79	21
CY062404.1	1266	394	41	0	1214	432	54	1	1164	471	61	5	1116	508	70	7	1068	543	82	8
CY062405.1	1250	416	35	0	1196	459	45	1	1144	503	49	5	1094	544	56	7	1045	582	66	8
CY062406.1	1247	421	33	0	1194	464	42	1	1143	507	46	5	1094	546	54	7	1045	583	65	8
CY062407.1	1250	416	35	0	1196	459	45	1	1144	503	49	5	1094	544	56	7	1045	582	66	8
CY062408.1	1252	398	51	0	1199	439	62	1	1149	478	69	5	1101	513	80	7	1053	547	93	8
CY062409.1	1250	410	41	0	1197	451	52	1	1146	492	58	5	1097	529	68	7	1048	564	81	8
CY062410.1	1250	410	41	0	1197	451	52	1	1146	492	58	5	1097	529	68	7	1048	564	81	8
CY062411.1	1247	430	24	0	1192	476	32	1	1140	521	35	5	1089	564	41	7	1038	605	50	8
CY062412.1	1247	430	24	0	1192	476	32	1	1140	521	35	5	1089	564	41	7	1038	605	50	8

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY062413.1	1267	393	41	0	1217	429	54	1	1169	467	60	5	1124	500	70	7	1079	531	83	8
CY062414.1	1252	406	43	0	1202	444	54	1	1154	482	60	5	1108	516	70	7	1062	548	83	8
CY062415.1	1259	399	43	0	1210	432	55	4	1163	468	60	10	1119	499	71	11	1075	528	85	10
CY062416.1	1230	437	34	0	1178	478	44	1	1128	519	49	5	1079	557	58	7	1030	592	71	8
CY062417.1	1267	393	41	0	1217	429	54	1	1169	467	60	5	1124	500	70	7	1079	531	83	8
CY062418.1	1247	421	33	0	1194	464	42	1	1143	507	46	5	1094	546	54	7	1045	583	65	8
CY062419.1	1268	392	41	0	1219	427	54	1	1172	464	60	5	1128	497	69	7	1084	528	81	8
CY062420.1	1267	393	41	0	1217	429	54	1	1169	467	60	5	1124	500	70	7	1079	531	83	8
CY062421.1	1258	410	33	0	1205	453	42	1	1154	496	46	5	1106	534	54	7	1058	570	65	8
CY062422.1	1258	410	33	0	1205	453	42	1	1154	496	46	5	1106	534	54	7	1058	570	65	8
CY062423.1	1267	393	41	0	1217	429	54	1	1169	467	60	5	1124	500	70	7	1079	531	83	8
CY062424.1	1267	393	41	0	1217	429	54	1	1169	467	60	5	1124	500	70	7	1079	531	83	8
CY062425.1	1267	393	41	0	1217	429	54	1	1169	467	60	5	1124	500	70	7	1079	531	83	8
CY062426.1	1250	418	33	0	1196	462	42	1	1144	506	46	5	1094	546	54	7	1046	580	67	8
CY062427.1	1267	393	41	0	1217	429	54	1	1169	467	60	5	1124	500	70	7	1079	531	83	8
CY062428.1	1267	393	41	0	1217	429	54	1	1169	467	60	5	1124	500	70	7	1079	531	83	8
CY062429.1	1267	393	41	0	1217	429	54	1	1169	467	60	5	1124	500	70	7	1079	531	83	8
CY062430.1	1267	393	41	0	1217	429	54	1	1169	467	60	5	1124	500	70	7	1079	531	83	8
CY062431.1	1231	427	42	1	1180	461	57	3	1131	497	63	10	1084	531	70	16	1036	565	79	21
CY062432.1	1257	408	36	0	1206	447	47	1	1157	484	55	5	1110	518	66	7	1065	547	81	8
CY062491.1	1283	411	39	2	1235	448	46	6	1189	484	50	12	1145	516	60	12	1101	548	70	11
CY062498.1	1278	422	34	0	1228	461	44	1	1180	499	50	5	1133	533	61	7	1087	566	73	8
CY062505.1	1283	411	39	2	1235	448	46	6	1189	484	50	12	1145	516	60	12	1101	548	70	11
CY062511.1	1281	415	38	0	1233	450	50	1	1187	485	57	5	1143	516	68	7	1098	547	81	8
CY062517.1	1289	412	33	0	1238	453	42	1	1189	494	46	5	1142	531	54	7	1095	566	65	8
CY062522.1	1302	399	33	0	1252	439	42	1	1204	479	46	5	1158	515	54	7	1112	549	65	8
CY062529.1	1283	411	39	2	1235	448	46	6	1189	484	50	12	1145	516	60	12	1101	548	70	11
CY062540.1	1283	411	39	2	1235	448	46	6	1189	484	50	12	1145	516	60	12	1101	548	70	11
CY062635.1	1281	399	34	0	1232	436	45	1	1185	474	50	5	1140	508	58	8	1095	540	68	11
CY062643.1	1258	422	38	1	1206	461	49	3	1156	501	52	10	1109	536	59	15	1063	568	69	19
CY062651.1	1279	404	35	1	1227	444	45	3	1177	485	47	10	1129	523	52	15	1081	560	59	19
CY062659.1	1276	410	34	1	1225	449	42	5	1176	489	47	9	1127	527	55	12	1078	562	68	10
CY062667.1	1270	428	35	1	1217	469	45	3	1166	511	47	10	1116	551	52	15	1066	590	59	19
CY062675.1	1266	421	47	0	1213	461	59	1	1162	501	66	5	1114	536	76	8	1066	569	89	10
CY062683.1	1260	409	65	0	1210	441	82	1	1163	472	94	5	1120	497	110	7	1075	525	125	9
CY062691.1	1253	440	41	0	1201	479	53	1	1151	519	58	6	1103	555	67	9	1056	587	80	11
CY062699.1	1288	410	36	0	1234	453	46	1	1181	497	51	5	1131	536	59	8	1081	573	70	10
CY062707.1	1299	396	39	0	1248	434	51	1	1198	472	59	5	1150	506	71	7	1102	540	84	8
CY062715.1	1256	441	37	0	1202	482	49	1	1150	522	57	5	1101	559	66	8	1053	592	79	10
CY062723.1	1289	414	31	0	1235	455	43	1	1184	496	49	5	1135	534	58	7	1086	570	70	8
CY062731.1	1285	410	39	0	1232	450	51	1	1180	490	59	5	1131	525	71	7	1082	560	84	8
CY062739.1	1293	406	35	0	1241	448	44	1	1191	490	48	5	1143	528	56	7	1095	564	67	8
CY062747.1	1272	426	35	0	1219	468	45	1	1168	510	50	5	1118	549	59	7	1068	585	72	8
CY062755.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY062763.1	1267	428	39	0	1215	468	50	1	1165	508	56	5	1117	545	64	8	1069	580	75	10
CY062771.1	1278	420	36	0	1228	459	46	1	1180	498	51	5	1133	535	58	8	1086	570	68	10
CY062779.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1143	530	54	7	1095	566	65	8
CY062787.1	1294	407	33	0	1242	449	42	1	1191	492	46	5	1142	531	54	7	1093	568	65	8
CY062795.1	1278	421	35	0	1222	465	46	1	1168	510	51	5	1117	549	61	7	1067	584	75	8
CY062803.1	1288	412	34	0	1235	454	44	1	1184	495	50	5	1135	532	60	7	1087	565	74	8
CY062811.1	1249	452	33	0	1193	497	43	1	1139	542	48	5	1087	583	57	7	1036	621	69	8
CY062819.1	1279	422	33	0	1226	465	42	1	1176	506	47	5	1128	544	52	10	1080	580	62	12
CY062827.1	1269	417	48	0	1216	457	60	1	1166	496	67	5	1116	531	80	7	1067	564	95	8
CY062835.1	1259	439	36	0	1203	484	46	1	1150	528	51	5	1100	567	60	7	1050	604	72	8
CY062843.1	1270	415	49	0	1218	451	64	1	1168	489	72	5	1120	524	82	8	1069	564	90	11
CY062851.1	1270	428	36	0	1216	471	46	1	1165	513	51	5	1116	551	60	7	1067	587	72	8
CY062859.1	1283	418	33	0	1229	462	42	1	1178	505	46	5	1129	544	54	7	1080	581	65	8
CY062867.1	1280	411	43	0	1228	451	54	1	1178	491	60	5	1130	527	70	7	1083	559	84	8
CY062875.1	1251	414	68	1	1197	451	82	4	1147	486	91	10	1097	519	105	13	1050	546	123	15
CY062883.1	1280	416	38	0	1231	452	50	1	1184	488	57	5	1137	523	67	7	1090	555	81	8
CY062891.1	1282	410	41	1	1230	449	52	3	1180	489	55	10	1132	526	61	15	1084	562	69	19
CY062899.1	1270	428	36	0	1216	471	46	1	1164	514	51	5	1116	551	59	8	1068	586	70	10
CY062907.1	1270	418	33	0	1216	462	42	1	1165	505	46	5	1116	544	54	7	1067	581	65	8
CY062915.1	1258	427	35	1	1204	469	45	3	1153	510	48	10	1103	550	53	15	1054	588	60	19
CY062923.1	1250	435	36	0	1195	479	46	1	1142	523	51	5	1092	562	59	8	1042	599	70	10
CY062931.1	1227	459	35	0	1169	506	45	1	1113	553	50	5	1060	595	59	7	1008	634	71	8
CY062939.1	1267	418	36	0	1215	458	47	1	1166	498	52	5	1118	534	62	7	1070	567	76	8
CY062947.1	1274	413	34	0	1222	453	45	1	1172	493	51	5	1125	528	61	7	1078	562	72	9
CY062955.1	1270	415	36	0	1218	456	46	1	1168	497	51	5	1120	535	58	8	1072	571	68	10
CY062963.1	1271	414	35	1	1219	454	45	3	1169	495	47	10	1122	532	52	15	1075	568	59	19
CY062971.1	1246	444	31	0	1193	483	42	3	1143	523	46	9	1095	559	53	12	1047	593	66	8
CY062979.1	1269	407	45	0	1217	447	56	1	1167	487	62	5	1120	521	73	7	1073	553	87	8
CY062987.1	1247	447	27	0	1190	495	35	1	1137	539	40	5	1087	577	49	8	1036	614	61	10
CY062995.1	1292	386	43	0	1241	426	53	1	1191	468	57	5	1143	505	66	7	1094	541	78	8
CY063003.1	1257	431	33	0	1206	472	42	1	1155	515	46	5	1105	554	55	7	1056	587	70	8
CY063011.1	1253	434	34	0	1203	472	45	1	1153	513	50	5	1104	550	59	8	1056	581	73	11
CY063019.1	1271	414	35	1	1219	454	45	3	1169	495	47	10	1120	534	52	15	1072	571	59	19
CY063027.1	1262	435	24	0	1209	477	34	1	1157	519	40	5	1106	558	50	7	1057	593	63	8
CY063035.1	1252	432	37	0	1200	472	48	1	1150	512	54	5	1103	547	63	8	1056	580	75	10
CY063043.1	1253	433	35	0	1199	476	45	1	1147	519	50	5	1097	558	59	7	1048	594	71	8
CY063051.1	1246	449	39	0	1194	489	49	2	1145	528	54	7	1097	564	62	11	1049	598	73	14
CY063059.1	1260	446	35	0	1206	489	45	1	1154	532	50	5	1105	569	60	7	1057	601	75	8
CY063067.1	1268	413	53	0	1219	446	68	1	1173	478	78	5	1130	505	92	7	1086	532	108	8
CY063075.1	1293	408	33	0	1241	450	42	1	1191	492	46	5	1142	531	54	7	1093	568	65	8
CY063083.1	1249	457	26	2	1192	505	34	3	1138	550	42	4	1086	592	49	6	1036	629	61	4
CY063091.1	1269	430	35	0	1214	474	45	1	1162	517	50	5	1112	556	59	7	1063	592	71	8
CY063099.1	1288	410	35	1	1235	451	45	3	1184	493	47	10	1136	531	52	15	1088	568	59	19
CY063107.1	1276	426	32	0	1223	469	41	1	1172	512	45	5	1122	553	52	7	1072	592	62	8

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY063115.1	1268	431	35	0	1213	475	45	1	1164	512	53	5	1117	546	64	7	1069	578	79	8
CY063123.1	1281	410	42	1	1228	450	53	3	1177	491	56	10	1129	528	62	15	1081	563	71	19
CY063131.1	1297	403	33	1	1245	444	42	3	1195	486	43	10	1148	524	47	15	1100	562	53	19
CY063139.1	1288	420	26	0	1235	463	35	1	1184	506	39	5	1135	546	46	7	1086	584	56	8
CY063147.1	1262	422	49	1	1210	457	64	3	1160	495	69	10	1112	530	77	15	1064	564	87	19
CY063155.1	1275	416	42	1	1220	459	52	3	1168	502	54	10	1118	542	59	15	1068	581	66	19
CY063163.1	1268	413	53	0	1219	446	68	1	1173	478	78	5	1130	505	92	7	1086	532	108	8
CY063171.1	1309	394	31	0	1258	436	39	1	1209	478	42	5	1162	516	49	7	1113	555	58	8
CY063179.1	1241	432	47	1	1189	467	62	3	1139	504	68	10	1092	537	77	15	1045	570	85	21
CY063187.1	1256	425	39	1	1202	465	51	3	1150	506	55	10	1103	539	64	15	1054	574	74	19
CY063195.1	1257	420	43	1	1202	462	54	3	1150	503	58	10	1100	543	63	15	1050	582	70	19
CY063203.1	1256	425	39	1	1202	465	51	3	1150	506	55	10	1103	539	64	15	1054	574	74	19
CY063211.1	1257	420	43	1	1202	462	54	3	1150	503	58	10	1100	543	63	15	1050	582	70	19
CY063219.1	1271	409	40	1	1219	447	52	3	1169	488	54	10	1121	526	59	15	1073	563	66	19
CY063227.1	1245	440	36	0	1193	481	46	1	1141	524	51	5	1091	561	62	7	1041	595	77	8
CY063235.1	1266	418	37	0	1213	459	48	1	1164	496	56	5	1117	531	66	7	1069	565	79	8
CY063243.1	1263	418	39	1	1210	458	50	3	1159	499	53	10	1110	536	60	15	1061	572	69	19
CY063251.1	1268	417	35	1	1214	459	45	3	1162	502	47	10	1111	543	52	15	1060	583	59	19
CY063259.1	1244	431	46	0	1189	474	57	1	1137	515	64	5	1089	551	71	10	1041	585	83	12
CY063267.1	1287	410	24	0	1235	453	32	1	1185	496	35	5	1136	537	41	7	1087	576	50	8
CY063275.1	1273	406	42	0	1222	445	53	1	1173	484	59	5	1126	519	69	7	1079	554	79	9
CY063283.1	1279	400	42	0	1226	442	52	1	1174	485	57	5	1122	526	66	7	1072	563	78	8
CY063291.1	1286	402	33	0	1233	445	42	1	1181	489	46	5	1129	531	54	7	1079	569	65	8
CY063299.1	1275	410	35	1	1222	451	45	3	1171	493	47	10	1121	533	52	15	1071	572	59	19
CY063307.1	1276	410	35	0	1225	451	44	1	1175	493	48	5	1127	531	56	7	1078	568	67	8
FJ966082.1	1267	401	33	0	1219	439	42	1	1172	478	46	5	1127	513	54	7	1080	548	65	8
FJ966952.1	1281	377	43	0	1233	413	54	1	1187	449	60	5	1143	481	70	7	1099	511	83	8
FJ966959.1	1277	389	35	0	1228	427	45	1	1181	466	49	5	1137	501	56	7	1093	533	67	8
FJ966960.1	1274	384	43	0	1225	421	54	1	1178	458	60	5	1133	491	70	7	1088	522	83	8
FJ966974.1	1280	388	33	0	1232	426	42	1	1185	465	46	5	1140	500	54	7	1094	534	65	8
FJ966982.1	1277	389	35	0	1228	427	45	1	1181	466	49	5	1137	501	56	7	1093	533	67	8
FJ969509.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
FJ969511.1	1281	377	43	0	1233	413	54	1	1187	449	60	5	1143	481	70	7	1099	511	83	8
FJ969540.1	1294	376	31	0	1248	413	39	1	1203	451	42	5	1160	485	49	7	1115	519	59	8
FJ971076.1	1280	388	33	0	1232	426	42	1	1185	465	46	5	1140	500	54	7	1094	534	65	8
FJ974024.3	1312	399	33	0	1264	437	42	1	1218	475	46	5	1174	509	54	7	1130	541	65	8
FJ974026.3	1312	399	33	0	1264	437	42	1	1218	475	46	5	1174	509	54	7	1130	541	65	8
FJ981612.1	1277	389	35	0	1228	427	45	1	1181	466	49	5	1137	501	56	7	1093	533	67	8
FJ981613.1	1280	388	33	0	1232	426	42	1	1185	465	46	5	1140	500	54	7	1094	534	65	8
FJ981615.1	1277	389	35	0	1228	427	45	1	1181	466	49	5	1137	501	56	7	1093	533	67	8
FJ982430.1	1280	386	33	0	1232	424	42	1	1186	462	46	5	1142	496	54	7	1098	528	65	8
FJ984337.1	1266	402	33	0	1215	443	42	1	1167	483	46	5	1121	519	54	7	1076	553	64	8
FJ984347.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
FJ984355.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
FJ984360.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
FJ984364.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
FJ984375.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
FJ984385.1	1277	389	35	0	1228	427	45	1	1181	466	49	5	1137	501	56	7	1093	533	67	8
FJ984394.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
FJ984397.1	1249	418	34	0	1197	459	44	1	1147	500	49	5	1099	537	58	7	1051	572	70	8
FJ984401.1	1249	418	34	0	1197	459	44	1	1147	500	49	5	1099	537	58	7	1051	572	70	8
FJ998207.1	1307	394	42	0	1258	432	52	1	1213	467	58	5	1169	499	68	7	1125	530	80	8
FJ998208.1	1312	398	33	0	1264	436	42	1	1218	474	46	5	1174	508	54	7	1130	540	65	8
FJ998209.1	1293	417	33	0	1241	459	42	1	1191	501	46	5	1143	539	54	7	1095	575	65	8
FN401574.1	1301	397	35	0	1251	435	46	1	1203	474	51	5	1157	508	61	7	1112	538	75	8
FN423713.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
FN434444.1	1255	411	35	0	1204	450	46	1	1155	489	52	5	1108	523	63	7	1061	556	75	9
FN434453.1	1255	411	35	0	1204	450	46	1	1155	489	52	5	1108	523	63	7	1061	556	75	9
FN434458.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
FN434469.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ117024.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ117032.1	1277	389	35	0	1228	427	45	1	1181	466	49	5	1137	501	56	7	1093	533	67	8
GQ117040.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ117043.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ117044.1	1267	401	33	0	1219	439	42	1	1172	478	46	5	1127	513	54	7	1080	548	65	8
GQ117051.1	1277	389	35	0	1228	427	45	1	1181	466	49	5	1137	501	56	7	1093	533	67	8
GQ117056.1	1259	400	42	0	1211	436	53	1	1165	472	59	5	1121	504	69	7	1077	534	82	8
GQ117059.1	1277	389	35	0	1228	427	45	1	1181	466	49	5	1137	501	56	7	1093	533	67	8
GQ117062.1	1269	399	33	0	1218	440	42	1	1170	480	46	5	1126	513	55	7	1082	544	67	8
GQ117067.1	1282	386	33	0	1234	424	42	1	1188	462	46	5	1144	496	54	7	1100	528	65	8
GQ117079.1	1268	400	33	0	1218	440	42	1	1171	478	47	5	1127	511	56	7	1083	542	68	8
GQ117082.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ117086.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ117091.1	1293	375	33	0	1245	412	43	1	1199	449	48	5	1155	482	57	7	1111	513	69	8
GQ117097.1	1259	400	42	0	1212	434	54	1	1167	469	59	6	1124	500	68	9	1082	527	81	11
GQ117100.2	1234	433	34	0	1182	474	44	1	1132	515	49	5	1084	553	57	7	1036	589	68	8
GQ117103.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ117112.1	1272	396	33	0	1222	436	42	1	1174	476	46	5	1128	512	54	7	1082	546	65	8
GQ117116.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ117119.1	1286	372	43	0	1238	408	54	1	1192	444	60	5	1149	475	70	7	1106	504	83	8
GQ122097.1	1270	389	42	0	1221	426	53	1	1173	465	58	5	1127	500	67	7	1081	533	79	8
GQ131023.1	1269	399	33	0	1221	437	42	1	1175	475	46	5	1131	509	54	7	1087	541	65	8
GQ132142.1	1307	394	42	0	1258	432	52	1	1213	467	58	5	1169	499	68	7	1125	530	80	8
GQ132143.1	1288	421	34	0	1238	460	44	1	1190	499	49	5	1144	534	58	7	1098	567	70	8
GQ132144.1	1293	417	33	0	1241	459	42	1	1191	501	46	5	1143	539	54	7	1095	575	65	8
GQ132145.1	1303	409	31	0	1254	449	39	1	1207	489	42	5	1162	525	49	7	1116	560	59	8
GQ132146.1	1291	409	43	0	1240	447	55	1	1191	488	57	7	1143	526	63	11	1095	562	72	14
GQ132147.1	1307	394	42	0	1258	432	52	1	1213	467	58	5	1169	499	68	7	1125	530	80	8

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
GQ149623.1	1270	398	33	0	1219	439	42	1	1170	478	48	5	1125	508	61	7	1080	538	75	8
GQ149630.1	1272	396	33	0	1222	436	42	1	1174	476	46	5	1128	512	54	7	1082	546	65	8
GQ149634.1	1272	396	33	0	1222	436	42	1	1174	476	46	5	1128	512	54	7	1082	546	65	8
GQ149641.1	1268	390	42	1	1219	428	51	3	1172	466	54	9	1126	502	61	12	1080	536	71	14
GQ149647.1	1270	398	33	0	1219	439	42	1	1170	478	48	5	1125	508	61	7	1080	538	75	8
GQ149654.1	1271	395	35	0	1222	433	45	1	1175	472	49	5	1130	508	56	7	1085	542	66	8
GQ149662.1	1271	395	35	0	1222	433	45	1	1175	472	49	5	1130	508	56	7	1085	542	66	8
GQ149668.1	1271	395	35	0	1222	433	45	1	1175	472	49	5	1130	508	56	7	1085	542	66	8
GQ149671.1	1272	396	33	0	1222	436	42	1	1174	476	46	5	1128	512	54	7	1082	546	65	8
GQ149674.1	1272	396	33	0	1222	436	42	1	1174	476	46	5	1128	512	54	7	1082	546	65	8
GQ149677.1	1272	396	33	0	1222	436	42	1	1174	476	46	5	1128	512	54	7	1082	546	65	8
GQ149684.1	1272	396	33	0	1222	436	42	1	1174	476	46	5	1128	512	54	7	1082	546	65	8
GQ149689.1	1271	395	35	0	1222	433	45	1	1175	472	49	5	1130	508	56	7	1085	542	66	8
GQ149692.1	1282	386	33	0	1234	424	42	1	1188	462	46	5	1144	496	54	7	1100	528	65	8
GQ150328.1	1274	447	56	0	1222	483	66	6	1172	518	75	12	1125	549	86	17	1079	577	100	21
GQ150335.1	1270	385	33	0	1223	422	42	1	1178	459	46	5	1135	492	54	7	1092	523	65	8
GQ150338.1	1244	411	33	0	1192	453	42	1	1143	494	46	5	1096	531	54	7	1049	566	65	8
GQ150342.1	1268	410	38	0	1217	450	48	1	1168	490	52	6	1120	527	58	11	1074	560	68	14
GQ160526.1	1282	383	36	0	1234	418	46	3	1188	455	50	8	1144	489	56	12	1100	522	62	17
GQ160527.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ160531.1	1264	399	38	0	1219	430	51	1	1176	460	60	5	1135	486	73	7	1093	513	87	8
GQ160534.1	1261	407	33	0	1210	448	42	1	1161	489	46	5	1113	527	54	7	1065	562	66	8
GQ160538.1	1282	386	33	0	1234	424	42	1	1188	462	46	5	1144	496	54	7	1100	528	65	8
GQ160541.1	1287	369	45	0	1239	405	56	1	1193	442	61	5	1149	476	69	7	1105	508	80	8
GQ160542.1	1275	395	31	0	1225	436	39	1	1177	477	42	5	1130	515	49	7	1083	551	59	8
GQ160543.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ160550.1	1259	406	36	0	1209	445	46	1	1161	485	49	6	1115	521	56	9	1069	555	66	11
GQ160553.1	1287	369	45	0	1239	405	56	1	1193	442	61	5	1149	476	69	7	1105	508	80	8
GQ160556.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ160560.1	1287	369	45	0	1239	405	56	1	1193	442	61	5	1149	476	69	7	1105	508	80	8
GQ160565.1	1287	369	45	0	1239	405	56	1	1193	442	61	5	1149	476	69	7	1105	508	80	8
GQ160566.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ160567.1	1267	401	33	0	1215	443	42	1	1165	485	46	5	1115	525	54	7	1066	562	65	8
GQ160568.1	1268	402	31	0	1216	445	39	1	1166	488	42	5	1118	527	49	7	1069	565	59	8
GQ160574.1	1277	389	35	0	1228	427	45	1	1181	466	49	5	1137	501	56	7	1093	533	67	8
GQ160578.1	1282	386	33	0	1234	424	42	1	1188	462	46	5	1144	496	54	7	1100	528	65	8
GQ160579.1	1281	377	43	0	1233	413	54	1	1187	449	60	5	1143	481	70	7	1099	511	83	8
GQ160582.1	1287	369	45	0	1239	405	56	1	1193	442	61	5	1149	476	69	7	1105	508	80	8
GQ160586.1	1269	397	35	0	1219	436	45	1	1171	476	49	5	1126	512	56	7	1081	545	67	8
GQ160591.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ160594.1	1287	369	45	0	1239	405	56	1	1193	442	61	5	1149	476	69	7	1105	508	80	8
GQ160599.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ160601.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ160602.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
GQ160605.1	1272	396	33	0	1222	436	42	1	1174	476	46	5	1128	512	54	7	1082	546	65	8
GQ160606.1	1275	382	44	0	1227	417	56	1	1181	452	63	5	1135	485	74	7	1089	516	88	8
GQ160607.1	1281	377	43	0	1233	413	54	1	1187	449	60	5	1143	481	70	7	1099	511	83	8
GQ160611.1	1235	418	34	0	1183	459	44	1	1133	500	49	5	1085	537	58	7	1037	572	70	8
GQ160613.1	1252	402	33	0	1201	443	42	1	1152	484	46	5	1105	521	54	7	1059	554	66	8
GQ162170.1	1283	385	33	0	1236	422	42	1	1191	460	45	5	1147	496	51	7	1103	530	60	8
GQ162172.1	1261	403	37	0	1210	443	47	1	1162	482	52	5	1117	515	62	7	1072	546	75	8
GQ162174.1	1282	386	33	0	1234	424	42	1	1188	462	46	5	1144	496	54	7	1100	528	65	8
GQ162182.1	1282	386	33	0	1234	424	42	1	1188	462	46	5	1144	496	54	7	1100	528	65	8
GQ162183.1	1286	380	35	0	1239	416	45	1	1194	453	49	5	1150	489	55	7	1106	523	64	8
GQ162185.1	1270	398	33	0	1219	439	42	1	1170	478	48	5	1125	508	61	7	1080	538	75	8
GQ162190.1	1272	396	33	0	1222	436	42	1	1174	476	46	5	1128	512	54	7	1082	546	65	8
GQ162191.1	1272	396	33	0	1222	436	42	1	1174	476	46	5	1128	512	54	7	1082	546	65	8
GQ162194.1	1284	384	33	0	1236	422	42	1	1190	461	45	5	1146	497	51	7	1101	532	60	8
GQ162195.1	1288	380	33	0	1239	419	42	1	1192	458	46	5	1147	493	54	7	1102	526	65	8
GQ162197.1	1272	396	33	0	1222	436	42	1	1174	476	46	5	1128	512	54	7	1082	546	65	8
GQ162200.1	1269	387	45	0	1220	424	56	1	1173	461	62	5	1128	494	72	7	1082	528	82	9
GQ162202.1	1270	398	33	0	1219	439	42	1	1170	478	48	5	1125	508	61	7	1080	538	75	8
GQ162204.1	1282	386	33	0	1234	424	42	1	1188	462	46	5	1144	496	54	7	1100	528	65	8
GQ165814.1	1282	386	33	0	1234	424	42	1	1188	462	46	5	1144	496	54	7	1100	528	65	8
GQ165815.1	1282	386	33	0	1234	424	42	1	1188	462	46	5	1144	496	54	7	1100	528	65	8
GQ166212.2	1284	435	34	0	1231	477	44	1	1180	519	49	5	1131	557	58	7	1082	593	70	8
GQ166213.2	1299	393	33	0	1251	431	42	1	1205	469	46	5	1161	503	54	7	1117	535	65	8
GQ166223.1	1269	397	35	0	1222	433	45	1	1177	469	50	5	1134	501	59	7	1091	531	71	8
GQ166661.1	1268	398	35	0	1220	435	45	1	1174	472	50	5	1130	505	59	7	1086	536	71	8
GQ166752.1	1274	370	33	0	1227	407	42	1	1182	444	46	5	1139	477	54	7	1096	508	65	8
GQ166760.1	1251	380	33	0	1204	416	43	1	1159	452	48	5	1115	485	57	7	1073	513	70	8
GQ168606.1	1287	418	37	0	1235	459	47	1	1187	498	52	5	1141	532	62	7	1095	564	75	8
GQ168617.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ168620.1	1272	396	33	0	1222	436	42	1	1174	476	46	5	1128	512	54	7	1082	546	65	8
GQ168623.1	1282	386	33	0	1234	424	42	1	1188	462	46	5	1144	496	54	7	1100	528	65	8
GQ168628.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ168631.1	1282	386	33	0	1234	424	42	1	1188	462	46	5	1144	496	54	7	1100	528	65	8
GQ168633.1	1289	379	33	0	1242	416	42	1	1197	454	45	5	1154	489	51	7	1111	521	61	8
GQ168636.1	1287	369	45	0	1239	405	56	1	1193	442	61	5	1149	476	69	7	1105	508	80	8
GQ168642.1	1263	403	35	0	1215	437	48	1	1168	473	55	5	1124	503	67	7	1079	533	81	8
GQ168644.1	1280	390	31	0	1230	431	39	1	1183	471	42	5	1140	504	50	7	1097	535	61	8
GQ168645.1	1278	392	31	0	1227	434	39	1	1178	476	42	5	1131	514	49	7	1084	550	59	8
GQ168650.1	1275	395	31	0	1225	436	39	1	1177	477	42	5	1130	515	49	7	1083	551	59	8
GQ168652.1	1276	394	31	0	1226	435	39	1	1178	476	42	5	1132	513	49	7	1086	548	59	8
GQ168655.1	1264	404	33	0	1213	445	42	1	1164	486	46	5	1117	524	53	7	1070	560	63	8
GQ168657.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ168659.1	1258	412	31	0	1206	455	39	1	1156	498	42	5	1108	537	49	7	1060	574	59	8
GQ168661.1	1276	394	31	0	1226	435	39	1	1178	476	42	5	1132	513	49	7	1085	549	59	8

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
GQ168664.1	1272	391	38	0	1226	424	50	1	1182	457	57	5	1139	487	68	7	1096	516	81	8
GQ168668.1	1275	395	31	0	1225	436	39	1	1177	477	42	5	1130	515	49	7	1083	551	59	8
GQ168671.1	1277	389	35	0	1228	427	45	1	1181	466	49	5	1137	501	56	7	1093	533	67	8
GQ168673.1	1251	414	36	0	1200	454	46	1	1152	492	52	5	1106	527	61	7	1061	559	72	9
GQ168676.1	1286	372	43	0	1238	408	54	1	1192	444	60	5	1149	475	70	7	1106	504	83	8
GQ168851.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ168861.1	1277	389	35	0	1228	427	45	1	1181	466	49	5	1137	501	56	7	1093	533	67	8
GQ168886.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ169382.1	1264	426	50	1	1210	468	60	3	1158	510	63	10	1107	549	69	16	1058	584	78	20
GQ183617.1	1300	395	33	0	1252	433	42	1	1206	471	46	5	1162	505	54	7	1118	537	65	8
GQ183625.1	1300	393	33	0	1252	431	42	1	1206	469	46	5	1162	503	54	7	1118	535	65	8
GQ183633.1	1276	395	54	1	1225	434	64	3	1176	473	68	9	1128	510	76	12	1080	545	87	14
GQ184630.2	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ200208.1	1282	386	33	0	1234	424	42	1	1188	462	46	5	1144	496	54	7	1100	528	65	8
GQ200217.1	1277	391	33	0	1228	429	43	1	1181	467	48	5	1136	501	57	7	1091	533	69	8
GQ200221.1	1277	389	35	0	1228	427	45	1	1181	466	49	5	1137	501	56	7	1093	533	67	8
GQ200231.1	1287	369	45	0	1239	405	56	1	1193	442	61	5	1149	476	69	7	1105	508	80	8
GQ200237.1	1254	415	32	0	1202	457	41	1	1152	499	45	5	1104	537	53	7	1055	574	64	8
GQ200250.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ200255.1	1282	386	33	0	1234	424	42	1	1188	462	46	5	1144	496	54	7	1100	528	65	8
GQ200268.1	1287	369	45	0	1239	405	56	1	1193	442	61	5	1149	476	69	7	1105	508	80	8
GQ200270.1	1267	401	33	0	1219	439	42	1	1173	477	46	5	1129	511	54	7	1085	543	65	8
GQ200273.1	1286	372	43	0	1238	408	54	1	1192	444	60	5	1149	475	70	7	1106	504	83	8
GQ200287.1	1240	428	33	0	1188	470	42	1	1138	512	46	5	1090	550	54	7	1042	586	65	8
GQ202695.1	1246	398	35	0	1198	435	45	1	1152	472	50	5	1108	505	59	7	1064	536	71	8
GQ205434.1	1259	396	33	0	1209	436	42	1	1161	476	46	5	1115	512	54	7	1069	546	65	8
GQ205436.1	1259	396	33	0	1209	436	42	1	1161	476	46	5	1115	512	54	7	1069	546	65	8
GQ205438.1	1259	396	33	0	1209	436	42	1	1161	476	46	5	1115	512	54	7	1069	546	65	8
GQ214138.1	1298	383	38	1	1254	415	48	3	1211	449	52	8	1169	481	59	11	1127	511	69	13
GQ214144.1	1301	413	35	0	1252	451	45	1	1205	489	50	5	1160	523	59	7	1116	554	71	8
GQ214151.1	1304	407	43	4	1254	444	52	8	1207	477	63	11	1162	510	70	15	1116	543	79	16
GQ214156.1	1298	405	35	0	1250	442	45	1	1204	479	50	5	1160	512	59	7	1116	543	71	8
GQ219573.1	1282	386	33	0	1234	424	42	1	1188	462	46	5	1144	496	54	7	1100	528	65	8
GQ219574.1	1271	393	37	0	1223	430	47	1	1177	466	53	5	1133	501	60	7	1089	534	68	10
GQ219575.1	1282	386	33	0	1234	424	42	1	1188	462	46	5	1144	496	54	7	1100	528	65	8
GQ219576.1	1282	386	33	0	1234	424	42	1	1188	462	46	5	1144	496	54	7	1100	528	65	8
GQ219577.1	1282	386	33	0	1234	424	42	1	1188	462	46	5	1144	496	54	7	1100	528	65	8
GQ219578.1	1282	385	34	0	1234	421	45	1	1188	456	52	5	1144	487	63	7	1100	518	75	8
GQ219579.1	1285	383	33	0	1236	422	42	1	1189	461	46	5	1144	497	53	7	1100	530	63	8
GQ219580.1	1282	386	33	0	1234	424	42	1	1188	462	46	5	1144	496	54	7	1100	528	65	8
GQ219581.1	1282	386	33	0	1234	424	42	1	1188	462	46	5	1144	496	54	7	1100	528	65	8
GQ219586.1	1293	423	36	0	1241	465	45	1	1191	507	49	5	1143	545	57	7	1095	581	68	8
GQ221694.1	1285	383	33	0	1238	420	42	1	1193	457	46	5	1150	490	54	7	1107	521	65	8
GQ221786.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
GQ221788.1	1268	400	33	0	1218	440	42	1	1171	478	47	5	1127	511	56	7	1083	542	68	8
GQ221791.1	1277	389	35	0	1228	427	45	1	1181	466	49	5	1137	501	56	7	1093	533	67	8
GQ221794.1	1272	389	40	0	1225	425	50	1	1182	459	55	5	1140	490	64	7	1097	520	76	8
GQ221798.1	1291	377	33	0	1244	414	42	1	1199	452	45	5	1157	486	51	7	1114	518	61	8
GQ221801.1	1299	361	41	0	1253	396	51	1	1209	431	56	5	1168	461	65	7	1126	490	77	8
GQ221803.1	1274	396	31	0	1223	438	39	1	1174	480	42	5	1127	518	49	7	1080	554	59	8
GQ221805.1	1282	386	33	0	1234	424	42	1	1188	462	46	5	1144	496	54	7	1100	528	65	8
GQ221809.1	1279	391	31	0	1231	430	39	1	1187	467	42	5	1144	501	49	7	1100	534	59	8
GQ221812.1	1286	372	43	0	1238	408	54	1	1192	444	60	5	1149	475	70	7	1106	504	83	8
GQ221814.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ221818.1	1280	377	44	0	1233	411	56	1	1188	445	63	5	1143	477	74	7	1099	506	88	8
GQ221820.1	1286	372	43	0	1238	408	54	1	1192	444	60	5	1149	475	70	7	1106	504	83	8
GQ221823.1	1299	359	43	0	1253	394	53	1	1209	430	57	5	1166	464	64	7	1123	496	74	8
GQ221826.1	1286	372	43	0	1238	408	54	1	1192	444	60	5	1149	475	70	7	1106	504	83	8
GQ223112.1	1271	395	35	0	1222	433	45	1	1175	472	49	5	1130	508	56	7	1085	542	66	8
GQ223408.1	1270	392	39	0	1220	431	49	1	1172	470	54	5	1125	505	64	7	1078	539	76	8
GQ223435.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ223440.1	1306	397	36	0	1256	437	45	1	1209	476	49	5	1165	509	58	7	1121	540	70	8
GQ225349.1	1261	402	38	0	1210	442	48	1	1161	482	53	5	1113	520	61	7	1065	556	72	8
GQ225357.1	1249	418	34	0	1197	459	44	1	1147	500	49	5	1099	537	58	7	1051	572	70	8
GQ225365.1	1247	421	33	0	1194	464	42	1	1143	507	46	5	1094	546	54	7	1045	583	65	8
GQ225373.1	1282	386	33	0	1234	424	42	1	1188	462	46	5	1144	496	54	7	1100	528	65	8
GQ225381.1	1269	399	33	0	1218	440	42	1	1169	481	46	5	1122	518	54	7	1075	553	65	8
GQ227545.1	1304	406	53	0	1254	443	63	3	1205	482	68	8	1158	518	77	8	1113	550	89	9
GQ231981.1	1259	400	42	0	1211	436	53	1	1165	472	59	5	1121	504	69	7	1078	533	82	8
GQ231987.1	1287	377	37	0	1237	414	49	1	1189	453	54	5	1143	488	63	7	1098	519	76	8
GQ231990.1	1286	372	43	0	1238	408	54	1	1192	444	60	5	1149	475	70	7	1106	504	83	8
GQ231993.1	1282	386	33	0	1234	424	42	1	1188	462	46	5	1144	496	54	7	1100	528	65	8
GQ231995.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1066	562	65	8
GQ231996.1	1279	391	31	0	1229	432	39	1	1181	473	42	5	1132	513	49	7	1084	550	59	8
GQ231999.1	1275	395	31	0	1225	436	39	1	1177	477	42	5	1130	515	49	7	1083	551	59	8
GQ232002.1	1290	378	33	0	1243	415	42	1	1198	453	45	5	1156	487	51	7	1113	519	61	8
GQ232003.1	1272	396	33	0	1222	436	42	1	1174	476	46	5	1128	512	54	7	1082	546	65	8
GQ232007.1	1256	412	33	0	1205	453	42	1	1156	494	46	5	1109	531	54	7	1062	566	65	8
GQ232009.1	1281	374	45	1	1233	412	52	4	1187	451	53	10	1143	485	60	13	1099	517	70	15
GQ232010.1	1294	366	41	0	1248	401	51	1	1204	436	56	5	1164	465	65	7	1123	493	77	8
GQ232014.1	1277	391	33	0	1228	429	43	1	1181	467	48	5	1136	501	57	7	1091	533	69	8
GQ232017.1	1264	404	33	0	1213	445	42	1	1164	486	46	5	1117	524	53	7	1070	560	63	8
GQ232019.1	1284	374	42	1	1236	410	52	3	1190	446	56	9	1146	479	64	12	1102	510	75	14
GQ232023.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ232028.1	1282	386	33	0	1234	424	42	1	1188	462	46	5	1144	496	54	7	1100	528	65	8
GQ232033.1	1268	398	35	0	1220	435	45	1	1174	472	50	5	1130	505	59	7	1086	536	71	8
GQ232035.1	1272	396	33	0	1222	436	42	1	1174	476	46	5	1128	512	54	7	1082	546	65	8
GQ232037.1	1277	381	43	0	1229	417	54	1	1183	453	60	5	1138	486	70	7	1094	516	83	8

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
GQ232038.1	1270	384	47	0	1222	419	59	1	1176	454	66	5	1131	486	77	7	1087	515	91	8
GQ232044.1	1240	428	33	0	1188	470	42	1	1138	512	46	5	1091	548	55	7	1044	582	67	8
GQ232049.1	1275	395	31	0	1225	436	39	1	1177	477	42	5	1130	515	49	7	1083	551	59	8
GQ232052.1	1282	386	33	0	1234	424	42	1	1188	462	46	5	1144	496	54	7	1100	528	65	8
GQ232054.1	1259	400	42	0	1211	436	53	1	1165	472	59	5	1121	504	69	7	1077	534	82	8
GQ232057.1	1287	369	45	0	1239	405	56	1	1193	442	61	5	1149	476	69	7	1105	508	80	8
GQ232060.1	1272	396	33	0	1222	436	42	1	1174	476	46	5	1128	512	54	7	1082	546	65	8
GQ232064.1	1275	395	31	0	1225	436	39	1	1177	477	42	5	1130	515	49	7	1083	551	59	8
GQ232067.1	1270	398	33	0	1219	439	42	1	1169	481	46	5	1121	519	54	7	1074	554	65	8
GQ232070.1	1259	400	42	0	1211	436	53	1	1165	472	59	5	1121	504	69	7	1077	534	82	8
GQ232073.1	1269	389	43	0	1220	425	55	1	1173	461	62	5	1128	494	72	7	1082	528	82	9
GQ232076.1	1282	386	33	0	1233	425	42	1	1186	465	45	5	1142	501	51	7	1097	535	61	8
GQ232085.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ232093.1	1281	373	47	0	1233	409	58	1	1187	446	63	5	1143	479	72	7	1099	510	84	8
GQ232099.1	1245	414	42	0	1194	454	52	1	1145	494	57	5	1098	530	66	7	1051	563	79	8
GQ243749.1	1238	414	35	0	1186	457	41	3	1136	499	44	8	1088	537	51	11	1040	573	61	13
GQ243751.1	1238	415	34	0	1186	456	44	1	1136	497	49	5	1088	534	58	7	1040	569	70	8
GQ243753.1	1254	398	35	0	1206	435	45	1	1160	472	50	5	1116	505	59	7	1072	536	71	8
GQ243755.1	1261	392	34	0	1213	429	44	1	1167	467	48	5	1123	501	56	7	1079	533	67	8
GQ243757.1	1238	415	34	0	1186	456	44	1	1136	497	49	5	1088	534	58	7	1040	569	70	8
GQ243759.1	1249	405	33	0	1197	447	42	1	1147	489	46	5	1099	527	54	7	1051	563	65	8
GQ243760.1	1249	405	33	0	1200	444	42	1	1153	483	46	5	1109	516	55	7	1064	548	67	8
GQ243761.1	1249	405	33	0	1197	447	42	1	1147	489	46	5	1099	527	54	7	1051	563	65	8
GQ247724.1	1272	396	33	0	1222	436	42	1	1174	476	46	5	1128	512	54	7	1082	546	65	8
GQ247726.1	1293	423	36	0	1241	464	46	1	1191	505	51	5	1143	542	60	7	1095	577	72	8
GQ249333.1	1270	398	33	0	1221	437	42	1	1174	476	46	5	1128	512	54	7	1082	545	66	8
GQ249337.1	1282	386	33	0	1234	424	42	1	1188	462	46	5	1144	496	54	7	1100	528	65	8
GQ250161.1	1250	415	36	0	1198	456	46	1	1148	497	51	5	1100	534	60	7	1052	569	72	8
GQ251035.1	1306	401	40	0	1257	437	52	1	1210	475	57	5	1165	509	66	7	1119	542	78	8
GQ253492.2	1249	418	34	0	1197	459	44	1	1147	500	49	5	1099	537	58	7	1051	572	70	8
GQ253498.1	1273	395	33	0	1223	435	42	1	1175	475	46	5	1129	511	54	7	1083	545	65	8
GQ255897.1	1252	406	43	0	1203	443	54	1	1156	480	60	5	1111	513	70	7	1066	544	83	8
GQ255900.1	1263	405	33	0	1211	446	43	1	1161	487	48	5	1113	524	57	7	1065	559	69	8
GQ255901.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ258462.1	1252	415	34	0	1200	456	44	1	1150	497	49	5	1102	534	58	7	1054	569	70	8
GQ259909.1	1281	379	41	0	1233	413	54	1	1187	449	60	5	1143	481	70	7	1099	511	83	8
GQ261272.1	1282	386	33	0	1234	424	42	1	1188	462	46	5	1144	496	54	7	1100	528	65	8
GQ261275.1	1266	387	48	0	1218	423	59	1	1172	458	66	5	1128	491	75	7	1084	521	86	10
GQ261277.1	1230	433	38	0	1180	469	51	1	1132	506	58	5	1087	537	70	7	1042	567	83	9
GQ267839.1	1271	393	37	0	1223	430	47	1	1177	466	53	5	1133	501	60	7	1089	534	68	10
GQ268003.2	1268	400	41	1	1219	437	50	4	1171	475	55	9	1126	506	67	9	1080	538	79	10
GQ280264.1	1271	397	33	0	1220	438	42	1	1171	479	46	5	1124	516	54	7	1077	551	65	8
GQ280797.1	1261	407	33	0	1212	446	42	1	1164	486	46	5	1117	523	54	7	1070	557	66	8
GQ283484.1	1280	411	33	0	1228	453	42	1	1178	495	46	5	1130	533	54	7	1082	569	65	8

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
GQ283488.1	1294	407	42	0	1243	447	52	1	1194	487	57	5	1148	521	67	7	1103	552	80	8
GQ283493.1	1288	422	33	0	1236	464	42	1	1188	504	46	5	1141	541	54	7	1094	576	65	8
GQ286175.1	1264	443	54	34	1210	485	50	46	1158	527	53	36	1110	561	65	19	1061	595	78	15
GQ287619.1	1264	395	42	0	1216	431	53	1	1169	468	59	5	1124	501	69	7	1077	534	82	8
GQ287621.1	1282	386	33	0	1234	424	42	1	1188	462	46	5	1144	496	54	7	1100	528	65	8
GQ287623.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ287625.1	1233	425	43	0	1185	458	57	1	1140	490	65	6	1097	518	77	9	1054	544	92	11
GQ287627.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ288372.1	1288	435	40	0	1234	478	49	2	1182	521	54	6	1132	560	63	8	1082	597	75	9
GQ290059.1	1323	382	33	0	1275	420	42	1	1229	458	46	5	1185	492	54	7	1141	524	65	8
GQ290106.1	1269	399	33	0	1218	440	42	1	1169	481	46	5	1122	518	54	7	1075	553	65	8
GQ293077.1	1265	436	46	0	1214	471	61	1	1165	507	70	5	1118	539	83	7	1071	569	99	8
GQ303340.1	1278	380	42	1	1231	416	51	3	1186	452	54	9	1142	486	61	12	1098	518	71	14
GQ323443.1	1260	407	34	0	1210	446	44	1	1162	485	49	5	1117	518	59	7	1072	549	72	8
GQ323446.1	1256	412	33	0	1205	453	42	1	1156	494	46	5	1109	531	54	7	1062	566	65	8
GQ323451.1	1256	412	33	0	1205	453	42	1	1156	494	46	5	1109	531	54	7	1062	566	65	8
GQ323455.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ323464.1	1272	396	33	0	1222	436	42	1	1174	476	46	5	1128	512	54	7	1082	546	65	8
GQ323470.1	1251	413	37	0	1199	454	47	1	1149	495	52	5	1101	532	61	7	1053	567	73	8
GQ323473.1	1270	398	33	0	1219	439	42	1	1169	481	46	5	1121	519	54	7	1074	554	65	8
GQ323483.1	1281	377	43	0	1233	413	54	1	1187	449	60	5	1143	481	70	7	1099	511	83	8
GQ323486.1	1282	386	33	0	1234	424	42	1	1188	462	46	5	1144	496	54	7	1100	528	65	8
GQ323489.1	1282	386	33	0	1234	424	42	1	1188	462	46	5	1144	496	54	7	1100	528	65	8
GQ323495.1	1268	398	35	0	1220	435	45	1	1174	472	50	5	1130	505	59	7	1086	536	71	8
GQ323509.1	1282	386	33	0	1234	424	42	1	1188	462	46	5	1144	496	54	7	1100	528	65	8
GQ323520.1	1257	402	42	0	1211	434	55	1	1167	465	63	6	1125	493	74	9	1084	518	87	12
GQ323530.1	1268	398	35	0	1220	435	45	1	1174	472	50	5	1130	505	59	7	1086	536	71	8
GQ323551.1	1256	412	33	0	1205	453	42	1	1156	494	46	5	1109	531	54	7	1062	566	65	8
GQ323560.1	1293	373	35	0	1245	410	45	1	1199	448	49	5	1155	483	56	7	1111	516	66	8
GQ323564.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ323574.1	1270	396	35	0	1220	434	46	1	1172	472	52	5	1126	508	59	8	1080	543	68	10
GQ323576.1	1277	391	33	0	1228	429	43	1	1181	467	48	5	1136	501	57	7	1091	533	69	8
GQ323579.1	1252	413	36	0	1199	454	47	1	1149	495	52	5	1102	530	62	7	1055	563	75	8
GQ329066.1	1264	403	35	0	1209	447	45	1	1157	489	51	5	1107	527	61	7	1058	561	75	8
GQ329070.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ329076.1	1242	424	35	0	1192	462	46	1	1144	500	52	5	1098	534	62	7	1052	566	75	8
GQ329082.1	1248	419	34	0	1196	460	44	1	1146	501	49	5	1098	538	58	7	1050	573	70	8
GQ329088.1	1256	408	37	0	1205	449	45	2	1155	491	48	7	1106	530	55	10	1057	567	65	12
GQ329093.1	1252	406	43	0	1203	443	54	1	1156	480	60	5	1111	513	70	7	1066	544	83	8
GQ329100.1	1271	386	42	2	1223	422	48	8	1177	456	52	15	1133	488	59	17	1090	517	70	17
GQ329106.1	1255	413	33	0	1202	456	42	1	1151	499	46	5	1102	538	54	7	1053	575	65	8
GQ330645.1	1293	423	36	0	1241	465	45	1	1191	507	49	5	1143	545	57	7	1095	581	68	8
GQ334330.1	1264	395	42	0	1216	431	53	1	1169	468	59	5	1124	501	69	7	1077	534	82	8
GQ334338.1	1264	395	42	0	1216	431	53	1	1169	468	59	5	1124	501	69	7	1077	534	82	8

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
GQ334346.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ334355.1	1272	396	33	0	1219	439	42	1	1169	480	47	5	1121	517	56	7	1074	550	69	8
GQ338335.1	1256	412	33	0	1202	456	42	1	1150	500	46	5	1100	540	54	7	1050	578	65	8
GQ338339.1	1268	398	35	0	1220	435	45	1	1174	472	50	5	1130	505	59	7	1086	536	71	8
GQ338349.1	1259	400	42	0	1212	434	54	1	1167	469	59	6	1124	500	68	9	1082	527	81	11
GQ338355.1	1283	369	48	1	1235	408	51	7	1189	445	55	11	1145	479	63	11	1101	511	74	9
GQ338358.1	1281	377	43	0	1233	413	54	1	1187	449	60	5	1143	481	70	7	1099	511	83	8
GQ338361.1	1272	396	33	0	1222	436	42	1	1174	476	46	5	1128	512	54	7	1082	546	65	8
GQ338364.1	1277	391	33	0	1228	429	43	1	1181	467	48	5	1136	501	57	7	1091	533	69	8
GQ338368.1	1249	418	34	0	1197	459	44	1	1147	500	49	5	1099	537	58	7	1051	572	70	8
GQ338372.1	1282	386	33	0	1234	424	42	1	1188	462	46	5	1144	496	54	7	1100	528	65	8
GQ338375.1	1277	391	33	0	1228	429	43	1	1181	467	48	5	1136	501	57	7	1091	533	69	8
GQ338378.1	1293	373	35	0	1245	410	45	1	1199	448	49	5	1155	483	56	7	1111	516	66	8
GQ338381.1	1247	411	43	0	1194	450	56	1	1143	490	63	5	1094	527	73	7	1046	562	84	9
GQ338385.1	1287	369	45	0	1239	405	56	1	1193	442	61	5	1149	476	69	7	1105	508	80	8
GQ338391.1	1282	386	33	0	1234	424	42	1	1188	462	46	5	1144	496	54	7	1100	528	65	8
GQ338394.1	1271	385	45	0	1222	422	56	1	1175	460	61	5	1130	495	69	7	1085	528	80	8
GQ338400.1	1268	398	35	0	1220	435	45	1	1174	472	50	5	1130	505	59	7	1086	536	71	8
GQ338402.1	1267	401	33	0	1219	439	42	1	1172	478	46	5	1127	513	54	7	1080	548	65	8
GQ338405.1	1249	418	34	0	1197	459	44	1	1147	500	49	5	1099	537	58	7	1051	572	70	8
GQ338409.1	1288	380	33	0	1239	418	43	1	1192	456	48	5	1148	489	57	7	1104	520	69	8
GQ338414.1	1272	396	33	0	1222	436	42	1	1174	476	46	5	1128	512	54	7	1082	546	65	8
GQ338416.1	1268	398	35	0	1220	435	45	1	1174	472	50	5	1130	505	59	7	1086	536	71	8
GQ339881.1	1272	396	33	0	1222	436	42	1	1174	476	46	5	1128	512	54	7	1082	546	65	8
GQ351290.1	1287	411	33	0	1235	453	42	1	1185	495	46	5	1137	533	54	7	1089	569	65	8
GQ351314.1	1246	409	46	0	1195	448	57	1	1146	487	63	5	1098	523	73	7	1050	556	87	8
GQ351319.1	1290	417	40	0	1237	457	52	1	1186	499	57	5	1137	537	66	7	1088	573	78	8
GQ356787.1	1265	394	42	0	1215	433	52	1	1167	472	57	5	1121	507	66	7	1076	538	79	8
GQ359758.1	1307	425	60	3	1258	460	67	10	1211	495	69	20	1164	530	74	25	1117	561	88	24
GQ359765.1	1293	421	42	0	1240	463	52	1	1189	505	57	5	1138	545	66	7	1087	583	78	8
GQ359771.1	1256	415	36	0	1205	455	45	2	1156	495	49	7	1109	531	57	10	1062	565	68	12
GQ360060.1	1293	425	33	0	1241	467	42	1	1191	509	46	5	1143	547	54	7	1095	583	65	8
GQ365368.1	1273	434	33	0	1220	476	43	1	1169	518	48	5	1121	555	57	7	1073	590	69	8
GQ365410.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ365418.1	1257	411	33	0	1205	453	42	1	1153	497	46	5	1103	537	54	7	1054	574	65	8
GQ365426.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ365428.1	1258	406	34	3	1206	448	41	6	1156	490	44	11	1107	529	51	14	1058	566	61	16
GQ365436.1	1264	395	42	0	1216	431	53	1	1169	468	59	5	1124	501	69	7	1077	534	82	8
GQ365444.1	1282	385	34	0	1234	421	45	1	1188	456	52	5	1144	487	63	7	1100	518	75	8
GQ365446.1	1237	430	34	0	1184	472	44	1	1133	514	49	5	1082	554	58	7	1031	591	71	8
GQ365455.1	1272	396	33	0	1219	439	42	1	1169	480	47	5	1121	517	56	7	1074	550	69	8
GQ365658.1	1285	384	35	0	1236	421	46	1	1189	459	51	5	1144	492	61	7	1100	521	75	8
GQ365666.1	1282	386	33	0	1234	424	42	1	1188	462	46	5	1144	496	54	7	1100	528	65	8
GQ365674.1	1266	425	34	0	1214	466	44	1	1164	507	49	5	1116	544	58	7	1068	579	70	8

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
GQ368664.1	1256	412	33	0	1205	453	42	1	1156	494	46	5	1109	531	54	7	1062	566	65	8
GQ368665.1	1231	437	33	0	1177	481	42	1	1126	524	46	5	1077	563	54	7	1028	600	65	8
GQ368667.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ369403.1	1279	453	45	0	1226	492	53	6	1175	530	60	12	1127	564	69	17	1079	596	81	21
GQ369406.1	1274	447	56	0	1222	483	66	6	1172	518	75	12	1125	549	86	17	1079	577	100	21
GQ369409.1	1297	419	53	8	1247	454	62	12	1198	489	61	25	1152	520	71	26	1105	551	82	28
GQ369412.1	1298	433	46	0	1248	471	50	8	1200	508	54	15	1153	543	60	21	1106	576	69	26
GQ369417.1	1282	429	66	0	1230	463	76	8	1180	497	84	16	1134	526	95	22	1087	556	106	28
GQ369422.1	1303	422	52	0	1254	454	63	6	1207	485	73	12	1161	517	82	17	1115	547	94	21
GQ369425.1	1307	403	67	0	1257	434	78	8	1210	464	87	16	1166	491	98	22	1121	519	109	28
GQ375284.1	1293	423	36	0	1241	464	46	1	1191	505	51	5	1143	542	60	7	1095	577	72	8
GQ377035.1	1256	412	33	0	1205	453	42	1	1155	495	46	5	1106	534	54	7	1057	571	65	8
GQ377043.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ377045.1	1286	382	33	0	1239	419	42	1	1194	456	46	5	1151	489	54	7	1108	520	65	8
GQ377047.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ377052.1	1280	388	33	0	1232	426	42	1	1185	465	46	5	1140	500	54	7	1094	534	65	8
GQ377061.1	1300	370	31	0	1253	407	40	1	1208	444	44	5	1165	477	52	7	1122	508	63	8
GQ377064.1	1281	374	45	1	1233	412	52	4	1187	451	53	10	1143	485	60	13	1099	517	70	15
GQ377069.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ377072.1	1281	385	35	0	1233	422	45	1	1187	460	49	5	1145	493	56	7	1103	523	67	8
GQ377075.1	1282	386	33	0	1234	424	42	1	1188	462	46	5	1144	496	54	7	1100	528	65	8
GQ377082.1	1286	372	43	0	1238	408	54	1	1192	444	60	5	1149	475	70	7	1106	504	83	8
GQ377085.1	1277	378	46	0	1228	414	58	1	1181	450	65	5	1137	481	76	7	1093	510	90	8
GQ377087.1	1282	386	33	0	1234	424	42	1	1188	462	46	5	1144	496	54	7	1100	528	65	8
GQ377093.1	1293	367	41	0	1247	402	51	1	1203	437	56	5	1160	469	65	7	1117	499	77	8
GQ377095.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ377101.1	1279	387	35	0	1233	422	45	1	1188	458	50	5	1145	490	59	7	1102	520	71	8
GQ377103.1	1267	401	33	0	1216	442	42	1	1167	484	45	5	1120	522	52	7	1073	558	62	8
GQ377107.1	1258	410	33	0	1204	454	42	1	1152	498	46	5	1104	535	55	7	1055	571	67	8
GQ379822.1	1273	397	31	0	1224	437	39	1	1177	477	42	5	1132	513	49	7	1086	548	59	8
GQ385300.1	1316	400	37	0	1267	437	48	1	1220	474	54	5	1175	508	62	8	1129	541	73	10
GQ392017.1	1290	398	33	0	1241	437	42	1	1194	476	46	5	1149	511	54	7	1104	544	65	8
GQ392022.1	1293	423	36	0	1241	465	45	1	1191	507	49	5	1143	545	57	7	1095	581	68	8
GQ392029.1	1276	422	33	0	1225	463	42	1	1176	504	46	5	1129	541	54	7	1082	576	65	8
GQ396732.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ397278.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ402187.1	1264	443	36	0	1212	484	46	1	1163	523	52	5	1116	558	62	7	1069	591	75	8
GQ402188.1	1312	398	33	0	1264	436	42	1	1218	474	46	5	1174	508	54	7	1130	540	65	8
GQ402189.1	1296	414	33	0	1247	453	42	1	1200	492	46	5	1155	527	54	7	1110	560	65	8
GQ402190.1	1312	398	33	0	1264	436	42	1	1218	474	46	5	1174	508	54	7	1130	540	65	8
GQ402191.1	1270	435	39	0	1222	471	50	1	1176	506	57	5	1132	537	68	7	1089	564	83	8
GQ402192.1	1302	408	33	0	1252	448	42	1	1204	488	46	5	1158	524	54	7	1112	558	65	8
GQ402193.1	1302	408	33	0	1252	448	42	1	1204	488	46	5	1158	524	54	7	1112	558	65	8
GQ402194.1	1298	410	35	0	1250	447	45	1	1204	484	50	5	1160	517	59	7	1116	548	71	8

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
GQ402195.1	1277	433	33	0	1224	476	42	1	1173	519	46	5	1124	558	54	7	1075	595	65	8
GQ402196.1	1312	398	33	0	1264	436	42	1	1218	474	46	5	1174	508	54	7	1130	540	65	8
GQ402197.1	1307	385	51	0	1259	419	64	1	1213	455	70	5	1169	487	80	7	1125	517	93	8
GQ402198.1	1308	397	38	0	1260	434	48	1	1214	471	53	5	1170	504	62	7	1126	535	74	8
GQ402199.1	1302	408	33	0	1252	448	42	1	1204	488	46	5	1158	524	54	7	1112	558	65	8
GQ402200.1	1272	435	36	0	1222	474	46	1	1174	512	52	5	1128	546	62	7	1082	578	75	8
GQ402201.1	1312	398	33	0	1264	436	42	1	1218	474	46	5	1174	508	54	7	1130	540	65	8
GQ402202.1	1264	443	36	0	1212	484	46	1	1163	523	52	5	1116	558	62	7	1069	591	75	8
GQ402203.1	1273	437	33	0	1222	478	42	1	1175	517	46	5	1130	552	54	7	1085	585	65	8
GQ402204.1	1293	417	33	0	1242	458	42	1	1194	497	47	5	1147	533	56	7	1100	567	68	8
GQ402205.1	1312	398	33	0	1264	436	42	1	1218	474	46	5	1174	508	54	7	1130	540	65	8
GQ402206.1	1280	430	33	0	1229	471	42	1	1181	510	47	5	1135	545	56	7	1089	578	68	8
GQ411897.1	1303	420	43	0	1253	458	53	2	1205	496	58	7	1158	531	67	10	1112	563	78	13
GQ411907.1	1256	412	33	0	1205	453	42	1	1156	494	46	5	1109	531	54	7	1062	566	65	8
GQ411908.1	1220	444	37	0	1168	483	49	1	1118	522	56	5	1070	558	65	8	1023	590	78	10
GQ414764.1	1259	408	34	0	1207	449	44	1	1158	489	49	5	1111	524	59	7	1064	557	72	8
GQ414765.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ414766.1	1231	437	33	0	1177	481	42	1	1125	525	46	5	1075	565	54	7	1025	603	65	8
GQ414767.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ414768.1	1242	426	33	0	1190	468	42	1	1141	508	47	5	1094	544	56	7	1046	579	68	8
GQ421199.1	1272	396	33	0	1222	436	42	1	1174	476	46	5	1128	512	54	7	1082	546	65	8
GQ421200.1	1242	424	35	0	1191	464	45	1	1142	504	50	5	1095	540	59	7	1048	574	71	8
GQ421201.1	1242	421	38	0	1192	458	50	1	1144	495	57	5	1098	530	64	9	1052	562	75	12
GQ421203.1	1254	404	43	0	1203	443	54	1	1154	483	59	5	1108	518	68	7	1062	550	81	8
GQ426218.1	1290	414	42	0	1239	453	53	1	1190	492	59	5	1143	527	69	7	1095	563	79	9
GQ455032.1	1268	398	35	0	1220	435	45	1	1174	472	50	5	1130	505	59	7	1086	536	71	8
GQ457465.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ457470.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ457479.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ457482.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ457487.1	1282	386	33	0	1233	425	42	1	1186	465	45	5	1142	501	51	7	1097	535	61	8
GQ457497.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ457501.1	1238	421	42	0	1187	460	53	1	1139	497	60	5	1093	530	71	7	1047	561	85	8
GQ457506.1	1286	386	29	0	1237	427	36	1	1190	468	38	5	1144	506	44	7	1098	542	53	8
GQ457511.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ457514.1	1246	421	34	0	1195	461	44	1	1146	501	49	5	1098	538	58	7	1050	572	71	8
GQ457517.1	1301	356	44	0	1255	389	56	1	1210	423	63	5	1167	453	74	7	1124	481	88	8
GQ457519.1	1245	423	33	0	1194	463	43	1	1145	503	48	5	1097	540	57	7	1049	574	70	8
GQ463200.1	1272	396	33	0	1222	436	42	1	1174	476	46	5	1128	512	54	7	1082	546	65	8
GQ464408.1	1309	394	33	0	1261	432	42	1	1215	470	46	5	1171	504	54	7	1127	536	65	8
GQ465672.1	1264	443	36	0	1212	484	46	1	1163	523	52	5	1116	558	62	7	1069	591	75	8
GQ465673.1	1296	414	33	0	1244	456	42	1	1193	499	46	5	1144	538	54	7	1095	575	65	8
GQ465674.1	1307	394	42	0	1258	432	52	1	1213	467	58	5	1169	499	68	7	1125	530	80	8
GQ465675.1	1307	394	42	0	1258	432	52	1	1213	467	58	5	1169	499	68	7	1125	530	80	8

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
GQ465676.1	1307	394	42	0	1258	432	52	1	1213	467	58	5	1169	499	68	7	1125	530	80	8
GQ465677.1	1298	410	35	0	1250	447	45	1	1204	484	50	5	1160	517	59	7	1116	548	71	8
GQ465678.1	1293	417	33	0	1241	459	42	1	1191	501	46	5	1143	539	54	7	1095	575	65	8
GQ465679.1	1309	392	42	0	1261	427	49	6	1215	461	55	12	1171	493	62	17	1127	523	72	21
GQ465680.1	1302	408	33	0	1252	448	42	1	1204	488	46	5	1158	524	54	7	1112	558	65	8
GQ465681.1	1308	397	38	0	1260	434	48	1	1214	471	53	5	1170	504	62	7	1126	535	74	8
GQ465682.1	1308	397	38	0	1260	434	48	1	1214	471	53	5	1170	504	62	7	1126	535	74	8
GQ465683.1	1308	397	38	0	1260	434	48	1	1214	471	53	5	1170	504	62	7	1126	535	74	8
GQ485656.1	1289	406	42	1	1238	446	51	3	1189	486	54	9	1141	524	61	12	1093	560	71	14
GQ485661.1	1292	405	41	0	1240	446	51	1	1190	487	56	5	1142	522	67	7	1095	553	82	8
GQ494354.1	1293	423	36	0	1241	465	45	1	1191	507	49	5	1143	545	57	7	1095	581	68	8
GQ496142.1	1298	416	38	0	1250	453	48	1	1204	490	53	5	1160	523	62	7	1116	554	74	8
GQ496149.1	1298	416	38	0	1250	453	48	1	1204	490	53	5	1160	523	62	7	1116	554	74	8
GQ499334.1	1266	402	33	0	1217	441	42	1	1171	478	47	5	1127	512	54	8	1082	546	63	10
GQ499336.1	1282	378	41	0	1234	415	51	1	1189	451	56	5	1146	483	65	7	1102	514	77	8
GQ502906.2	1281	412	38	0	1229	452	49	1	1178	492	56	5	1131	526	67	7	1084	557	82	8
GQ505853.1	1289	406	42	1	1238	445	52	3	1189	484	56	9	1141	521	64	12	1093	556	75	14
GQ527163.1	1239	424	58	0	1185	462	73	1	1134	498	84	5	1086	529	99	7	1040	555	118	8
GQ527164.1	1229	455	37	0	1177	495	48	1	1127	535	54	5	1079	571	64	7	1031	605	77	8
GQ527165.1	1249	429	42	1	1196	471	51	3	1145	513	54	9	1095	553	61	12	1045	591	71	14
GQ527166.1	1232	441	48	0	1180	479	61	1	1129	519	68	5	1080	556	78	7	1031	591	91	8
GQ527167.1	1289	406	42	1	1238	446	51	3	1189	486	54	9	1141	524	61	12	1093	560	71	14
GQ866928.1	1233	456	51	1	1179	497	62	3	1127	538	66	10	1075	577	73	16	1025	611	84	20
GQ866929.1	1231	436	45	0	1180	473	58	1	1130	510	67	5	1082	543	80	7	1034	577	92	9
GQ866931.1	1245	426	43	0	1193	465	55	1	1144	502	63	5	1097	535	75	7	1049	569	87	9
GQ866951.1	1298	455	44	13	1242	497	53	16	1190	534	63	15	1140	569	75	11	1089	604	88	12
GQ866959.1	1204	451	51	0	1149	490	66	1	1096	530	75	5	1044	567	88	7	992	603	102	9
GQ894806.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1112	528	54	7	1063	565	65	8
GQ894808.1	1236	429	36	0	1183	470	47	1	1132	511	53	5	1084	547	63	7	1036	581	76	8
GQ894816.1	1272	396	33	0	1222	436	42	1	1174	476	46	5	1128	512	54	7	1082	546	65	8
GQ894821.1	1281	377	43	0	1233	413	54	1	1187	449	60	5	1143	481	70	7	1099	511	83	8
GQ894825.1	1256	412	33	0	1205	453	42	1	1156	494	46	5	1109	531	54	7	1062	566	65	8
GQ894827.1	1268	398	35	0	1220	435	45	1	1174	472	50	5	1130	505	59	7	1086	536	71	8
GQ894828.1	1255	413	33	0	1200	458	42	1	1148	502	46	5	1100	538	56	7	1051	573	69	8
GQ894830.1	1247	421	33	0	1194	464	42	1	1143	507	46	5	1094	546	54	7	1045	583	65	8
GQ894839.1	1256	412	33	0	1205	453	42	1	1156	494	46	5	1109	531	54	7	1062	566	65	8
GQ894841.1	1253	411	37	0	1201	451	48	1	1151	492	52	6	1103	531	57	10	1055	568	65	13
GQ894842.1	1264	399	38	0	1219	430	51	1	1176	460	60	5	1135	486	73	7	1093	513	87	8
GQ894845.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GQ894849.1	1261	407	33	0	1209	449	42	1	1159	491	46	5	1111	529	54	7	1063	565	65	8
GQ894862.1	1281	379	41	0	1233	413	54	1	1187	449	60	5	1143	481	70	7	1099	511	83	8
GQ894865.1	1262	406	33	0	1211	447	42	1	1162	488	46	5	1115	525	54	7	1068	560	65	8
GQ894869.1	1270	397	34	0	1222	434	44	1	1176	471	49	5	1132	504	58	7	1088	535	70	8
GQ894898.1	1259	400	42	0	1211	436	53	1	1165	472	59	5	1121	504	69	7	1077	534	82	8

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
GQ894899.1	1282	386	33	0	1233	425	42	1	1186	464	46	5	1141	499	54	7	1096	532	65	8
GQ894905.1	1261	407	33	0	1211	446	43	1	1163	485	48	5	1117	520	57	7	1071	553	69	8
GQ894906.1	1282	383	36	0	1234	418	46	3	1188	455	50	8	1144	489	56	12	1100	522	62	17
GQ894907.1	1259	400	42	0	1211	436	53	1	1165	472	59	5	1121	504	69	7	1077	534	82	8
GQ894911.1	1257	403	41	0	1205	442	53	1	1155	483	58	5	1107	520	67	7	1059	555	79	8
GQ894913.1	1256	412	33	0	1205	453	42	1	1156	494	46	5	1109	531	54	7	1062	566	65	8
GQ894920.1	1276	390	35	0	1229	426	45	1	1184	462	50	5	1141	494	59	7	1098	524	71	8
GQ894922.1	1265	397	39	0	1217	432	51	1	1170	468	58	5	1125	499	70	7	1080	530	82	9
GQ894929.1	1248	415	38	0	1202	447	51	1	1158	478	60	5	1116	505	73	7	1073	533	87	8
GQ894934.1	1264	399	38	0	1219	430	51	1	1176	460	60	5	1135	486	73	7	1093	513	87	8
GQ894935.1	1259	413	29	0	1208	453	39	1	1159	493	44	5	1111	532	50	8	1063	569	59	10
GQ915017.1	1268	402	31	0	1216	445	39	1	1166	488	42	5	1118	527	49	7	1069	565	59	8
GQ915018.1	1273	397	31	0	1221	440	39	1	1171	483	42	5	1122	523	49	7	1073	561	59	8
GQ915019.1	1254	404	43	0	1201	442	56	2	1151	480	60	10	1103	517	67	14	1055	552	78	16
GQ915020.1	1257	413	31	0	1206	455	39	1	1158	495	43	5	1111	532	51	7	1063	568	62	8
GQ915021.1	1264	406	31	0	1212	449	39	1	1163	490	43	5	1115	528	51	7	1066	565	62	8
GQ915022.1	1265	403	33	0	1212	446	42	1	1160	490	46	5	1110	530	54	7	1061	567	65	8
GQ915023.1	1284	384	33	0	1233	425	42	1	1184	466	46	5	1138	501	55	7	1092	534	67	8
GQ915024.1	1256	412	33	0	1203	455	42	1	1152	498	46	5	1103	537	54	7	1054	574	65	8
GQ915025.1	1256	412	33	0	1205	453	42	1	1156	494	46	5	1109	531	54	7	1062	566	65	8
GQ915076.1	1256	389	55	1	1206	426	66	3	1158	463	71	9	1111	498	80	12	1063	534	89	15
GU014748.1	1242	413	45	1	1187	458	52	4	1136	499	56	10	1088	534	66	13	1041	566	79	15
GU014750.1	1263	397	41	0	1212	437	51	1	1163	476	57	5	1116	512	66	7	1068	547	78	8
GU014752.1	1260	408	33	0	1210	447	43	1	1162	486	48	5	1116	521	57	7	1070	554	69	8
GU014754.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GU014756.1	1279	387	35	0	1227	428	45	1	1179	469	45	8	1132	505	53	11	1085	539	64	13
GU014758.1	1251	417	33	0	1198	459	43	1	1148	500	48	5	1100	536	58	7	1052	570	71	8
GU014760.1	1233	434	34	0	1180	476	44	1	1129	518	49	5	1082	552	60	7	1035	584	74	8
GU014762.1	1233	434	34	0	1180	476	44	1	1129	518	49	5	1082	552	60	7	1035	584	74	8
GU014764.1	1283	386	32	0	1235	425	40	1	1189	465	42	5	1145	501	48	7	1101	535	57	8
GU014766.1	1253	415	33	0	1198	460	42	1	1146	504	46	5	1096	544	54	7	1047	581	65	8
GU014768.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GU014770.1	1244	406	51	0	1193	441	66	1	1144	477	75	5	1098	507	89	7	1051	539	102	9
GU014772.1	1259	402	40	0	1204	445	51	1	1152	486	58	5	1103	524	67	7	1054	560	79	8
GU014774.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GU014776.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GU014778.1	1258	410	33	0	1204	454	42	1	1152	498	46	5	1104	535	55	7	1055	571	67	8
GU014780.1	1237	425	39	0	1185	465	50	1	1135	505	56	5	1087	541	66	7	1039	575	79	8
GU014782.1	1265	400	36	0	1213	441	46	1	1163	482	51	5	1115	519	60	7	1067	554	72	8
GU014784.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GU014786.1	1248	419	34	0	1196	460	44	1	1146	501	49	5	1098	539	56	8	1050	575	66	10
GU014788.1	1259	408	34	0	1208	448	44	1	1159	488	49	5	1112	524	58	7	1066	557	70	8
GU014790.1	1258	406	34	3	1206	448	41	6	1156	490	44	11	1107	529	51	14	1058	566	61	16
GU014792.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
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GU014796.1	1263	403	35	0	1211	444	45	1	1161	485	50	5	1113	522	59	7	1065	557	71	8
GU014798.1	1261	404	36	0	1211	442	47	1	1163	480	53	5	1117	515	62	7	1071	548	74	8
GU014800.1	1249	418	34	0	1197	459	44	1	1147	500	49	5	1099	537	58	7	1052	571	70	8
GU014802.1	1256	412	33	0	1205	453	42	1	1156	494	46	5	1109	531	54	7	1062	566	65	8
GU014804.1	1280	364	57	0	1232	398	70	1	1186	433	77	5	1142	464	88	7	1098	493	102	8
GU014806.1	1257	410	34	0	1205	451	44	1	1155	492	49	5	1107	529	58	7	1059	564	70	8
GU014808.1	1269	399	33	0	1218	440	42	1	1169	481	46	5	1122	518	54	7	1075	553	65	8
GU014810.1	1261	407	33	0	1206	452	42	1	1153	497	46	5	1104	536	54	7	1055	573	65	8
GU045582.1	1257	411	33	0	1204	454	42	1	1153	497	46	5	1104	536	54	7	1056	571	66	8
GU045583.1	1246	418	37	0	1194	458	48	1	1144	498	54	5	1096	533	65	7	1049	565	79	8
GU045584.1	1231	432	38	0	1179	471	50	1	1130	508	58	5	1083	540	71	7	1038	567	88	8
GU057010.1	1249	417	35	0	1197	458	45	1	1147	500	49	5	1099	538	56	8	1051	574	66	10
GU057011.1	1247	419	35	0	1194	460	46	1	1143	501	52	5	1094	539	60	8	1046	573	72	10
GU057012.1	1249	417	35	0	1197	458	45	1	1147	500	49	5	1099	538	56	8	1051	574	66	10
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GU057016.1	1249	417	35	0	1197	458	45	1	1147	500	49	5	1099	538	56	8	1051	574	66	10
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GU057021.1	1249	417	35	0	1197	458	45	1	1147	500	49	5	1099	538	56	8	1051	574	66	10
GU057022.1	1245	412	44	0	1194	452	52	3	1145	491	57	8	1097	527	66	11	1049	563	75	14
GU057023.1	1252	414	35	0	1200	457	41	3	1150	499	44	8	1101	538	51	11	1053	574	61	13
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GU057026.1	1245	412	44	0	1194	452	52	3	1145	491	57	8	1097	527	66	11	1049	563	75	14
GU057027.1	1246	420	35	0	1194	463	41	3	1144	505	44	8	1096	542	52	11	1049	574	65	13
GU057028.1	1252	414	35	0	1200	457	41	3	1150	499	44	8	1101	538	51	11	1053	574	61	13
GU057029.1	1252	414	35	0	1200	457	41	3	1150	499	44	8	1101	538	51	11	1053	574	61	13
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GU057031.1	1252	414	35	0	1200	457	41	3	1150	499	44	8	1101	538	51	11	1053	574	61	13
GU108486.1	1300	435	39	0	1246	479	46	3	1194	523	50	7	1144	563	58	9	1093	602	69	10
GU112090.1	1296	439	34	0	1241	484	43	1	1188	529	47	5	1137	570	55	7	1085	610	66	8
GU117765.1	1231	437	33	0	1177	481	42	1	1126	523	47	5	1078	559	57	7	1030	593	70	8
GU189640.1	1261	397	44	0	1208	438	55	1	1157	481	59	5	1108	520	63	11	1059	556	73	14
GU189649.1	1296	439	34	0	1241	484	43	1	1188	529	47	5	1137	570	55	7	1085	610	66	8
GU198201.1	1249	417	35	0	1197	458	45	1	1147	500	49	5	1099	538	56	8	1051	574	66	10
GU211219.1	1306	409	37	0	1258	446	47	1	1212	483	52	5	1168	517	60	7	1123	550	71	8
GU211227.1	1293	423	36	0	1241	465	45	1	1191	507	49	5	1143	545	57	7	1095	581	68	8
GU211235.1	1293	422	36	0	1241	464	45	1	1191	506	49	5	1143	544	57	7	1095	580	68	8
GU211243.1	1277	437	38	0	1222	480	49	1	1170	521	56	5	1120	558	67	7	1071	591	82	8

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
GU214058.1	1261	407	33	0	1210	448	42	1	1161	489	46	5	1113	527	54	7	1065	562	66	8
GU220604.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GU226570.2	1279	389	33	0	1228	430	42	1	1179	471	46	5	1132	508	54	7	1085	543	65	8
GU226571.2	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
GU226572.2	1252	413	36	0	1197	457	46	1	1144	501	51	5	1096	538	60	7	1048	573	72	8
GU271944.1	1279	424	35	0	1227	465	45	1	1177	507	49	5	1129	545	56	8	1081	581	66	10
GU290047.1	1293	417	33	0	1241	459	42	1	1191	501	46	5	1143	539	54	7	1095	575	65	8
GU290055.1	1291	415	37	0	1236	457	49	1	1184	497	57	5	1134	535	66	8	1085	570	78	10
GU290188.1	1248	411	42	0	1193	452	55	1	1141	493	62	5	1093	528	73	7	1044	563	86	8
GU290190.1	1224	435	42	0	1166	479	55	1	1110	524	62	5	1060	560	74	7	1009	596	88	8
GU292341.1	1267	418	32	0	1217	458	41	1	1169	498	45	5	1123	534	53	7	1076	569	64	8
GU292344.1	1236	421	41	0	1183	463	51	1	1132	506	55	5	1082	546	63	7	1032	583	75	8
GU292345.1	1217	446	35	0	1160	491	46	1	1106	534	53	5	1056	573	62	7	1004	612	74	8
GU292346.1	1238	408	51	1	1186	448	61	3	1136	488	65	9	1086	528	72	12	1038	563	83	14
GU292347.1	1239	425	34	0	1186	467	44	1	1136	507	50	5	1088	545	58	7	1040	581	69	8
GU292348.1	1254	402	42	0	1199	445	53	1	1146	487	60	5	1095	527	69	7	1045	564	81	8
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GU292350.1	1244	408	46	0	1192	448	57	1	1142	488	63	5	1094	524	73	7	1046	558	86	8
GU292351.1	1231	434	33	0	1176	479	42	1	1123	524	46	5	1072	565	54	7	1022	603	65	8
GU292352.1	1203	451	44	0	1149	489	59	1	1098	526	69	5	1050	558	83	7	1002	588	100	8
GU292353.1	1246	410	42	0	1195	446	56	1	1146	484	63	5	1099	519	73	7	1052	553	84	9
GU292354.1	1246	410	42	0	1195	445	57	1	1146	482	65	5	1099	516	76	7	1052	549	88	9
GU292355.1	1222	425	51	0	1171	458	68	1	1122	492	79	5	1075	526	90	7	1028	559	100	11
GU292356.1	1253	412	33	0	1199	456	42	1	1147	500	46	5	1097	540	54	7	1047	578	65	8
GU323343.1	1294	429	44	0	1241	470	55	1	1190	512	60	5	1141	549	70	7	1092	584	83	8
GU324344.1	1306	431	40	0	1249	475	52	1	1196	516	60	5	1145	552	73	7	1095	585	87	10
GU332630.1	1213	440	47	1	1157	483	57	4	1105	522	64	10	1055	558	75	13	1005	592	89	15
GU332633.1	1232	430	37	1	1174	475	48	3	1119	520	50	11	1068	560	56	16	1018	596	66	20
GU338362.1	1304	416	37	7	1252	458	44	8	1202	500	48	10	1154	538	56	10	1105	576	65	11
GU338363.1	1288	422	42	7	1234	465	49	9	1182	507	55	10	1133	543	66	10	1083	579	78	11
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GU367317.1	1270	448	42	1	1217	489	51	4	1167	529	56	8	1119	567	60	12	1070	604	70	11
GU367325.1	1289	415	47	1	1238	456	54	4	1189	497	57	9	1141	535	64	12	1093	570	75	14
GU367327.1	1284	437	41	1	1231	479	50	3	1181	517	60	5	1133	552	72	6	1085	585	86	7
GU369646.1	1245	416	40	0	1191	458	51	1	1140	499	57	5	1091	538	65	7	1044	573	76	8
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GU369648.1	1261	407	33	0	1210	448	42	1	1161	489	46	5	1113	527	54	7	1065	562	66	8
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GU369652.1	1298	435	41	9	1246	475	49	11	1196	516	53	12	1147	554	62	11	1097	591	73	12
GU369654.1	1298	433	41	10	1244	477	47	12	1192	520	52	12	1141	560	61	10	1090	599	71	11
GU369655.1	1289	443	41	9	1236	485	48	11	1184	528	53	11	1134	566	63	10	1084	601	76	11
GU369656.1	1286	441	40	3	1234	481	49	6	1184	521	55	8	1135	558	65	9	1085	594	77	11
GU369657.1	1276	428	44	0	1223	470	52	3	1171	514	56	7	1122	552	65	9	1073	588	77	9
GU369660.1	1286	442	44	9	1234	482	52	11	1184	522	58	11	1135	559	68	10	1085	595	80	11

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Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
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GU369663.1	1282	435	43	9	1228	478	50	11	1176	520	56	11	1126	558	66	10	1076	594	78	11
GU369664.1	1291	437	44	10	1238	478	50	14	1187	519	53	17	1137	558	59	19	1086	598	65	22
GU369665.1	1291	441	42	13	1238	481	48	18	1187	521	51	21	1137	559	57	21	1086	598	63	23
GU369666.1	1280	443	49	10	1227	483	56	14	1176	523	60	17	1126	561	67	19	1075	600	74	22
GU369671.1	1268	462	43	9	1210	507	52	11	1156	548	61	11	1104	587	72	10	1051	626	84	11
GU369672.1	1250	478	40	6	1196	516	51	9	1145	552	62	11	1095	588	72	12	1045	623	83	12
GU369673.1	1263	466	44	9	1209	506	54	11	1157	547	61	11	1107	583	73	10	1056	620	85	11
GU369674.1	1265	434	38	9	1210	479	44	11	1157	523	49	11	1106	563	58	10	1054	603	68	11
GU371256.1	1237	471	36	0	1178	520	45	1	1125	560	54	5	1075	597	65	7	1023	634	79	8
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GU371270.1	1266	406	29	0	1215	448	37	1	1166	490	40	5	1118	529	47	7	1069	566	58	8
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GU433025.1	1274	431	47	0	1220	471	60	1	1169	509	69	5	1120	543	82	7	1071	576	96	9
GU433033.1	1293	423	36	0	1241	465	45	1	1191	507	49	5	1143	545	57	7	1095	581	68	8
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GU470879.1	1263	405	33	0	1211	447	42	1	1161	489	46	5	1113	527	54	7	1065	563	65	8
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GU480925.1	1255	413	33	0	1203	455	42	1	1153	497	46	5	1106	534	54	7	1059	569	65	8
GU480928.1	1226	416	59	0	1172	453	75	1	1120	492	84	5	1069	530	95	7	1019	564	110	8
GU480938.1	1284	432	36	0	1232	474	45	1	1182	517	48	5	1134	556	54	8	1085	594	63	10
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GU560008.1	1279	435	38	0	1227	476	48	1	1177	518	52	5	1129	556	59	8	1081	592	69	10
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GU560024.1	1245	434	31	0	1187	483	39	1	1130	533	42	5	1077	576	50	7	1023	618	61	8
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GU560026.1	1254	387	46	1	1202	427	55	4	1152	468	58	10	1105	503	65	15	1059	535	76	18
GU562450.1	1283	423	45	1	1231	465	52	4	1180	509	53	10	1131	548	59	14	1081	587	67	17
GU562458.1	1284	432	36	0	1232	474	45	1	1182	517	48	5	1134	556	54	8	1085	594	63	10
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GU576512.1	1246	421	34	0	1195	461	44	1	1146	501	49	5	1098	538	58	7	1050	572	71	8
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GU576517.1	1217	442	42	0	1166	478	56	1	1117	515	64	5	1069	548	77	7	1021	579	93	8
GU576519.1	1233	434	34	0	1178	478	44	1	1125	522	49	5	1073	563	58	7	1021	601	71	8

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Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
GU576521.1	1246	421	34	0	1195	461	44	1	1146	501	49	5	1098	538	58	7	1050	572	71	8
GU576522.1	1232	435	34	0	1180	476	44	1	1131	515	50	5	1083	551	60	7	1034	585	74	8
GU576524.1	1234	429	38	0	1183	468	49	1	1134	506	56	5	1086	542	66	7	1038	575	80	8
GU576540.1	1242	425	34	0	1186	470	45	0	1134	511	56	0	1085	549	65	2	1036	585	76	4
GU576542.1	1250	415	36	0	1198	456	46	1	1148	497	51	5	1100	535	58	8	1052	571	68	10
GU592889.1	1274	431	47	0	1220	471	60	1	1169	509	69	5	1120	543	82	7	1071	576	96	9
GU592897.1	1284	431	39	0	1233	471	49	1	1185	510	53	6	1137	549	58	10	1089	586	66	13
GU592905.1	1298	427	36	0	1245	469	46	1	1193	512	51	5	1143	551	60	7	1093	588	72	8
GU595065.1	1210	420	64	1	1158	455	79	3	1108	492	85	10	1059	528	92	16	1010	563	101	21
GU727573.1	1229	418	33	0	1178	459	42	1	1128	501	46	5	1079	540	54	7	1030	576	66	8
GU727825.1	1289	416	39	0	1234	459	50	1	1181	503	55	5	1131	541	65	7	1082	574	80	8
GU946680.1	1242	426	33	0	1187	471	42	1	1136	514	46	5	1087	553	54	7	1037	591	65	8
GU953235.1	1259	407	35	0	1208	447	45	1	1159	487	50	5	1112	523	59	7	1064	558	71	8
GU953238.1	1242	426	33	0	1187	471	42	1	1136	514	46	5	1087	553	54	7	1037	591	65	8
GU968907.1	1254	409	38	0	1201	447	52	1	1151	486	59	5	1104	522	64	11	1057	556	71	17
GU968908.2	1242	404	55	0	1188	441	71	1	1137	480	78	6	1089	514	88	10	1041	546	100	14
GU968909.2	1252	414	35	0	1200	457	41	3	1150	499	44	8	1102	537	51	11	1054	573	61	13
GU968910.2	1252	414	35	0	1200	457	41	3	1150	499	44	8	1102	537	51	11	1054	573	61	13
GU968911.2	1249	417	35	0	1197	458	45	1	1147	500	49	5	1099	538	56	8	1051	574	66	10
GU968912.2	1244	416	41	0	1192	456	52	1	1142	497	57	5	1095	533	65	8	1048	567	76	10
GU968913.1	1242	424	35	0	1189	466	45	1	1138	507	51	5	1090	540	63	8	1042	573	76	10
GU968914.2	1251	417	33	0	1199	459	42	1	1148	502	46	5	1098	542	54	7	1048	580	65	8
GU968915.2	1249	417	35	0	1197	458	45	1	1147	500	49	5	1099	538	56	8	1051	574	66	10
GU968916.2	1259	409	33	0	1206	452	42	1	1155	495	46	5	1106	534	54	7	1057	571	65	8
GU968917.2	1246	420	35	0	1193	462	45	1	1142	505	49	5	1095	542	56	8	1046	579	66	10
GU968918.2	1272	404	25	0	1222	443	35	1	1174	483	39	5	1127	521	45	8	1080	557	53	11
GU968919.1	1257	411	33	0	1204	454	42	1	1153	497	46	5	1104	534	56	7	1056	567	70	8
GU968920.2	1249	417	35	0	1197	458	45	1	1147	500	49	5	1099	538	56	8	1051	574	66	10
GU968921.2	1249	417	35	0	1197	458	45	1	1147	500	49	5	1100	537	56	8	1053	572	66	10
GU979208.1	1267	396	37	1	1211	439	48	3	1158	482	50	11	1109	520	56	16	1061	554	66	20
GU984387.1	1229	441	31	0	1176	480	42	3	1126	520	46	9	1079	555	53	12	1032	588	66	8
GU984390.1	1234	429	38	0	1182	469	49	1	1133	508	55	5	1086	543	65	7	1040	575	78	8
GU984393.1	1235	433	33	0	1178	480	42	1	1124	526	46	5	1073	566	55	7	1023	603	67	8
GU984396.1	1253	415	33	0	1200	458	42	1	1151	499	46	5	1104	536	54	7	1056	572	65	8
GU984399.1	1247	417	36	1	1195	456	47	3	1145	496	50	10	1097	533	56	15	1050	567	65	19
GU984402.1	1235	428	37	1	1183	466	49	3	1133	505	53	10	1085	540	61	15	1038	572	72	19
GU984405.1	1213	452	36	0	1155	500	45	1	1102	544	50	5	1051	583	60	7	1000	620	73	8
GU984408.1	1213	452	36	0	1155	500	45	1	1102	544	50	5	1051	583	60	7	1000	620	73	8
GU984411.1	1233	428	40	0	1179	469	52	1	1130	508	58	5	1083	542	69	7	1035	575	83	8
GU984414.1	1253	415	33	0	1200	458	42	1	1151	499	46	5	1104	536	54	7	1056	572	65	8
GU984417.1	1253	415	33	0	1200	458	42	1	1151	499	46	5	1104	536	54	7	1056	572	65	8
HM006714.1	1244	422	35	0	1191	464	45	1	1140	507	49	5	1091	546	56	8	1042	583	66	10
HM006715.1	1234	426	41	0	1181	467	52	1	1130	509	57	5	1081	547	65	8	1032	583	76	10
HM006716.1	1244	422	35	0	1191	464	45	1	1140	507	49	5	1091	546	56	8	1042	583	66	10

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
HM006717.1	1253	413	35	0	1202	453	45	1	1153	494	49	5	1106	531	56	8	1059	566	66	10
HM006718.1	1244	422	35	0	1191	464	45	1	1140	507	49	5	1091	546	56	8	1042	583	66	10
HM006719.1	1242	419	40	0	1191	458	51	1	1142	498	56	5	1095	534	64	8	1048	568	75	10
HM006720.1	1238	428	35	0	1184	471	45	1	1132	515	49	5	1082	555	56	8	1032	593	66	10
HM012479.1	1227	442	32	0	1172	482	44	3	1120	522	50	9	1071	556	60	12	1021	589	76	8
HM014332.1	1294	434	59	4	1240	474	68	9	1188	513	73	16	1137	550	83	19	1085	587	94	23
HM101145.1	1295	423	26	0	1242	467	35	0	1192	507	45	0	1144	545	55	0	1095	582	67	0
HM104477.1	1280	427	36	1	1228	469	43	4	1179	509	47	9	1130	548	54	12	1081	585	65	13
HM124383.1	1294	425	25	0	1241	468	35	0	1190	506	48	0	1140	544	60	0	1091	578	75	0
HM138491.1	1261	426	33	0	1208	469	42	1	1157	512	46	5	1107	552	54	7	1058	589	65	8
HM138493.1	1268	449	35	0	1212	494	45	1	1158	539	50	5	1106	580	59	7	1055	618	71	8
HM138501.1	1286	413	51	1	1233	455	59	4	1182	497	63	9	1131	537	71	12	1080	574	83	14
HM157254.1	1268	424	51	1	1212	470	58	4	1160	512	62	10	1111	546	74	13	1060	580	89	15
HM165185.1	1259	408	34	0	1208	447	45	1	1159	487	50	5	1112	523	58	8	1065	557	68	11
HM173599.1	1296	435	47	0	1243	478	52	5	1192	520	54	11	1142	559	60	15	1092	596	71	16
HM204566.1	1265	454	47	3	1209	498	54	7	1155	542	57	10	1103	582	64	12	1052	619	76	12
HM204567.1	1271	405	33	0	1219	447	42	1	1169	489	46	5	1121	527	54	7	1073	563	65	8
HM204568.1	1248	450	57	0	1193	487	72	3	1142	522	83	7	1093	556	96	8	1044	588	112	9
HM204569.1	1219	453	36	0	1164	497	46	1	1111	541	51	5	1061	579	61	7	1012	613	75	8
HM204570.1	1246	431	34	0	1192	474	44	1	1140	517	49	5	1092	554	58	7	1044	589	70	8
HM204571.1	1256	417	35	0	1205	456	46	1	1156	496	50	6	1109	532	58	9	1062	566	69	11
HM204572.1	1210	489	45	0	1154	531	58	1	1102	568	69	5	1051	604	79	10	1000	638	94	12
HM204573.1	1240	420	46	1	1187	459	58	3	1136	499	63	9	1085	538	72	12	1034	575	84	14
HM204574.1	1262	413	33	0	1211	454	42	1	1161	496	46	5	1113	534	54	7	1065	570	65	8
HM204575.1	1302	417	49	3	1249	457	56	8	1198	499	56	13	1149	538	59	17	1099	576	69	14
HM204576.1	1278	399	31	0	1228	440	39	1	1179	482	42	5	1133	519	49	7	1086	555	59	8
HM204577.1	1270	431	42	1	1214	472	55	3	1160	515	59	10	1109	554	66	15	1058	592	75	19
HM204578.1	1239	451	53	1	1182	493	66	3	1127	537	68	12	1074	578	74	18	1021	618	82	23
HM204579.1	1276	436	53	5	1221	474	64	10	1169	512	68	15	1118	550	72	21	1068	586	80	25
HM214472.1	1267	401	33	0	1219	439	42	1	1172	478	46	5	1127	513	54	7	1080	548	65	8
HM214474.1	1262	406	33	0	1214	444	42	1	1167	483	46	5	1122	518	54	7	1075	553	65	8
HM214478.1	1262	406	33	0	1214	444	42	1	1167	483	46	5	1122	518	54	7	1075	553	65	8
HM219618.1	1256	417	28	0	1203	457	40	1	1154	496	46	5	1107	533	53	8	1059	569	63	10
HM219621.1	1192	409	100	0	1132	443	125	1	1077	475	143	6	1024	506	161	10	974	532	181	14
HM219624.1	1244	411	45	1	1194	444	60	3	1147	477	67	10	1102	507	77	15	1058	535	87	21
HM219627.1	1246	407	48	0	1195	442	63	1	1146	478	72	5	1098	514	81	8	1050	550	90	11
HM219630.1	1249	397	55	0	1198	436	64	3	1148	476	68	9	1098	515	74	14	1049	550	85	17
HM219633.1	1244	411	45	1	1194	444	60	3	1147	477	67	10	1102	507	77	15	1058	535	87	21
HM219636.1	1244	411	45	1	1194	444	60	3	1147	477	67	10	1102	507	77	15	1058	535	87	21
HM219639.1	1250	419	32	0	1196	463	41	1	1146	505	45	5	1098	542	54	7	1051	576	66	8

Appendix D

Number of Host-blind (All Influenza Sequences Excluding 2009 H1N1) N-mers 0, 1, 2, OR 3+ Changes Away Present in each Pandemic Influenza 2009 H1N1 (Segment 6) Sequences Considered

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
AB514228.1	923	346	123	18	880	362	135	32	836	383	143	39	798	397	154	43	758	415	166	46
AB514229.1	918	351	123	18	875	367	135	32	830	389	143	39	792	403	154	43	752	421	166	46
AB531445.1	911	357	123	19	867	372	136	34	823	391	145	42	783	406	156	47	741	425	168	51
AB537490.1	894	378	120	18	843	403	131	32	793	432	137	39	748	452	149	43	701	476	162	46
AB538391.1	939	362	123	18	893	381	135	32	846	405	143	39	804	423	154	43	760	445	166	46
CY039528.2	940	377	123	18	894	395	136	32	848	416	146	39	807	431	159	43	764	450	173	46
CY039895.1	917	348	131	18	874	362	145	32	828	385	153	39	789	401	163	43	748	421	174	46
CY039903.1	906	361	127	18	862	377	140	32	817	398	149	39	779	410	162	43	739	427	174	47
CY039988.1	910	363	119	18	866	381	130	32	823	402	137	39	785	415	149	43	745	432	162	46
CY040001.1	930	351	123	18	886	368	135	32	841	390	143	39	801	406	154	43	759	426	166	46
CY040009.1	933	351	123	18	889	368	135	32	844	390	143	39	804	406	154	43	762	426	166	46
CY040017.1	929	351	123	18	885	368	135	32	840	390	143	39	800	406	154	43	758	426	166	46
CY040025.1	920	351	123	18	876	368	135	32	831	390	143	39	791	406	154	43	749	426	166	46
CY040033.1	911	361	123	18	867	378	135	32	821	401	143	39	782	416	154	43	741	435	166	46
CY040044.1	930	351	123	18	886	368	135	32	841	390	143	39	801	406	154	43	759	426	166	46
CY040458.1	905	351	123	18	862	367	135	32	818	388	143	39	779	403	154	43	738	423	165	46
CY040607.1	930	351	123	18	886	368	135	32	841	390	143	39	801	406	154	43	759	426	166	46
CY040615.1	930	351	123	18	886	368	135	32	841	390	143	39	801	406	154	43	759	426	166	46
CY040623.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY040631.1	920	351	123	18	876	368	135	32	831	390	143	39	791	406	154	43	749	426	166	46
CY040639.2	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY040647.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY040655.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY040663.1	928	344	122	18	883	363	133	32	837	388	139	39	796	405	150	43	753	426	162	46
CY040671.1	930	351	123	18	886	368	135	32	841	390	143	39	801	406	154	43	759	426	166	46
CY040679.2	920	351	123	18	876	368	135	32	831	390	143	39	791	406	154	43	749	426	166	46
CY040687.2	920	351	123	18	876	368	135	32	831	390	143	39	791	406	154	43	749	426	166	46
CY040695.2	920	351	123	18	876	368	135	32	831	390	143	39	791	406	154	43	749	426	166	46
CY040703.1	920	351	123	18	876	368	135	32	831	390	143	39	791	406	154	43	749	426	166	46
CY040711.1	930	351	123	18	886	368	135	32	841	390	143	39	801	406	154	43	759	426	166	46
CY040719.1	941	331	122	18	897	349	133	32	852	373	139	39	812	389	150	43	772	407	162	46
CY040727.2	922	351	123	18	878	368	135	32	833	390	143	39	793	406	154	43	751	426	166	46
CY040736.2	918	358	120	18	874	375	134	30	828	398	146	33	789	413	162	32	749	431	176	34

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY040744.1	930	351	123	18	886	368	135	32	841	390	143	39	801	406	154	43	759	426	166	46
CY040752.1	925	351	123	18	881	368	135	32	836	390	143	39	796	406	154	43	754	426	166	46
CY040760.1	919	351	123	18	875	368	135	32	830	390	143	39	790	406	154	43	748	426	166	46
CY040768.1	922	351	123	18	878	368	135	32	833	390	143	39	793	406	154	43	751	426	166	46
CY040776.1	921	351	123	18	877	368	135	32	832	390	143	39	792	406	154	43	750	426	166	46
CY040784.2	923	337	137	18	879	354	148	33	834	378	150	44	794	395	157	51	752	416	166	56
CY040792.1	925	345	124	19	880	365	133	34	834	389	137	44	793	407	146	49	750	428	158	52
CY040800.1	930	351	123	18	886	368	135	32	841	390	143	39	801	406	154	43	759	426	166	46
CY040808.1	930	351	123	18	886	368	135	32	841	390	143	39	801	406	154	43	759	426	166	46
CY040816.1	930	351	123	18	886	368	135	32	841	390	143	39	801	406	154	43	759	426	166	46
CY040824.1	920	351	123	18	876	368	135	32	831	390	143	39	791	406	154	43	749	426	166	46
CY040832.1	920	351	123	18	876	368	135	32	831	390	143	39	791	406	154	43	749	426	166	46
CY040840.1	921	351	123	18	877	368	135	32	832	390	143	39	792	406	154	43	750	426	166	46
CY040848.2	918	353	121	18	874	371	131	33	829	395	136	41	789	411	145	47	747	428	158	52
CY040856.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY040864.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY040874.1	918	358	123	18	874	375	135	32	828	398	143	39	789	413	154	43	748	432	166	46
CY040882.1	921	355	123	18	877	372	135	32	831	395	143	39	792	410	154	43	751	429	166	46
CY040890.1	889	346	154	21	846	357	161	46	801	377	163	56	763	390	172	54	723	407	182	54
CY041052.1	936	344	122	18	891	363	133	32	845	388	139	39	804	405	150	43	761	426	162	46
CY041060.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY041068.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY041076.1	927	351	123	18	883	368	135	32	838	390	143	39	798	406	154	43	756	426	166	46
CY041084.1	924	345	124	19	879	365	133	34	833	389	137	44	792	407	146	49	749	428	158	52
CY041092.1	922	351	123	18	878	368	135	32	833	390	143	39	793	406	154	43	751	426	166	46
CY041100.1	920	351	123	18	876	368	135	32	831	390	143	39	791	406	154	43	749	426	166	46
CY041108.1	916	355	123	18	872	372	135	32	826	395	143	39	787	410	154	43	746	429	166	46
CY041116.1	921	351	123	18	877	368	135	32	832	390	143	39	792	406	154	43	750	426	166	46
CY041124.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY041132.1	919	351	123	18	875	368	135	32	830	390	143	39	790	406	154	43	748	426	166	46
CY041140.1	915	351	123	18	871	368	135	32	826	390	143	39	786	406	154	43	744	426	166	46
CY041148.1	916	355	123	18	872	372	135	32	826	395	143	39	787	410	154	43	746	429	166	46
CY041156.1	924	355	123	18	880	372	135	32	834	395	143	39	795	410	154	43	754	429	166	46
CY041164.1	920	351	123	18	876	368	135	32	831	390	143	39	791	406	154	43	749	426	166	46
CY041172.1	922	351	123	18	878	368	135	32	833	390	143	39	793	406	154	43	751	426	166	46
CY041180.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY041188.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY041196.1	926	351	123	18	882	368	135	32	837	390	143	39	797	406	154	43	755	426	166	46
CY041204.1	936	344	122	18	891	363	133	32	845	388	139	39	804	405	150	43	761	426	162	46
CY041484.1	920	351	123	18	876	368	135	32	831	390	143	39	791	406	154	43	749	426	166	46
CY041492.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY041500.1	938	344	122	18	893	363	133	32	847	388	139	39	806	405	150	43	763	426	162	46
CY041508.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY041516.1	929	351	123	18	885	368	135	32	840	390	143	39	800	406	154	43	758	426	166	46

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY041524.1	920	351	123	18	876	368	135	32	831	390	143	39	791	406	154	43	749	426	166	46
CY041532.1	922	351	123	18	878	368	135	32	833	390	143	39	793	406	154	43	751	426	166	46
CY041543.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY041551.1	922	351	123	18	878	368	135	32	833	390	143	39	793	406	154	43	751	426	166	46
CY041559.1	930	351	123	18	886	368	135	32	841	390	143	39	801	406	154	43	759	426	166	46
CY041567.1	923	351	123	18	879	368	135	32	834	390	143	39	794	406	154	43	752	426	166	46
CY041575.1	920	351	123	18	876	368	135	32	831	390	143	39	791	406	154	43	749	426	166	46
CY041583.1	930	351	123	18	886	368	135	32	841	390	143	39	801	406	154	43	759	426	166	46
CY041591.1	919	351	123	18	875	368	135	32	830	390	143	39	790	406	154	43	748	426	166	46
CY041599.1	918	356	122	18	874	374	131	34	828	397	138	42	789	411	152	45	748	429	166	46
CY041607.1	923	351	123	18	879	368	135	32	834	390	143	39	794	406	154	43	752	426	166	46
CY041615.1	930	344	122	18	885	363	133	32	839	388	139	39	798	405	150	43	755	426	162	46
CY041623.1	906	361	127	18	862	377	140	32	817	398	149	39	779	410	162	43	739	427	174	47
CY041631.1	930	351	123	18	886	368	135	32	841	390	143	39	801	406	154	43	759	426	166	46
CY041639.1	923	348	123	18	880	364	135	32	835	386	143	39	797	400	154	43	757	418	166	46
CY041647.1	922	351	123	18	878	368	135	32	833	390	143	39	793	406	154	43	751	426	166	46
CY041728.1	920	351	123	18	876	368	135	32	831	390	143	39	791	406	154	43	749	426	166	46
CY041736.1	922	351	123	18	878	368	135	32	833	390	143	39	793	406	154	43	751	426	166	46
CY041744.1	922	351	123	18	878	368	135	32	833	390	143	39	793	406	154	43	751	426	166	46
CY041752.1	917	348	131	18	874	362	145	32	828	385	153	39	789	401	163	43	748	421	174	46
CY041760.1	922	351	123	18	878	368	135	32	834	389	143	39	794	405	154	43	752	425	166	46
CY041768.1	923	351	123	18	879	368	135	32	834	390	143	39	794	406	154	43	752	426	166	46
CY041776.1	922	351	123	18	878	368	135	32	833	390	143	39	793	406	154	43	751	426	166	46
CY041784.1	922	351	123	18	878	368	135	32	833	390	143	39	793	406	154	43	751	426	166	46
CY041792.1	921	351	123	18	877	368	135	32	832	390	143	39	792	406	154	43	750	426	166	46
CY041800.1	910	359	127	18	866	375	140	32	821	396	149	39	781	411	161	43	739	430	174	46
CY041808.1	927	351	123	18	883	368	135	32	838	390	143	39	798	406	154	43	756	426	166	46
CY041816.1	918	356	127	18	875	371	140	32	830	391	150	39	790	405	163	43	750	420	178	46
CY041824.1	927	351	123	18	883	368	135	32	838	390	143	39	798	406	154	43	756	426	166	46
CY041832.1	921	351	123	18	877	368	135	32	832	390	143	39	792	406	154	43	750	426	166	46
CY041962.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
CY041970.1	930	358	132	18	885	374	146	32	839	396	155	39	799	411	167	43	757	430	179	47
CY041977.1	918	372	132	18	873	388	146	32	827	411	152	41	785	429	163	44	740	452	175	47
CY041985.1	913	346	132	19	869	364	143	33	823	387	149	42	784	402	161	42	743	421	172	45
CY043080.1	911	352	129	18	869	365	143	32	826	383	153	39	787	397	164	44	746	414	177	48
CY043088.1	913	346	133	18	869	360	148	32	823	382	157	39	784	396	169	43	743	414	182	46
CY043096.1	910	345	137	18	866	358	153	32	820	380	161	40	782	392	173	45	742	408	186	49
CY043104.1	913	346	132	19	869	364	143	33	823	387	149	42	784	402	161	42	743	421	172	45
CY043112.1	913	346	132	19	869	364	143	33	823	387	149	42	784	402	161	42	743	421	172	45
CY043120.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY043125.1	921	351	123	18	877	368	135	32	832	390	143	39	792	406	154	43	750	426	166	46
CY043133.1	921	351	123	18	877	368	135	32	832	390	143	39	792	406	154	43	750	426	166	46
CY043141.1	921	351	123	18	877	368	135	32	832	390	143	39	792	406	154	43	750	426	166	46
CY043149.1	909	359	127	18	865	375	140	32	820	396	149	39	780	411	161	43	738	430	174	46

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY043157.1	926	351	123	18	882	368	135	32	837	390	143	39	797	406	154	43	755	426	166	46
CY043165.1	924	348	131	18	881	362	145	32	835	385	153	39	796	401	163	43	755	421	174	46
CY043173.1	923	355	123	18	879	372	135	32	833	395	143	39	794	410	154	43	753	429	166	46
CY043181.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY043189.1	927	351	123	18	883	368	135	32	838	390	143	39	798	406	154	43	756	426	166	46
CY043197.1	927	351	123	18	883	368	135	32	838	390	143	39	798	406	154	43	756	426	166	46
CY043205.1	922	351	123	18	878	368	135	32	833	390	143	39	793	406	154	43	751	426	166	46
CY043213.1	922	351	123	18	878	368	135	32	833	390	143	39	793	406	154	43	751	426	166	46
CY043221.1	917	348	131	18	874	362	145	32	828	385	153	39	789	401	163	43	748	421	174	46
CY043229.1	926	351	123	18	882	368	135	32	837	390	143	39	797	406	154	43	755	426	166	46
CY043237.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY043245.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY043253.1	920	351	123	18	876	368	135	32	831	390	143	39	791	406	154	43	749	426	166	46
CY043261.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY043269.1	922	351	123	18	878	368	135	32	833	390	143	39	793	406	154	43	751	426	166	46
CY043277.1	917	362	123	19	873	379	134	34	828	401	138	45	788	417	148	50	746	437	159	54
CY043285.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY043293.1	916	359	127	18	872	375	140	32	827	396	149	39	787	411	161	43	745	430	174	46
CY043301.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY043309.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY043336.1	931	351	123	18	887	368	135	32	842	390	143	39	802	406	154	43	760	426	166	46
CY043344.1	930	351	123	18	886	368	135	32	841	390	143	39	801	406	154	43	759	426	166	46
CY043352.1	918	365	123	18	872	384	135	32	825	408	143	39	784	425	154	43	741	446	166	46
CY044050.1	923	351	123	18	879	368	135	32	834	390	143	39	794	406	154	43	752	426	166	46
CY044058.1	921	355	123	18	876	373	135	32	830	396	143	39	789	413	154	43	746	434	166	46
CY044066.1	924	351	123	18	880	368	135	32	835	390	143	39	795	406	154	43	753	426	166	46
CY044074.1	923	350	123	18	880	366	135	32	836	387	143	39	797	402	154	43	756	421	166	46
CY044082.1	923	350	124	17	880	366	136	32	836	387	144	39	797	402	154	42	756	421	166	45
CY044090.1	925	351	123	18	881	368	135	32	836	390	143	39	796	406	154	43	754	426	166	46
CY044098.1	925	351	123	18	881	368	135	32	836	390	143	39	796	406	154	43	754	426	166	46
CY044106.1	922	347	126	19	878	367	129	39	833	390	136	46	793	406	151	40	751	426	165	35
CY044114.1	922	351	123	18	878	368	135	32	833	390	143	39	793	406	154	43	751	426	166	46
CY044122.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY044130.1	927	351	123	18	883	368	135	32	838	390	143	39	798	406	154	43	756	426	166	46
CY044138.1	921	351	123	18	877	368	135	32	832	390	143	39	792	406	154	43	750	426	166	46
CY044149.1	915	353	123	19	871	369	137	32	826	390	146	38	786	405	157	43	746	423	167	48
CY044157.1	904	357	126	23	861	372	137	39	816	393	145	46	778	407	155	50	738	425	167	51
CY044165.1	906	346	143	15	862	358	156	34	816	379	163	44	777	393	174	48	736	411	186	50
CY044173.1	917	352	123	18	872	370	135	32	826	393	143	39	785	410	154	43	742	431	166	46
CY044181.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY044189.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY044198.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY044206.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY044214.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY044222.1	916	348	127	19	873	364	135	37	829	384	140	48	789	400	151	52	747	420	163	55
CY044230.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY044237.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
CY044245.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
CY044253.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
CY044258.1	960	351	123	18	916	368	135	32	871	390	143	39	831	406	154	43	789	426	166	46
CY044863.1	929	351	123	18	885	368	135	32	840	390	143	39	800	406	154	43	758	426	166	46
CY044871.1	922	351	123	18	878	368	135	32	833	390	143	39	793	406	154	43	751	426	166	46
CY044879.1	920	351	123	18	876	368	135	32	831	390	143	39	791	406	154	43	749	426	166	46
CY044887.1	922	351	123	18	878	368	135	32	833	390	143	39	793	406	154	43	751	426	166	46
CY044895.1	907	359	127	18	863	375	140	32	818	396	149	39	778	411	161	43	736	430	174	46
CY044903.1	916	359	126	19	873	376	136	34	828	401	140	42	788	418	149	47	746	437	163	48
CY044911.1	924	351	123	18	880	368	135	32	835	390	143	39	795	406	154	43	753	426	166	46
CY044919.1	922	351	123	18	878	368	135	32	833	390	143	39	793	406	154	43	751	426	166	46
CY044927.1	904	364	127	18	859	381	140	32	813	403	149	39	772	419	161	43	729	440	172	47
CY044935.1	921	351	123	18	877	368	135	32	832	390	143	39	792	406	154	43	750	426	166	46
CY044943.1	922	351	123	18	878	368	135	32	833	390	143	39	793	406	154	43	751	426	166	46
CY044951.1	922	351	123	18	878	368	135	32	833	390	143	39	793	406	154	43	751	426	166	46
CY044959.1	924	351	123	18	880	368	135	32	835	390	143	39	795	406	154	43	753	426	166	46
CY044967.1	927	351	123	18	883	368	135	32	838	390	143	39	798	406	154	43	756	426	166	46
CY044975.1	924	351	123	18	880	368	135	32	835	390	143	39	795	406	154	43	753	426	166	46
CY044983.1	923	351	123	18	879	368	135	32	834	390	143	39	794	406	154	43	752	426	166	46
CY044991.1	927	351	123	18	883	368	135	32	838	390	143	39	798	406	154	43	756	426	166	46
CY044999.1	928	350	123	18	885	366	135	32	841	387	143	39	802	402	154	43	761	421	166	46
CY045007.1	924	355	123	18	880	372	135	32	834	395	143	39	795	410	154	43	754	429	166	46
CY045015.1	926	350	125	18	882	368	137	31	836	391	142	41	795	408	151	47	755	426	164	41
CY045023.1	927	351	123	18	883	368	135	32	838	390	143	39	798	406	154	43	756	426	166	46
CY045031.1	927	351	123	18	883	368	135	32	838	390	143	39	798	406	154	43	756	426	166	46
CY045039.1	921	355	123	18	877	372	135	32	831	395	143	39	792	410	154	43	751	429	166	46
CY045047.1	927	352	125	15	883	368	138	30	838	390	144	40	798	406	154	43	756	426	166	46
CY045055.1	926	351	123	18	882	368	135	32	837	390	143	39	797	406	154	43	755	426	166	46
CY045063.1	925	354	123	18	881	371	135	32	836	393	143	39	796	409	154	43	754	429	166	46
CY045071.1	926	349	124	21	882	366	135	36	837	388	141	45	797	404	151	50	755	424	162	54
CY045079.1	920	351	123	18	876	368	135	32	831	390	143	39	791	406	154	43	749	426	166	46
CY045087.1	917	348	131	18	874	362	145	32	828	385	153	39	789	401	163	43	748	421	174	46
CY045095.1	927	351	123	18	883	368	135	32	838	390	143	39	798	406	154	43	756	426	166	46
CY045145.1	918	355	123	18	874	372	135	32	828	395	143	39	789	410	154	43	748	429	166	46
CY045153.1	924	343	129	20	880	362	137	36	835	386	136	50	795	404	142	56	753	425	153	57
CY045161.1	920	351	123	18	876	368	135	32	831	390	143	39	791	406	154	43	749	426	166	46
CY045169.1	922	351	123	18	878	368	135	32	833	390	143	39	793	406	154	43	751	426	166	46
CY045177.1	926	351	123	18	882	368	135	32	837	390	143	39	797	406	154	43	755	426	166	46
CY045185.1	925	351	123	18	881	368	135	32	836	390	143	39	796	406	154	43	754	426	166	46
CY045193.1	927	351	123	18	883	368	135	32	838	390	143	39	798	406	154	43	756	426	166	46
CY045201.1	927	351	123	18	884	367	135	32	840	388	143	39	801	403	154	43	760	422	166	46

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY045209.1	924	353	123	18	879	371	135	32	833	394	143	39	792	411	154	43	749	432	166	46
CY045217.1	927	351	123	18	883	368	135	32	838	390	143	39	798	406	154	43	756	426	166	46
CY045228.1	926	367	127	18	880	385	140	32	833	408	149	39	791	425	161	43	748	444	175	46
CY045236.2	944	367	123	18	899	385	135	32	853	408	143	39	812	425	154	43	769	446	166	46
CY045244.1	946	351	123	18	902	368	135	32	857	390	143	39	817	406	154	43	775	426	166	46
CY045484.1	937	348	133	19	893	362	148	33	847	384	157	40	808	398	167	46	769	414	180	46
CY045492.1	912	348	133	19	868	362	148	33	822	384	157	40	783	398	167	46	744	414	180	46
CY045497.1	949	351	123	18	905	368	135	32	860	390	143	39	820	406	154	43	777	427	166	46
CY045505.1	938	351	123	18	894	368	135	32	849	390	143	39	809	406	154	43	767	426	166	46
CY045513.1	914	356	123	18	870	373	135	32	824	396	143	39	784	412	154	43	742	432	166	46
CY045932.1	926	360	123	18	881	378	135	32	834	402	143	39	793	419	154	43	750	440	166	46
CY045940.1	947	347	119	18	903	365	130	32	857	389	137	39	818	405	147	43	777	425	158	46
CY045948.1	943	351	123	18	900	367	135	32	855	389	143	39	817	403	154	43	777	421	166	46
CY045956.1	951	351	123	18	907	368	135	32	862	390	143	39	822	406	154	43	780	426	166	46
CY045964.1	942	347	130	19	898	364	140	35	852	389	143	45	813	406	149	52	772	427	156	58
CY045972.1	960	342	126	20	913	362	133	39	867	385	137	50	827	400	144	59	785	420	152	66
CY045980.1	967	342	129	20	922	359	137	39	877	379	143	50	837	396	147	60	795	418	152	68
CY046189.1	921	352	123	18	876	370	135	32	830	393	143	39	789	410	154	43	746	431	166	46
CY046197.1	936	342	123	18	893	358	135	32	848	380	143	39	810	394	154	43	771	411	166	46
CY046205.1	920	352	124	17	875	370	133	34	829	393	142	39	788	410	153	44	745	431	165	48
CY046213.1	921	352	123	18	876	370	135	32	830	393	143	39	789	410	154	43	746	431	166	46
CY046221.1	921	352	123	18	876	370	135	32	830	393	143	39	789	410	154	43	746	431	166	46
CY046229.1	921	352	123	18	876	370	135	32	830	393	143	39	789	410	154	43	746	431	166	46
CY046237.1	920	352	123	18	875	370	135	32	829	393	143	39	788	410	154	43	745	431	166	46
CY046245.1	917	355	123	18	873	372	135	32	827	395	143	39	788	410	154	43	747	429	166	46
CY046253.1	917	352	123	18	872	370	135	32	826	393	143	39	785	410	154	43	742	431	166	46
CY046261.1	920	352	123	18	875	370	135	32	829	393	143	39	788	410	154	43	745	431	166	46
CY046269.1	923	352	123	18	878	370	135	32	832	393	143	39	791	410	154	43	748	431	166	46
CY046277.1	923	352	123	18	878	370	135	32	832	393	143	39	791	410	154	43	748	431	166	46
CY046285.1	933	336	131	18	890	350	145	32	844	373	153	39	806	388	163	43	766	407	174	46
CY046293.1	921	352	123	18	876	370	135	32	830	393	143	39	789	410	154	43	746	431	166	46
CY046301.1	919	352	123	18	874	370	135	32	828	393	143	39	787	410	154	43	744	431	166	46
CY046309.1	921	352	123	18	876	370	135	32	830	393	143	39	789	410	154	43	746	431	166	46
CY046317.1	927	352	123	18	882	370	135	32	836	393	143	39	795	410	154	43	752	431	166	46
CY046325.1	925	352	123	18	880	370	135	32	834	393	143	39	793	410	154	43	750	431	166	46
CY046333.1	923	352	123	18	878	370	135	32	832	393	143	39	791	410	154	43	748	431	166	46
CY046341.1	919	352	123	18	874	370	135	32	828	393	143	39	787	410	154	43	744	431	166	46
CY046349.1	924	352	123	18	879	370	135	32	833	393	143	39	792	410	154	43	749	431	166	46
CY046357.1	924	352	123	18	879	370	135	32	833	393	143	39	792	410	154	43	749	431	166	46
CY046365.1	916	355	123	18	872	372	135	32	826	395	143	39	787	410	154	43	746	429	166	46
CY046373.1	919	352	123	18	874	370	135	32	828	393	143	39	787	410	154	43	744	431	166	46
CY046381.1	921	352	123	18	876	370	135	32	830	393	143	39	789	410	154	43	746	431	166	46
CY046389.1	921	352	123	18	876	370	135	32	830	393	143	39	789	410	154	43	746	431	166	46
CY046397.1	927	352	123	18	882	370	135	32	836	393	143	39	795	410	154	43	752	431	166	46

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY046405.1	927	352	123	18	882	370	135	32	836	393	143	39	795	410	154	43	752	431	166	46
CY046413.1	930	352	123	18	885	370	135	32	839	393	143	39	798	410	154	43	755	431	166	46
CY046421.1	927	352	123	18	882	370	135	32	836	393	143	39	795	410	154	43	752	431	166	46
CY046429.1	924	352	123	18	879	370	135	32	833	393	143	39	792	410	154	43	749	431	166	46
CY046437.1	920	352	123	18	875	370	135	32	829	393	143	39	788	410	154	43	745	431	166	46
CY046445.1	914	365	123	18	869	383	135	32	822	407	143	39	782	423	154	43	740	443	166	46
CY046453.1	920	352	123	18	875	370	135	32	829	393	143	39	788	410	154	43	745	431	166	46
CY046461.1	921	352	123	18	876	370	135	32	830	393	143	39	789	410	154	43	746	431	166	46
CY046469.1	927	352	123	18	882	370	135	32	836	393	143	39	795	410	154	43	752	431	166	46
CY046477.1	925	352	123	18	880	370	135	32	834	393	143	39	793	410	154	43	750	431	166	46
CY046485.1	923	352	123	18	878	370	135	32	832	393	143	39	791	410	154	43	748	431	166	46
CY046493.1	925	352	123	18	880	370	135	32	834	393	143	39	793	410	154	43	750	431	166	46
CY046501.1	925	352	123	18	880	370	135	32	834	393	143	39	793	410	154	43	750	431	166	46
CY046509.1	923	352	123	18	878	370	135	32	832	393	143	39	791	410	154	43	748	431	166	46
CY046517.1	923	352	123	18	878	370	135	32	832	393	143	39	791	410	154	43	748	431	166	46
CY046525.1	927	352	123	18	882	370	135	32	836	393	143	39	795	410	154	43	752	431	166	46
CY046533.1	927	352	123	18	882	370	135	32	836	393	143	39	795	410	154	43	752	431	166	46
CY046541.1	914	364	125	16	868	383	135	33	820	408	143	39	779	425	153	43	736	446	165	45
CY046549.1	925	352	123	18	880	370	135	32	834	393	143	39	793	410	154	43	750	431	166	46
CY046557.1	925	352	123	18	880	370	135	32	834	393	143	39	793	410	154	43	750	431	166	46
CY046565.1	917	352	123	18	872	370	135	32	826	393	143	39	785	410	154	43	742	431	166	46
CY046573.1	920	352	123	18	875	370	135	32	829	393	143	39	788	410	154	43	745	431	166	46
CY046581.1	925	352	123	18	880	370	135	32	834	393	143	39	793	410	154	43	750	431	166	46
CY046589.1	922	355	123	18	878	372	135	32	833	394	143	39	794	409	154	43	753	428	166	46
CY046597.1	923	352	123	18	878	370	135	32	832	393	143	39	791	410	154	43	748	431	166	46
CY046605.1	918	361	123	18	872	380	135	32	824	405	143	39	782	423	154	43	738	445	166	46
CY046613.1	913	360	120	18	868	378	132	32	822	401	140	39	781	418	151	43	738	438	165	45
CY046621.1	924	352	123	18	879	370	135	32	833	393	143	39	793	409	154	43	751	429	166	46
CY046629.1	927	352	123	18	882	370	135	32	836	393	143	39	795	410	154	43	752	431	166	46
CY046637.1	919	352	123	18	874	370	135	32	828	393	143	39	787	410	154	43	744	431	166	46
CY046645.1	926	352	123	18	881	370	135	32	835	393	143	39	794	410	154	43	751	431	166	46
CY046653.1	926	352	123	18	881	370	135	32	835	393	143	39	794	410	154	43	751	431	166	46
CY046661.1	928	352	123	18	883	370	135	32	837	393	143	39	796	410	154	43	753	431	166	46
CY046669.1	927	352	123	18	882	370	135	32	836	393	143	39	795	410	154	43	752	431	166	46
CY046677.1	925	352	124	18	879	370	137	32	832	393	146	39	790	410	158	43	746	431	171	46
CY046685.1	926	352	123	18	881	370	135	32	835	393	143	39	794	410	154	43	751	431	166	46
CY046693.1	925	352	123	18	880	370	135	32	834	393	143	39	793	410	154	43	750	431	166	46
CY046701.1	921	351	123	18	877	368	135	32	832	390	143	39	792	406	154	43	750	426	166	46
CY046709.1	939	352	114	11	895	370	130	20	850	393	140	27	810	410	151	33	768	431	163	38
CY046717.1	925	352	123	18	880	370	135	32	834	393	143	39	793	410	154	43	750	431	166	46
CY046725.1	925	352	123	18	880	370	135	32	834	393	143	39	793	410	154	43	750	431	166	46
CY046733.1	906	367	123	18	861	384	136	32	815	406	145	39	774	421	158	43	731	442	170	46
CY046741.1	926	353	123	18	880	372	135	32	833	396	143	39	790	415	154	43	746	436	167	46
CY046749.1	919	352	123	18	874	370	135	32	828	393	143	39	787	410	154	43	744	431	166	46

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY046757.1	921	352	123	18	876	370	135	32	830	393	143	39	789	410	154	43	746	431	166	46
CY046765.1	923	352	123	18	878	370	135	32	832	393	143	39	791	410	154	43	748	431	166	46
CY046773.1	924	355	123	18	880	372	135	32	834	395	143	39	795	410	154	43	754	429	166	46
CY046781.1	917	352	123	18	872	370	135	32	826	393	143	39	785	410	154	43	742	431	166	46
CY046789.1	922	352	128	18	877	369	141	32	831	391	150	39	790	407	162	43	747	427	175	46
CY046797.1	919	359	124	18	874	376	137	32	829	397	146	39	789	412	158	43	747	431	171	46
CY046805.1	927	352	123	18	882	370	135	32	836	393	143	39	796	409	154	43	754	429	166	46
CY046813.1	928	352	123	18	883	370	135	32	837	393	143	39	796	410	154	43	753	431	166	46
CY046821.1	913	352	132	16	869	366	145	33	822	388	155	39	782	402	167	43	740	421	180	45
CY046829.1	926	352	123	18	881	370	135	32	835	393	143	39	794	410	154	43	751	431	166	46
CY046837.1	925	352	123	18	880	370	135	32	834	393	143	39	793	410	154	43	750	431	166	46
CY046845.1	927	352	123	18	882	370	135	32	836	393	143	39	795	410	154	43	752	431	166	46
CY046853.1	923	355	123	18	879	372	135	32	833	395	143	39	794	410	154	43	753	429	166	46
CY046861.1	920	352	123	18	875	370	135	32	829	393	143	39	788	410	154	43	745	431	166	46
CY046869.1	921	352	123	18	876	370	135	32	830	393	143	39	789	410	154	43	746	431	166	46
CY046877.1	921	352	123	18	876	370	135	32	830	393	143	39	789	410	154	43	746	431	166	46
CY046885.1	924	352	123	18	879	370	135	32	833	393	143	39	792	410	154	43	749	431	166	46
CY046893.1	916	356	123	18	870	375	135	32	824	398	143	39	782	416	154	43	738	438	166	46
CY046901.1	919	352	123	18	874	370	135	32	828	393	143	39	787	410	154	43	744	431	166	46
CY046909.1	923	352	123	18	878	370	135	32	832	393	143	39	791	410	154	43	748	431	166	46
CY046917.1	923	352	123	18	876	372	135	32	828	397	143	39	785	417	153	43	740	440	165	46
CY046947.1	936	351	123	18	892	368	135	32	847	390	143	39	807	406	154	43	765	426	166	46
CY046953.1	936	351	123	18	892	368	135	32	848	389	143	39	808	405	154	43	766	425	166	46
CY046957.1	920	351	123	18	876	368	135	32	831	390	143	39	791	406	154	43	749	426	166	46
CY046965.1	929	351	123	18	885	368	135	32	840	390	143	39	800	406	154	43	758	426	166	46
CY046973.1	923	355	123	18	879	372	135	32	833	395	143	39	794	410	154	43	753	429	166	46
CY047312.1	917	358	121	18	872	374	133	34	825	398	135	47	785	414	147	44	743	434	160	43
CY047320.1	922	351	123	18	878	368	135	32	833	390	143	39	793	406	154	43	751	426	166	46
CY047328.1	920	351	123	18	876	368	135	32	831	390	143	39	791	406	154	43	749	426	166	46
CY047336.1	920	351	123	18	876	368	135	32	831	390	143	39	791	406	154	43	749	426	166	46
CY047344.1	916	361	126	18	872	377	139	32	828	396	149	39	788	412	159	44	746	432	170	48
CY047352.1	920	351	123	18	876	368	135	32	831	390	143	39	791	406	154	43	749	426	166	46
CY047360.1	925	348	127	18	881	364	140	32	836	385	149	39	796	400	161	43	754	420	172	47
CY047368.1	929	350	125	18	885	368	137	31	839	391	142	41	798	408	151	47	758	426	164	41
CY047376.1	920	351	123	18	876	368	135	32	831	390	143	39	791	406	154	43	749	426	166	46
CY047384.1	920	343	129	20	876	362	137	36	831	386	136	50	791	404	142	56	749	425	153	57
CY047746.1	929	360	130	19	885	375	142	35	840	396	149	44	800	412	157	51	758	431	170	54
CY048927.1	914	358	123	18	869	376	135	32	823	399	143	39	782	416	154	43	740	436	166	46
CY048935.1	909	363	123	18	863	382	135	32	817	405	143	39	776	422	154	43	733	443	166	46
CY049062.1	937	351	123	18	893	368	135	32	848	390	143	39	808	406	154	43	766	426	166	46
CY049070.1	919	351	123	18	875	368	135	32	830	390	143	39	790	406	154	43	748	426	166	46
CY049078.1	908	354	128	18	864	371	139	33	819	393	146	41	780	407	157	46	739	425	169	50
CY049086.1	899	351	123	18	856	367	135	32	812	388	143	39	773	403	154	43	732	423	165	46
CY049094.1	898	351	123	18	855	367	135	32	811	388	143	39	772	403	154	43	731	423	165	46

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY049102.1	921	351	123	18	877	368	135	32	832	390	143	39	792	406	154	43	750	426	166	46
CY049110.1	921	351	123	18	877	368	135	32	832	390	143	39	792	406	154	43	750	426	166	46
CY049118.1	932	351	123	18	888	368	135	32	843	390	143	39	803	406	154	43	761	426	166	46
CY049126.1	894	345	113	18	851	363	123	32	807	386	129	39	768	403	138	43	727	424	149	45
CY049134.1	913	351	123	18	869	368	135	32	824	390	143	39	784	406	154	43	742	426	166	46
CY049142.1	938	345	119	18	897	360	130	32	856	379	137	39	818	394	147	43	778	414	157	46
CY049150.1	936	337	123	18	895	351	135	32	852	372	142	39	815	386	152	43	776	404	163	46
CY049158.1	896	351	123	18	853	367	135	32	809	388	143	39	770	403	154	43	729	423	165	46
CY049166.1	904	351	123	18	860	368	135	32	815	390	143	39	775	406	154	43	733	426	166	46
CY049174.1	907	339	123	18	866	353	135	32	823	374	142	39	785	389	152	43	745	409	162	46
CY049182.1	914	335	123	18	871	351	135	32	828	371	143	39	790	385	154	43	750	403	166	46
CY049190.1	910	336	123	18	868	351	135	32	825	371	143	39	787	385	154	43	748	403	165	46
CY049198.1	929	322	123	18	889	335	135	32	848	354	142	39	812	367	152	43	775	383	163	46
CY049206.1	902	351	123	18	858	368	135	32	813	390	143	39	773	406	154	43	731	426	166	46
CY049214.1	907	351	123	18	863	368	135	32	818	390	143	39	778	406	154	43	736	426	166	46
CY049222.1	907	351	123	18	863	368	135	32	818	390	143	39	778	406	154	43	736	426	166	46
CY049230.1	915	344	122	18	871	362	133	32	826	386	139	39	786	401	151	43	744	420	164	46
CY049238.1	901	351	123	18	857	368	135	32	812	390	143	39	772	406	154	43	730	426	166	46
CY049246.1	894	355	123	18	850	372	135	32	806	392	144	39	767	406	156	43	726	424	169	46
CY049254.1	932	344	122	18	888	362	133	32	843	386	139	39	803	401	151	43	761	420	164	46
CY049262.1	904	354	123	18	860	371	135	32	815	393	143	39	775	409	154	43	733	429	166	46
CY049270.1	897	357	127	18	853	373	140	32	809	393	149	39	770	406	162	43	729	424	174	47
CY049278.1	920	351	123	18	876	368	135	32	831	390	143	39	791	406	154	43	749	426	166	46
CY049286.1	922	355	123	18	877	373	135	32	831	396	143	39	791	412	154	43	749	432	166	46
CY049294.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY049302.1	913	351	123	18	869	368	135	32	824	390	143	39	784	406	154	43	742	426	166	46
CY049310.1	904	351	123	18	860	368	135	32	815	390	143	39	775	406	154	43	733	426	166	46
CY049318.1	908	351	123	18	864	368	135	32	819	390	143	39	779	406	154	43	737	426	166	46
CY049326.1	900	351	123	18	857	367	135	32	813	388	143	39	774	403	154	43	733	423	165	46
CY049334.1	1044	266	81	8	1020	274	93	11	995	288	103	11	972	297	112	16	947	307	123	19
CY049342.1	921	351	123	18	877	368	135	32	832	390	143	39	792	406	154	43	750	426	166	46
CY049350.1	908	351	123	18	864	368	135	32	819	390	143	39	779	406	154	43	737	426	166	46
CY049358.1	906	351	123	18	862	368	135	32	817	390	143	39	777	406	154	43	735	426	166	46
CY049366.1	937	351	123	18	893	368	135	32	848	390	143	39	808	406	154	43	766	426	166	46
CY049374.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY049382.1	892	367	123	18	847	385	135	32	801	408	143	39	760	425	154	43	717	446	166	46
CY049390.1	912	351	123	18	868	368	135	32	823	390	143	39	783	406	154	43	741	426	166	46
CY049398.1	914	351	123	18	870	368	135	32	825	390	143	39	785	406	154	43	743	426	166	46
CY049406.1	895	367	123	18	850	385	135	32	804	408	143	39	763	425	154	43	720	446	166	46
CY049421.1	935	335	123	18	892	351	135	32	848	372	143	39	810	386	154	43	771	403	166	46
CY049429.1	908	338	122	18	866	354	133	32	823	377	138	39	785	391	149	43	745	409	161	46
CY049437.1	896	351	123	18	853	367	135	32	809	388	143	39	770	403	154	43	729	423	165	46
CY049445.1	896	339	134	19	853	355	145	34	809	378	147	45	770	394	154	52	729	415	161	58
CY049453.1	904	344	122	18	861	361	133	32	817	384	139	39	778	398	151	43	737	417	163	46

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY049461.1	937	334	123	18	895	349	135	32	853	368	143	39	818	379	154	43	781	394	166	46
CY049469.1	906	351	123	18	862	368	135	32	817	390	143	39	777	406	154	43	735	426	166	46
CY049477.1	917	339	123	18	875	354	135	32	832	374	143	39	794	388	154	43	754	406	166	46
CY049485.1	896	351	123	18	853	367	135	32	809	388	143	39	770	403	154	43	729	423	165	46
CY049493.1	973	290	113	15	943	295	125	27	917	301	132	34	894	303	141	41	869	310	150	44
CY049501.1	915	344	123	18	873	359	135	32	831	378	143	39	794	392	153	43	755	410	164	46
CY049509.1	901	351	123	18	857	368	135	32	812	390	143	39	772	406	154	43	730	426	166	46
CY049517.1	907	351	123	18	863	368	135	32	818	390	143	39	778	406	154	43	736	426	166	46
CY049525.1	905	351	123	18	861	368	135	32	816	390	143	39	776	406	154	43	734	426	166	46
CY049533.1	910	336	123	18	868	351	135	32	826	370	143	39	790	382	154	43	753	398	165	46
CY049541.1	890	359	123	18	848	374	135	32	807	392	143	39	770	405	154	43	731	423	165	46
CY049549.1	917	338	123	18	874	354	135	32	830	375	143	39	791	390	154	43	750	409	166	46
CY049557.1	901	351	123	18	857	368	135	32	812	390	143	39	772	406	154	43	730	426	166	46
CY049565.1	915	344	122	18	871	362	133	32	826	386	139	39	786	401	151	43	744	420	164	46
CY049573.1	908	350	123	18	865	367	134	32	821	389	141	39	782	403	153	43	741	420	167	46
CY049581.1	907	351	123	18	863	368	135	32	818	390	143	39	778	406	154	43	736	426	166	46
CY049589.1	937	338	123	18	895	353	135	32	852	373	143	39	814	387	154	43	774	405	166	46
CY049597.1	939	334	123	18	897	349	135	32	854	369	143	39	816	383	154	43	776	401	166	46
CY049605.1	956	310	115	18	917	325	125	31	877	344	134	35	842	357	145	37	805	374	156	40
CY049613.1	904	343	133	18	862	355	148	32	819	374	157	39	782	386	169	43	744	401	182	46
CY049621.1	1022	242	105	12	997	244	117	23	976	248	122	31	957	250	128	37	936	257	134	40
CY049629.1	916	326	126	20	876	339	136	36	835	357	141	46	799	369	148	54	762	387	153	61
CY049637.1	941	337	118	18	902	350	129	32	861	370	135	39	825	384	144	43	788	401	154	46
CY049645.1	942	309	114	18	905	321	124	32	867	338	130	39	832	352	138	43	794	371	147	46
CY049653.1	954	308	119	18	917	319	130	32	879	336	136	39	846	347	145	43	811	363	154	46
CY049661.1	910	339	123	18	870	352	135	32	830	368	144	39	794	380	155	43	755	398	166	46
CY049669.1	922	337	123	18	881	351	135	32	839	370	143	39	802	383	154	43	763	400	166	46
CY049677.1	891	355	123	18	848	371	135	32	802	394	143	39	763	409	154	43	722	429	165	46
CY049685.1	895	351	123	18	852	367	135	32	808	388	143	39	769	403	154	43	728	423	165	46
CY049693.1	895	350	124	19	852	367	127	41	808	388	134	49	769	403	144	54	728	423	154	58
CY049701.1	879	366	125	16	836	382	135	33	792	401	145	39	753	414	157	43	712	433	169	45
CY049822.1	913	346	133	18	869	360	148	32	823	382	157	39	784	396	169	43	743	414	182	46
CY049830.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
CY049845.1	913	346	133	18	869	360	148	32	823	382	157	39	784	396	169	43	743	414	182	46
CY049853.1	900	367	119	24	855	386	127	41	810	408	134	49	770	424	144	54	728	444	155	58
CY049861.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY049869.1	913	346	133	18	869	360	148	32	823	382	157	39	784	396	169	43	743	414	182	46
CY049877.1	913	346	133	18	869	360	148	32	823	382	157	39	784	396	169	43	743	414	182	46
CY049885.1	902	366	124	18	858	380	139	32	814	397	151	39	775	410	163	44	734	428	175	48
CY049893.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY049901.1	917	351	123	18	873	368	135	32	828	390	143	39	788	406	154	43	746	426	166	46
CY049909.1	910	347	135	18	866	363	148	32	820	385	157	39	781	399	169	43	741	416	181	47
CY049917.1	910	347	135	18	866	363	148	32	820	385	157	39	781	399	169	43	741	416	181	47
CY049925.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY049933.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY049941.1	913	346	132	19	869	364	143	33	823	387	149	42	784	402	161	42	743	421	172	45
CY049949.1	911	348	132	19	865	368	143	33	817	393	149	42	777	409	161	42	736	428	172	45
CY049957.1	911	348	132	19	865	368	143	33	817	393	149	42	777	409	161	42	736	428	172	45
CY049965.1	911	348	132	19	865	368	143	33	817	393	149	42	777	409	161	42	736	428	172	45
CY049973.1	916	351	124	19	872	370	134	33	826	393	140	42	786	409	153	41	744	429	165	43
CY049981.1	917	360	115	18	873	378	126	32	827	401	134	39	787	417	146	42	745	437	159	44
CY049989.1	902	367	123	18	857	385	135	32	811	408	143	39	770	425	154	43	727	446	166	46
CY049997.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY050005.1	920	351	122	17	875	369	134	31	829	392	144	36	789	407	157	39	747	426	169	44
CY050013.1	906	367	119	18	860	386	131	32	814	408	140	39	774	422	153	43	732	441	166	46
CY050021.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY050029.1	906	367	121	16	860	386	132	31	814	408	142	40	774	422	155	46	732	441	168	48
CY050037.1	920	351	122	17	875	369	134	31	829	392	144	36	789	407	157	39	747	426	169	44
CY050045.1	918	348	121	23	873	366	134	34	827	389	145	36	787	404	158	41	746	421	171	46
CY050053.1	918	348	121	23	873	366	134	34	827	389	145	36	787	404	158	41	746	421	171	46
CY050061.1	918	348	121	23	873	366	134	34	827	389	145	36	787	404	158	41	746	421	171	46
CY050069.1	913	346	133	18	869	360	148	32	823	382	157	39	784	396	169	43	743	414	182	46
CY050077.1	911	352	129	18	869	365	143	32	826	383	153	39	787	397	164	44	746	414	177	48
CY050085.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY050088.1	915	353	123	19	871	369	137	32	826	390	146	38	786	405	157	43	746	423	167	48
CY050144.1	925	352	123	18	880	370	135	32	834	393	143	39	793	410	154	43	750	431	166	46
CY050152.1	928	352	123	18	883	370	135	32	837	393	143	39	796	410	154	43	753	431	166	46
CY050160.1	923	356	123	18	878	374	135	32	833	396	143	39	792	413	154	43	749	434	166	46
CY050168.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY050176.1	920	346	133	18	876	360	148	32	830	382	157	39	791	396	169	43	750	414	182	46
CY050184.1	923	356	123	18	878	374	135	32	833	396	143	39	792	413	154	43	749	434	166	46
CY050192.1	918	354	123	18	874	371	135	32	829	393	143	39	789	409	154	43	747	429	166	46
CY050200.1	925	352	123	18	880	370	135	32	834	393	143	39	793	410	154	43	750	431	166	46
CY050208.1	928	351	123	18	885	367	135	32	842	387	143	39	804	401	154	43	764	419	166	46
CY050216.1	927	352	123	18	882	370	135	32	836	393	143	39	795	410	154	43	752	431	166	46
CY050224.1	912	359	125	18	868	374	139	32	822	396	148	39	783	411	158	44	742	430	169	48
CY050232.1	926	352	123	18	881	370	135	32	835	393	143	39	794	410	154	43	751	431	166	46
CY050240.1	916	371	120	17	872	388	132	31	827	410	141	36	787	426	152	42	745	446	164	45
CY050248.1	904	370	128	18	859	388	139	33	813	411	146	41	773	426	157	46	731	445	169	50
CY050256.1	912	367	123	18	867	385	135	32	821	408	143	39	780	425	154	43	737	446	166	46
CY050330.1	927	352	123	18	882	370	135	32	836	393	143	39	795	410	154	43	752	431	166	46
CY050341.1	921	336	123	18	880	350	135	32	838	369	143	39	801	382	154	43	762	399	166	46
CY050349.1	919	339	123	18	878	353	135	32	836	372	143	39	799	385	154	43	760	402	166	46
CY050357.1	924	334	123	18	883	348	135	32	841	367	143	39	804	380	154	43	765	397	166	46
CY050365.1	885	337	123	18	842	353	135	32	798	374	143	39	759	389	154	43	718	408	166	46
CY050374.1	924	355	123	18	880	372	135	32	834	395	143	39	795	410	154	43	754	429	166	46
CY050382.1	927	352	123	18	882	370	135	32	836	393	143	39	795	410	154	43	752	431	166	46
CY050390.1	927	352	123	18	882	370	135	32	836	393	143	39	795	410	154	43	752	431	166	46

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY050398.1	927	352	123	18	882	370	135	32	836	393	143	39	795	410	154	43	752	431	166	46
CY050406.1	927	352	123	18	882	370	135	32	836	393	143	39	795	410	154	43	752	431	166	46
CY050414.1	927	352	123	18	882	370	135	32	836	393	143	39	795	410	154	43	752	431	166	46
CY050422.1	920	356	126	18	876	373	134	36	831	394	141	45	791	409	154	44	751	424	171	42
CY050430.1	919	360	123	18	873	379	135	32	826	403	143	39	784	421	154	43	740	443	166	46
CY050438.1	928	352	123	18	883	370	135	32	837	393	143	39	796	410	154	43	753	431	166	46
CY050446.1	921	352	123	18	876	370	135	32	830	393	143	39	789	410	154	43	746	431	166	46
CY050849.1	911	360	123	18	865	379	135	32	818	403	143	39	777	419	155	43	735	437	169	46
CY050857.1	917	345	133	19	873	362	142	36	827	385	149	44	788	400	159	49	747	420	168	54
CY050865.1	928	351	123	18	883	369	135	32	837	392	143	39	796	409	154	43	754	428	167	46
CY050873.1	910	361	123	18	868	376	135	32	824	397	143	39	785	412	154	43	744	431	166	46
CY050881.1	907	358	134	21	862	377	142	36	815	400	148	44	775	415	159	44	732	435	171	46
CY050889.1	931	348	123	18	888	364	135	32	843	386	143	39	805	400	154	43	765	418	166	46
CY050897.1	927	352	123	18	882	370	135	32	836	393	143	39	795	410	154	43	752	431	166	46
CY050905.1	927	352	123	18	882	370	135	32	836	393	143	39	795	410	154	43	752	431	166	46
CY050913.1	927	352	123	18	882	370	135	32	836	392	144	39	794	408	157	43	750	428	171	46
CY050921.1	927	352	123	18	882	370	135	32	836	393	143	39	795	410	154	43	752	431	166	46
CY050929.1	918	354	130	18	873	371	143	32	827	393	152	39	786	409	164	43	743	429	177	46
CY050937.1	927	352	123	18	882	370	135	32	836	393	143	39	795	410	154	43	752	431	166	46
CY050945.1	928	352	123	18	883	370	135	32	837	393	143	39	796	410	154	43	753	431	166	46
CY050953.1	924	355	123	18	880	372	135	32	834	395	143	39	795	410	154	43	754	429	166	46
CY050961.1	903	376	123	18	857	394	136	32	811	416	145	39	770	431	158	43	727	451	171	46
CY050969.1	927	352	123	18	882	370	135	32	836	393	143	39	795	410	154	43	752	431	166	46
CY050977.1	925	352	123	18	880	370	135	32	834	393	143	39	793	410	154	43	750	431	166	46
CY050985.1	927	352	123	18	882	370	135	32	836	393	143	39	795	410	154	43	752	431	166	46
CY050993.1	908	367	127	18	863	382	142	32	818	401	153	39	779	413	167	43	738	430	180	47
CY051001.1	926	352	123	18	881	370	135	32	835	393	143	39	794	410	154	43	751	431	166	46
CY051009.1	922	356	125	16	877	374	135	33	830	398	143	39	790	414	153	43	748	434	165	45
CY051017.1	897	381	123	18	850	401	135	32	802	426	143	39	759	445	154	43	714	468	166	46
CY051025.1	927	352	123	18	882	370	135	32	836	393	143	39	795	410	154	43	752	431	166	46
CY051033.1	920	358	124	18	877	373	137	32	833	393	146	39	793	409	157	43	751	429	169	46
CY051041.1	925	355	123	18	881	372	135	32	835	395	143	39	796	410	154	43	755	429	166	46
CY051049.1	919	352	123	18	874	370	135	32	828	393	143	39	787	410	154	43	744	431	166	46
CY051057.1	919	352	123	18	874	370	135	32	828	393	143	39	787	410	154	43	744	431	166	46
CY051065.1	919	352	123	18	874	370	135	32	828	393	143	39	787	410	154	43	744	431	166	46
CY051073.1	919	352	123	18	874	370	135	32	828	393	143	39	787	410	154	43	744	431	166	46
CY051081.1	919	352	123	18	874	370	135	32	828	393	143	39	787	410	154	43	744	431	166	46
CY051089.1	915	356	125	16	870	374	135	33	823	398	143	39	783	414	153	43	741	434	165	45
CY051097.1	927	352	123	18	882	370	135	32	836	393	143	39	795	410	154	43	752	431	166	46
CY051105.1	919	352	123	18	874	370	135	32	828	393	143	39	787	410	154	43	744	431	166	46
CY051113.1	916	355	123	18	872	372	135	32	826	395	143	39	787	410	154	43	746	429	166	46
CY051121.1	925	352	123	18	880	370	135	32	834	393	143	39	793	410	154	43	750	431	166	46
CY051129.1	925	352	123	18	880	370	135	32	834	393	143	39	793	410	154	43	750	431	166	46
CY051137.1	925	342	133	18	880	360	144	33	834	384	149	42	793	402	157	48	750	424	166	53

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY051145.1	934	342	124	17	890	361	136	29	845	385	142	36	805	402	151	42	763	423	161	46
CY051153.1	927	351	123	18	883	368	135	32	838	390	143	39	798	406	154	43	756	426	166	46
CY051161.1	927	352	123	18	882	370	135	32	836	393	143	39	795	410	154	43	752	431	166	46
CY051169.1	928	352	123	18	883	370	135	32	837	393	143	39	796	410	154	43	753	431	166	46
CY051177.1	926	352	123	18	881	370	135	32	835	393	143	39	794	410	154	43	751	431	166	46
CY051185.1	923	356	125	16	878	374	135	33	831	398	143	39	791	414	153	43	749	434	165	45
CY051193.1	938	347	117	17	895	364	130	29	850	387	138	35	810	404	149	38	768	425	161	41
CY051201.1	926	352	123	18	881	370	135	32	835	393	143	39	794	410	154	43	751	431	166	46
CY051209.1	922	357	123	18	875	377	135	32	828	401	143	39	785	420	154	43	740	443	166	46
CY051217.1	916	360	123	18	870	379	135	32	823	403	143	39	781	421	154	43	737	443	166	46
CY051225.1	920	356	125	16	875	374	135	33	828	398	143	39	788	414	153	43	746	434	165	45
CY051233.1	926	352	123	18	881	370	135	32	835	393	143	39	794	410	154	43	751	431	166	46
CY051241.1	927	352	123	18	882	370	135	32	836	393	143	39	795	410	154	43	752	431	166	46
CY051249.1	923	355	123	18	879	372	135	32	833	395	143	39	794	410	154	43	753	429	166	46
CY051257.1	927	352	123	18	882	370	135	32	836	393	143	39	795	410	154	43	752	431	166	46
CY051265.1	927	352	123	18	882	370	135	32	836	393	143	39	795	410	154	43	752	431	166	46
CY051273.1	926	352	123	18	881	370	135	32	835	393	143	39	794	410	154	43	751	431	166	46
CY051281.1	927	352	123	18	882	370	135	32	836	393	143	39	795	410	154	43	752	431	166	46
CY051289.1	926	352	123	18	881	370	135	32	835	393	143	39	794	410	154	43	751	431	166	46
CY051297.1	927	340	136	18	882	356	150	32	837	375	161	39	796	392	171	44	753	413	182	48
CY051305.1	927	352	123	18	882	370	135	32	836	393	143	39	795	410	154	43	752	431	166	46
CY051313.1	931	348	123	18	886	366	135	32	840	389	143	39	798	407	154	43	754	429	166	46
CY051321.1	927	352	123	18	882	370	135	32	836	393	143	39	795	410	154	43	752	431	166	46
CY051329.1	926	352	123	18	881	370	135	32	835	393	143	39	794	410	154	43	751	431	166	46
CY051337.1	919	352	123	18	874	370	135	32	828	393	143	39	787	410	154	43	744	431	166	46
CY051345.1	926	352	123	18	881	370	135	32	835	393	143	39	794	410	154	43	751	431	166	46
CY051353.1	919	352	123	18	874	370	135	32	828	393	143	39	787	410	154	43	744	431	166	46
CY051361.1	919	352	123	18	874	370	135	32	828	393	143	39	787	410	154	43	744	431	166	46
CY051369.1	927	352	123	18	882	370	135	32	836	393	143	39	795	410	154	43	752	431	166	46
CY051377.1	926	352	123	18	881	370	135	32	835	393	143	39	794	410	154	43	751	431	166	46
CY051385.1	927	352	123	18	882	370	135	32	836	393	143	39	795	410	154	43	752	431	166	46
CY051393.1	920	353	123	18	874	372	135	32	827	396	143	39	785	414	154	43	741	436	166	46
CY051401.1	916	355	123	18	872	372	135	32	826	395	143	39	787	410	154	43	746	429	166	46
CY051409.1	915	364	122	18	870	382	134	32	824	405	142	39	783	422	153	43	740	443	165	46
CY051417.1	928	352	123	18	883	370	135	32	837	393	143	39	796	410	154	43	753	431	166	46
CY051425.1	925	352	123	18	880	370	135	32	834	393	143	39	793	410	154	43	750	431	166	46
CY051433.1	926	352	123	18	881	370	135	32	835	393	143	39	794	410	154	43	751	431	166	46
CY051441.1	923	355	123	18	879	372	135	32	833	395	143	39	794	410	154	43	753	429	166	46
CY051449.1	921	356	123	18	875	375	135	32	829	398	143	39	789	414	154	43	747	434	166	46
CY051457.1	926	352	123	18	881	370	135	32	835	393	143	39	794	410	154	43	751	431	166	46
CY051465.1	918	360	123	18	872	379	135	32	825	403	143	39	783	421	154	43	739	443	166	46
CY051473.1	920	357	123	18	874	376	135	32	827	400	143	39	783	420	154	43	737	444	166	46
CY051481.1	926	352	123	18	881	370	135	32	835	393	143	39	794	410	154	43	751	431	166	46
CY051489.1	926	352	123	18	881	370	135	32	835	393	143	39	794	410	154	43	751	431	166	46

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY051497.1	926	352	123	18	881	370	135	32	835	393	143	39	794	410	154	43	751	431	166	46
CY051505.1	926	352	123	18	881	370	135	32	835	393	143	39	794	410	154	43	751	431	166	46
CY051513.1	927	352	123	18	882	370	135	32	836	393	143	39	795	410	154	43	752	431	166	46
CY051521.1	927	352	123	18	882	370	135	32	836	393	143	39	795	410	154	43	752	431	166	46
CY051529.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY051537.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY051545.1	918	359	125	18	874	374	139	32	828	396	148	39	789	411	158	44	748	430	169	48
CY051553.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY051561.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY051569.1	938	341	123	18	895	357	134	33	851	378	143	39	811	395	155	41	769	416	166	44
CY051577.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY051585.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY051593.1	918	357	127	18	874	373	140	32	829	394	149	39	789	409	161	43	747	428	174	46
CY051601.1	922	355	122	21	878	373	131	37	833	395	137	46	793	411	148	50	751	431	159	55
CY051609.1	902	371	129	18	858	387	142	32	812	409	151	39	771	426	162	43	730	443	176	46
CY051617.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY051625.1	919	352	131	18	875	367	145	32	830	388	154	39	790	403	166	43	748	422	179	46
CY051633.1	918	360	123	19	873	379	130	37	827	401	139	42	787	415	154	43	745	433	169	44
CY051641.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY051649.1	923	356	125	16	878	374	135	33	831	398	143	39	791	414	153	43	749	434	165	45
CY051657.1	919	352	131	18	875	369	143	32	832	389	151	39	793	403	163	43	752	421	176	46
CY051665.1	924	350	128	18	879	366	142	32	833	387	152	39	792	402	165	43	748	422	179	46
CY051673.1	916	354	132	18	874	365	148	32	830	382	160	39	791	393	175	43	749	410	190	46
CY051681.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY051689.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY051697.1	928	350	124	19	885	360	142	33	840	381	148	42	800	397	160	46	758	418	169	48
CY051705.1	920	351	131	18	878	363	146	32	835	380	157	39	796	394	168	44	755	412	180	48
CY051713.1	920	351	131	18	878	363	146	32	835	380	157	39	796	394	168	44	755	412	180	48
CY051721.1	920	351	131	18	878	363	146	32	835	380	157	39	796	394	168	44	755	412	180	48
CY051729.1	934	337	131	18	892	349	146	32	849	366	157	39	810	380	168	44	769	398	180	48
CY051737.1	934	337	131	18	892	349	146	32	849	366	157	39	810	380	168	44	769	398	180	48
CY051745.1	934	337	131	18	892	349	146	32	849	366	157	39	810	380	168	44	769	398	180	48
CY051753.1	927	340	135	18	883	356	148	32	838	377	157	39	798	392	169	43	756	411	182	46
CY051761.1	909	366	127	18	864	383	140	32	818	406	147	40	780	417	160	45	740	432	174	49
CY051769.1	909	366	127	18	864	383	140	32	818	406	147	40	780	417	160	45	740	432	174	49
CY051777.1	909	366	127	18	864	383	140	32	818	406	147	40	780	417	160	45	740	432	174	49
CY051785.1	928	347	127	18	884	363	140	32	840	383	149	39	801	397	161	43	759	417	173	46
CY051793.1	909	366	127	18	864	383	140	32	818	406	147	40	780	417	160	45	740	432	174	49
CY051801.1	918	346	138	18	873	360	154	32	828	379	165	39	788	392	179	43	747	406	196	46
CY051809.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY051817.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY051825.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY051833.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY051841.1	928	345	130	17	884	360	144	31	838	383	154	36	799	398	166	39	758	417	177	44

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY051849.1	928	352	122	17	883	370	134	31	837	393	144	36	798	407	157	39	757	425	169	44
CY051857.1	916	362	123	18	871	380	135	32	824	404	143	39	784	420	154	43	742	440	166	46
CY051865.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY051873.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY051881.1	917	344	141	18	873	355	159	32	827	376	169	39	788	389	182	43	747	406	196	46
CY051889.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY051897.1	922	355	120	23	879	372	129	39	835	393	136	47	796	408	146	52	755	427	157	56
CY051905.1	923	346	133	18	879	360	148	32	833	382	157	39	794	396	169	43	753	414	182	46
CY051913.1	923	346	133	18	879	360	148	32	833	382	157	39	794	396	169	43	753	414	182	46
CY051921.1	923	346	133	18	879	360	148	32	833	382	157	39	794	396	169	43	753	414	182	46
CY052000.1	937	350	123	18	894	366	135	32	850	387	143	39	811	402	154	43	770	421	166	46
CY052021.1	935	352	123	18	890	370	135	32	845	391	144	39	804	407	156	43	761	427	169	46
CY052085.1	910	358	123	19	867	374	134	34	823	395	138	45	783	411	148	50	741	431	159	54
CY052087.1	918	347	127	18	874	363	140	32	829	384	149	39	789	399	161	43	747	418	174	46
CY052100.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY052108.1	903	368	123	18	857	387	135	32	810	411	143	39	768	429	154	43	724	451	166	46
CY052116.1	906	365	131	18	860	383	144	32	814	405	153	39	771	423	165	43	726	445	178	46
CY052124.1	924	355	123	18	880	372	135	32	834	395	143	39	795	410	154	43	754	429	166	46
CY052132.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY052140.1	925	354	123	18	881	371	135	32	836	393	143	39	796	409	154	43	754	429	166	46
CY052148.1	929	350	123	18	886	366	135	32	843	386	143	39	805	400	154	43	765	418	166	46
CY052156.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY052164.1	920	351	131	18	878	363	146	32	835	380	157	39	796	394	168	44	755	412	180	48
CY052172.1	898	377	127	18	853	393	141	32	807	415	149	40	770	423	164	45	731	435	180	49
CY052180.1	909	366	127	18	864	383	140	32	818	406	147	40	780	417	160	45	740	432	174	49
CY052188.1	920	357	125	18	876	373	138	32	832	393	147	39	793	407	159	43	752	425	172	46
CY052196.1	920	357	125	18	876	373	138	32	832	393	147	39	793	407	159	43	752	425	172	46
CY052204.1	913	364	122	21	867	384	129	39	819	409	132	51	778	426	141	57	736	446	152	61
CY052212.1	949	336	118	17	907	352	130	30	864	372	141	34	828	384	154	36	790	399	168	39
CY052220.1	930	351	122	17	885	369	134	31	839	392	144	36	799	407	157	39	757	426	169	44
CY052228.1	927	352	123	18	883	369	135	32	838	391	143	39	798	407	154	43	756	427	166	46
CY052236.1	922	343	136	19	877	364	134	44	831	388	136	54	791	405	142	59	749	425	154	59
CY052244.1	920	357	125	18	876	373	138	32	832	393	147	39	793	407	159	43	752	425	172	46
CY052252.1	929	351	123	18	885	368	135	32	840	390	143	39	800	406	154	43	758	426	166	46
CY052260.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY052268.1	929	350	123	18	886	366	135	32	842	387	143	39	803	402	154	43	762	421	166	46
CY052276.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY052284.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY052292.1	929	351	123	18	885	368	135	32	840	390	143	39	800	406	154	43	758	426	166	46
CY052300.1	923	346	133	18	879	360	148	32	833	382	157	39	794	396	169	43	753	414	182	46
CY052308.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY052316.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY052324.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY052332.1	920	357	125	18	876	373	138	32	832	393	147	39	793	407	159	43	752	425	172	46

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY052340.1	925	343	129	23	880	363	130	46	834	387	128	61	793	406	134	66	750	428	143	69
CY052369.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY052377.1	922	353	126	19	878	370	137	34	833	392	144	42	793	407	155	47	752	424	168	51
CY052385.1	920	357	125	18	876	373	138	32	832	393	147	39	793	407	159	43	752	425	172	46
CY052393.1	928	351	125	16	884	368	137	31	839	390	144	41	799	406	154	43	757	426	166	46
CY052401.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY052409.1	927	345	130	18	883	362	142	32	838	384	150	39	798	400	161	43	756	420	173	46
CY052417.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY052425.1	927	352	123	18	882	370	135	32	836	393	143	39	796	409	154	43	754	429	166	46
CY052433.1	936	343	123	18	894	358	135	32	851	378	143	39	811	395	153	43	769	416	164	46
CY052441.1	932	347	125	16	887	364	138	31	841	386	146	41	800	402	157	43	757	423	169	46
CY052449.1	936	343	123	18	894	358	135	32	851	378	143	39	811	395	153	43	769	416	164	46
CY052457.1	918	351	133	18	875	362	150	32	831	379	162	39	792	391	176	43	751	408	190	46
CY052465.1	926	353	123	18	881	371	135	32	835	394	143	39	794	412	153	43	751	433	165	46
CY052473.1	918	351	133	18	875	362	150	32	831	379	162	39	792	391	176	43	751	408	190	46
CY052481.1	936	343	123	18	894	358	135	32	851	378	143	39	811	395	153	43	769	416	164	46
CY052489.1	925	343	134	18	882	357	148	32	838	377	157	39	800	389	170	43	760	406	182	47
CY052497.1	930	349	123	18	886	366	135	32	841	388	143	39	801	404	154	43	759	424	166	46
CY052505.1	944	335	123	18	901	351	135	32	857	372	143	39	817	389	153	43	775	410	164	46
CY052513.1	892	382	122	24	846	401	125	47	799	423	133	56	759	438	144	61	718	455	157	65
CY052521.1	934	340	128	18	888	357	142	32	841	380	151	39	799	397	164	42	755	418	178	44
CY052529.1	927	352	123	18	882	370	135	32	836	393	143	39	794	411	154	43	750	433	166	46
CY052537.1	936	343	123	18	894	358	135	32	851	378	143	39	811	395	153	43	769	416	164	46
CY052545.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY052553.1	944	335	123	18	901	351	135	32	857	372	143	39	817	389	153	43	775	410	164	46
CY052561.1	915	353	134	18	870	369	148	32	824	391	157	39	785	403	171	43	744	420	184	47
CY052569.1	936	343	123	18	894	358	135	32	851	378	143	39	811	395	153	43	769	416	164	46
CY052577.1	936	343	123	18	894	358	135	32	852	377	143	39	813	393	153	43	772	413	164	46
CY052585.1	927	352	123	18	883	369	135	32	838	391	143	39	798	407	154	43	756	427	166	46
CY052593.1	910	362	130	18	865	378	140	36	820	399	147	45	780	415	157	50	740	433	167	55
CY052601.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY052609.1	927	352	123	18	882	370	135	32	837	391	144	39	796	407	156	43	753	427	169	46
CY052617.1	922	357	123	18	877	375	135	32	831	398	143	39	791	414	154	43	748	434	167	46
CY052625.1	930	349	123	18	886	366	135	32	841	388	143	39	801	404	154	43	759	424	166	46
CY052633.1	927	352	123	18	882	370	135	32	837	391	144	39	796	407	156	43	753	427	169	46
CY052641.1	914	364	124	18	871	379	137	32	828	396	148	39	790	406	163	43	750	420	179	46
CY052649.1	922	355	120	23	879	372	129	39	835	393	136	47	796	408	146	52	755	427	157	56
CY052657.1	917	361	124	18	872	378	137	32	826	400	146	39	784	416	159	43	740	436	173	46
CY052665.1	925	343	129	23	880	363	130	46	834	387	128	61	793	406	134	66	750	428	143	69
CY052673.1	911	366	125	18	867	382	138	32	823	402	147	39	784	416	159	43	743	434	172	46
CY052681.1	917	343	129	23	872	363	130	46	826	387	128	61	785	406	134	66	742	428	143	69
CY052689.1	927	352	123	18	882	370	135	32	836	393	143	39	794	411	154	43	750	433	166	46
CY052697.1	944	335	123	18	901	351	135	32	857	372	143	39	817	389	153	43	775	410	164	46
CY052705.1	909	368	125	18	866	383	138	32	822	401	149	39	783	414	162	43	741	432	176	46

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY052713.1	927	352	123	18	883	369	135	32	839	389	144	39	799	405	155	43	756	426	167	46
CY052721.1	920	354	127	19	876	371	138	34	831	393	145	42	792	408	155	47	751	426	168	49
CY052729.1	926	353	123	18	881	371	135	32	835	394	143	39	794	412	153	43	751	433	165	46
CY052737.1	920	359	123	18	875	377	135	32	829	400	143	39	788	417	154	43	745	437	167	46
CY052745.1	927	352	123	18	882	370	135	32	836	393	143	39	795	410	154	43	752	431	166	46
CY052753.1	920	354	127	19	876	371	138	34	831	393	145	42	792	408	155	47	751	426	168	49
CY052761.1	920	354	127	19	876	371	138	34	831	393	145	42	792	408	155	47	751	426	168	49
CY052769.1	918	359	125	18	874	376	137	32	829	398	145	39	789	414	156	43	747	434	168	46
CY052777.1	923	347	132	18	880	359	148	32	835	377	160	39	796	388	175	43	755	404	190	46
CY052785.1	912	354	127	19	868	371	138	34	823	393	145	42	784	408	155	47	743	426	168	49
CY052793.1	932	347	123	18	887	364	136	32	841	386	145	39	800	402	157	43	757	423	169	46
CY052801.1	920	354	127	19	876	371	138	34	831	393	145	42	792	408	155	47	751	426	168	49
CY052809.1	908	366	122	24	862	386	124	47	815	409	131	56	775	425	141	61	734	443	153	65
CY052817.1	927	352	123	18	883	369	135	32	838	391	143	39	798	407	154	43	756	427	166	46
CY052825.1	928	354	120	18	885	371	131	32	841	394	137	39	801	412	146	43	759	435	155	46
CY052833.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY052841.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY052849.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY052857.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY052865.1	918	351	133	18	875	362	150	32	831	379	162	39	792	391	176	43	751	408	190	46
CY052873.1	931	352	120	17	887	369	134	29	842	391	143	35	802	407	154	39	759	428	166	43
CY052881.1	910	359	125	18	865	376	138	32	819	398	147	39	778	414	159	43	735	434	172	46
CY052889.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY052897.1	928	351	123	18	883	368	136	32	837	390	145	39	796	405	158	43	753	424	172	46
CY052905.1	920	356	126	18	876	372	139	32	830	394	148	39	791	408	160	43	750	426	173	46
CY052913.1	927	350	117	26	882	368	127	42	836	390	136	48	795	406	148	50	752	427	161	50
CY052921.1	927	352	123	18	882	370	135	32	835	394	143	39	793	412	154	43	749	434	166	46
CY052929.1	927	352	123	18	883	369	135	32	838	391	143	39	798	407	154	43	756	427	166	46
CY052937.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY052945.1	928	354	120	18	885	371	131	32	841	394	137	39	801	412	146	43	759	435	155	46
CY052953.1	927	352	123	18	882	370	135	32	837	391	144	39	796	407	156	43	753	427	169	46
CY052961.1	914	355	133	18	871	367	149	32	825	390	156	40	786	406	164	46	746	424	174	51
CY052969.1	923	346	133	18	879	360	148	32	833	382	157	39	794	396	169	43	753	414	182	46
CY052977.1	923	346	133	18	879	360	148	32	833	382	157	39	794	396	169	43	753	414	182	46
CY052985.1	923	346	133	18	879	360	148	32	833	382	157	39	794	396	169	43	753	414	182	46
CY052993.1	923	346	133	18	879	360	148	32	833	382	157	39	794	396	169	43	753	414	182	46
CY053001.1	923	346	133	18	879	360	148	32	833	382	157	39	794	396	169	43	753	414	182	46
CY053009.1	923	346	133	18	879	360	148	32	833	382	157	39	794	396	169	43	753	414	182	46
CY053017.1	923	346	133	18	879	360	148	32	833	382	157	39	794	396	169	43	753	414	182	46
CY053025.1	923	346	133	18	879	360	148	32	833	382	157	39	794	396	169	43	753	414	182	46
CY053033.1	923	346	133	18	879	360	148	32	833	382	157	39	794	396	169	43	753	414	182	46
CY053041.1	923	346	133	18	879	360	148	32	833	382	157	39	794	396	169	43	753	414	182	46
CY053049.1	923	346	133	18	879	360	148	32	833	382	157	39	794	396	169	43	753	414	182	46
CY053057.1	923	346	133	18	879	360	148	32	833	382	157	39	794	396	169	43	753	414	182	46

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY053065.1	923	346	133	18	879	360	148	32	833	382	157	39	794	396	169	43	753	414	182	46
CY053073.1	937	342	123	18	897	355	135	32	855	378	139	39	817	395	147	43	776	415	159	45
CY053081.1	924	355	123	18	880	372	135	32	834	395	143	39	795	410	154	43	754	429	166	46
CY053089.1	924	355	123	18	880	372	135	32	834	395	143	39	795	410	154	43	754	429	166	46
CY053097.1	937	346	119	18	895	362	130	32	852	383	137	39	813	399	147	43	771	420	158	46
CY053105.1	937	346	119	18	895	362	130	32	852	383	137	39	813	399	147	43	770	421	158	46
CY053113.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY053121.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY053129.1	911	368	123	18	864	388	135	32	815	414	143	39	772	433	154	43	727	456	166	46
CY053137.1	911	368	123	18	864	388	135	32	815	414	143	39	772	433	154	43	727	456	166	46
CY053144.1	921	362	119	18	878	379	130	32	835	399	138	39	796	414	149	43	754	434	161	46
CY053152.1	921	362	119	18	878	379	130	32	835	399	138	39	796	414	149	43	754	434	161	46
CY053160.1	920	357	125	18	876	373	138	32	832	393	147	39	793	407	159	43	752	425	172	46
CY053168.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY053176.1	927	348	131	15	882	366	139	34	835	390	144	44	793	408	155	47	749	430	167	48
CY053184.1	916	363	123	18	870	382	135	32	822	407	143	39	781	424	154	43	738	445	166	46
CY053192.1	927	348	131	15	882	366	139	34	835	390	144	44	793	408	155	47	749	430	167	48
CY053200.1	927	348	131	15	882	366	139	34	835	390	144	44	793	408	155	47	749	430	167	48
CY053208.1	911	368	123	18	866	386	135	32	819	410	143	39	779	426	154	43	737	446	166	46
CY053216.1	911	368	123	18	866	386	135	32	819	410	143	39	779	426	154	43	737	446	166	46
CY053224.1	932	346	132	11	888	362	144	27	843	384	150	38	803	400	161	42	761	420	172	46
CY053232.1	932	346	132	11	888	362	144	27	843	384	150	38	803	400	161	42	761	420	172	46
CY053240.1	924	355	123	18	880	372	135	32	834	395	143	39	795	410	154	43	754	429	166	46
CY053248.1	924	355	123	18	880	372	135	32	834	395	143	39	795	410	154	43	754	429	166	46
CY053256.1	932	346	132	11	888	362	144	27	843	384	150	38	803	400	161	42	761	420	172	46
CY053263.1	932	346	132	11	888	362	144	27	843	384	150	38	803	400	161	42	761	420	172	46
CY053271.1	927	348	131	15	882	366	139	34	835	390	144	44	793	408	155	47	749	430	167	48
CY053279.1	934	341	131	15	890	358	139	34	846	379	144	44	806	395	155	47	765	414	167	48
CY053287.1	912	367	123	18	867	385	135	32	821	408	143	39	780	425	154	43	737	446	166	46
CY053295.1	905	367	123	18	860	385	135	32	814	408	143	39	773	425	154	43	730	446	166	46
CY053303.1	912	367	123	18	867	385	135	32	821	408	143	39	780	425	154	43	737	446	166	46
CY053311.1	932	346	132	11	888	362	144	27	843	384	150	38	803	400	161	42	761	420	172	46
CY053340.1	895	364	124	28	849	383	136	39	802	406	145	43	760	423	157	46	716	444	170	48
CY053344.1	895	364	124	26	849	383	136	37	802	406	145	42	760	423	157	45	716	444	170	48
CY053350.1	895	364	126	21	849	383	136	37	802	406	145	42	760	423	157	46	716	444	170	49
CY053418.1	953	351	129	18	912	363	143	32	870	380	153	39	832	394	163	44	792	412	174	48
CY053476.1	938	354	126	19	894	371	137	34	849	393	145	41	809	409	156	45	767	429	168	48
CY053484.1	938	354	126	19	894	371	137	34	849	393	145	41	809	409	156	45	767	429	168	48
CY053492.1	938	354	126	19	894	371	137	34	849	393	145	41	809	409	156	45	767	429	168	48
CY053500.1	938	354	126	19	894	371	137	34	849	393	145	41	809	409	156	45	767	429	168	48
CY053508.1	938	357	128	19	894	372	140	35	849	393	147	44	809	409	155	51	767	429	167	54
CY053621.1	933	345	123	21	890	362	129	40	846	383	129	55	806	399	138	61	764	418	150	65
CY053629.1	1001	358	148	32	956	369	157	56	910	389	157	69	870	401	166	68	828	420	175	67
CY053647.1	934	329	128	19	895	342	138	34	854	359	147	40	820	369	158	43	784	383	170	45

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY053683.1	1005	334	123	18	963	349	135	32	919	371	142	39	878	391	150	43	835	415	159	46
CY053691.1	995	334	123	18	953	349	135	32	909	371	142	39	868	391	150	43	825	415	159	46
CY053730.1	956	372	136	18	913	385	151	32	871	399	164	39	835	405	181	43	797	415	199	46
CY053738.1	967	347	126	18	924	362	139	32	880	383	147	39	841	398	158	43	800	418	169	46
CY053746.1	938	347	126	18	895	362	139	32	851	383	147	39	812	398	158	43	771	418	169	46
CY053754.1	969	357	116	16	924	376	127	30	878	401	132	38	837	420	140	45	795	440	153	46
CY053786.1	937	350	123	18	894	366	135	32	850	387	143	39	811	402	154	43	770	421	166	46
CY053898.1	918	357	124	19	873	375	136	29	828	397	145	32	788	413	156	38	746	432	169	43
CY053902.2	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY053905.2	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY053917.2	917	352	123	18	873	368	136	32	828	389	145	39	788	404	157	43	746	423	170	46
CY053920.2	923	346	123	18	880	362	135	32	836	383	143	39	798	397	154	43	758	415	166	46
CY053930.1	917	352	123	18	873	368	136	32	828	389	145	39	788	404	157	43	746	423	170	46
CY053940.2	919	350	123	18	874	368	135	32	829	390	143	39	790	405	154	43	749	424	166	46
CY053943.2	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY053951.2	919	350	123	18	874	368	135	32	829	390	143	39	790	405	154	43	749	424	166	46
CY053954.2	923	346	123	18	880	362	135	32	836	383	143	39	798	396	155	43	758	413	168	46
CY053957.2	904	365	123	18	858	384	135	32	811	408	143	39	770	425	154	43	727	446	166	46
CY053960.2	918	337	137	18	874	354	147	34	829	378	150	44	789	395	157	51	747	416	166	56
CY053963.1	938	351	123	18	894	368	135	32	849	390	143	39	809	406	154	43	767	426	166	46
CY053966.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY053969.2	921	348	123	18	877	365	135	32	832	387	143	39	790	406	153	43	746	429	164	46
CY053972.2	913	356	123	18	867	375	135	32	820	399	143	39	778	417	154	43	734	439	166	46
CY053975.1	909	356	127	18	865	370	142	32	820	390	151	40	780	404	163	45	738	422	176	49
CY054297.1	911	352	132	18	865	368	147	32	819	390	156	39	781	401	170	43	741	416	185	46
CY054632.1	1007	334	123	18	965	349	135	32	921	371	142	39	880	391	150	43	837	415	159	46
CY054640.1	998	344	123	18	956	359	135	32	913	380	142	39	874	396	152	43	833	416	163	46
CY054648.1	981	348	121	19	939	362	133	34	897	379	142	42	859	392	153	47	819	409	165	51
CY054656.1	983	370	123	17	936	389	136	31	888	412	148	36	847	428	161	39	804	448	174	43
CY054664.1	960	367	123	18	914	386	135	32	867	409	144	39	826	425	156	43	783	445	169	46
CY054672.1	985	350	126	18	941	366	139	32	896	388	147	39	856	404	158	43	814	425	169	46
CY054680.1	991	347	126	18	948	362	139	32	904	383	147	39	865	398	158	43	824	418	169	46
CY054685.1	927	352	123	18	882	370	135	32	836	393	143	39	795	410	154	43	752	431	166	46
CY054693.1	916	358	128	18	872	375	139	33	826	398	146	41	788	411	157	46	748	428	169	50
CY054709.1	903	363	136	18	858	379	150	32	813	399	160	39	773	413	173	43	731	431	187	46
CY054717.1	925	352	123	18	880	370	135	32	835	391	144	39	794	407	156	43	751	427	169	46
CY054725.1	935	341	123	19	891	359	130	37	846	381	138	42	807	395	152	43	766	413	166	44
CY054733.1	933	346	123	18	890	362	135	32	846	383	143	39	808	397	154	43	768	415	166	46
CY054741.1	922	355	123	18	877	373	135	32	831	396	143	39	791	412	154	43	749	432	166	46
CY054749.1	927	352	123	18	883	369	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY054757.1	931	342	127	18	888	356	141	32	843	377	150	39	803	392	162	43	761	411	175	46
CY054765.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY054773.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY054781.1	926	351	123	18	882	368	135	32	837	390	143	39	797	406	154	43	755	426	166	46

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY054789.1	913	365	124	18	869	381	137	32	824	402	146	39	784	417	158	43	742	437	168	48
CY054797.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY054805.1	927	351	124	18	882	368	137	32	836	390	146	39	795	406	158	43	752	426	171	46
CY054813.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY054821.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY054829.1	906	371	123	18	861	389	135	32	814	413	143	39	773	430	154	43	731	449	167	46
CY054837.1	926	351	123	18	882	368	135	32	837	390	143	39	797	406	154	43	755	426	166	46
CY054845.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY054853.1	927	352	123	18	882	370	135	32	837	391	144	39	796	407	156	43	753	427	169	46
CY054861.1	927	352	123	18	882	370	135	32	837	391	144	39	796	407	156	43	753	427	169	46
CY054869.1	903	363	136	18	858	379	150	32	813	399	160	39	773	413	173	43	731	431	187	46
CY054877.1	920	351	123	18	876	368	135	32	831	390	143	39	791	406	154	43	749	426	166	46
CY054885.1	914	364	124	18	869	381	137	32	823	403	146	39	781	420	158	43	738	440	171	46
CY054893.1	919	352	123	18	874	370	135	32	829	391	144	39	788	407	156	43	745	427	169	46
CY054901.1	923	354	122	21	878	373	129	39	833	394	133	51	792	410	143	57	749	430	155	61
CY054909.1	905	374	123	18	860	392	135	32	813	416	143	39	775	429	155	43	735	446	168	46
CY054917.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY054925.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY054933.1	927	352	123	18	882	371	134	32	837	390	145	39	796	405	159	42	753	424	173	45
CY054941.1	927	352	123	18	882	370	135	32	837	391	144	39	796	407	156	43	753	427	169	46
CY054949.1	917	357	128	18	874	371	142	32	830	390	152	39	790	406	162	44	748	426	173	48
CY054957.1	929	351	123	18	885	368	135	32	840	390	143	39	800	406	154	43	758	426	166	46
CY054965.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY054973.1	927	352	123	18	883	369	135	32	838	391	143	39	798	407	154	43	756	427	166	46
CY054981.1	925	352	123	18	880	370	135	32	835	391	144	39	794	407	156	43	751	427	169	46
CY054989.1	925	352	123	18	881	369	135	32	836	391	143	39	796	407	154	43	754	427	166	46
CY054997.1	927	352	123	18	881	371	135	32	833	396	143	39	790	415	153	44	746	437	164	48
CY055005.1	925	352	123	18	881	369	135	32	836	391	143	39	796	407	154	43	754	427	166	46
CY055013.1	926	351	123	18	882	368	135	32	837	390	143	39	797	406	154	43	755	426	166	46
CY055021.1	927	352	123	18	883	369	135	32	838	391	143	39	798	407	154	43	756	427	166	46
CY055029.1	912	367	123	18	867	385	135	32	821	408	143	39	780	425	154	43	737	446	166	46
CY055037.1	920	358	122	20	877	372	134	36	833	391	142	45	792	407	153	49	749	427	165	52
CY055045.1	927	352	123	18	883	369	135	32	838	391	143	39	798	408	153	43	756	429	164	46
CY055053.1	928	350	124	18	884	367	136	32	839	389	144	38	799	405	155	43	757	425	167	46
CY055061.1	920	342	130	20	876	358	141	36	831	380	145	47	791	397	153	53	749	419	160	59
CY055069.1	927	350	124	19	883	368	127	41	838	390	134	49	798	406	144	54	756	426	155	58
CY055077.1	927	350	124	19	883	368	127	41	838	390	134	49	798	406	144	54	756	426	155	58
CY055170.1	918	350	124	18	874	366	137	32	829	387	146	39	788	403	158	43	745	423	171	46
CY055197.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY055199.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY055201.1	926	344	122	18	884	361	132	32	841	384	137	39	803	401	145	43	763	421	155	46
CY055203.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY055205.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY055207.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY055209.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY055211.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY055213.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY055215.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY055217.1	926	344	122	18	884	361	132	32	841	384	137	39	803	401	145	43	763	421	155	46
CY055219.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY055221.1	918	353	121	18	874	369	134	32	829	392	141	39	789	411	148	44	747	430	161	47
CY055223.1	918	350	123	19	874	368	130	37	829	390	138	42	789	406	151	43	747	426	164	44
CY055225.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY055227.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY055229.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY055231.1	918	344	129	19	874	362	138	35	829	386	137	49	789	404	143	52	747	425	154	53
CY055233.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY055235.1	910	354	127	19	866	371	138	34	821	393	145	42	782	408	155	47	741	426	168	49
CY055237.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY055239.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY055241.1	914	341	136	19	870	358	148	33	825	380	153	43	786	394	165	44	745	412	176	48
CY055243.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY055245.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY055247.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY055249.1	902	367	123	18	857	385	135	32	811	408	143	39	770	425	154	43	727	446	166	46
CY055251.1	914	355	123	18	869	373	135	32	823	396	143	39	783	412	154	43	741	432	166	46
CY055253.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY055255.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY055257.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY055259.1	921	334	132	23	879	349	141	40	836	369	146	50	797	383	156	56	756	401	167	61
CY055261.1	918	351	123	18	874	368	135	32	829	390	143	39	788	407	154	43	745	428	166	46
CY055263.1	911	354	126	19	867	371	138	33	822	393	145	41	782	409	155	43	740	429	166	46
CY055265.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY055267.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY055273.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY055281.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY055289.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY055297.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY055305.1	952	365	123	18	906	384	135	32	859	408	143	39	818	425	154	43	775	446	166	46
CY055323.1	918	354	120	18	874	371	134	30	829	393	146	33	789	409	162	32	748	428	176	34
CY055325.1	911	353	128	18	867	369	141	32	822	390	150	39	782	404	163	43	740	422	177	46
CY055328.1	912	357	123	18	867	375	135	32	821	398	143	39	778	417	154	43	733	440	166	46
CY055330.1	942	331	119	18	900	347	130	32	856	369	137	39	814	389	146	43	770	413	156	46
CY055332.1	917	352	123	18	873	369	135	32	828	391	143	39	787	408	154	43	743	430	166	46
CY055335.1	922	346	125	17	878	362	136	34	833	383	144	44	792	400	153	49	749	421	165	49
CY055341.1	930	339	123	18	887	355	135	32	843	376	143	39	803	392	154	43	762	411	166	46
CY055343.1	929	343	120	18	886	358	133	32	841	380	141	39	800	397	152	43	756	418	166	45
CY055345.1	934	326	132	18	890	343	141	35	846	364	149	42	806	381	159	45	764	402	170	46

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY055347.1	926	344	122	18	883	361	131	34	839	382	137	43	800	397	147	47	760	415	159	48
CY055352.1	917	352	123	18	873	369	135	32	828	391	143	39	787	408	154	43	743	430	166	46
CY055356.1	922	347	123	18	878	364	135	32	833	386	143	39	792	403	154	43	749	424	166	46
CY055359.1	909	355	125	21	865	372	134	38	822	391	136	52	783	405	146	58	742	424	157	62
CY055363.1	922	342	125	21	878	360	130	42	833	382	133	56	792	400	138	64	749	421	149	64
CY055365.1	915	354	123	18	871	371	135	32	825	394	143	39	783	413	153	43	740	434	165	46
CY055368.1	927	343	122	18	884	360	133	32	840	383	139	39	801	397	151	43	760	415	164	46
CY055371.1	919	350	123	18	876	366	135	32	832	387	143	39	793	402	154	43	752	421	166	46
CY055373.1	919	350	123	18	876	366	135	32	832	387	143	39	793	402	154	43	752	421	166	46
CY055375.1	932	338	122	18	890	354	131	34	847	374	137	43	809	388	147	47	770	405	159	48
CY055377.1	917	352	123	18	872	370	135	32	825	394	143	39	783	412	154	43	739	434	166	46
CY055379.1	920	348	122	20	875	367	132	35	829	390	142	40	789	406	154	43	747	426	166	47
CY055381.1	914	353	122	21	870	371	130	38	825	393	131	52	785	409	140	58	743	429	151	62
CY055384.1	938	331	123	18	895	347	135	32	851	368	143	39	810	386	153	43	767	408	164	46
CY055388.1	917	352	123	18	872	370	135	32	827	391	144	39	786	407	156	43	743	427	169	46
CY055390.1	914	353	122	21	870	371	130	38	825	393	131	52	785	409	140	58	743	429	151	62
CY055397.1	902	367	123	18	855	387	135	32	809	409	144	39	767	426	156	43	723	447	169	46
CY055401.1	900	364	128	18	855	380	142	32	809	400	153	39	766	418	164	44	722	438	177	48
CY055403.1	912	358	122	18	869	375	131	34	824	397	137	43	785	411	148	47	748	423	163	48
CY055405.1	917	352	123	18	872	370	135	32	827	391	144	39	786	407	156	43	743	427	169	46
CY055407.1	917	352	123	18	872	370	135	32	827	391	144	39	786	407	156	43	743	427	169	46
CY055409.1	927	343	122	18	884	360	133	32	840	383	139	39	801	397	151	43	760	415	164	46
CY055411.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY055413.1	927	343	122	18	884	360	133	32	840	383	139	39	801	397	151	43	760	415	164	46
CY055425.1	909	366	127	18	864	383	140	32	818	406	147	40	780	417	160	45	740	432	174	49
CY055433.1	913	366	123	18	869	383	135	32	824	405	143	39	784	421	154	43	742	441	166	46
CY055441.1	899	374	129	18	854	391	142	32	808	414	149	40	770	425	162	45	730	440	176	49
CY055449.1	924	347	131	18	880	359	148	32	836	374	162	39	796	389	172	45	756	406	183	50
CY055457.1	927	352	123	18	883	369	135	32	838	391	143	39	798	407	154	43	756	427	166	46
CY055465.1	928	354	121	17	884	371	133	31	839	392	144	36	799	408	156	39	757	428	168	43
CY055473.1	923	350	127	18	879	367	138	33	834	389	145	39	794	405	155	42	752	425	166	46
CY055488.1	925	352	123	18	881	369	135	32	836	391	143	39	796	407	154	43	754	427	166	46
CY055496.1	926	354	121	17	882	371	133	31	837	392	144	36	797	408	156	39	755	428	168	43
CY055504.1	896	383	122	17	849	403	134	31	801	427	145	35	759	445	157	39	715	467	169	43
CY055512.1	927	352	123	18	883	369	135	32	838	391	143	39	798	407	154	43	756	427	166	46
CY055520.1	925	352	123	18	881	369	135	32	836	391	143	39	796	407	154	43	754	427	166	46
CY055528.1	915	351	132	20	870	370	133	44	824	393	140	52	786	405	152	57	746	421	165	57
CY055536.1	920	354	127	19	875	371	132	41	831	389	142	49	792	401	155	54	751	419	165	60
CY055544.1	920	357	124	19	875	376	127	41	830	398	134	49	792	411	145	54	752	428	157	58
CY055552.1	920	354	127	19	875	371	132	41	831	389	142	49	792	401	155	54	751	419	165	60
CY055567.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY055575.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY055583.1	927	350	124	19	883	368	127	41	838	390	134	49	798	406	144	54	756	426	155	58
CY055591.1	927	352	122	19	884	369	137	26	839	394	143	30	799	411	152	38	757	430	165	44

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY055599.1	923	356	123	18	879	373	135	32	835	393	144	39	796	408	154	44	755	427	165	48
CY055607.1	930	347	124	19	886	365	127	41	841	387	134	49	800	405	143	54	757	427	153	58
CY055615.1	920	354	127	19	875	371	132	41	831	389	142	49	792	401	155	54	751	419	165	60
CY055623.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY055631.1	927	352	122	19	884	369	137	26	839	394	143	30	799	411	152	38	757	430	165	44
CY055639.1	934	343	124	19	891	360	127	41	847	381	134	49	807	398	143	54	764	420	153	58
CY055647.1	927	342	132	19	883	360	143	33	838	382	149	42	798	398	161	42	756	418	172	45
CY055655.1	932	343	126	19	886	366	124	43	840	390	128	53	798	408	137	59	753	431	148	63
CY055663.1	927	350	124	19	883	368	127	41	838	390	134	49	798	406	144	54	756	426	155	58
CY055670.1	919	350	124	19	875	368	127	41	830	390	134	49	790	406	144	54	748	426	155	58
CY055678.1	927	350	124	19	883	368	127	41	838	390	134	49	798	406	144	54	756	426	155	58
CY055686.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY055694.1	926	351	124	19	882	369	127	41	838	390	134	49	798	407	143	54	756	428	153	58
CY055702.1	930	347	124	19	886	365	127	41	841	387	134	49	800	405	143	54	757	427	153	58
CY055710.1	930	347	124	19	886	365	127	41	841	387	134	49	800	405	143	54	757	427	153	58
CY055718.1	903	366	124	19	858	385	127	41	812	408	134	49	771	425	144	54	728	446	155	58
CY055726.1	916	361	124	19	871	380	127	41	825	403	134	49	784	420	144	54	740	442	155	58
CY055734.1	927	350	124	19	883	368	127	41	838	390	134	49	798	406	144	54	756	426	155	58
CY055742.1	913	364	124	19	867	384	127	41	820	408	134	49	779	425	144	54	736	446	155	58
CY055750.1	927	352	122	19	884	369	137	26	839	394	143	30	799	411	152	38	757	430	165	44
CY055758.1	927	350	124	19	883	368	127	41	838	390	134	49	798	406	144	54	756	426	155	58
CY055766.1	920	346	136	18	876	362	149	32	832	381	159	39	793	395	170	44	752	413	182	48
CY055774.1	934	351	116	19	890	369	131	26	845	392	139	30	805	409	148	38	763	430	158	45
CY055782.1	920	354	127	19	873	373	132	41	827	393	142	49	786	408	154	54	743	428	164	60
CY055790.1	917	355	129	19	873	371	134	41	828	392	142	49	788	407	153	54	747	424	166	58
CY055798.1	921	356	124	19	876	375	127	41	830	398	134	49	791	412	145	54	750	430	157	58
CY055806.1	931	348	122	19	889	364	137	26	845	388	143	30	804	406	152	38	761	426	165	44
CY055814.1	927	350	124	19	883	368	127	41	838	390	134	49	798	406	144	54	756	426	155	58
CY055822.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY055830.1	925	350	124	19	881	368	127	41	836	390	134	49	796	406	144	54	754	426	155	58
CY055838.1	920	354	127	19	875	371	132	41	831	389	142	49	792	401	155	54	751	419	165	60
CY055846.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY055854.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY055862.1	927	350	124	19	883	368	127	41	838	390	134	49	798	406	144	54	756	426	155	58
CY055870.1	927	350	124	19	883	368	127	41	838	390	134	49	798	406	144	54	756	426	155	58
CY055878.1	927	350	124	19	883	368	127	41	838	390	134	49	798	406	144	54	756	426	155	58
CY055886.1	911	366	124	19	866	385	127	41	820	408	134	49	779	425	144	54	736	446	155	58
CY055894.1	927	350	124	19	883	368	127	41	838	390	134	49	797	407	144	54	753	429	155	58
CY055902.1	927	350	124	19	883	368	127	41	838	390	134	49	798	406	144	54	756	426	155	58
CY055910.1	911	356	134	19	866	372	140	41	823	387	152	49	786	394	168	54	747	407	181	60
CY055918.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY055926.1	927	350	124	19	883	368	127	41	838	390	134	49	798	406	144	54	756	426	155	58
CY055934.1	906	368	127	19	860	386	132	41	815	405	142	49	775	418	155	54	733	437	165	60
CY055942.1	906	368	127	19	860	386	132	41	815	405	142	49	775	418	155	54	733	437	165	60

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY055950.1	921	352	129	18	879	365	143	32	836	383	153	39	797	398	163	44	756	417	174	48
CY055958.1	927	352	123	18	883	369	135	32	838	391	143	39	798	407	154	43	756	427	166	46
CY055966.1	932	347	123	18	888	364	135	32	843	386	143	39	802	403	154	43	759	424	166	46
CY055974.1	927	352	123	18	883	369	135	32	838	391	143	39	798	407	154	43	756	427	166	46
CY055982.1	927	352	123	18	883	369	135	32	838	391	143	39	798	407	154	43	756	427	166	46
CY055990.1	927	352	123	18	883	369	135	32	838	391	143	39	798	407	154	43	756	427	166	46
CY055998.1	927	352	123	18	883	369	135	32	838	391	143	39	798	407	154	43	756	427	166	46
CY056006.1	938	348	116	18	896	365	126	32	853	386	133	39	815	401	143	43	775	420	154	46
CY056014.1	914	357	123	18	871	373	135	32	827	394	143	39	786	412	153	43	743	434	164	46
CY056022.1	914	368	121	17	871	382	135	31	827	400	148	36	788	413	159	42	747	430	172	47
CY056030.1	927	352	123	18	883	369	135	32	838	391	143	39	798	407	154	43	756	427	166	46
CY056038.1	939	338	122	21	896	355	130	38	852	376	131	52	810	395	139	58	766	418	149	62
CY056046.1	929	339	134	18	884	356	147	32	838	378	156	39	797	394	167	44	755	413	179	48
CY056054.1	921	358	123	18	876	376	135	32	829	400	143	39	787	418	154	43	743	440	166	46
CY056062.1	919	360	123	18	873	379	135	32	826	402	144	39	782	421	156	43	736	444	168	47
CY056070.1	910	356	128	18	866	372	141	32	822	391	151	39	783	404	164	43	742	421	178	46
CY056078.1	905	366	123	18	859	385	135	32	812	409	143	39	770	427	154	43	726	449	166	46
CY056086.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY056094.1	902	377	123	18	854	398	135	32	805	424	143	39	761	444	154	43	715	468	166	46
CY056102.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY056110.1	916	363	123	18	872	380	135	32	827	402	143	39	787	418	154	43	745	438	166	46
CY056118.1	918	359	125	18	874	376	137	32	829	398	145	39	789	414	156	43	747	434	168	46
CY056126.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY056134.1	925	352	123	18	881	369	135	32	836	391	143	39	796	407	154	43	754	427	166	46
CY056142.1	914	353	132	19	867	374	143	33	818	400	149	42	776	418	161	42	733	439	172	45
CY056150.1	919	352	129	18	877	365	143	32	834	383	153	39	795	397	164	44	754	414	177	48
CY056158.1	922	355	125	18	878	371	138	32	833	392	147	39	792	408	159	43	749	427	173	46
CY056166.1	914	364	124	18	869	385	131	34	823	409	136	43	782	427	145	46	739	449	156	48
CY056174.1	919	351	122	18	873	370	134	32	826	394	142	39	783	413	152	44	739	435	163	49
CY056182.1	924	353	123	18	880	370	135	32	835	392	143	39	795	408	154	43	753	428	166	46
CY056190.1	919	352	123	18	875	369	135	32	830	391	143	39	790	407	154	43	748	427	166	46
CY056198.1	921	350	129	18	877	367	138	35	832	389	145	43	792	405	153	50	750	425	162	56
CY056206.1	927	352	123	18	883	369	135	32	838	391	143	39	798	407	154	43	756	427	166	46
CY056214.1	927	352	123	18	883	369	135	32	838	391	143	39	798	407	154	43	756	427	166	46
CY056222.1	928	349	125	18	884	367	133	35	839	390	140	41	799	406	153	44	757	426	166	44
CY056230.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY056238.1	926	353	123	18	881	371	135	32	834	395	143	39	792	413	154	43	748	435	166	46
CY056244.1	925	352	123	18	881	369	135	32	836	391	143	39	796	407	154	43	754	427	166	46
CY056245.1	928	351	122	19	884	368	138	26	839	390	147	30	799	406	157	38	757	426	168	45
CY056247.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY056248.1	917	352	123	18	872	370	135	32	826	393	143	39	785	410	154	43	742	431	166	46
CY056249.1	926	344	122	18	881	363	133	32	835	388	139	39	794	405	150	43	751	426	162	46
CY056250.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY056251.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY056252.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY056253.1	923	346	123	18	880	362	135	32	836	383	143	39	798	397	154	43	758	415	166	46
CY056254.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY056255.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY056284.1	918	357	117	18	874	374	129	32	830	397	135	39	789	418	141	44	747	437	154	47
CY056285.1	921	348	123	18	877	365	135	32	832	387	143	39	791	405	153	43	748	427	164	46
CY056286.1	923	342	127	18	881	355	141	32	837	375	150	39	798	388	163	43	757	405	177	46
CY056287.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY056288.1	918	354	120	18	874	369	134	32	829	390	144	38	789	406	156	40	747	426	168	43
CY056289.1	913	356	123	18	867	375	135	32	820	399	143	39	778	417	154	43	734	439	166	46
CY056290.1	913	348	131	18	869	363	145	32	823	386	153	39	781	405	163	43	737	428	174	46
CY056291.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY056292.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY056293.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY056295.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY056389.1	916	358	128	18	872	375	139	33	826	398	146	41	788	411	157	46	748	428	169	50
CY056397.1	935	345	118	20	892	362	126	37	849	384	129	47	809	401	141	48	766	423	154	43
CY056405.1	895	378	127	18	849	394	142	32	802	417	150	40	764	426	165	45	725	438	181	49
CY056413.1	907	366	127	18	862	383	140	32	816	406	147	40	778	417	160	45	738	432	174	49
CY056421.1	918	359	123	18	873	377	135	32	827	400	143	39	787	415	155	43	745	434	168	46
CY056429.1	911	369	127	13	865	385	145	24	819	404	160	28	778	416	176	32	735	433	192	36
CY056437.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY056445.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY056453.1	894	378	125	21	847	396	138	36	800	419	143	47	761	430	155	54	719	448	164	62
CY056461.1	918	359	123	18	873	377	135	32	827	400	143	39	787	415	155	43	745	434	168	46
CY056469.1	907	366	127	18	862	383	140	32	816	406	147	40	778	417	160	45	738	432	174	49
CY056477.1	926	351	123	18	882	368	135	32	837	390	143	39	797	406	154	43	754	427	166	46
CY056485.1	925	352	123	18	881	369	135	32	836	391	143	39	796	407	154	43	754	427	166	46
CY056493.1	920	358	124	18	876	374	137	32	832	394	146	39	793	408	158	43	752	426	171	46
CY056501.1	920	359	123	18	875	377	135	32	829	400	143	39	789	415	155	43	747	434	168	46
CY056509.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY056517.1	928	352	121	19	885	367	133	34	842	385	142	42	803	399	153	47	762	417	165	51
CY056525.1	920	357	125	18	877	371	139	32	833	390	149	39	792	407	159	44	749	428	170	48
CY056533.1	928	350	126	16	884	366	139	30	839	388	146	38	799	404	156	45	757	424	168	47
CY056541.1	903	376	123	18	857	395	135	32	809	420	143	39	768	436	155	43	725	456	168	46
CY056549.1	926	351	123	18	882	368	135	32	837	390	143	39	797	406	154	43	755	426	166	46
CY056557.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY056565.1	913	366	123	18	869	383	135	32	824	405	143	39	784	421	154	43	742	441	166	46
CY056573.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY056581.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY056589.1	925	351	126	18	881	367	139	32	837	386	149	39	797	401	161	43	756	418	175	46
CY056597.1	927	352	123	18	883	369	135	32	838	391	143	39	798	407	154	43	756	427	166	46
CY056605.1	929	350	123	18	886	366	135	32	842	387	143	39	803	402	154	43	762	421	166	46
CY056613.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY056621.1	914	365	123	18	868	384	135	32	821	408	143	39	780	425	154	43	737	446	166	46
CY056629.1	918	359	125	18	874	376	137	32	829	398	145	39	789	414	156	43	747	434	168	46
CY056637.1	926	353	123	18	883	369	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY056645.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY056653.1	913	363	126	18	870	381	136	32	826	402	144	39	787	416	159	39	748	432	171	42
CY056661.1	935	344	123	18	890	362	135	32	844	385	143	39	803	402	154	43	760	423	166	46
CY056669.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY056677.1	927	352	123	18	882	370	135	32	836	393	143	39	795	410	154	43	752	431	166	46
CY056685.1	927	352	123	18	883	369	135	32	838	391	143	39	798	407	154	43	756	427	166	46
CY056693.1	912	357	128	23	868	376	133	42	825	395	128	63	786	409	135	71	745	426	148	73
CY056701.1	917	345	134	24	874	358	140	47	830	376	139	66	790	391	149	71	749	409	160	70
CY056709.1	916	363	123	18	871	381	135	32	825	404	143	39	784	421	154	43	741	442	166	46
CY056717.1	908	369	122	21	864	386	131	38	821	403	135	52	783	414	147	58	743	429	161	62
CY056725.1	907	372	123	18	861	391	135	32	814	413	145	39	772	429	158	43	728	450	171	46
CY056733.1	923	356	123	18	878	373	136	32	832	394	146	39	791	409	159	43	748	430	171	46
CY056741.1	929	364	109	18	885	383	119	32	840	406	126	39	800	423	136	43	758	444	147	46
CY056749.1	916	353	132	19	869	374	143	33	820	399	150	42	777	416	164	42	733	436	177	45
CY056757.1	931	351	121	17	885	371	136	27	839	392	151	29	799	406	167	32	757	426	181	34
CY056765.1	914	375	113	18	868	396	123	32	821	422	129	39	779	442	138	43	736	463	151	45
CY056773.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY056781.1	927	352	123	18	883	369	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY056789.1	927	343	131	19	883	362	133	42	838	385	133	56	798	402	140	62	756	422	151	63
CY056797.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY056805.1	933	346	123	18	890	362	135	32	845	384	143	39	805	400	154	43	763	420	166	46
CY056813.1	929	351	123	18	885	368	135	32	840	390	143	39	800	406	154	43	758	426	166	46
CY056821.1	927	352	123	18	882	370	135	32	836	393	143	39	795	410	154	43	752	431	166	46
CY056829.1	922	352	128	18	878	368	141	32	833	389	150	39	793	404	162	43	751	422	176	46
CY056837.1	927	352	123	18	883	369	135	32	838	391	143	39	798	407	154	43	756	427	166	46
CY056845.1	906	369	127	18	862	384	140	33	817	405	144	45	775	424	148	55	731	445	158	61
CY056853.1	926	353	123	18	881	371	135	32	835	394	143	39	795	410	154	43	753	430	166	46
CY056861.1	930	356	117	17	886	373	130	30	841	395	141	34	801	411	153	37	760	430	165	41
CY056869.1	907	368	125	18	860	389	137	31	810	416	142	41	766	436	151	47	723	457	164	41
CY056877.1	925	352	123	18	881	369	135	32	836	391	143	39	796	407	154	43	754	427	166	46
CY056885.1	930	356	117	17	886	373	130	30	841	395	141	34	801	411	153	37	760	430	165	41
CY056893.1	922	352	123	18	878	369	135	32	833	391	143	39	793	407	154	43	751	427	166	46
CY056901.1	925	352	123	18	881	369	135	32	836	391	143	39	796	407	154	43	754	427	166	46
CY056909.1	916	356	125	18	872	372	138	32	827	393	147	39	786	409	159	43	743	428	173	46
CY056917.1	938	339	123	18	895	355	135	32	851	376	143	39	812	391	154	43	772	409	166	46
CY056925.1	922	353	122	21	878	371	130	38	833	393	131	52	793	409	140	58	751	429	151	62
CY056933.1	912	362	123	18	867	380	135	32	821	403	143	39	780	420	154	43	737	441	166	46
CY056941.1	932	347	123	18	888	364	135	32	843	386	143	39	802	403	154	43	759	424	166	46
CY056949.1	927	350	123	18	884	366	135	32	840	387	143	39	801	402	154	43	760	421	166	46
CY056957.1	920	357	123	18	877	373	135	32	832	395	143	39	792	412	153	43	751	431	165	46
CY056965.1	926	350	123	18	883	366	135	32	839	387	143	39	800	402	154	43	759	421	166	46

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY056973.1	935	349	117	17	891	366	130	30	846	388	141	34	805	405	153	37	762	426	165	41
CY056981.1	927	350	123	18	884	366	135	32	840	387	143	39	801	402	154	43	760	421	166	46
CY056989.1	927	354	121	18	883	369	131	36	838	391	136	46	799	405	149	48	758	424	161	48
CY056997.1	928	351	123	18	884	368	135	32	839	390	143	39	798	407	154	43	755	428	166	46
CY057005.1	935	345	122	18	890	364	133	32	845	387	140	39	804	402	153	43	761	421	167	46
CY057013.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY057021.1	939	340	123	18	896	356	135	32	852	377	143	39	812	393	154	43	769	414	166	46
CY057029.1	916	360	125	19	876	371	135	37	831	397	131	52	789	419	134	60	745	443	143	64
CY057074.1	944	368	126	19	898	387	137	34	851	411	144	42	810	427	155	47	770	443	168	51
CY057080.1	907	357	128	18	862	374	141	32	818	392	152	39	778	405	166	43	736	422	181	46
CY057208.1	916	358	128	18	872	375	139	33	826	398	146	41	788	411	157	46	748	428	169	50
CY057216.1	916	358	128	18	872	375	139	33	826	398	146	41	788	411	157	46	748	428	169	50
CY057224.1	916	358	128	18	872	375	139	33	826	398	146	41	788	411	157	46	748	428	169	50
CY057232.1	897	374	129	18	852	391	142	32	806	414	149	40	768	425	162	45	728	440	176	49
CY057240.1	938	341	121	20	892	362	130	35	845	388	138	40	804	405	150	43	761	426	162	47
CY057248.1	908	369	122	21	864	386	131	38	821	403	135	52	783	414	147	58	743	429	161	62
CY057256.1	929	350	123	18	886	366	135	32	843	386	143	39	804	401	154	43	763	420	166	47
CY057264.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY057272.1	920	359	123	18	875	377	135	32	829	400	143	39	789	415	155	43	747	434	168	46
CY057280.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY057288.1	908	369	125	18	863	387	131	38	817	409	140	44	776	424	153	47	733	443	167	48
CY057296.1	922	347	133	18	878	363	146	32	833	384	155	39	793	399	167	43	751	418	180	46
CY057304.1	922	362	118	18	877	380	129	33	831	403	135	42	789	421	144	48	744	443	157	51
CY057312.1	913	352	136	19	866	372	148	33	817	398	153	43	776	414	165	44	734	433	176	48
CY057320.1	927	352	123	18	883	369	135	32	838	391	143	39	798	407	154	43	756	427	166	46
CY057328.1	923	352	123	18	879	369	135	32	834	391	143	39	794	407	154	43	752	427	166	46
CY057336.1	927	352	123	18	883	369	135	32	838	391	143	39	798	407	154	43	756	427	166	46
CY057344.1	928	351	123	18	884	368	135	32	839	390	143	39	800	405	154	43	759	424	166	46
CY057352.1	905	347	148	18	862	357	164	34	815	379	172	43	774	394	184	48	731	414	195	53
CY057360.1	935	345	122	18	890	364	133	32	845	387	140	39	804	402	153	43	761	421	167	46
CY057368.1	921	358	123	18	875	377	135	32	828	401	143	39	786	418	155	43	742	439	168	46
CY057376.1	924	348	129	19	881	362	139	37	835	389	135	52	793	410	139	60	749	433	149	64
CY057384.1	920	352	130	18	876	367	138	38	829	395	134	53	788	415	139	60	745	437	149	65
CY057392.1	920	345	137	18	874	364	147	34	828	389	150	44	787	407	157	51	744	429	166	56
CY057400.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY057408.1	928	351	123	18	884	368	135	32	839	390	143	39	800	405	154	43	759	424	166	46
CY057416.1	926	353	123	18	880	372	135	32	834	394	144	39	792	411	156	43	748	432	169	46
CY057424.1	928	351	123	18	884	368	135	32	839	390	143	39	800	405	154	43	759	424	166	46
CY057432.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY057440.1	921	358	123	18	875	377	135	32	828	401	143	39	786	418	155	43	742	439	168	46
CY057448.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY057456.1	923	352	123	22	879	369	134	37	834	391	143	39	794	407	154	41	752	427	166	44
CY057464.1	925	347	129	19	882	361	139	37	835	389	135	52	793	410	139	60	749	433	149	64
CY057472.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY057480.1	932	356	114	18	888	375	124	32	844	397	131	39	804	413	143	42	762	433	156	44
CY057488.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY057496.1	928	351	123	18	884	368	135	32	839	390	143	39	800	405	154	43	759	424	166	46
CY057504.1	928	351	123	18	884	368	135	32	839	390	143	39	800	405	154	43	759	424	166	46
CY057512.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY057520.1	932	356	114	18	888	375	124	32	844	397	131	39	804	413	143	42	762	433	156	44
CY057528.1	910	367	125	18	864	384	138	33	817	408	144	42	775	425	155	47	731	446	168	49
CY057536.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY057544.1	926	347	125	22	883	362	135	39	839	383	142	47	800	398	152	52	759	417	163	56
CY057552.1	926	347	125	22	883	362	135	39	839	383	142	47	800	398	152	52	759	417	163	56
CY057560.1	921	357	124	18	877	374	136	32	832	396	144	39	792	412	153	45	750	432	163	50
CY057568.1	927	352	123	18	883	369	135	32	838	391	143	39	798	407	154	43	756	427	166	46
CY057576.1	929	350	123	18	886	366	135	32	842	387	143	39	803	402	154	43	762	421	166	46
CY057584.1	925	352	123	18	881	369	135	32	836	391	143	39	796	407	154	43	754	427	166	46
CY057592.1	916	360	122	20	873	376	133	35	829	396	140	44	790	410	151	48	749	427	165	48
CY057600.1	925	343	133	19	879	362	142	36	833	384	150	44	791	401	161	49	747	423	171	54
CY057608.1	922	358	118	20	880	374	128	35	838	393	134	44	798	409	144	48	756	428	157	48
CY057616.1	925	349	127	19	881	364	142	32	836	384	152	41	796	398	165	45	753	417	179	47
CY057624.1	929	350	123	18	886	366	135	32	842	387	143	39	803	402	154	43	762	421	166	46
CY057632.1	927	346	128	19	883	364	136	36	838	384	146	43	798	399	159	46	756	419	170	47
CY057640.1	927	352	123	18	883	369	135	32	838	391	143	39	798	407	154	43	756	427	166	46
CY057648.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY057656.1	922	357	123	18	877	375	135	32	831	398	143	39	790	414	155	43	747	434	168	46
CY057664.1	933	340	129	18	890	354	141	34	846	373	149	43	806	387	161	48	764	405	174	52
CY057672.1	925	343	133	19	879	362	142	36	833	384	150	44	791	401	161	49	747	423	171	54
CY057680.1	929	351	123	18	885	368	135	32	840	389	144	39	799	404	157	43	756	423	171	46
CY057688.1	929	351	123	18	885	368	135	32	840	390	143	39	800	406	154	43	758	426	166	46
CY057696.1	925	352	125	18	881	367	139	32	836	387	149	39	796	401	162	43	754	419	176	46
CY057704.1	926	351	123	18	882	368	135	32	837	390	143	39	797	406	154	43	755	426	166	46
CY057712.1	911	365	126	18	866	381	140	32	820	404	146	41	779	421	155	47	736	441	166	52
CY057720.1	920	357	125	18	876	373	138	32	832	393	147	39	793	407	159	43	751	426	172	46
CY057728.1	926	347	125	22	883	362	135	39	839	383	142	47	800	398	152	52	759	417	163	56
CY057736.1	929	350	123	18	886	366	135	32	842	387	143	39	803	402	154	43	762	421	166	46
CY057744.1	908	372	123	18	862	391	135	32	815	415	143	39	773	433	154	43	729	455	166	46
CY057752.1	924	358	118	20	882	374	128	35	840	393	134	44	800	409	144	48	758	428	157	48
CY057760.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY057768.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY057776.1	918	357	126	19	874	374	137	34	829	396	143	43	789	412	154	47	747	432	166	51
CY057784.1	911	368	123	18	866	385	136	32	820	408	144	39	779	422	158	43	736	440	173	46
CY057792.1	918	354	129	19	874	369	139	37	826	398	135	52	784	419	139	60	740	442	149	64
CY057800.1	931	351	122	17	886	369	134	31	840	392	144	36	800	407	157	39	758	426	169	44
CY057808.1	926	355	122	18	882	372	134	32	837	393	143	39	797	408	154	44	757	426	164	49
CY057816.1	929	350	123	18	886	366	135	32	842	387	143	39	803	402	154	43	762	421	166	46
CY057824.1	911	365	126	18	866	381	140	32	820	404	146	41	779	421	155	47	736	441	166	52

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY057832.1	924	355	123	18	880	372	135	32	835	394	143	39	796	408	155	43	755	426	168	46
CY057840.1	933	348	120	19	891	365	122	41	847	387	128	49	807	404	137	54	765	425	147	58
CY057848.1	922	349	129	20	877	369	137	36	831	394	136	50	790	412	143	56	747	433	155	57
CY057856.1	923	359	120	18	879	377	131	32	834	400	138	39	794	415	150	43	752	432	166	45
CY057864.1	922	354	126	18	878	368	141	32	833	386	152	40	793	400	161	47	752	417	173	50
CY057872.1	918	354	129	19	874	369	139	37	826	398	135	52	784	419	139	60	740	442	149	64
CY057880.1	929	350	123	18	886	366	135	32	842	387	143	39	803	402	154	43	762	421	166	46
CY057888.1	925	340	137	18	880	358	147	34	835	382	150	44	795	399	157	51	753	420	166	56
CY057896.1	920	357	125	18	876	373	138	32	832	393	147	39	793	407	159	43	751	426	172	46
CY057904.1	928	350	120	22	884	368	128	39	839	390	138	42	799	405	151	44	757	424	164	47
CY057912.1	911	368	123	18	865	387	135	32	819	409	144	39	777	426	156	43	733	447	169	46
CY057920.1	927	352	123	18	882	370	135	32	837	391	144	39	796	407	156	43	753	427	169	46
CY057928.1	920	357	125	18	876	373	138	32	832	393	147	39	793	407	159	43	751	426	172	46
CY057936.1	929	350	123	18	886	366	135	32	842	387	143	39	803	402	154	43	762	421	166	46
CY057944.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY057952.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY057960.1	922	355	125	18	879	368	140	32	836	384	152	39	797	398	164	43	756	416	177	46
CY057968.1	920	359	123	18	876	376	135	32	831	398	143	39	790	415	154	43	748	435	166	46
CY057976.1	914	359	127	18	869	375	141	32	824	394	152	39	783	411	162	44	740	432	173	48
CY057984.1	917	362	123	18	872	380	135	32	827	402	143	39	787	418	154	43	745	438	166	46
CY057992.1	926	349	123	20	882	366	135	31	837	388	142	37	797	404	152	46	755	424	164	48
CY058000.1	926	351	123	18	882	368	135	32	837	390	143	39	797	406	154	43	755	426	166	46
CY058008.1	926	351	123	18	882	368	135	32	837	390	143	39	797	406	154	43	755	426	166	46
CY058016.1	918	359	123	18	874	376	135	32	829	398	143	39	788	415	154	43	746	435	166	46
CY058024.1	922	346	129	21	880	362	138	37	838	383	138	50	798	400	144	57	756	420	153	60
CY058032.1	912	364	131	13	869	380	136	35	825	401	141	52	786	416	150	62	745	435	160	67
CY058040.1	925	358	116	19	880	372	132	33	834	394	138	42	792	411	150	47	748	433	159	50
CY058048.1	900	359	140	21	856	377	148	35	812	395	152	47	772	412	156	58	729	436	159	68
CY058056.1	930	350	120	18	885	365	135	32	839	386	146	38	798	402	159	40	755	423	171	43
CY058064.1	918	361	123	18	873	379	135	32	827	402	143	39	786	419	154	43	743	440	166	46
CY058078.1	916	358	128	18	872	375	139	33	826	398	146	41	788	411	157	46	747	429	169	50
CY058086.1	916	358	128	18	872	375	139	33	826	398	146	41	788	411	157	46	748	428	169	50
CY058094.1	916	358	128	18	872	375	139	33	826	398	146	41	788	411	157	46	748	428	169	50
CY058102.1	916	358	128	18	872	375	139	33	826	398	146	41	788	411	157	46	748	428	169	50
CY058110.1	916	358	128	18	872	375	139	33	826	398	146	41	788	411	157	46	748	428	169	50
CY058118.1	916	358	128	18	872	375	139	33	826	398	146	41	788	411	157	46	748	428	169	50
CY058126.1	916	358	128	18	872	375	139	33	826	398	146	41	788	411	157	46	748	428	169	50
CY058134.1	916	358	128	18	872	375	139	33	826	398	146	41	788	411	157	46	748	428	169	50
CY058142.1	911	363	128	18	866	381	139	33	819	405	146	41	779	420	157	46	737	439	169	50
CY058150.1	916	358	128	18	872	375	139	33	826	398	146	41	788	411	157	46	748	428	169	50
CY058158.1	916	358	128	18	872	375	139	33	826	398	146	41	788	411	157	46	748	428	169	50
CY058166.1	916	358	128	18	872	375	139	33	826	398	146	41	788	411	157	46	748	428	169	50
CY058174.1	911	363	128	18	867	380	139	33	820	404	146	41	782	417	157	46	743	432	170	50
CY058182.1	920	356	126	18	876	372	139	32	830	394	148	39	791	408	160	43	750	426	173	46

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY058190.1	916	358	128	18	872	375	139	33	826	398	146	41	788	411	157	46	748	428	169	50
CY058198.1	903	371	128	18	859	388	139	33	813	411	146	41	775	424	157	46	735	441	169	50
CY058206.1	920	356	126	18	876	372	139	32	830	394	148	39	791	408	160	43	750	426	173	46
CY058214.1	916	358	128	18	872	375	139	33	826	398	146	41	788	411	157	46	748	428	169	50
CY058222.1	916	358	128	18	872	375	139	33	826	398	146	41	788	411	157	46	748	428	169	50
CY058230.1	920	356	126	18	876	372	139	32	830	394	148	39	791	408	160	43	750	426	173	46
CY058238.1	925	352	123	20	882	369	130	38	837	391	136	46	798	407	146	48	757	426	157	51
CY058246.1	921	356	126	18	877	372	139	32	831	394	148	39	792	408	160	43	751	426	173	46
CY058254.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY058262.1	923	346	133	18	880	359	148	32	836	378	158	39	796	395	166	45	754	416	175	50
CY058270.1	924	344	134	18	880	359	148	32	835	380	157	39	796	393	170	43	755	411	182	47
CY058278.1	927	352	123	18	883	369	135	32	838	391	143	39	798	407	154	43	756	427	166	46
CY058286.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY058294.1	926	351	123	18	882	368	135	32	837	390	143	39	797	406	154	43	755	426	166	46
CY058302.1	920	351	123	18	876	368	135	32	831	390	143	39	791	406	154	43	749	426	166	46
CY058310.1	916	358	118	20	874	374	128	35	832	393	134	44	792	409	144	48	750	428	157	48
CY058318.1	915	357	122	21	869	376	130	39	822	398	138	48	779	416	148	54	734	436	162	58
CY058326.1	926	347	125	22	883	362	135	39	839	383	142	47	800	398	152	52	759	417	163	56
CY058334.1	910	367	123	18	864	386	135	32	817	410	143	39	775	428	154	43	731	450	166	46
CY058342.1	920	357	123	18	875	375	135	32	829	398	143	39	788	414	155	43	745	434	168	46
CY058350.1	918	359	123	18	874	376	135	32	829	398	143	39	788	415	154	43	746	435	166	46
CY058358.1	926	351	123	18	882	368	135	32	837	390	143	39	797	406	154	43	755	426	166	46
CY058366.1	898	360	141	19	854	372	151	40	809	392	158	50	769	407	167	54	727	426	176	58
CY058374.1	927	350	123	18	884	366	135	32	840	387	143	39	801	402	154	43	760	421	166	46
CY058382.1	920	348	132	18	876	361	148	32	831	381	157	40	791	395	169	45	750	411	183	49
CY058390.1	922	347	131	20	878	363	144	31	833	384	152	37	793	399	163	46	751	418	176	48
CY058398.1	928	349	123	20	884	366	135	31	839	388	142	37	799	404	152	46	757	424	164	48
CY058406.1	924	358	118	20	882	374	128	35	840	393	134	44	800	409	144	48	758	428	157	48
CY058414.1	921	358	123	18	876	376	135	32	829	400	143	39	788	417	154	43	745	438	166	46
CY058422.1	893	385	122	20	848	403	133	35	804	422	141	44	762	438	153	48	718	457	168	48
CY058430.1	927	352	123	18	884	368	135	32	840	389	143	39	801	404	154	43	760	423	166	46
CY058438.1	929	350	123	18	886	366	135	32	842	387	143	39	803	402	154	43	762	421	166	46
CY058446.1	920	357	125	18	876	373	138	32	832	393	147	39	793	407	159	43	751	426	172	46
CY058454.1	920	358	124	18	878	369	140	32	835	386	151	39	796	401	162	43	755	421	173	46
CY058462.1	920	359	123	18	876	376	135	32	831	398	143	39	790	415	154	43	748	435	166	46
CY058470.1	919	360	123	18	874	378	135	32	828	401	143	39	787	418	154	43	744	439	166	46
CY058478.1	931	333	138	18	886	347	154	32	840	369	163	39	798	385	176	43	753	407	189	46
CY058526.1	916	358	128	18	872	375	139	33	826	398	146	41	788	411	157	46	748	428	169	50
CY058534.1	916	358	128	18	872	375	139	33	826	398	146	41	788	411	157	46	748	428	169	50
CY058542.1	916	348	136	20	872	369	138	40	826	394	139	52	788	409	145	61	748	427	155	63
CY058550.1	915	360	127	16	871	376	142	28	825	398	152	34	786	412	164	38	745	430	176	43
CY058558.1	926	351	123	18	882	368	135	32	837	390	143	39	797	406	154	43	755	426	166	46
CY058566.1	926	351	123	18	882	368	135	32	837	390	143	39	797	406	154	43	755	426	166	46
CY058574.1	922	355	123	18	879	371	135	32	834	393	143	39	796	407	154	43	756	425	166	46

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY058582.1	922	355	123	18	879	371	135	32	834	393	143	39	796	407	154	43	756	425	166	46
CY058590.1	918	355	123	22	874	372	130	41	828	395	137	49	789	411	145	55	748	430	157	57
CY058598.1	922	355	123	18	879	371	135	32	834	393	143	39	796	407	154	43	756	425	166	46
CY058606.1	923	352	123	20	880	369	130	38	835	391	136	46	796	407	146	48	755	426	157	51
CY058614.1	926	337	137	18	882	354	147	34	837	378	150	44	797	395	157	51	754	417	166	56
CY058622.1	921	357	124	18	877	374	136	32	832	396	144	39	792	412	153	45	750	432	163	50
CY058630.1	927	352	123	18	883	369	135	32	838	391	143	39	798	407	154	43	756	427	166	46
CY058638.1	927	352	123	18	883	369	135	32	838	391	143	39	798	407	154	43	756	427	166	46
CY058646.1	929	354	116	21	885	373	125	36	840	397	131	43	800	415	140	47	758	438	149	47
CY058654.1	911	365	126	18	866	381	140	32	820	404	146	41	779	421	155	47	736	442	165	52
CY058662.1	929	354	116	21	885	373	125	36	840	397	131	43	800	415	140	47	758	438	149	47
CY058670.1	926	353	123	18	880	372	135	32	834	394	144	39	792	411	156	43	748	432	169	46
CY058678.1	925	335	141	19	882	349	150	38	837	371	154	49	796	388	161	57	752	411	168	64
CY058686.1	928	351	122	17	883	369	134	31	837	392	144	36	797	407	157	39	755	426	169	44
CY058694.1	909	351	138	20	864	372	140	41	819	394	140	56	779	411	146	62	736	434	152	67
CY058702.1	914	363	123	18	868	382	135	32	821	406	143	39	779	424	154	43	735	446	166	46
CY058710.1	918	345	137	18	872	363	149	33	826	387	152	44	784	405	160	51	740	427	170	56
CY058718.1	921	354	127	18	877	369	141	32	832	390	150	39	792	405	162	43	750	424	175	46
CY058726.1	936	344	122	18	892	362	133	32	847	386	139	39	807	401	151	43	765	420	164	46
CY058734.1	921	354	127	18	877	369	141	32	832	390	150	39	792	405	162	43	750	424	175	46
CY058742.1	923	350	126	21	879	367	135	38	834	387	138	52	793	401	150	58	750	422	160	63
CY058821.1	910	352	129	19	864	369	142	34	817	392	150	42	775	410	160	47	732	431	170	52
CY058823.1	917	352	123	18	873	369	135	32	828	391	143	39	788	406	155	43	746	425	168	46
CY058825.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY058827.1	931	338	123	18	888	354	135	32	844	375	143	39	805	390	154	43	766	407	166	46
CY058829.1	926	344	122	18	881	363	133	32	835	388	139	39	794	405	150	43	751	426	162	46
CY058831.1	926	344	122	18	881	363	133	32	835	388	139	39	794	405	150	43	751	426	162	46
CY058833.1	911	354	127	18	865	372	140	32	818	394	150	39	776	410	163	43	732	430	177	46
CY058835.1	917	347	128	18	871	365	141	32	823	388	151	39	782	403	164	43	740	421	178	46
CY058837.1	918	346	127	19	874	364	131	40	829	386	140	45	789	402	151	46	747	422	163	47
CY060458.1	880	391	117	22	834	410	130	32	786	436	136	38	742	454	146	48	696	475	158	57
CY060461.1	924	346	122	18	882	362	133	32	839	383	140	39	801	398	150	43	761	417	162	45
CY060491.1	897	368	126	19	849	389	134	37	802	411	143	45	761	426	155	50	719	445	166	55
CY060504.1	951	372	117	18	905	392	128	32	858	417	135	39	817	435	145	43	774	457	156	46
CY060512.1	951	372	117	18	905	392	128	32	858	417	135	39	817	435	145	43	774	457	156	46
CY060520.1	964	347	129	18	920	363	139	35	876	382	147	44	836	396	158	50	794	416	169	54
CY060528.1	963	351	123	18	919	368	135	32	874	390	143	39	834	406	154	43	792	426	166	46
CY060536.1	947	356	119	24	902	374	132	37	856	397	141	42	815	414	152	44	772	435	164	48
CY060544.1	958	359	123	18	913	377	135	32	867	400	143	39	826	417	154	43	783	438	166	46
CY060552.1	941	376	123	18	893	397	135	32	844	423	142	40	801	442	152	45	756	465	163	49
CY060560.1	964	352	132	10	919	369	143	26	873	391	151	38	832	408	159	47	790	428	168	55
CY060568.1	956	361	119	18	911	380	130	32	868	400	138	39	828	415	150	43	786	434	163	46
CY060576.1	926	367	130	18	883	381	144	32	839	400	154	38	799	415	165	44	757	433	178	48
CY060584.1	948	350	115	25	901	372	125	39	854	396	134	43	811	415	146	42	766	437	160	44

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY060592.1	958	350	115	25	911	372	125	39	864	396	134	43	821	415	146	42	776	437	160	44
CY060600.1	968	350	115	25	921	372	125	39	874	396	134	43	831	415	146	42	786	437	160	44
CY060608.1	950	350	115	25	903	372	125	39	856	396	134	43	813	415	146	42	768	437	160	44
CY060616.1	960	352	123	18	915	370	135	32	870	391	144	39	829	407	156	43	786	427	169	46
CY060624.1	937	366	115	25	889	389	125	39	841	414	134	43	797	434	146	42	751	457	160	44
CY060632.1	968	350	115	25	921	372	125	39	874	396	134	43	831	415	146	42	786	437	160	44
CY060640.1	942	368	123	18	895	388	135	32	848	410	145	39	805	427	158	43	760	448	172	46
CY060648.1	965	352	123	18	920	370	135	32	875	391	144	39	834	407	156	43	791	427	169	46
CY060656.1	965	352	123	18	920	370	135	32	875	391	144	39	834	407	156	43	791	427	169	46
CY060664.1	964	350	115	25	917	372	125	39	870	396	134	43	827	415	146	42	782	437	160	44
CY060672.1	964	350	115	25	917	372	125	39	870	396	134	43	827	415	146	42	782	437	160	44
CY060680.1	951	354	120	23	906	373	127	41	861	394	132	52	821	409	143	57	779	428	155	61
CY060688.1	974	343	123	18	931	359	135	32	888	379	143	39	849	394	154	43	810	411	166	46
CY060696.1	968	350	115	25	921	372	125	39	874	396	134	43	831	415	146	42	786	437	160	44
CY060704.1	948	350	115	25	901	372	125	39	854	396	134	43	811	415	146	42	766	437	160	44
CY060712.1	948	350	115	25	901	372	125	39	854	396	134	43	811	415	146	42	766	437	160	44
CY060720.1	965	352	123	18	919	371	135	32	873	392	145	39	831	408	158	43	787	428	172	46
CY060728.1	953	364	123	18	908	382	135	32	862	405	143	39	821	422	154	43	778	443	166	46
CY060736.1	966	351	123	18	922	368	135	32	877	390	143	39	837	406	154	43	795	426	166	46
CY060744.1	970	338	123	18	927	354	135	32	883	375	143	39	844	390	154	43	803	409	166	46
CY060752.1	943	346	127	19	899	363	135	37	854	386	137	49	814	404	142	57	772	425	152	60
CY060757.1	914	365	123	18	869	383	135	32	823	406	143	39	782	423	154	43	739	444	166	46
CY060765.1	927	352	123	18	882	370	135	32	835	394	143	39	793	412	154	43	749	434	166	46
CY060773.1	909	366	127	18	862	386	138	33	814	411	145	41	771	431	154	46	726	454	165	50
CY060781.1	931	359	113	18	887	378	123	32	842	402	129	39	802	419	139	43	761	437	153	45
CY060789.1	917	362	123	18	871	381	135	32	824	405	143	39	782	422	155	43	738	443	168	46
CY060797.1	927	349	126	18	883	367	136	33	838	390	140	43	798	407	146	51	756	427	158	54
CY060805.1	922	363	116	19	877	377	132	33	831	399	138	42	791	414	151	46	748	434	162	48
CY060813.1	925	340	132	23	882	356	139	42	838	377	150	42	800	389	167	41	760	406	180	43
CY060821.1	917	364	122	17	872	381	132	34	828	399	144	40	789	412	160	41	750	426	177	42
CY060829.1	929	354	119	18	884	371	132	32	838	392	142	39	798	407	153	44	756	427	164	48
CY060837.1	940	339	123	18	897	357	130	35	853	377	139	42	814	391	155	41	774	409	168	44
CY060845.1	902	377	121	20	857	393	134	35	812	412	146	41	771	429	159	43	730	449	172	44
CY060853.1	927	352	123	18	883	369	135	32	838	391	143	39	798	407	154	43	756	427	166	46
CY060861.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY060869.1	921	345	136	18	876	362	149	32	830	383	157	41	789	401	162	50	746	423	169	54
CY060877.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY060885.1	909	368	125	18	866	383	138	32	822	401	149	39	783	414	162	43	741	432	176	46
CY060893.1	912	350	138	20	868	370	140	41	824	391	140	56	785	407	146	62	743	429	152	67
CY060901.1	920	359	123	18	876	374	137	32	831	395	146	39	790	412	157	43	747	432	170	46
CY060909.1	929	350	123	18	886	365	136	32	841	388	143	39	801	406	152	43	758	428	164	45
CY060917.1	926	346	130	18	882	361	144	32	838	379	155	39	798	393	168	43	755	412	182	46
CY060925.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY060933.1	932	334	136	18	888	349	150	32	842	372	157	40	801	389	166	46	759	409	176	51

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY060941.1	926	353	123	18	881	371	135	32	835	394	143	39	794	412	153	43	751	433	165	46
CY060949.1	923	350	126	21	879	367	135	38	834	387	138	52	793	401	150	58	750	422	160	63
CY060957.1	911	351	138	20	866	372	140	41	821	394	140	56	781	411	146	62	738	434	152	67
CY060965.1	927	352	123	18	883	369	135	32	838	391	143	39	798	407	154	43	756	427	166	46
CY060973.1	927	352	123	18	883	369	135	32	838	391	143	39	798	407	154	43	756	427	166	46
CY060981.1	891	384	127	18	848	398	141	32	804	417	151	39	765	429	165	43	723	444	183	45
CY060989.1	921	354	127	18	877	369	141	32	832	390	150	39	792	405	162	43	750	424	175	46
CY060997.1	928	360	116	16	883	380	126	31	838	403	132	41	796	421	143	42	751	444	156	44
CY061005.1	928	342	132	18	886	355	146	32	842	376	154	38	803	392	164	43	762	412	175	46
CY061013.1	912	370	121	17	867	388	133	31	821	410	144	36	781	426	156	39	739	446	168	43
CY061021.1	925	356	121	18	879	373	131	36	832	397	136	46	791	413	149	48	748	434	161	48
CY061029.1	924	353	122	21	880	371	130	38	835	393	131	52	795	409	140	58	753	429	151	62
CY061037.1	914	363	126	18	869	380	139	32	823	402	148	39	783	417	160	43	741	435	174	46
CY061045.1	911	351	138	20	866	372	140	41	821	394	140	56	781	411	146	62	738	434	152	67
CY061053.1	930	351	122	17	885	369	134	31	839	392	144	36	799	407	157	39	757	425	170	44
CY061061.1	904	363	135	18	860	379	147	33	816	398	155	42	776	413	166	47	733	434	177	51
CY061069.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY061077.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY061085.1	896	378	125	21	851	396	134	38	805	418	136	52	764	434	146	58	721	454	158	62
CY061093.1	909	368	122	21	864	387	130	38	818	410	131	52	777	427	140	58	734	448	151	62
CY061101.1	909	368	122	21	864	387	130	38	818	410	131	52	777	427	140	58	734	448	151	62
CY061109.1	921	352	122	17	877	370	130	35	832	392	130	51	792	408	138	61	750	428	149	65
CY061117.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY061125.1	924	353	122	21	880	371	130	38	835	393	131	52	795	409	140	58	753	429	151	62
CY061133.1	924	353	122	21	880	371	130	38	835	393	131	52	795	409	140	58	753	429	151	62
CY061141.1	938	346	119	17	895	361	133	30	852	380	145	34	814	393	158	37	775	409	171	41
CY061149.1	917	371	113	18	869	391	126	32	821	413	137	39	779	429	151	42	736	448	166	44
CY061157.1	910	367	123	18	865	385	135	32	819	408	143	39	778	425	154	43	735	446	166	46
CY061165.1	922	352	123	21	878	370	131	38	833	392	132	51	793	408	141	58	751	428	152	62
CY061173.1	922	352	124	20	877	372	130	38	831	395	138	45	792	410	150	46	753	425	166	41
CY061181.1	923	350	126	21	879	367	135	38	834	388	137	52	794	403	147	58	752	423	157	63
CY061189.1	904	349	147	20	859	369	150	41	814	390	151	56	774	406	158	62	731	428	165	67
CY061197.1	927	352	123	18	882	370	135	32	836	393	143	39	796	408	155	43	754	427	168	46
CY061205.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY061213.1	924	361	117	18	879	378	130	32	833	399	140	39	793	415	152	42	751	435	165	44
CY061221.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY061229.1	897	382	127	14	852	398	142	26	808	416	152	35	769	427	166	40	728	442	182	41
CY061237.1	927	352	123	18	883	369	135	32	838	391	143	39	798	407	154	43	756	427	166	46
CY061245.1	927	352	123	18	883	369	135	32	838	391	143	39	798	407	154	43	756	427	166	46
CY061253.1	924	353	122	21	881	369	131	38	839	385	135	52	802	395	147	58	763	409	161	62
CY061261.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY061269.1	932	347	123	18	888	364	135	32	843	386	143	39	802	403	154	43	759	424	166	46
CY061277.1	928	350	125	17	884	366	136	34	839	387	144	44	799	403	153	49	757	423	165	49
CY061285.1	929	352	121	18	885	369	133	32	840	391	141	39	800	407	152	43	758	427	164	46

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY061549.1	907	357	128	18	862	374	141	32	818	392	152	39	778	405	166	43	736	422	181	46
CY061556.1	909	364	122	17	864	382	134	31	818	405	144	36	778	420	157	39	736	439	169	44
CY061564.1	912	360	123	17	869	374	137	31	825	392	150	36	784	409	161	40	741	430	172	45
CY061572.1	901	368	122	21	856	387	130	38	810	410	131	52	769	427	140	58	726	448	151	62
CY061580.1	909	362	123	18	865	378	136	32	820	399	145	39	780	414	157	43	738	433	170	46
CY061588.1	916	353	122	21	872	371	130	38	827	393	131	52	787	409	140	58	745	429	151	62
CY061596.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY061727.1	943	346	127	19	899	363	135	37	854	386	137	49	814	404	142	57	772	425	152	60
CY061735.1	943	346	127	19	899	363	135	37	854	386	137	49	814	404	142	57	772	425	152	60
CY061751.1	939	359	123	18	894	377	135	32	848	399	144	39	807	415	156	43	764	435	169	46
CY061759.1	939	359	123	18	894	377	135	32	848	399	144	39	807	415	156	43	764	435	169	46
CY061767.1	928	363	129	18	884	378	143	32	839	398	153	39	798	414	164	44	754	434	177	48
CY061775.1	928	363	129	18	884	378	143	32	839	398	153	39	798	414	164	44	754	434	177	48
CY061783.1	929	363	129	18	885	378	143	32	840	398	153	39	799	414	164	44	755	434	177	48
CY061791.1	924	363	129	18	880	378	143	32	835	398	153	39	794	414	164	44	750	434	177	48
CY061799.1	929	363	129	18	885	378	143	32	840	398	153	39	799	414	164	44	755	434	177	48
CY061807.1	946	354	121	19	899	375	128	37	851	401	130	49	809	420	136	57	765	442	147	60
CY061908.1	920	362	120	18	874	381	134	30	828	403	147	33	787	419	164	32	745	438	179	34
CY061916.1	916	363	123	18	871	381	135	32	825	404	143	39	784	421	154	43	741	442	166	46
CY061924.1	911	370	121	18	865	387	131	36	818	411	136	46	777	427	149	48	734	448	161	48
CY061932.1	893	384	125	18	842	406	133	38	791	434	136	50	749	449	148	55	706	468	160	57
CY061940.1	929	350	123	18	886	366	135	32	842	387	143	39	803	402	154	43	762	421	166	46
CY061948.1	916	363	123	18	872	380	135	32	827	402	143	39	787	418	154	43	745	438	166	46
CY061956.1	928	351	123	18	884	368	135	32	840	389	143	39	800	405	154	43	758	425	166	46
CY061964.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY061972.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY061980.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY061988.1	918	359	125	18	874	376	137	32	829	398	145	39	789	414	156	43	747	434	168	47
CY061996.1	916	361	123	18	871	379	135	32	825	402	143	39	784	419	154	43	741	440	166	46
CY062004.1	910	368	122	18	863	388	134	32	815	413	142	39	772	430	154	44	728	451	165	50
CY062012.1	894	381	125	18	848	400	131	38	801	423	140	44	759	440	152	47	715	461	165	48
CY062020.1	917	360	123	18	872	378	135	32	826	401	143	39	785	418	154	43	742	439	166	46
CY062028.1	912	365	123	18	866	384	135	32	819	408	143	39	778	425	154	43	735	446	166	46
CY062036.1	920	358	127	13	876	374	140	28	831	396	145	44	790	414	155	50	747	436	166	52
CY062044.1	921	354	122	21	877	372	129	39	832	394	132	51	792	410	141	57	750	430	152	61
CY062052.1	924	355	129	10	878	373	141	25	831	396	150	36	789	413	160	44	746	432	172	51
CY062060.1	916	348	132	22	872	365	143	37	827	388	147	47	787	405	155	53	745	427	162	59
CY062068.1	926	349	125	18	882	367	131	37	837	390	138	44	797	406	152	43	755	426	165	39
CY062076.1	927	347	131	15	883	364	139	34	838	386	144	44	798	402	155	47	756	422	167	48
CY062084.1	921	355	124	18	878	370	137	32	834	390	146	39	795	404	158	43	754	422	171	46
CY062092.1	912	341	143	22	869	354	157	37	824	377	160	48	784	394	167	55	742	416	173	62
CY062100.1	913	366	129	10	867	383	142	25	820	404	153	36	778	419	165	44	735	438	177	51
CY062108.1	927	350	123	18	884	366	135	32	840	387	143	39	801	402	154	43	760	421	166	46
CY062116.1	913	366	129	10	867	383	142	25	820	404	153	36	778	419	165	44	735	438	177	51

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY062124.1	920	355	125	18	876	370	139	32	831	391	148	39	791	407	158	44	749	427	169	48
CY062132.1	922	355	126	18	877	371	140	32	833	389	151	39	794	401	165	43	753	419	176	48
CY062140.1	915	364	123	18	871	381	135	32	826	403	143	39	786	419	154	43	744	439	166	46
CY062148.1	947	332	123	18	905	347	135	32	862	368	142	39	823	384	152	43	782	404	163	46
CY062156.1	915	366	129	10	869	383	142	25	822	404	153	36	780	419	165	44	737	438	177	51
CY062164.1	928	351	123	18	883	369	135	32	838	390	144	39	796	408	155	43	752	430	167	46
CY062172.1	915	366	129	10	869	383	142	25	822	404	153	36	780	419	165	44	737	438	177	51
CY062180.1	911	358	125	26	865	379	124	51	818	403	113	77	775	421	122	83	730	443	133	82
CY062188.1	911	358	125	26	865	379	124	51	818	403	113	77	775	421	122	83	730	443	133	82
CY062196.1	928	363	111	18	884	381	122	32	839	403	130	39	799	419	141	43	757	439	153	46
CY062204.1	927	352	123	18	883	369	135	32	838	391	143	39	798	407	154	43	756	427	166	46
CY062212.1	912	367	123	18	867	385	135	32	821	408	143	39	780	425	154	43	737	446	166	46
CY062220.1	929	351	123	18	885	368	135	32	840	390	143	39	800	406	154	43	758	426	166	46
CY062228.1	928	347	126	19	884	364	133	38	839	386	140	46	799	403	148	52	757	424	156	59
CY062236.1	906	363	132	19	858	385	143	33	808	412	149	42	765	431	161	42	721	453	172	45
CY062244.1	927	352	123	18	883	369	135	32	838	391	143	39	798	407	154	43	756	427	166	46
CY062252.1	940	351	111	18	897	368	122	32	853	389	130	39	814	404	141	43	774	422	153	46
CY062258.1	918	351	124	17	874	368	134	33	829	390	142	40	789	406	154	43	747	426	166	47
CY062259.1	905	361	126	18	861	377	139	32	816	398	148	39	777	411	161	43	736	428	175	46
CY062260.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY062261.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY062262.1	910	353	127	20	864	371	135	39	816	397	138	50	774	416	145	57	730	439	154	62
CY062263.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
CY062264.1	925	344	123	18	882	360	135	32	838	381	143	39	799	396	154	43	758	415	166	46
CY062270.1	931	364	126	19	885	383	137	34	838	407	144	42	796	423	156	47	753	441	170	51
CY062278.1	913	358	123	18	868	376	135	32	822	399	143	39	781	416	154	43	738	437	166	46
CY062302.1	914	351	123	18	870	368	135	32	825	390	143	39	785	406	154	43	743	426	166	46
CY062310.1	855	351	123	18	811	368	135	32	766	390	143	39	726	406	154	43	684	426	166	46
CY062318.1	899	361	133	18	853	379	146	32	806	402	155	39	765	418	167	43	722	438	180	46
CY062326.1	892	371	116	18	847	390	127	32	802	412	135	39	762	428	147	42	720	448	160	44
CY062492.1	915	353	128	18	871	369	141	32	825	391	150	39	786	405	162	43	744	425	174	46
CY062499.1	889	380	132	20	842	399	142	37	794	423	148	45	752	440	158	49	708	461	171	50
CY062506.1	911	352	132	18	865	368	147	32	819	390	156	39	781	401	170	43	741	416	185	46
CY062518.2	889	380	132	20	842	399	142	37	794	423	148	45	752	440	158	49	708	461	171	50
CY062523.1	903	368	123	18	858	386	135	32	812	409	143	39	771	426	154	43	728	447	166	46
CY062530.1	889	380	132	20	842	399	142	37	794	423	148	45	752	440	158	49	708	461	171	50
CY062542.1	904	356	130	20	858	378	135	38	811	404	136	50	770	423	144	53	727	445	154	54
CY062637.1	908	371	123	18	862	390	135	32	816	413	143	39	776	429	154	43	734	449	166	46
CY062645.1	917	360	123	18	871	379	135	32	824	403	143	39	783	420	154	43	740	441	166	46
CY062653.1	906	369	122	21	862	386	131	38	819	403	135	52	781	414	147	58	741	429	161	62
CY062661.1	927	350	123	18	884	366	135	32	840	387	143	39	801	402	154	43	760	421	166	46
CY062669.1	929	352	121	18	885	369	133	32	840	391	141	39	800	407	152	43	758	427	164	46
CY062677.1	935	350	117	18	892	368	127	32	847	393	132	39	806	412	141	43	763	433	154	45
CY062685.1	916	353	132	19	869	374	143	33	820	400	149	42	778	418	161	42	735	439	172	45

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY062693.1	929	350	123	18	886	366	135	32	842	387	143	39	803	402	154	43	762	421	166	46
CY062701.1	932	347	123	18	888	364	135	32	843	386	143	39	802	403	154	43	759	424	166	46
CY062709.1	927	344	127	22	884	359	139	37	840	380	146	45	801	395	156	50	760	414	167	54
CY062717.1	923	356	123	18	879	373	135	32	834	395	143	39	794	410	155	43	752	429	168	46
CY062725.1	928	353	129	10	884	369	141	25	839	390	150	36	799	406	159	44	757	426	169	51
CY062733.1	927	344	127	22	884	359	139	37	840	380	146	45	801	395	156	50	760	414	167	54
CY062741.1	921	358	123	18	876	376	135	32	830	399	143	39	789	416	154	43	746	437	166	46
CY062749.1	913	352	137	18	868	368	151	32	823	388	161	38	783	401	175	43	741	419	188	47
CY062757.1	931	340	131	18	888	354	145	32	843	376	153	39	802	394	163	43	759	416	174	46
CY062765.1	933	347	123	18	889	364	135	32	844	386	143	39	803	403	154	43	760	424	166	46
CY062773.1	920	359	123	18	874	378	135	32	828	400	144	39	787	416	156	43	744	436	169	46
CY062781.1	904	369	125	22	859	386	135	39	813	409	142	47	772	426	152	52	729	447	163	56
CY062789.1	929	350	123	18	886	366	135	32	842	387	143	39	803	402	154	43	762	421	166	46
CY062797.1	933	339	137	11	893	350	153	23	850	374	157	33	810	395	161	40	768	418	168	47
CY062805.1	923	356	123	18	879	373	135	32	834	395	143	39	794	411	154	43	752	431	166	46
CY062813.1	936	347	119	18	889	369	129	32	843	394	135	39	802	410	147	43	760	426	163	46
CY062821.1	929	350	123	18	886	366	135	32	842	387	143	39	803	402	154	43	762	421	166	46
CY062829.1	928	354	121	17	884	371	133	31	839	392	144	36	799	408	156	39	757	428	168	43
CY062837.1	921	350	134	15	876	367	143	34	830	390	148	44	788	408	159	47	744	431	170	48
CY062845.1	932	346	125	17	888	362	136	34	843	383	144	44	802	400	153	49	759	421	165	49
CY062853.1	922	354	126	18	877	371	139	32	831	394	147	39	789	412	158	43	745	435	169	46
CY062861.1	910	366	126	18	863	385	139	32	816	409	147	39	775	426	158	43	732	448	169	46
CY062869.1	927	352	123	18	882	370	135	32	836	393	143	39	794	411	154	43	750	433	166	46
CY062877.1	903	368	131	18	859	383	137	40	816	399	148	48	779	407	164	51	740	420	178	56
CY062885.1	920	351	130	19	875	366	142	37	830	387	148	49	788	404	158	55	744	425	169	56
CY062893.1	900	366	133	21	855	383	141	40	809	404	143	55	769	417	155	61	727	434	169	65
CY062901.1	930	344	122	24	886	361	135	35	841	383	144	39	800	400	155	45	758	419	168	48
CY062909.1	920	354	126	18	875	371	139	32	829	394	147	39	787	412	158	43	743	435	169	46
CY062917.1	926	354	120	18	880	374	131	32	835	396	139	39	795	411	151	43	754	426	167	46
CY062925.1	928	344	122	24	884	361	135	35	839	383	144	39	798	400	155	45	756	419	168	48
CY062933.1	930	349	121	18	886	367	131	33	841	391	136	41	800	408	145	47	757	426	158	52
CY062941.1	925	352	123	18	880	370	135	32	835	391	144	39	794	407	156	43	751	427	169	46
CY062949.1	924	352	124	18	880	367	140	30	835	387	154	33	794	402	172	32	752	420	188	34
CY062957.1	931	346	123	18	887	363	135	32	843	384	143	39	802	401	154	43	759	422	166	46
CY062965.1	925	353	125	15	880	370	136	32	834	393	143	42	791	412	154	46	746	435	166	45
CY062973.1	944	331	125	18	901	347	137	32	856	370	144	39	814	391	152	43	771	415	161	46
CY062981.1	943	334	123	18	901	349	135	32	857	371	142	39	816	391	150	43	773	415	159	46
CY062989.1	914	363	123	18	869	381	135	32	823	404	143	39	781	422	154	43	737	444	166	46
CY062997.1	911	366	123	18	867	383	135	32	822	405	143	39	782	421	154	43	740	441	166	46
CY063005.1	917	358	123	20	872	373	137	35	827	393	145	44	787	407	156	49	744	426	169	53
CY063013.1	918	358	123	20	873	373	137	35	828	393	145	44	788	407	156	49	745	426	169	53
CY063021.1	926	351	124	17	882	368	136	32	837	390	144	39	797	406	154	42	755	426	166	45
CY063029.1	920	357	124	17	876	374	134	33	831	397	141	40	789	416	152	43	745	439	163	47
CY063037.1	930	347	123	18	886	364	135	32	841	386	143	39	800	403	154	43	757	424	166	46

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
CY063045.1	935	342	123	18	892	358	135	32	848	379	143	39	809	394	154	43	768	413	166	46
CY063053.1	908	366	128	18	862	384	141	32	815	407	150	38	775	420	164	43	733	437	179	46
CY063061.1	919	355	128	18	876	370	141	32	832	390	150	39	792	404	163	43	750	422	177	46
CY063069.1	916	353	132	19	869	374	143	33	820	400	149	42	778	418	161	42	735	439	172	45
CY063077.1	928	352	122	18	884	370	132	33	839	393	139	40	799	409	153	41	758	428	166	44
CY063085.1	923	343	136	18	877	362	148	32	830	386	154	41	789	403	162	48	747	421	176	51
CY063093.1	928	354	121	17	884	371	133	31	839	392	144	36	799	408	156	39	757	428	168	43
CY063101.1	928	347	127	18	883	364	140	32	836	388	146	41	793	406	156	47	749	427	169	49
CY063109.1	926	353	123	19	882	370	135	33	837	392	143	40	797	408	152	46	757	426	164	46
CY063117.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY063125.1	908	369	122	21	864	386	131	38	821	403	135	52	783	414	147	58	743	429	161	62
CY063133.1	918	361	123	18	873	379	135	32	827	402	143	39	786	419	154	43	743	440	166	46
CY063141.1	928	351	123	18	884	368	135	32	839	390	143	39	799	406	154	43	757	426	166	46
CY063149.1	924	353	122	21	880	371	130	38	835	393	131	52	795	409	140	58	753	429	151	62
CY063157.1	927	352	123	18	883	369	135	32	838	391	143	39	798	407	154	43	756	427	166	46
CY063165.1	906	363	132	19	858	385	143	33	808	412	149	42	765	431	161	42	721	453	172	45
CY063173.1	913	366	123	18	869	383	135	32	824	405	143	39	784	421	154	43	742	441	166	46
CY063181.1	922	353	122	21	878	371	130	38	833	393	131	52	793	409	140	58	751	429	151	62
CY063189.1	929	346	122	21	885	364	130	38	838	388	131	52	796	406	140	58	752	428	151	62
CY063197.1	925	352	123	18	881	369	135	32	836	391	143	39	796	407	154	43	754	427	166	46
CY063205.1	929	346	122	21	885	364	130	38	838	388	131	52	796	406	140	58	752	428	151	62
CY063213.1	925	352	123	18	881	369	135	32	836	391	143	39	796	407	154	43	754	427	166	46
CY063221.1	926	351	123	18	882	368	135	32	837	390	143	39	797	406	154	43	755	426	166	46
CY063229.1	926	360	114	18	880	381	124	32	835	404	131	39	793	422	143	42	749	444	156	44
CY063237.1	926	351	123	18	882	368	135	32	837	390	143	39	796	407	154	43	753	428	165	47
CY063245.1	916	360	122	20	873	376	133	35	829	396	140	44	790	410	151	48	749	427	165	48
CY063253.1	918	358	124	18	874	374	137	32	830	394	146	39	790	408	159	43	748	426	173	46
CY063261.1	924	347	125	22	881	362	135	39	837	383	142	47	798	398	152	52	757	417	163	56
CY063269.1	926	351	123	18	882	368	135	32	837	390	143	39	797	406	154	43	755	426	166	46
CY063277.1	918	357	125	18	874	373	138	32	830	393	147	39	791	407	159	43	749	426	172	46
CY063285.1	916	354	129	19	872	369	139	37	824	398	135	52	782	419	139	60	738	442	149	64
CY063293.1	916	354	129	19	872	369	139	37	824	398	135	52	782	419	139	60	738	442	149	64
CY063301.1	925	352	123	18	881	369	135	32	836	391	143	39	796	407	154	43	754	427	166	46
CY063309.1	927	350	123	18	884	366	135	32	840	387	143	39	801	402	154	43	760	421	166	46
FJ966084.1	921	348	123	18	878	364	135	32	833	386	143	39	795	400	154	43	755	418	166	46
FJ966956.1	913	346	133	18	869	360	148	32	823	382	157	39	784	396	169	43	743	414	182	46
FJ966969.1	907	355	123	18	863	372	135	32	817	395	143	39	778	410	154	43	737	429	166	46
FJ966973.1	921	348	123	18	878	364	135	32	833	386	143	39	795	400	154	43	755	418	166	46
FJ966981.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
FJ969517.1	921	348	123	18	878	364	135	32	833	386	143	39	795	400	154	43	755	418	166	46
FJ969520.1	895	351	123	18	851	368	135	32	806	390	143	39	766	406	154	43	724	426	166	46
FJ969534.1	915	351	123	18	871	368	135	32	826	390	143	39	786	406	154	43	744	426	166	46
FJ969541.1	895	351	123	18	851	368	135	32	806	390	143	39	766	406	154	43	724	426	166	46
FJ971075.1	913	346	133	18	869	360	148	32	823	382	157	39	784	396	169	43	743	414	182	46

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
FJ973552.1	886	324	113	18	845	341	123	31	806	358	131	37	771	370	143	39	735	385	155	41
FJ973555.1	885	336	106	18	841	358	114	31	797	382	120	37	759	399	130	39	719	419	142	40
FJ981614.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
FJ982431.1	904	348	131	18	861	362	145	32	815	385	153	39	776	401	163	43	735	421	174	46
FJ984335.1	913	356	123	18	869	373	135	32	825	394	143	39	786	409	154	43	745	428	166	46
FJ984340.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
FJ984344.1	919	350	123	18	876	366	135	32	832	387	143	39	794	401	154	43	754	419	166	46
FJ984350.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
FJ984357.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
FJ984362.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
FJ984371.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
FJ984378.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
FJ984383.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
FJ984386.1	921	348	123	18	878	364	135	32	833	386	143	39	795	400	154	43	755	418	166	46
FJ984390.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
FJ998213.1	919	359	125	18	875	374	139	32	829	396	148	39	790	411	158	44	749	430	169	48
FJ998214.1	919	355	123	18	875	372	135	32	829	395	143	39	790	410	154	43	749	429	166	46
FJ998215.1	929	351	123	18	885	368	135	32	840	390	143	39	800	406	154	43	758	426	166	46
FN401575.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
FN423714.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
FN434445.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
FN434454.1	904	365	123	18	858	384	135	32	811	408	143	39	770	425	154	43	727	446	166	46
FN434459.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
FN434470.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ117022.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ117028.1	898	372	127	13	853	389	140	28	806	413	145	44	766	429	156	50	724	449	168	52
GQ117036.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ117042.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ117048.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ117053.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ117058.1	914	356	127	13	870	372	140	28	824	395	145	44	785	410	156	50	744	429	168	52
GQ117064.1	913	356	123	18	868	374	135	32	821	398	143	39	782	413	154	43	741	432	166	46
GQ117071.1	914	350	127	19	870	367	134	38	824	390	139	48	785	405	147	55	744	425	155	61
GQ117077.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ117081.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ117084.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ117094.1	911	359	122	18	868	375	134	32	823	397	142	39	784	412	153	43	742	432	165	46
GQ117099.2	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ117102.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ117105.1	913	346	133	18	869	360	148	32	823	382	157	39	784	396	169	43	743	414	182	46
GQ117108.1	917	347	131	15	873	364	139	34	828	386	144	44	788	402	155	47	746	422	167	48
GQ117114.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ117118.1	913	346	133	18	869	360	148	32	823	382	157	39	784	396	169	43	743	414	182	46
GQ122096.1	911	358	123	18	867	375	135	32	822	397	143	39	783	412	154	43	742	431	166	46

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
GQ122098.1	871	357	125	18	828	371	139	32	783	393	147	39	745	408	156	44	705	427	166	48
GQ122104.1	871	352	117	18	828	369	128	32	783	392	135	39	745	407	145	43	705	426	156	46
GQ132154.1	919	359	125	18	875	374	139	32	829	396	148	39	790	411	158	44	749	430	169	48
GQ132155.1	916	362	126	18	873	378	136	34	828	399	143	43	790	412	154	47	750	429	167	48
GQ132156.1	930	351	123	18	886	368	135	32	841	390	143	39	801	406	154	43	759	426	166	46
GQ132157.1	929	351	123	18	885	368	135	32	840	390	143	39	800	406	154	43	758	426	166	46
GQ132158.1	920	359	125	18	876	374	139	32	830	396	148	39	791	411	158	44	750	430	169	48
GQ132159.1	929	351	123	18	885	368	135	32	840	390	143	39	800	406	154	43	758	426	166	46
GQ132185.1	903	364	125	18	858	381	138	32	812	403	147	39	773	417	159	43	732	435	172	46
GQ149622.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ149631.1	918	350	124	18	874	366	137	32	829	387	146	39	788	403	158	43	745	423	171	46
GQ149640.1	923	346	123	18	880	362	135	32	836	383	143	39	799	396	154	43	760	413	166	46
GQ149644.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ149650.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ149656.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ149659.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ149664.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ149666.1	894	352	117	18	851	369	128	32	806	392	135	39	768	407	145	43	728	426	156	46
GQ149670.1	912	354	126	18	869	367	141	32	824	390	147	40	784	408	154	46	743	428	163	51
GQ149672.1	912	354	126	18	869	367	141	32	824	390	147	40	784	408	154	46	743	428	163	51
GQ149681.1	902	367	123	18	857	385	135	32	811	408	143	39	771	424	154	43	729	444	166	46
GQ149688.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ149691.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ150330.1	943	350	143	22	899	362	157	39	855	377	165	52	818	387	171	64	779	401	183	70
GQ150333.1	894	359	125	18	850	374	139	32	804	396	148	39	765	411	158	44	724	430	169	48
GQ150336.1	881	374	123	18	835	392	136	32	788	415	145	39	748	430	157	43	706	448	171	46
GQ150343.1	961	360	119	18	917	378	130	32	874	399	137	39	835	414	148	43	794	433	160	46
GQ160524.1	914	354	125	17	870	370	136	34	824	392	144	44	785	407	153	49	744	426	165	49
GQ160529.1	918	351	123	18	875	367	135	32	830	389	143	39	792	403	154	43	752	421	166	46
GQ160533.1	917	352	123	18	872	370	135	32	827	391	144	39	786	407	156	43	743	427	169	46
GQ160536.1	904	364	124	18	859	381	137	32	812	404	146	39	772	419	158	43	730	438	171	46
GQ160540.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ160547.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ160554.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ160558.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ160571.1	914	356	127	13	870	372	140	28	824	395	145	44	785	410	156	50	744	429	168	52
GQ160581.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ160585.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ160589.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ160593.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ160610.1	904	351	123	18	860	368	135	32	815	390	143	39	775	406	154	43	733	426	166	46
GQ160612.1	890	365	123	18	845	382	136	32	800	403	145	39	761	417	157	43	720	434	171	46
GQ162169.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ162171.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
GQ162173.1	916	353	123	18	871	371	135	32	826	393	143	39	786	409	154	43	744	429	166	46
GQ162181.1	913	348	131	18	870	362	145	32	824	385	153	39	785	401	163	43	744	421	174	46
GQ162187.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ162189.1	912	354	126	18	869	367	141	32	824	390	147	40	784	408	154	46	743	428	163	51
GQ162193.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ162196.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ162201.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	428	167	46
GQ166204.1	912	355	125	18	869	370	138	32	824	391	147	39	786	405	157	44	747	422	168	48
GQ166205.1	912	355	125	18	869	370	138	32	824	391	147	39	786	405	157	44	747	422	168	48
GQ166216.1	935	351	123	18	891	368	135	32	846	390	143	39	806	406	154	43	763	427	166	46
GQ166217.2	938	365	136	18	895	376	153	32	849	396	164	39	811	407	178	43	771	422	193	46
GQ166224.1	905	364	125	16	859	383	135	33	811	408	143	39	770	425	153	43	727	446	165	45
GQ166659.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ166750.1	906	348	131	18	863	362	145	32	817	385	153	39	778	401	163	43	737	421	174	46
GQ166759.1	865	365	123	18	822	381	132	35	776	403	140	43	737	418	149	49	698	434	160	54
GQ168627.1	927	342	123	18	886	356	135	32	844	375	143	39	806	390	153	43	766	409	164	46
GQ168632.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ168643.1	913	348	131	18	870	362	145	32	824	385	153	39	785	401	163	43	744	421	174	46
GQ168648.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ168651.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ168654.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ168656.1	916	353	123	18	871	371	135	32	826	393	143	39	786	409	154	43	744	429	166	46
GQ168658.1	917	348	127	18	873	364	140	32	828	385	149	39	788	400	161	43	746	420	172	47
GQ168660.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ168666.1	926	343	123	18	884	358	135	32	841	378	143	39	803	392	154	43	763	410	166	46
GQ168669.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ168670.1	914	356	127	13	870	372	140	28	824	395	145	44	785	410	156	50	744	429	168	52
GQ168672.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ169381.1	922	360	119	18	878	378	130	32	835	399	137	39	796	414	148	43	755	433	160	46
GQ179931.1	874	371	119	18	829	389	131	32	785	410	139	39	746	423	152	43	705	440	166	46
GQ179932.1	882	363	119	18	838	381	130	32	795	402	137	39	757	415	149	43	717	432	162	46
GQ183619.1	924	351	123	18	881	367	135	32	836	389	143	39	798	403	154	43	758	421	166	46
GQ183627.1	924	351	123	18	881	367	135	32	836	389	143	39	798	403	154	43	758	421	166	46
GQ183634.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ184628.2	907	362	123	18	862	380	135	32	816	403	143	39	775	420	154	43	732	441	166	46
GQ200218.1	914	350	127	19	870	367	134	38	824	390	139	48	785	405	147	55	744	425	155	61
GQ200238.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ200251.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ200288.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ205435.1	891	365	123	18	846	382	136	32	801	403	145	39	762	417	157	43	721	434	171	46
GQ205437.1	890	365	123	18	845	382	136	32	800	403	145	39	761	417	157	43	720	434	171	46
GQ205439.1	891	365	123	18	846	382	136	32	801	403	145	39	762	417	157	43	721	434	171	46
GQ214140.1	932	355	123	18	888	372	135	32	842	395	143	39	803	410	154	43	762	429	166	46
GQ214146.1	932	355	123	18	888	372	135	32	842	395	143	39	803	410	154	43	762	429	166	46

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
GQ214152.1	925	366	119	18	881	384	130	32	836	407	137	39	796	424	147	43	753	446	158	46
GQ219585.1	930	362	123	18	885	380	135	32	839	403	143	39	798	420	154	43	755	441	166	46
GQ219779.1	924	341	117	18	885	355	127	32	845	374	133	39	808	389	142	43	769	408	152	46
GQ220729.1	923	346	123	18	880	362	135	32	836	383	143	39	798	397	154	43	758	415	166	46
GQ220730.1	923	346	123	18	880	362	135	32	836	383	143	39	798	397	154	43	758	415	166	46
GQ220731.1	923	346	123	18	880	362	135	32	836	383	143	39	798	397	154	43	758	415	166	46
GQ220732.2	923	346	123	18	880	362	135	32	836	383	143	39	798	397	154	43	758	415	166	46
GQ220733.1	923	346	123	18	880	362	135	32	836	383	143	39	798	397	154	43	758	415	166	46
GQ220734.1	923	346	123	18	880	362	135	32	836	383	143	39	798	397	154	43	758	415	166	46
GQ220735.1	923	346	123	18	880	362	135	32	836	383	143	39	798	397	154	43	758	415	166	46
GQ220736.1	923	346	123	18	880	362	135	32	836	383	143	39	798	397	154	43	758	415	166	46
GQ220737.1	923	346	123	18	880	362	135	32	836	383	143	39	798	397	154	43	758	415	166	46
GQ221696.1	908	359	125	18	864	374	139	32	818	396	148	39	779	411	158	44	738	430	169	48
GQ221787.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ221789.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ221795.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ221799.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ221802.1	913	346	133	18	869	360	148	32	823	382	157	39	784	396	169	43	743	414	182	46
GQ221804.1	926	344	122	18	881	363	133	32	835	388	139	39	794	405	150	43	751	426	162	46
GQ221806.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ221810.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ221813.1	913	346	133	18	869	360	148	32	823	382	157	39	784	396	169	43	743	414	182	46
GQ221815.1	934	339	119	18	891	357	129	32	847	380	135	39	808	397	144	43	767	419	153	46
GQ221819.1	913	346	133	18	869	360	148	32	823	382	157	39	784	396	169	43	743	414	182	46
GQ221821.1	913	346	133	18	869	360	148	32	823	382	157	39	784	396	169	43	743	414	182	46
GQ221824.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ221827.1	927	332	133	18	884	345	148	32	839	366	157	39	801	379	169	43	761	396	182	46
GQ222423.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ223113.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ223415.2	917	352	123	18	872	370	135	32	826	393	143	39	785	410	154	43	742	431	166	46
GQ223436.1	919	350	123	18	876	366	135	32	832	387	143	39	793	402	154	43	752	421	166	46
GQ223445.1	913	364	129	19	868	379	143	34	821	402	149	44	782	417	159	47	741	435	171	49
GQ225351.1	918	351	123	18	874	368	135	32	830	389	143	39	790	405	154	43	748	425	166	46
GQ225359.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ225367.1	917	348	127	18	873	364	140	32	828	385	149	39	788	400	161	43	746	420	172	47
GQ225375.1	918	351	123	18	875	367	135	32	830	389	143	39	792	403	154	43	752	421	166	46
GQ225383.1	917	352	123	18	872	370	135	32	826	393	143	39	785	410	154	43	742	431	166	46
GQ227546.1	951	355	123	18	907	372	135	32	861	395	143	39	822	410	154	43	781	429	166	46
GQ231980.1	912	354	126	18	868	370	139	32	823	391	148	39	785	404	160	43	744	422	173	46
GQ232005.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ232025.1	913	348	131	18	870	362	145	32	824	385	153	39	785	401	163	43	744	421	174	46
GQ232041.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ232087.1	919	350	123	18	876	366	135	32	832	387	143	39	793	402	154	43	752	421	166	46
GQ232095.1	918	351	123	18	875	367	135	32	830	389	143	39	792	403	154	43	752	421	166	46

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
GQ243750.1	904	351	123	18	860	368	135	32	815	390	143	39	775	406	154	43	733	426	166	46
GQ243752.1	904	353	128	18	860	369	140	33	815	391	144	44	775	407	155	45	733	427	167	47
GQ243754.1	899	357	125	16	854	375	135	33	807	399	143	39	767	415	153	43	725	435	165	45
GQ243756.1	895	360	123	18	852	376	135	32	807	398	143	39	769	412	154	43	729	430	166	46
GQ243758.1	904	351	123	18	860	368	135	32	815	390	143	39	775	406	154	43	733	426	166	46
GQ243762.1	904	351	123	18	860	368	135	32	815	390	143	39	775	406	154	43	733	426	166	46
GQ247727.1	943	350	123	18	900	366	135	32	856	387	143	39	817	402	154	43	776	421	166	46
GQ250162.1	919	350	123	18	876	366	135	32	832	387	143	39	793	402	154	43	752	421	166	46
GQ251037.1	940	358	123	18	895	376	135	32	849	399	143	39	808	416	154	43	765	437	166	46
GQ253495.2	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ253504.2	924	345	123	18	882	360	135	32	839	380	143	39	802	393	154	43	763	410	166	46
GQ254710.1	918	347	127	18	876	361	140	32	832	385	145	39	793	402	154	43	752	421	167	45
GQ254714.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ255898.1	916	351	124	19	872	370	134	33	826	393	140	42	786	409	153	41	744	429	165	43
GQ258463.1	904	351	123	18	860	368	135	32	815	390	143	39	775	406	154	43	733	426	166	46
GQ261273.1	923	346	123	18	880	362	135	32	836	383	143	39	798	397	154	43	758	415	166	46
GQ261274.1	923	346	123	18	880	362	135	32	836	383	143	39	798	397	154	43	758	415	166	46
GQ261276.1	923	346	123	18	880	362	135	32	836	383	143	39	798	397	154	43	758	415	166	46
GQ261278.1	904	364	122	20	858	384	132	35	811	408	142	40	770	425	154	43	727	446	166	47
GQ283481.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ283487.1	941	352	123	18	896	370	135	32	850	393	143	39	809	410	154	43	766	431	166	46
GQ283492.1	942	351	123	18	898	368	135	32	853	390	143	39	813	406	154	43	771	426	166	46
GQ287620.1	921	348	123	18	878	364	135	32	833	386	143	39	795	400	154	43	755	418	166	46
GQ287622.1	923	346	123	18	880	362	135	32	836	383	143	39	798	397	154	43	758	415	166	46
GQ287624.1	918	351	123	18	874	368	135	32	830	389	143	39	790	405	154	43	748	425	166	46
GQ287626.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ287628.1	918	351	123	18	874	368	135	32	830	389	143	39	790	405	154	43	748	425	166	46
GQ288374.1	958	348	127	18	914	364	140	32	869	385	149	39	829	400	161	43	787	420	172	47
GQ290107.1	917	352	123	18	872	370	135	32	826	393	143	39	785	410	154	43	742	431	166	46
GQ293078.1	936	351	123	18	892	368	135	32	847	390	143	39	807	406	154	43	765	426	166	46
GQ323441.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ323442.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ323445.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ323448.1	914	355	123	18	869	373	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ323450.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ323453.1	901	369	121	19	856	386	133	34	811	406	142	42	769	423	153	47	724	445	165	51
GQ323456.1	918	351	122	19	874	368	134	31	829	390	140	39	789	406	151	45	747	426	163	49
GQ323458.1	913	346	133	18	869	360	148	32	823	382	157	39	784	396	169	43	743	414	182	46
GQ323459.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ323460.1	915	348	129	18	872	363	141	33	827	387	143	44	787	404	150	51	746	422	161	56
GQ323461.1	914	354	125	17	870	370	136	34	824	392	144	44	785	407	153	49	744	426	165	49
GQ323468.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ323472.1	912	357	123	18	866	376	135	32	819	400	143	39	777	418	154	43	733	440	166	46
GQ323475.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
GQ323477.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ323478.1	913	348	131	18	870	362	145	32	824	385	153	39	785	401	163	43	744	421	174	46
GQ323479.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ323480.1	914	355	123	18	871	371	135	32	825	394	143	39	786	409	154	43	747	425	167	46
GQ323481.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ323482.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ323488.1	917	358	117	18	874	376	127	32	827	403	132	39	787	421	141	43	745	441	154	45
GQ323493.1	913	356	125	16	868	374	135	33	821	398	143	39	781	414	153	43	739	434	165	45
GQ323497.1	898	371	123	18	854	388	135	32	807	412	143	39	767	428	154	43	727	445	167	46
GQ323507.1	885	359	125	18	841	374	139	32	795	396	148	39	756	411	158	44	715	430	169	48
GQ323512.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ323513.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ323515.1	913	356	123	18	868	374	135	32	821	398	143	39	781	414	154	43	739	434	166	46
GQ323519.1	902	364	126	18	858	380	139	32	811	403	148	39	772	417	160	43	731	435	173	46
GQ323521.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ323523.1	910	345	137	18	866	358	153	32	820	380	161	40	782	392	173	45	742	408	186	49
GQ323524.1	905	357	130	18	860	374	143	32	813	397	152	39	773	412	164	43	731	430	178	46
GQ323525.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ323526.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ323529.1	913	356	125	16	868	374	135	33	821	398	143	39	781	414	153	43	739	434	165	45
GQ323532.1	914	346	132	18	871	358	148	32	827	376	159	39	787	393	167	45	745	414	176	50
GQ323540.1	904	363	125	18	859	381	136	33	812	405	143	41	772	421	153	46	730	441	164	50
GQ323542.1	913	356	123	18	868	374	135	32	821	398	143	39	781	414	154	43	739	434	166	46
GQ323543.1	908	359	125	18	864	374	139	32	818	396	148	39	779	411	158	44	738	430	169	48
GQ323544.1	913	351	128	18	870	367	139	33	826	388	144	43	787	403	155	45	746	422	167	48
GQ323545.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ323546.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ323547.1	908	346	135	21	864	360	147	38	818	382	154	47	779	396	165	52	738	414	177	56
GQ323548.1	917	352	123	18	872	370	135	32	826	393	143	39	785	410	154	43	742	431	166	46
GQ323549.1	914	355	123	18	871	371	135	32	825	394	143	39	786	409	154	43	747	425	167	46
GQ323553.1	889	380	123	18	845	395	137	32	799	416	147	39	760	428	161	43	719	445	174	47
GQ323554.1	913	346	133	18	869	360	148	32	823	382	157	39	784	396	169	43	743	414	182	46
GQ323555.1	909	347	139	15	865	359	154	32	819	381	161	43	779	395	173	48	737	413	186	48
GQ323556.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ323557.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ323559.1	914	343	134	19	870	360	145	34	824	385	147	45	785	401	154	52	744	421	162	58
GQ323562.1	903	362	125	20	859	378	131	41	814	398	139	50	776	411	148	57	736	428	159	62
GQ323565.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ323566.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ323567.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ323568.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ323569.1	918	341	133	18	875	356	146	32	831	376	155	39	791	392	166	43	749	412	178	46
GQ323570.1	917	352	123	18	872	370	135	32	826	393	143	39	786	409	154	43	744	429	166	46
GQ323571.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
GQ323572.1	917	352	123	18	872	370	135	32	826	393	143	39	785	410	154	43	742	431	166	46
GQ323573.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ323575.1	909	360	123	18	863	379	135	32	815	404	143	39	774	421	154	43	730	443	166	46
GQ328767.1	925	344	123	18	882	360	135	32	838	381	143	39	799	396	154	43	758	415	166	46
GQ328768.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ329072.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ329084.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ329090.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ329102.1	913	346	133	18	869	360	148	32	823	382	157	39	784	396	169	43	743	414	182	46
GQ329108.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ330646.1	941	351	123	18	897	368	135	32	852	390	143	39	812	407	153	43	770	428	164	46
GQ334332.1	921	348	123	18	878	364	135	32	833	386	143	39	795	400	154	43	755	418	166	46
GQ334340.1	921	348	123	18	878	364	135	32	833	386	143	39	795	400	154	43	755	418	166	46
GQ334348.1	918	351	123	18	874	368	135	32	830	389	143	39	790	405	154	43	748	425	166	46
GQ334357.1	917	352	123	18	872	370	135	32	826	393	143	39	785	410	154	43	742	431	166	46
GQ338330.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ338333.1	908	346	135	21	864	360	147	38	818	382	154	47	779	396	165	52	738	414	177	56
GQ338336.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ338341.1	900	354	135	21	855	369	147	38	808	392	154	47	768	407	165	52	726	426	177	56
GQ338342.1	899	370	123	18	855	386	136	32	809	408	145	39	770	421	158	43	729	439	171	46
GQ338348.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ338351.1	913	346	133	18	869	360	148	32	823	382	157	39	784	396	169	43	743	414	182	46
GQ338357.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ338360.1	913	346	133	18	869	360	148	32	823	382	157	39	784	396	169	43	743	414	182	46
GQ338362.1	917	352	123	18	872	370	135	32	826	393	143	39	785	410	154	43	742	431	166	46
GQ338370.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ338371.1	908	359	125	18	864	374	139	32	818	396	148	39	779	411	158	44	738	430	169	48
GQ338374.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ338377.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ338380.1	913	356	123	18	868	374	135	32	822	396	144	39	782	411	156	43	740	430	169	46
GQ338384.1	908	361	123	18	862	380	135	32	815	404	143	39	774	420	155	43	731	440	168	46
GQ338387.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ338393.1	908	359	125	18	864	374	139	32	818	396	148	39	779	411	158	44	738	430	169	48
GQ338396.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ338401.1	913	356	125	16	868	374	135	33	821	398	143	39	781	414	153	43	739	434	165	45
GQ338404.1	921	348	123	18	878	364	135	32	833	386	143	39	795	400	154	43	755	418	166	46
GQ338406.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ338411.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ338413.1	921	351	120	18	876	370	131	32	830	395	137	39	792	408	149	43	752	425	162	46
GQ338415.1	917	352	123	18	872	370	135	32	826	393	143	39	785	410	154	43	742	431	166	46
GQ338418.1	913	356	125	16	868	374	135	33	822	397	143	39	783	412	153	43	742	431	165	45
GQ340060.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ351292.1	920	351	123	18	876	368	135	32	831	390	143	39	791	406	154	43	749	426	166	46
GQ351316.1	903	366	123	18	856	386	135	32	809	409	144	39	767	426	156	43	723	447	169	46

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
GQ351320.1	940	358	123	18	895	376	135	32	849	399	143	39	808	416	154	43	765	437	166	46
GQ359760.1	939	375	132	16	893	391	144	34	844	416	152	41	803	432	161	47	760	452	172	50
GQ359766.1	948	350	123	18	905	366	135	32	861	387	143	39	822	402	154	43	781	421	166	46
GQ359769.1	934	351	123	18	890	368	135	32	845	390	143	39	805	406	154	43	763	426	166	46
GQ360062.1	936	351	123	18	892	368	135	32	847	390	143	39	807	406	154	43	765	426	166	46
GQ360064.1	938	353	125	18	894	370	137	32	849	392	145	39	809	408	155	44	767	428	167	47
GQ365363.1	954	351	123	18	910	368	135	32	865	390	143	39	825	406	154	43	783	426	166	46
GQ365366.1	940	350	123	18	897	366	135	32	853	387	143	39	814	402	154	43	773	421	166	46
GQ365370.1	865	342	107	18	823	361	116	31	782	379	125	37	745	393	137	39	706	410	151	40
GQ365412.1	918	351	123	18	874	368	135	32	830	389	143	39	790	405	154	43	748	425	166	46
GQ365420.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ365427.1	918	351	123	18	874	368	135	32	830	389	143	39	790	405	154	43	748	425	166	46
GQ365430.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ365438.1	921	348	123	18	878	364	135	32	833	386	143	39	795	400	154	43	755	418	166	46
GQ365445.1	909	360	123	18	864	378	135	32	818	401	143	39	779	416	154	43	738	435	166	46
GQ365448.1	917	352	123	18	872	370	135	32	827	391	144	39	786	407	156	43	743	427	169	46
GQ365457.1	917	352	123	18	872	370	135	32	826	393	143	39	785	410	154	43	742	431	166	46
GQ365660.1	894	352	116	18	851	369	127	32	806	392	134	39	768	407	144	43	728	426	155	46
GQ365668.1	891	351	135	18	848	363	151	32	802	384	161	39	764	396	174	43	724	412	188	46
GQ365676.1	924	345	115	18	881	363	125	32	837	386	131	39	798	403	140	43	757	423	152	45
GQ365680.1	950	351	123	18	906	368	135	32	861	390	143	39	821	406	154	43	779	426	166	46
GQ365682.1	953	355	123	18	909	372	135	32	863	395	143	39	824	410	154	43	783	429	166	46
GQ365685.1	957	351	123	18	913	368	135	32	868	390	143	39	828	406	154	43	786	426	166	46
GQ365688.1	892	351	123	18	848	368	135	32	803	390	143	39	763	406	154	43	721	426	166	46
GQ367304.1	953	353	123	18	908	371	135	32	862	394	143	39	822	408	156	43	780	427	169	46
GQ367490.1	917	352	123	18	872	370	135	32	826	393	143	39	785	410	154	43	742	431	166	46
GQ368663.1	902	367	123	18	857	385	135	32	811	408	143	39	770	425	154	43	727	446	166	46
GQ368666.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ368668.1	918	351	123	18	874	368	135	32	830	389	143	39	790	405	154	43	748	425	166	46
GQ369275.1	938	355	123	18	893	373	135	32	848	394	144	39	806	411	156	43	761	433	169	46
GQ369279.1	946	351	123	18	902	368	135	32	857	390	143	39	817	406	154	43	775	426	166	46
GQ369404.1	935	356	149	18	889	368	168	32	842	387	181	39	801	404	189	46	759	424	198	52
GQ369407.1	936	359	135	28	891	374	140	52	844	397	144	62	804	412	156	64	762	431	169	66
GQ369410.1	953	349	137	19	909	363	151	34	863	385	159	42	825	398	170	47	785	414	184	49
GQ369413.1	923	373	144	19	881	381	160	36	837	398	169	46	800	408	180	53	762	419	194	59
GQ369415.1	946	361	133	18	901	376	148	32	854	399	157	39	814	414	169	43	771	434	182	46
GQ369418.1	961	335	140	22	917	350	149	41	871	374	149	55	832	389	162	57	791	409	172	62
GQ369420.1	956	340	144	18	911	354	160	32	864	376	170	39	823	391	183	43	780	410	197	46
GQ369423.1	954	344	142	18	911	354	159	33	866	372	168	42	828	383	182	45	788	398	197	48
GQ369426.1	941	351	145	21	895	367	158	37	850	385	170	43	812	395	185	45	776	404	204	41
GQ369428.1	961	346	133	18	917	360	148	32	871	382	157	39	832	396	169	43	791	414	182	46
GQ373263.1	956	348	134	18	911	364	147	33	863	389	154	41	821	408	163	46	779	428	174	50
GQ375286.1	943	350	123	18	900	366	135	32	856	387	143	39	817	402	154	43	776	421	166	46
GQ377033.1	917	352	123	18	872	370	135	32	826	393	143	39	785	410	154	43	742	431	166	46

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
GQ377036.1	917	352	123	18	872	370	135	32	826	393	143	39	785	410	154	43	742	431	166	46
GQ377037.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ377040.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ377044.1	930	339	123	18	888	354	135	32	846	373	143	39	811	384	154	43	775	398	166	46
GQ377046.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ377048.1	908	359	125	18	864	374	139	30	818	396	148	35	779	411	158	37	738	430	169	42
GQ377050.1	921	348	123	18	878	364	135	32	833	386	143	39	795	400	154	43	755	418	166	46
GQ377057.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ377059.1	918	351	123	18	875	367	135	32	831	388	143	39	794	401	154	43	755	418	166	46
GQ377060.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ377063.1	913	356	123	18	868	374	135	32	821	398	143	39	781	414	154	43	739	434	166	46
GQ377067.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ377071.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ377074.1	908	359	125	18	864	374	139	32	818	396	148	39	779	411	158	44	738	430	169	48
GQ377077.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ377078.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ377079.1	921	348	123	18	878	364	135	32	833	386	143	39	795	400	154	43	755	418	166	46
GQ377084.1	913	346	133	18	869	360	148	32	823	382	157	39	784	396	169	43	743	414	182	46
GQ377086.1	908	359	125	18	864	374	139	32	818	396	148	39	779	411	158	44	738	430	169	48
GQ377092.1	916	347	132	15	872	363	141	34	827	385	146	44	788	399	159	46	747	417	173	46
GQ377100.1	913	346	133	18	869	360	148	32	823	382	157	39	784	396	169	43	743	414	182	46
GQ377102.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ377105.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ379820.1	912	354	126	18	869	367	141	32	824	390	147	40	784	408	154	46	743	428	163	51
GQ385302.1	949	355	125	18	906	370	138	32	861	391	147	39	823	405	157	44	784	422	168	48
GQ392023.1	936	356	123	18	892	373	135	32	848	393	144	39	809	408	154	44	768	427	165	48
GQ392031.1	913	354	127	18	870	369	140	32	827	387	150	39	790	398	163	43	751	414	175	47
GQ396511.1	864	342	108	18	820	363	117	31	777	384	125	37	739	399	137	39	699	417	151	40
GQ396731.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ396735.1	924	347	121	18	880	365	132	32	835	387	140	39	795	403	152	42	753	423	165	44
GQ396740.1	923	346	123	18	881	361	135	32	838	381	143	39	800	396	153	43	760	415	164	46
GQ396745.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ397116.1	902	367	123	18	857	385	135	32	811	408	143	39	770	425	154	43	727	446	166	46
GQ397117.1	907	362	123	18	863	379	135	32	818	401	143	39	779	416	154	43	738	435	166	46
GQ397120.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ397279.1	904	365	123	18	858	384	135	32	812	407	143	39	771	424	154	43	728	445	166	46
GQ402227.1	931	352	121	18	886	370	131	34	841	390	139	43	801	406	146	51	759	426	156	56
GQ402228.1	926	355	123	18	882	372	135	32	836	395	143	39	797	410	154	43	756	429	166	46
GQ402229.1	926	355	123	18	882	372	135	32	836	395	143	39	797	410	154	43	756	429	166	46
GQ402230.1	926	355	123	18	882	372	135	32	836	395	143	39	797	410	154	43	756	429	166	46
GQ402231.1	918	358	128	18	874	375	139	33	828	398	146	41	790	411	157	46	750	428	169	50
GQ402232.1	930	351	123	18	886	368	135	32	841	390	143	39	801	406	154	43	759	426	166	46
GQ402233.1	930	351	123	18	886	368	135	32	841	390	143	39	801	406	154	43	759	426	166	46
GQ402234.1	925	346	133	18	881	360	148	32	835	382	157	39	796	396	169	43	755	414	182	46

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
GQ402235.1	919	358	126	19	875	374	135	37	830	393	146	42	791	404	163	43	750	422	176	45
GQ402236.1	938	347	119	18	894	365	130	32	848	389	137	39	809	405	147	43	768	425	158	46
GQ402237.1	922	365	117	18	876	387	126	32	827	419	128	39	787	437	137	43	745	455	152	45
GQ402238.1	919	362	123	18	874	380	135	32	827	404	143	39	787	420	154	43	745	440	166	46
GQ402239.1	928	353	123	18	883	371	135	32	837	394	143	39	796	411	154	43	753	432	166	46
GQ402240.1	930	351	123	18	886	368	135	32	841	390	143	39	801	406	154	43	759	426	166	46
GQ402241.1	928	357	119	18	883	376	130	32	837	399	138	39	799	412	150	43	759	429	163	46
GQ402242.1	928	347	128	19	884	364	137	36	839	386	143	45	799	402	153	50	757	422	164	54
GQ402243.1	930	351	123	18	886	368	135	32	841	390	143	39	801	406	154	43	759	426	166	46
GQ402244.1	930	351	123	18	886	368	135	32	841	390	143	39	801	406	154	43	759	426	166	46
GQ402245.1	928	357	119	18	883	376	130	32	837	399	138	39	799	412	150	43	759	429	163	46
GQ402246.1	930	351	123	18	886	368	135	32	841	390	143	39	801	406	154	43	759	426	166	46
GQ411899.1	950	347	119	18	906	365	130	32	860	389	137	39	821	405	147	43	780	425	158	46
GQ411905.1	912	357	123	18	869	373	132	35	825	393	140	43	786	408	149	49	745	427	159	54
GQ421202.1	917	352	123	18	872	370	135	32	825	394	143	39	783	412	154	43	739	434	166	46
GQ421204.1	917	352	123	18	872	370	135	32	828	390	144	39	788	405	156	43	746	424	169	46
GQ426220.1	937	356	123	18	892	374	135	32	846	396	144	39	806	411	156	43	764	430	169	46
GQ433898.1	903	362	125	20	859	378	131	41	814	398	139	50	776	411	148	57	736	428	159	62
GQ455034.1	913	356	125	16	868	374	135	33	821	398	143	39	781	414	153	43	739	434	165	45
GQ457464.1	916	350	126	18	871	368	137	33	825	391	144	41	784	408	154	46	742	428	165	50
GQ457469.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ457481.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ457483.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ457486.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ457505.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ457510.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ457516.1	916	347	132	15	872	363	141	34	827	385	146	44	788	399	159	46	747	417	173	46
GQ463202.1	903	366	123	18	856	386	135	32	808	411	143	39	766	429	154	43	722	451	166	46
GQ463958.1	929	352	123	18	884	370	135	32	839	391	144	39	797	408	156	43	752	430	169	46
GQ465696.1	937	342	122	21	895	358	129	39	852	377	138	45	814	390	150	47	774	407	163	49
GQ465697.1	930	351	123	18	886	368	135	32	841	390	143	39	801	406	154	43	759	426	166	46
GQ465698.1	920	359	125	18	876	374	139	32	830	396	148	39	791	411	158	44	750	430	169	48
GQ465699.1	920	359	125	18	876	374	139	32	830	396	148	39	791	411	158	44	750	430	169	48
GQ465700.1	926	355	123	18	882	372	135	32	836	395	143	39	797	410	154	43	756	429	166	46
GQ465701.1	930	351	123	18	886	368	135	32	841	390	143	39	801	406	154	43	759	426	166	46
GQ465702.1	925	346	133	18	881	360	148	32	835	382	157	39	796	396	169	43	755	414	182	46
GQ465703.1	929	352	123	18	884	370	135	32	838	393	143	39	797	410	154	43	754	431	166	46
GQ465704.1	919	362	123	18	874	380	135	32	827	404	143	39	787	420	154	43	745	440	166	46
GQ465705.1	919	362	123	18	874	380	135	32	827	404	143	39	787	420	154	43	745	440	166	46
GQ465706.1	919	362	123	18	874	380	135	32	827	404	143	39	787	420	154	43	745	440	166	46
GQ465707.1	920	359	125	18	876	374	139	32	830	396	148	39	791	411	158	44	750	430	169	48
GQ485658.1	929	338	135	18	887	351	149	32	843	372	157	39	806	385	166	45	767	402	177	49
GQ485663.1	932	347	123	18	888	364	135	32	844	384	144	39	805	398	156	43	764	416	169	46
GQ494353.1	945	347	123	18	901	364	135	32	856	386	143	39	815	403	154	43	772	424	166	46

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
GQ496143.1	918	370	129	16	872	388	140	33	824	412	149	39	783	428	160	43	740	448	173	45
GQ496148.1	918	370	129	16	872	388	140	33	824	412	149	39	783	428	160	43	740	448	173	45
GQ497278.2	913	368	111	18	867	388	122	32	820	412	130	39	778	430	141	43	734	452	153	46
GQ497279.1	932	332	139	7	892	341	159	18	851	356	171	32	814	365	186	43	775	380	199	50
GQ499335.1	898	366	129	17	853	380	143	34	807	401	152	44	767	417	160	50	725	436	172	51
GQ499337.1	907	360	125	18	862	376	139	32	815	399	148	39	776	414	158	44	735	433	169	48
GQ502908.1	965	352	123	18	920	370	135	32	873	394	143	39	831	412	154	43	787	434	166	46
GQ504753.1	923	346	123	18	880	362	135	32	836	383	143	39	798	397	154	43	758	415	166	46
GQ505855.1	929	350	123	18	886	366	135	32	842	387	143	39	803	402	154	43	762	421	166	46
GQ527169.1	931	346	125	18	889	359	139	32	846	377	149	39	809	388	162	43	770	403	176	46
GQ866226.1	905	361	124	20	861	380	132	36	815	403	141	41	774	419	155	40	733	436	168	42
GQ866936.1	893	352	148	24	848	368	155	44	803	387	161	53	763	402	170	55	721	421	182	53
GQ866937.1	905	351	123	18	861	368	135	32	816	390	143	39	776	406	154	43	734	426	166	46
GQ866938.1	881	349	123	18	838	365	135	32	794	387	142	39	755	403	152	43	714	423	163	46
GQ866939.1	912	344	138	19	870	354	153	35	828	368	163	45	789	381	175	50	748	399	186	55
GQ866953.1	939	351	123	18	895	368	135	32	850	390	143	39	809	407	154	43	766	428	166	46
GQ866961.1	959	351	123	18	915	368	135	32	870	390	143	39	829	407	154	43	786	428	166	46
GQ894807.1	899	347	123	18	856	363	135	32	812	384	143	39	771	401	154	43	728	422	166	46
GQ894809.1	918	351	123	18	874	368	135	32	829	390	143	39	789	407	153	43	747	428	164	46
GQ894810.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ894811.1	891	378	123	18	844	398	135	32	797	422	143	39	755	440	154	43	711	462	166	46
GQ894817.1	910	354	128	18	863	373	141	32	816	396	150	39	776	411	162	43	734	430	175	46
GQ894819.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ894822.1	913	346	133	18	869	360	148	32	823	382	157	39	784	396	169	43	743	414	182	46
GQ894823.1	913	348	131	18	870	362	145	32	824	385	153	39	785	401	163	43	744	421	174	46
GQ894829.1	913	346	133	18	870	360	147	32	826	378	158	39	787	391	171	43	746	409	183	47
GQ894831.1	919	350	123	18	876	366	135	32	832	387	143	39	793	402	154	43	752	421	166	46
GQ894838.1	908	359	125	18	864	374	139	32	818	396	148	39	779	411	158	44	738	430	169	48
GQ894843.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ894846.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ894850.1	918	351	122	19	874	368	135	32	829	390	143	41	789	406	154	45	747	426	166	47
GQ894852.1	908	350	134	18	864	363	150	32	819	383	160	39	779	396	174	43	737	414	188	46
GQ894853.1	916	347	132	15	872	363	141	34	827	385	146	44	788	399	159	46	747	417	173	46
GQ894858.1	915	349	128	18	870	367	137	35	823	391	145	42	784	405	157	46	743	423	168	52
GQ894863.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ894866.1	923	346	123	18	880	362	135	32	836	383	143	39	797	398	154	43	758	415	166	46
GQ894870.1	905	359	128	18	862	373	142	32	817	393	152	39	778	408	162	44	737	427	173	48
GQ894876.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ894877.1	917	352	123	18	872	370	135	32	826	393	143	39	785	410	154	43	742	431	166	46
GQ894878.1	913	346	133	18	869	360	148	32	823	382	157	39	784	396	169	43	743	414	182	46
GQ894880.1	910	345	137	18	866	358	153	32	820	380	161	40	782	392	173	45	742	408	186	49
GQ894882.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ894883.1	913	346	133	18	869	360	148	32	823	382	157	39	784	396	169	43	743	414	182	46
GQ894886.1	913	346	133	18	869	360	148	32	823	382	157	39	784	396	169	43	743	414	182	46

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
GQ894888.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ894893.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ894896.1	902	367	123	18	857	385	135	32	811	408	143	39	770	425	154	43	727	446	166	46
GQ894897.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ894900.1	933	349	110	18	890	367	123	29	846	389	132	34	807	405	144	37	766	425	157	39
GQ894901.1	908	359	125	18	864	374	139	32	818	396	148	39	779	411	158	44	738	430	169	48
GQ894902.1	909	357	126	18	866	372	139	32	821	393	148	39	783	406	160	43	743	424	172	46
GQ894904.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ894908.1	914	355	123	18	870	372	135	32	824	395	143	39	785	410	154	43	744	429	166	46
GQ894909.1	917	352	123	18	872	370	135	32	826	393	143	39	785	410	154	43	742	431	166	46
GQ894912.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ894914.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ894921.1	899	370	125	16	852	390	135	33	803	416	143	39	762	433	153	43	719	454	165	45
GQ894923.1	921	348	123	18	878	364	135	32	833	386	143	39	794	402	153	43	752	423	164	46
GQ894927.1	915	348	129	18	872	363	141	33	827	387	143	44	787	404	150	51	746	422	161	56
GQ894932.1	916	355	122	17	871	373	134	31	824	397	144	36	785	411	157	39	744	429	169	44
GQ894933.1	918	351	123	18	875	367	135	32	830	389	143	39	792	403	154	43	752	421	166	46
GQ894936.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GQ894939.1	905	362	125	18	861	377	139	32	815	398	149	39	776	411	162	43	735	428	176	46
GQ906584.1	955	351	123	18	911	368	135	32	866	390	143	39	826	406	154	43	784	426	166	46
GU012634.1	933	343	116	18	892	359	126	32	851	379	132	39	815	393	141	43	777	411	151	46
GU012635.1	925	350	117	18	882	367	128	32	838	389	135	39	799	405	145	43	759	424	156	46
GU012636.1	934	343	115	18	893	359	125	32	851	380	131	39	815	394	140	43	777	412	150	46
GU014749.1	910	354	127	19	865	371	132	41	821	389	142	49	782	401	155	54	741	419	165	60
GU014751.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GU014753.1	918	350	123	19	874	368	130	37	829	390	138	42	789	406	151	43	747	426	164	44
GU014755.1	917	353	121	19	873	369	133	34	829	388	142	42	789	403	153	47	747	422	165	51
GU014757.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GU014759.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GU014761.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GU014763.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GU014765.1	922	347	123	18	878	364	135	32	833	386	143	39	794	401	154	43	753	420	166	46
GU014767.1	918	347	127	18	874	363	138	34	829	382	149	40	789	397	162	39	747	417	172	43
GU014769.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GU014771.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GU014773.1	918	338	135	19	874	355	146	34	829	379	151	42	789	396	160	47	747	417	170	51
GU014775.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GU014777.1	918	351	123	18	874	368	135	32	830	389	143	39	790	405	154	43	748	425	166	46
GU014779.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GU014781.1	909	354	129	18	867	367	142	33	823	389	146	43	784	404	154	50	743	423	164	55
GU014783.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GU014785.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GU014787.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GU014789.1	940	335	117	18	900	351	126	32	857	377	128	39	819	396	134	43	779	416	145	45

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
GU014791.1	904	365	123	18	858	384	135	32	811	408	143	39	770	425	154	43	727	446	166	46
GU014793.1	918	351	123	18	874	368	135	32	830	389	143	39	790	405	154	43	748	425	166	46
GU014795.1	918	351	123	18	875	367	135	32	830	389	143	39	792	403	154	43	752	421	166	46
GU014797.1	888	381	123	18	843	399	135	32	797	422	143	39	756	439	154	43	713	460	166	46
GU014799.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GU014801.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GU014803.1	898	362	132	18	854	377	146	32	809	397	156	39	769	411	169	43	727	428	184	46
GU014805.1	913	346	133	18	869	360	148	32	823	382	157	39	784	396	169	43	743	414	182	46
GU014807.1	903	366	123	18	857	385	135	32	810	409	143	39	769	426	154	43	726	447	166	46
GU014809.1	918	351	123	18	874	368	135	32	830	389	143	39	790	405	154	43	748	425	166	46
GU014811.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GU065289.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GU065290.1	925	344	123	18	882	360	135	32	840	378	144	39	801	392	156	43	760	410	169	46
GU065291.1	917	352	123	18	872	370	135	32	827	391	144	39	786	407	156	43	743	427	169	46
GU065292.1	948	336	108	18	909	353	115	32	868	377	117	39	831	395	123	43	793	413	134	45
GU071974.1	913	356	123	18	870	372	135	32	826	393	143	39	786	409	154	43	744	429	166	46
GU071975.1	890	379	123	18	845	397	135	32	799	420	143	39	758	437	154	43	715	458	166	46
GU071976.1	903	364	127	16	859	380	140	30	814	401	149	36	774	416	159	44	734	434	168	50
GU108488.1	938	355	123	18	893	373	135	32	848	395	143	39	807	412	154	43	764	433	166	46
GU112092.1	910	362	120	18	866	379	132	32	821	401	140	39	780	418	151	43	737	439	163	46
GU112751.1	913	368	111	18	867	388	122	32	820	412	130	39	778	430	141	43	734	452	153	46
GU112752.1	913	368	111	18	867	388	122	32	820	412	130	39	778	430	141	43	734	452	153	46
GU123901.1	934	336	121	19	891	353	124	41	847	374	131	49	808	389	141	54	767	408	152	58
GU123902.1	894	329	106	18	851	350	114	31	807	374	120	37	769	391	130	39	729	411	142	40
GU123903.1	897	345	113	18	853	364	123	32	809	386	130	39	769	403	140	43	727	423	153	45
GU123904.1	905	358	123	18	859	377	135	32	813	399	144	39	771	416	156	43	727	437	169	46
GU123905.1	904	357	123	18	858	376	135	32	812	398	144	39	770	415	156	43	726	436	169	46
GU123907.1	911	348	123	18	867	365	135	32	823	385	144	39	783	400	156	43	741	419	169	46
GU123908.1	918	350	124	18	874	366	137	32	829	387	146	39	788	403	158	43	745	423	171	46
GU123909.1	916	352	123	18	871	370	135	32	826	391	144	39	785	407	156	43	742	427	169	46
GU123910.1	931	337	122	19	888	353	135	32	844	374	143	41	804	390	154	45	762	410	166	47
GU123911.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GU123912.1	894	358	128	18	850	373	142	32	806	391	153	39	765	407	164	44	722	427	176	48
GU123913.1	858	336	124	19	814	354	127	41	770	374	135	49	730	389	146	54	688	408	158	58
GU123914.1	917	352	123	18	872	370	135	32	827	391	144	39	786	407	156	43	743	427	169	46
GU123915.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GU123918.1	881	352	123	18	836	370	135	32	791	391	144	39	750	407	156	43	707	427	169	46
GU123919.1	917	352	123	18	871	371	135	32	824	395	143	39	781	414	154	43	736	437	166	46
GU123920.1	891	353	123	18	845	372	135	32	799	394	144	39	757	411	156	43	713	432	169	46
GU123921.1	903	352	123	18	858	370	135	32	813	391	144	39	772	407	156	43	729	427	169	46
GU123922.1	921	338	123	18	878	354	135	32	834	375	143	39	795	390	154	43	756	407	166	46
GU123923.1	908	343	122	18	865	360	133	32	821	383	139	39	782	397	151	43	741	415	164	46
GU123924.1	889	343	115	18	846	363	124	31	802	386	131	37	763	403	142	39	722	424	153	41
GU134712.1	879	338	106	18	836	359	114	31	793	382	120	37	755	399	130	39	715	419	142	40

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
GU134713.1	883	353	128	18	839	370	140	32	794	392	148	39	754	408	159	43	712	428	171	46
GU134714.1	891	347	141	20	848	360	151	39	804	378	159	49	765	390	172	53	724	406	186	56
GU134715.1	909	351	127	18	865	366	141	32	820	386	151	39	781	398	165	43	740	414	180	46
GU134716.1	919	350	123	18	876	366	135	32	832	387	143	39	793	402	154	43	752	421	166	46
GU134717.1	922	347	123	18	878	364	135	32	833	386	143	39	792	403	154	43	749	424	166	46
GU134718.1	917	352	123	18	872	370	135	32	827	391	144	39	786	407	156	43	743	427	169	46
GU134720.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GU134721.1	917	352	123	18	872	370	135	32	827	391	144	39	786	407	156	43	743	427	169	46
GU134722.1	877	346	122	18	834	363	133	32	790	385	140	39	749	403	150	43	706	425	161	46
GU134724.1	912	352	123	18	867	370	135	32	822	391	144	39	781	407	156	43	738	427	169	46
GU134726.1	856	362	124	18	811	379	137	32	766	399	147	39	725	414	160	43	682	433	174	46
GU134727.1	896	358	128	18	852	373	142	32	808	391	153	39	767	407	164	44	724	427	176	48
GU134728.1	886	342	123	18	843	358	135	32	799	379	143	39	760	394	154	43	719	413	166	46
GU134731.1	869	338	138	20	824	355	146	39	779	376	147	54	738	393	155	61	695	413	167	65
GU134732.1	877	330	106	18	833	352	114	31	790	374	121	37	751	391	132	39	710	411	145	40
GU134733.1	871	339	129	19	828	357	133	39	784	378	134	53	746	392	145	56	706	411	153	55
GU134734.1	845	367	123	18	800	385	135	32	754	408	143	39	712	426	154	43	668	448	166	46
GU189642.1	887	351	123	18	843	368	135	32	798	390	143	39	758	406	154	43	716	426	166	46
GU189651.1	910	362	120	18	866	379	132	32	821	401	140	39	780	418	151	43	737	439	163	46
GU198203.1	907	359	125	19	863	376	136	34	818	397	144	42	776	415	154	47	732	437	165	51
GU211221.1	920	369	129	16	875	386	140	33	828	409	149	39	788	424	160	43	746	443	173	45
GU211229.1	931	362	123	18	887	379	135	32	841	402	143	39	802	417	154	43	761	436	166	46
GU211237.1	942	351	123	18	899	367	135	32	855	388	143	39	816	403	154	43	775	422	166	46
GU211245.1	938	354	123	18	895	370	135	32	850	392	143	39	812	406	154	43	772	424	166	46
GU216651.1	880	366	123	21	833	387	129	40	784	413	129	55	743	429	139	61	700	449	151	65
GU234175.1	910	369	123	18	864	388	135	32	816	412	144	39	775	428	156	43	732	448	169	46
GU290049.1	930	351	123	18	886	368	135	32	841	390	143	39	801	406	154	43	759	426	166	46
GU290057.1	922	359	126	15	878	374	138	32	834	394	146	42	795	408	158	46	754	426	171	45
GU290191.1	917	353	121	19	873	369	133	34	829	388	142	42	789	403	153	47	747	422	165	51
GU292381.1	893	372	124	18	848	388	138	32	803	408	148	39	763	422	161	43	720	441	175	46
GU292382.1	915	351	123	18	871	368	135	32	826	390	143	39	786	406	154	43	744	426	166	46
GU292383.1	910	356	123	18	864	375	135	32	817	399	143	39	775	417	154	43	730	440	166	46
GU292384.1	917	331	141	18	875	343	155	33	831	363	160	44	792	378	167	52	750	398	177	57
GU292385.1	901	365	123	18	856	383	135	32	811	405	143	39	771	421	154	43	728	442	166	46
GU292386.1	905	361	123	18	861	378	135	32	817	399	143	39	778	414	154	43	737	433	166	46
GU324339.1	960	354	126	18	917	367	141	32	874	382	154	39	835	392	170	43	794	407	185	47
GU332632.1	896	368	127	19	846	390	132	41	799	410	143	49	757	423	158	54	713	442	170	60
GU332635.1	910	325	115	18	868	345	116	38	825	368	121	45	787	385	130	45	749	403	143	41
GU361110.1	851	383	124	20	806	401	135	35	761	423	140	45	721	437	150	52	678	456	163	56
GU367316.1	927	356	132	18	886	368	146	32	846	381	158	39	807	394	171	43	766	412	183	47
GU367319.1	921	368	126	18	875	386	139	32	828	408	149	39	786	424	162	43	742	444	176	46
GU367326.1	949	358	118	8	905	375	134	19	862	394	146	29	822	408	160	38	780	426	175	43
GU367329.1	927	360	128	18	884	376	135	37	840	398	142	44	801	412	157	43	760	431	170	39
GU371257.1	945	342	123	18	904	356	135	32	862	375	143	39	823	391	153	43	782	411	164	46

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
GU433027.1	943	350	123	18	900	366	135	32	856	387	143	39	817	402	154	43	776	421	166	46
GU433035.1	943	350	123	18	900	366	135	32	856	387	143	39	817	402	154	43	776	421	166	46
GU451256.1	937	354	118	19	895	369	132	29	852	389	141	36	814	402	153	42	774	419	166	45
GU470881.1	918	350	125	17	874	368	138	29	829	390	146	36	789	406	156	42	747	426	167	46
GU471690.1	914	353	122	21	870	371	130	38	825	393	131	52	785	410	139	58	743	431	149	62
GU471691.1	910	361	126	18	867	377	138	32	823	397	145	41	784	411	156	46	743	429	167	51
GU471692.1	923	350	125	17	879	368	138	29	834	390	146	36	794	406	156	42	752	426	167	46
GU471693.1	923	351	123	18	879	368	135	32	834	390	143	39	794	406	154	43	752	426	166	46
GU471694.1	923	351	123	18	879	368	135	32	834	390	143	39	794	406	154	43	752	426	166	46
GU471695.1	905	351	139	20	859	369	148	38	813	391	148	54	771	409	153	63	726	431	163	67
GU480924.1	923	346	123	18	880	362	135	32	836	383	143	39	798	397	154	43	758	415	166	46
GU480927.1	909	360	123	18	863	379	135	32	816	403	143	39	774	421	154	43	730	443	166	46
GU480930.1	919	350	123	18	876	366	135	32	832	387	143	39	793	402	154	43	752	421	166	46
GU480937.1	942	347	126	18	899	362	139	32	855	383	147	39	816	398	158	43	775	418	169	46
GU480940.1	939	353	123	18	894	371	135	32	848	393	144	39	808	408	156	43	766	427	169	46
GU480945.1	940	344	135	18	897	358	149	32	852	379	158	39	814	390	172	43	774	407	183	48
GU560010.1	934	358	123	18	888	377	135	32	841	400	144	39	799	417	156	43	755	438	169	46
GU560018.1	926	367	123	18	879	387	135	32	830	412	144	39	787	430	156	43	742	452	169	46
GU562452.1	942	350	123	18	899	366	135	32	855	387	143	39	816	402	154	43	775	421	166	46
GU562460.1	942	347	126	18	899	362	139	32	855	383	147	39	816	398	158	43	775	418	169	46
GU562466.1	902	365	130	18	855	384	143	32	807	408	152	39	763	425	166	43	717	446	181	46
GU562467.1	923	351	123	18	879	368	135	32	834	390	143	39	794	406	154	43	752	426	166	46
GU562468.1	920	347	130	18	876	363	143	32	831	384	152	39	790	399	165	43	747	418	179	46
GU562469.1	923	340	130	22	880	355	140	39	837	374	148	47	798	389	158	52	757	408	169	56
GU571152.1	918	342	130	20	874	362	135	38	829	386	136	50	789	404	144	53	747	425	154	54
GU571153.1	904	356	130	20	858	378	135	38	811	404	136	50	770	423	144	53	727	445	154	54
GU571154.1	917	352	123	18	873	369	135	32	828	391	143	39	788	407	154	43	746	427	166	46
GU571155.1	903	366	123	18	857	385	135	32	810	409	143	39	769	426	154	43	726	447	166	46
GU571156.1	903	366	123	18	857	385	135	32	810	409	143	39	769	426	154	43	726	447	166	46
GU576503.1	917	352	123	18	873	369	135	32	830	388	144	39	791	402	156	43	750	420	169	46
GU576505.1	917	352	123	18	872	370	135	32	827	391	144	39	786	407	156	43	742	428	169	46
GU576507.1	922	347	123	18	878	364	135	32	833	386	143	39	792	403	154	43	749	424	166	46
GU576509.1	917	352	123	18	872	370	135	32	827	391	144	39	786	407	156	43	743	427	169	46
GU576511.1	917	352	123	18	872	370	135	32	827	391	144	39	786	407	156	43	743	427	169	46
GU576513.1	917	352	123	18	872	370	135	32	827	391	144	39	786	407	156	43	743	427	169	46
GU576516.1	917	352	123	18	872	370	135	32	827	391	144	39	786	407	156	43	743	427	169	46
GU576518.1	917	352	123	18	872	370	135	32	827	391	144	39	786	407	156	43	743	427	169	46
GU576520.1	917	352	123	18	872	370	135	32	827	391	144	39	786	407	156	43	743	427	169	46
GU576523.1	913	354	125	18	868	370	139	32	823	389	150	39	781	405	163	43	737	425	177	46
GU576525.1	917	352	123	18	872	370	135	32	827	391	144	39	786	407	156	43	743	427	169	46
GU576528.1	908	361	123	18	862	380	135	32	815	404	143	39	773	422	154	43	729	444	166	46
GU576530.1	914	353	122	21	870	371	130	38	825	393	131	52	785	409	140	58	743	429	151	62
GU576533.1	927	342	123	18	884	358	135	32	840	379	143	39	801	394	154	43	760	413	166	46
GU576535.1	914	353	122	21	870	371	130	38	825	393	131	52	785	409	140	58	743	429	151	62

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
GU576541.1	925	356	119	10	881	372	136	21	836	393	147	32	795	409	160	40	752	429	174	44
GU576543.1	910	350	132	18	864	369	141	35	818	391	150	41	777	406	165	44	734	425	180	44
GU576544.1	895	371	123	21	851	387	133	38	806	407	136	52	766	421	147	58	724	439	160	62
GU576545.1	925	346	118	21	884	362	125	38	843	381	125	52	805	396	133	58	765	415	143	62
GU592891.1	926	360	131	18	882	375	145	32	836	398	153	39	795	416	163	43	752	438	174	46
GU592899.1	926	360	131	18	882	375	145	32	836	398	153	39	795	416	163	43	752	438	174	46
GU592907.1	942	350	123	18	899	366	135	32	855	387	143	39	816	402	154	43	775	421	166	46
GU727826.1	953	334	123	18	911	349	135	32	867	371	142	39	826	391	150	43	783	415	159	46
GU936491.1	897	346	113	18	853	365	123	32	809	387	130	39	769	404	140	43	727	424	153	45
GU953237.1	918	351	123	18	874	368	135	32	829	390	143	39	789	406	154	43	747	426	166	46
GU953240.1	900	371	120	19	854	391	133	29	808	414	142	36	767	431	154	40	726	450	168	40
GU979210.1	929	338	125	18	886	355	130	38	842	376	138	45	803	391	150	45	764	408	164	42
GU984388.1	902	357	133	18	860	371	145	33	816	394	150	41	777	411	157	47	736	431	165	53
GU984391.1	917	343	135	15	873	363	138	36	828	387	137	51	788	405	141	56	746	426	152	58
GU984394.1	914	360	127	9	870	376	139	24	825	396	151	33	785	411	162	40	743	430	173	48
GU984397.1	921	348	123	18	878	364	135	32	833	386	143	39	795	400	154	43	755	418	166	46
GU984400.1	917	352	123	18	873	369	135	32	828	391	143	39	788	407	154	43	746	427	166	46
GU984403.1	917	352	123	18	873	369	135	32	828	391	143	39	788	407	154	43	746	427	166	46
GU984406.1	918	356	127	9	874	372	139	24	829	392	151	33	789	407	162	40	747	426	173	48
GU984409.1	918	356	127	9	874	372	139	24	829	392	151	33	789	407	162	40	747	426	173	48
GU984412.1	893	366	132	19	847	385	146	29	802	406	156	36	762	421	169	40	722	438	184	40
GU984415.1	901	370	120	19	855	390	133	29	809	413	142	36	768	430	154	40	727	449	168	40
GU984418.1	901	370	120	19	855	390	133	29	809	413	142	36	768	430	154	40	727	449	168	40
HM006721.1	886	383	123	18	837	405	135	32	785	433	144	39	742	450	157	43	697	471	171	46
HM006722.1	895	374	123	18	848	394	135	32	800	418	144	39	759	433	157	43	716	452	171	46
HM006723.1	895	374	123	18	848	394	135	32	800	418	144	39	759	433	157	43	716	452	171	46
HM006724.1	895	374	123	18	848	394	135	32	800	418	144	39	759	433	157	43	716	452	171	46
HM006725.1	875	392	125	18	830	408	136	35	784	427	147	43	745	438	160	49	704	453	174	54
HM006726.1	895	374	123	18	848	394	135	32	800	418	144	39	759	433	157	43	716	452	171	46
HM006727.1	895	374	123	18	848	394	135	32	800	418	144	39	759	433	157	43	716	452	171	46
HM012480.1	898	362	127	23	853	380	138	38	807	403	144	47	764	422	154	52	719	445	165	56
HM014326.1	951	376	128	18	907	391	142	32	862	410	153	39	823	421	168	43	783	434	185	46
HM051341.1	881	352	126	18	837	369	138	32	792	391	144	41	752	407	155	45	710	427	167	48
HM051349.1	871	350	123	18	828	366	135	32	784	387	143	39	745	402	154	43	704	421	166	46
HM064504.1	929	352	123	18	884	370	135	32	839	391	144	39	798	407	156	43	755	427	169	46
HM064505.1	929	352	123	18	884	370	135	32	839	391	144	39	798	407	156	43	755	427	169	46
HM101150.1	937	347	126	18	894	362	139	32	850	383	147	39	811	398	158	43	770	418	169	46
HM104437.1	827	369	121	18	782	386	134	32	736	410	141	39	695	430	148	44	652	450	161	47
HM104478.1	937	350	123	18	894	366	135	32	850	387	143	39	811	402	154	43	770	421	166	46
HM124385.1	953	342	115	18	911	359	125	32	868	381	131	39	830	397	140	43	790	418	149	46
HM138490.1	911	358	123	18	865	377	135	32	818	401	143	39	775	420	154	43	730	443	166	46
HM138492.1	911	358	123	18	865	377	135	32	818	401	143	39	775	420	154	43	730	443	166	46
HM138500.1	928	345	119	18	882	366	129	32	836	390	136	39	794	408	147	43	750	430	159	46
HM138502.1	918	347	127	18	875	362	140	32	830	384	147	40	793	396	158	45	754	412	170	49

	16-mers				17-mers				18-mers				19-mers				20-mers			
Accession #	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**
HM145748.1	916	365	123	18	870	384	135	32	823	408	143	39	782	425	154	43	739	446	166	46
HM157259.1	935	352	122	19	891	369	126	41	846	392	132	49	806	411	138	55	764	430	150	59
HM159391.1	858	351	123	18	814	368	135	32	769	390	143	39	729	406	154	43	687	426	166	46
HM159392.1	854	355	123	18	810	372	135	32	764	395	143	39	725	410	154	43	684	429	166	46
HM159393.1	858	351	123	18	814	368	135	32	769	390	143	39	729	406	154	43	687	426	166	46
HM159394.1	858	351	123	18	814	368	135	32	769	390	143	39	729	406	154	43	687	426	166	46
HM159395.1	858	351	123	18	814	368	135	32	769	390	143	39	729	406	154	43	687	426	166	46
HM159396.1	858	351	123	18	814	368	135	32	769	390	143	39	729	406	154	43	687	426	166	46
HM159397.1	858	351	123	18	814	368	135	32	769	390	143	39	729	406	154	43	687	426	166	46
HM159398.1	858	351	123	18	814	368	135	32	769	390	143	39	729	406	154	43	687	426	166	46
HM159399.1	858	351	123	18	814	368	135	32	769	390	143	39	729	406	154	43	687	426	166	46
HM159400.1	858	351	123	18	814	368	135	32	769	390	143	39	729	406	154	43	687	426	166	46
HM159401.1	858	351	123	18	814	368	135	32	769	390	143	39	729	406	154	43	687	426	166	46
HM159402.1	858	351	123	18	814	368	135	32	769	390	143	39	729	406	154	43	687	426	166	46
HM159403.1	857	352	123	18	812	370	135	32	767	391	144	39	726	407	156	43	683	427	169	46
HM159404.1	858	351	123	18	814	368	135	32	769	390	143	39	729	406	154	43	687	426	166	46
HM159405.1	854	355	123	18	810	372	135	32	764	395	143	39	725	410	154	43	684	429	166	46
HM159406.1	858	351	123	18	814	368	135	32	769	390	143	39	729	406	154	43	687	426	166	46
HM159407.1	857	352	123	18	812	370	135	32	767	391	144	39	726	407	156	43	683	427	169	46
HM159408.1	854	355	123	18	810	372	135	32	764	395	143	39	725	410	154	43	684	429	166	46
HM173601.1	954	351	123	18	910	368	135	32	865	390	143	39	825	406	154	43	783	426	166	46
HM219619.1	901	370	120	19	855	390	133	29	809	413	142	36	768	430	154	40	727	449	168	40
HM219622.1	908	361	123	18	865	377	135	32	821	398	143	39	784	411	154	43	745	428	166	46
HM219625.1	917	364	111	18	873	382	122	32	828	404	130	39	788	420	141	43	746	440	153	46
HM219628.1	891	374	119	26	844	391	134	40	795	416	144	46	752	433	158	45	707	455	170	48
HM219631.1	903	357	132	18	861	369	147	32	816	389	157	39	776	404	168	44	734	423	180	48
HM219634.1	917	352	123	18	873	369	135	32	828	391	143	39	788	407	154	43	746	427	166	46
HM219637.1	917	352	123	18	873	369	135	32	828	391	143	39	788	407	154	43	746	427	166	46
HM219640.1	888	374	130	18	842	392	143	32	795	415	152	39	753	432	164	43	709	453	177	46