# The role of genetics and the environment in systemic lupus erythematosus pathogenesis: A review of the past decade

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## **INTRODUCTION**

Systemic lupus erythematosus (SLE) is a systemic autoimmune disease that causes inflammation in multiple body systems. Clinical manifestations are varied and can range from mild rashes to end-organ damage. The pathogenesis of SLE is complex and much is still unknown. Genetic factors are widely agreed to play a role, however known susceptibility genes only account for a percentage of SLE risk and heritability. Environmental factors, external exposures that can cause biological changes, can also interact with preexisting SLE genes, increasing disease risk.

RESULTS		
		SLE Risk
C	eneti	CC
UE		LS
		2017
PPRC-ZFP90RNACD45DEF6RASCSRGAP2-TERTCD2IKBKEIL12BSIGLELPPGTF2IRD1-SYNCATXN1GTF21-ATGBACK2NCF1P2RYJAK2PCNXL3-SMG	26 EC6 GR1 16L2- ′2	DGKQSLC15A4GRB2MYNNFAM86B3PANKS1APLATCCL22GALCATG16L2CLEC16ARNASEH2CIL12RB2SGK223-ENTHD1-CLDN23-GRAP2MFHAS1
lyst nadsyn1	2016	2018
SPRED2 SH2B3 IKZF2 RAD51B IL12A CIITA TCF7 PLD2 DHCR8- CXorf21	<u>2015</u>	SMYD3TNFRSF-13BEIF4H-LIMK1 (TACI)ARHGAP27KITGRB2TRAPPC111LAT2GPR78LCTCSNK2A2TPCN2ST3AGL4
CNTN6 RNF114 BIN1 EHF SEC61G MED1		AHNAK2- GPR173 PLD4
RNF114 MTMR3 RASSF2	<u>2014</u>	2019 C1S DNASE1 DNASE1 RNASEH L3 2A
TET3 ZAS3 CDKN1B IL-37	2013	2020
CSK IKZF3- ILT3 ZPBP2 TMEM39A AFF3		FBN2 PTPRM EFNA5 NRGN PPM1H
PRKCB TYK2	2012	Figure 1: SLE
IRF8 ATG7 NCF2 PRDM1 IKZF1 -ATG5 IFIH1 PDCD4	2011	susceptibility genes identified in the past 10 years

## Aim 1

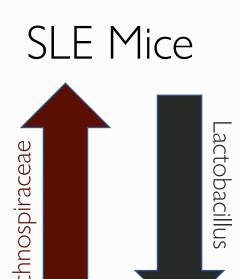
Identify result patterns across multiple articles

## Aim 2

Summarize the recent major findings in SLE genetics and environment

## Environment

### Microbiota



Human SLE Patients

Firmicutes/Bacteroidetes



When compared to healthy controls

### Viruses/Infections

- Higher Epstein Barr virus and cytomegalovirus antibody levels in SLE patients
- Malaria associated with protective qualities against lupus

#### Other

- Smoking associated with higher SLE risk
   Increasing environment exposures associated with
  - increasing SLE risk

## METHOD

Search databases using key terms e.g. "lupus", "SLE", "GWAS", "microbiota"

Remove articles that did not meet inclusion criteria:
English
Publication date 2011-2020

Article with priority were read first and met at least one of the following criteria
High impact journal
Large data set

Focus on patterns seen in multiple articles. Are the same genes/environmental factors implicated? Comparable results? Deviations from pattern?

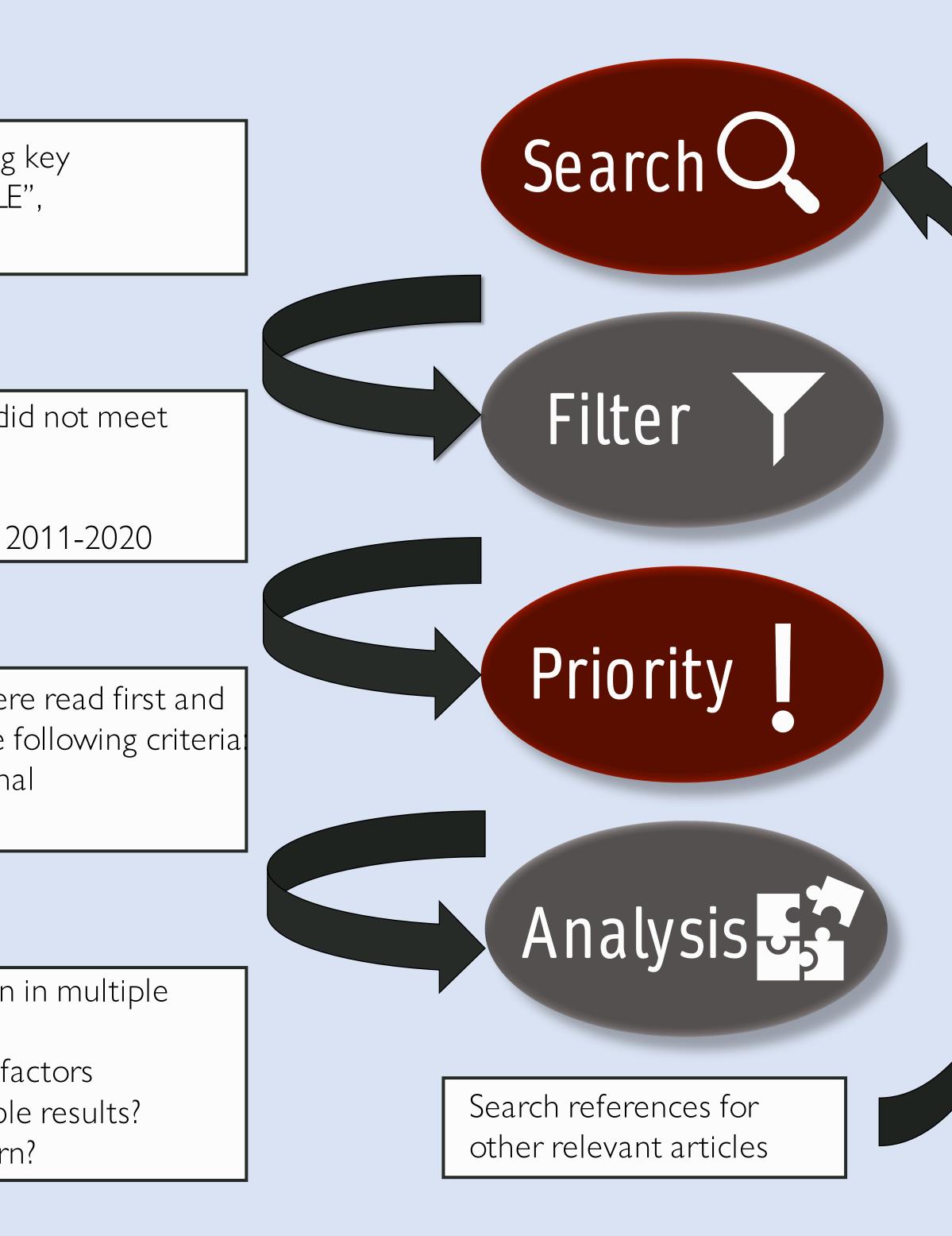
## CONCLUSION

Understanding the factors that contribute to the development of systemic lupus erythematosus is crucial to identifying methods to reduce risk and improve outcome. In recent years, many studies have given us more insight to the environment and genetic factors that play a role in SLE. The aim of this review was not to cover all the available literature, but rather to identify common themes in the research. We limited our review to this past decade in order to highlight the current questions that remain unanswered within this topic and to familiarize readers with the most crucial findings.

## References

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