

Novel Protein Biomarkers in Serum for Lupus Nephritis in Adult Patients

Anam Haque, Dr. Mohan
Biomedical Engineering Department

UNIVERSITY of HOUSTON

CULLEN COLLEGE of ENGINEERING
Department of Biomedical Engineering

Background

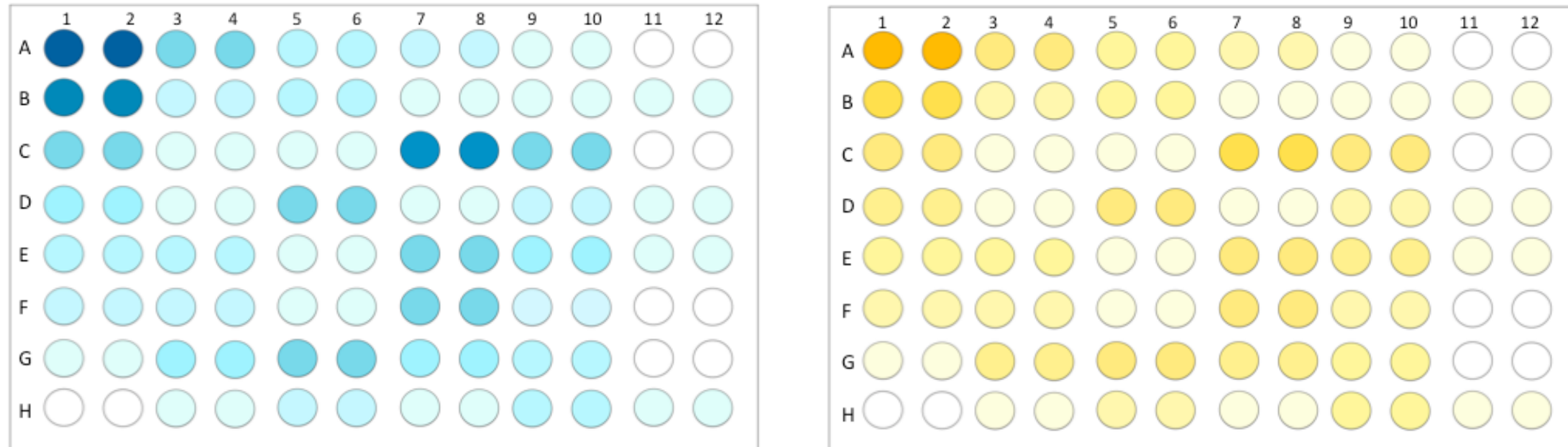
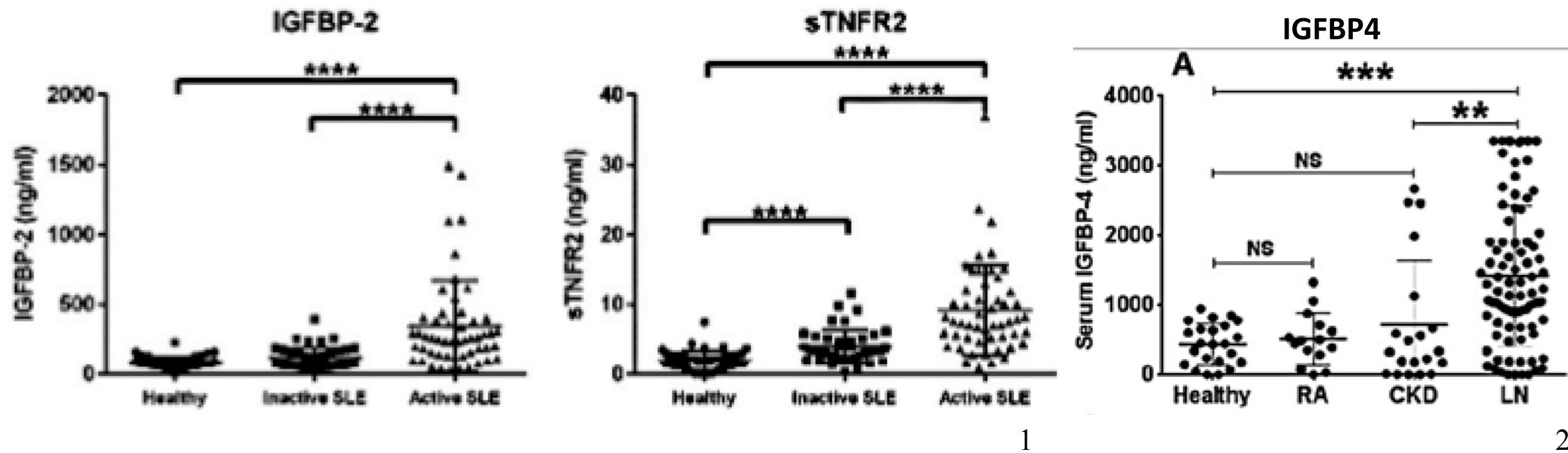
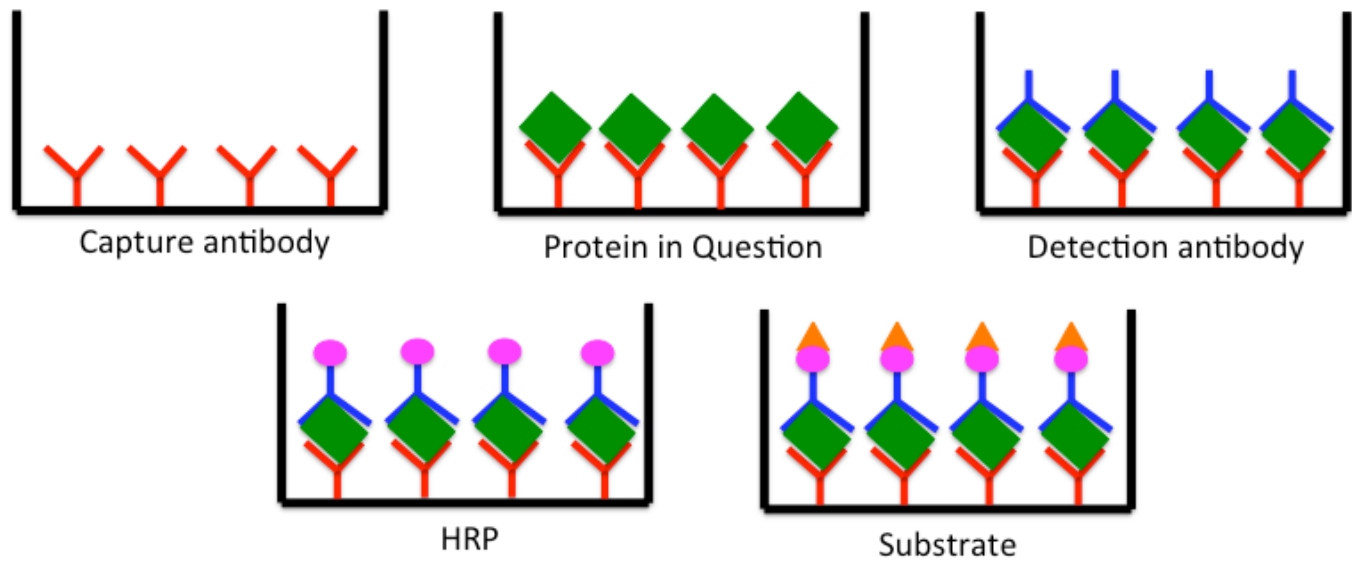
Systemic Lupus Erythematosus (SLE) is an autoimmune disorder where the body’s immune system attacks its own organ systems. This chronic inflammatory disease can effect different body systems like the skin, joints and kidneys. Lupus Nephritis (LN) is the inflammation of the kidney which occurs due to SLE. Lupus nephritis manifests when SLE involves the kidneys. Protein biomarkers provide a more efficient method of diagnosing and detecting LN. The current primary diagnostic tool used is renal biopsy which is expensive and invasive

Method

- Concurrent serum samples were obtained from Dr. Saxena from UTSW- for these serum samples we have access to biopsy data
- These samples were assayed for levels of proteins IGFBP2, IGFBP4, and sTNFR2
- In previous studies these proteins have been shown to be elevated in LN patients

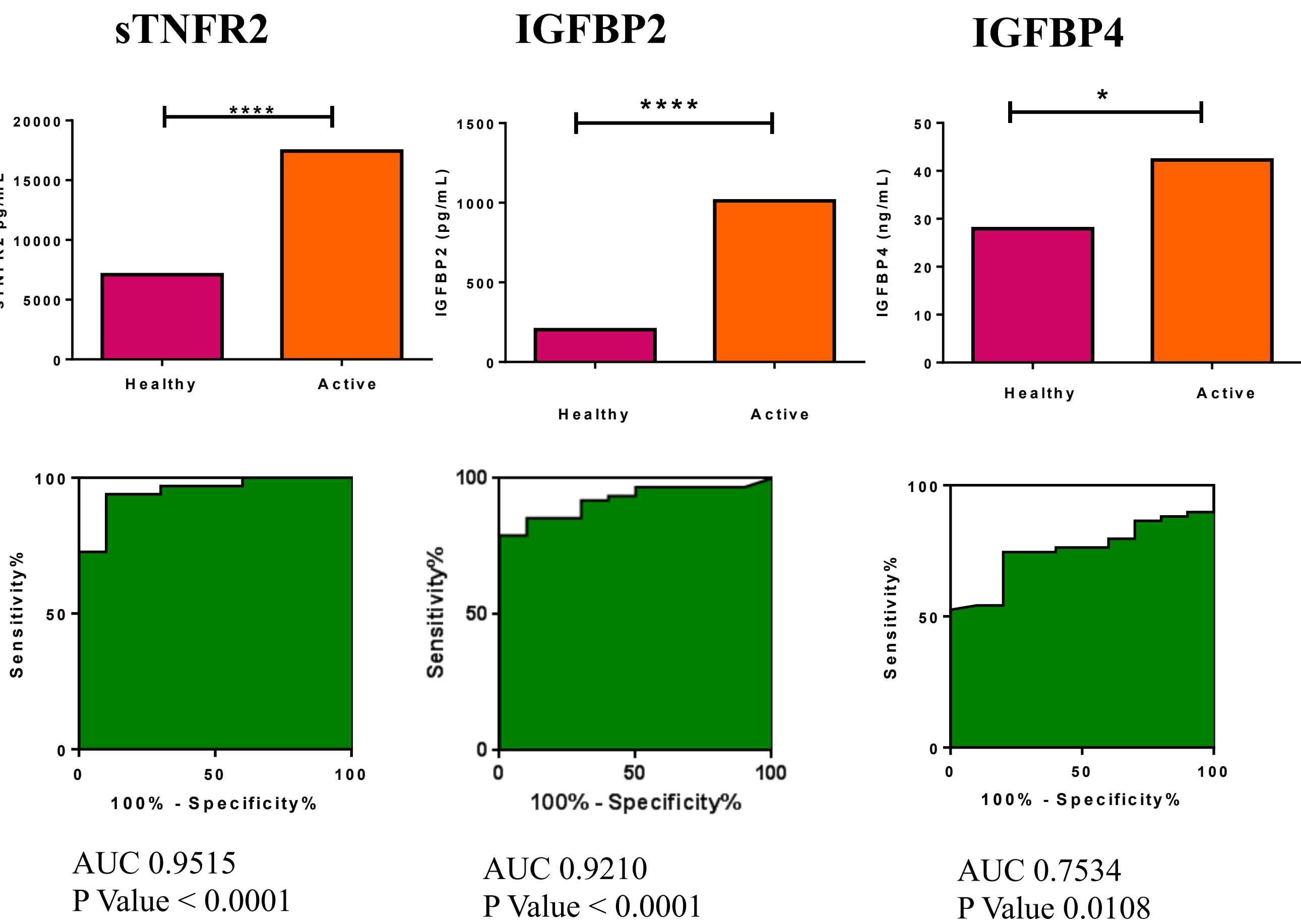
ELISA

Enzyme Linked Immunosorbent Assays were done to assay protein levels



Results

Healthy vs. Active LN Results

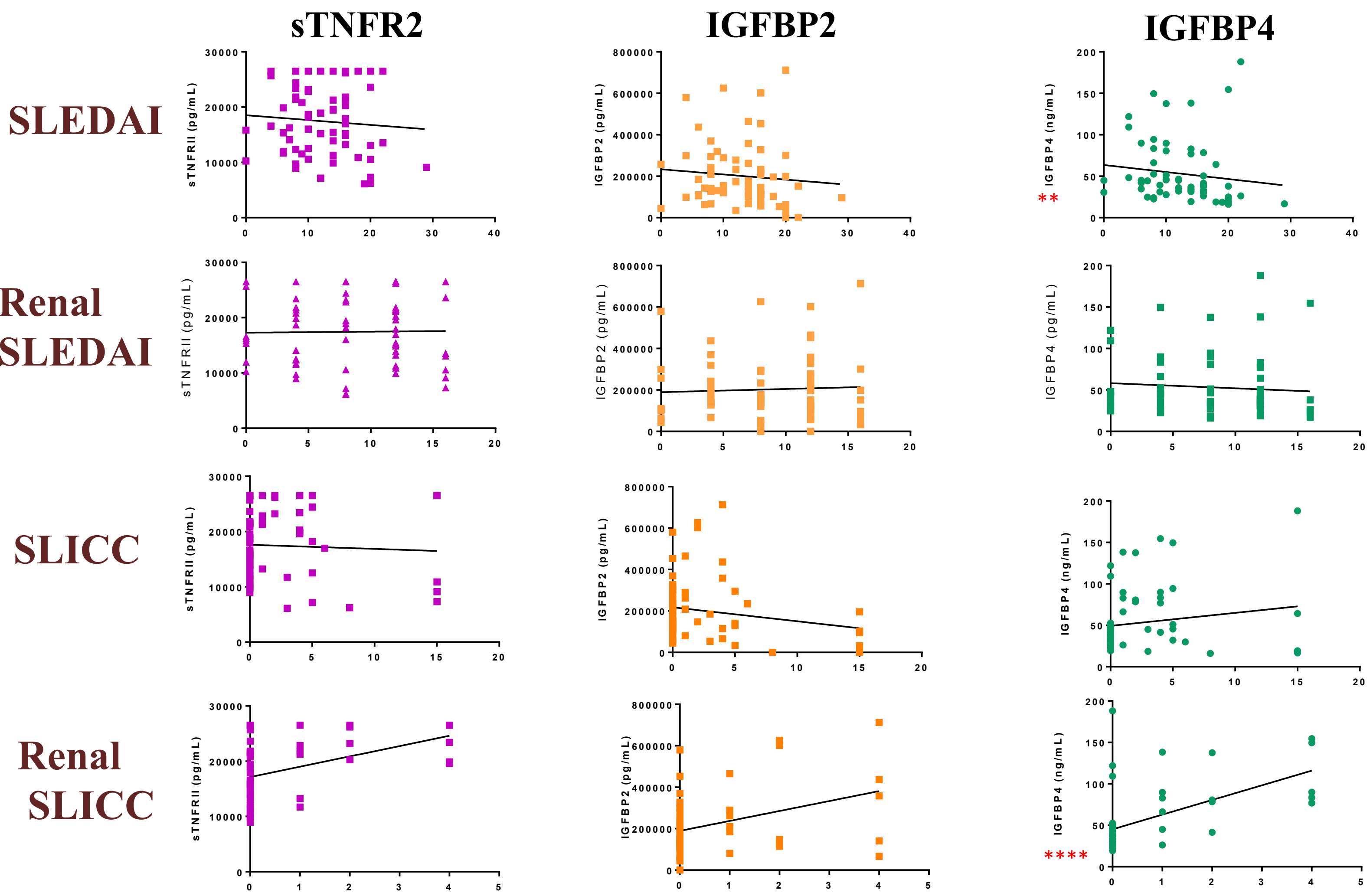


Correlation Analysis Results

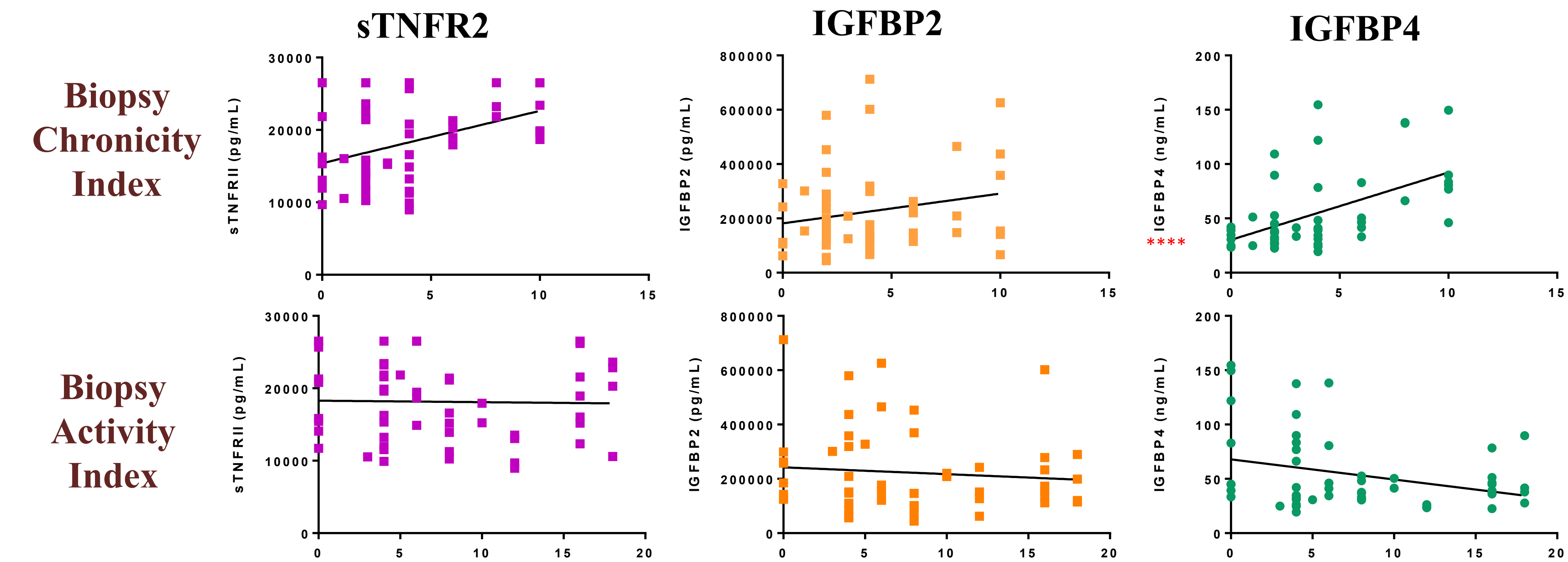
	sTNFR2	IGFBP2	IGFBP4
Age	0.0365	-0.0215	0.137
Race: Asian	0.0818	-0.116	-0.0952
Race: White	-0.295*	0.082	-0.297*
Race: Black	0.257	-0.0217	0.353**
Gender: Female	0.466****	0.511****	0.287*

	sTNFR2	IGFBP2	IGFBP4
Anti- dsDNA	-0.039	-0.024	-0.278*
C3	-0.058	0.013	0.247
C4	0.085	-0.12	0.262
Serum creatinine	0.381**	0.132	0.564****
Glomerular Filtration Rate	*-0.729***	*-0.457*	*-0.719***
Protein Creatinine Ratio	-0.028	-0.125	-0.083

* p< 0.05
** p< 0.01
*** p< 0.001
**** p< 0.0001



Biopsy Correlation Analysis



Conclusion

There is a significant correlation between biopsy results and levels of IGFBP4 in the serum. Further research must be done to see whether this biomarkers is elevated in other chronic kidney disease or whether its elevation is specific to patients with LN.

Aknowledgements

Dr. Samar Soliman
Dr. Saxena of UTSW Medical Center
Dr. Kamala Vanarsa and Samantha Stanley of Mohanlab
Funding: NIH R01

References

1.Mok, Chi Chiu, et al. "Axl, Ferritin, Insulin-Like Growth Factor Binding Protein 2, and Tumor Necrosis Factor Receptor Type II as Biomarkers in Systemic Lupus Erythematosus." *Arthritis care & research* 68.9 (2016): 1303-1309.
2.Wu, Tianfu et al. "Insulin-Like Growth Factor Binding Protein-4 as a Marker of Chronic Lupus Nephritis." Ed. Valquiria Bueno. *PLoS ONE* 11.3 (2016): e0151491. *PMC*. Web. 19 Aug. 2017.