

# OFFICIAL ABSTRACT and CERTIFICATION

## Osteopontin and Lupus Nephritis

Noah S. Kava

John F. Kennedy High School; Bellmore, New York, United States

Systemic lupus erythematosus (SLE) is an autoimmune disease which hinders the quality of life for millions of people. The most severe SLE cases often develop into lupus nephritis (LN), an intense form of the disease that causes renal inflammation and damage to kidney tissue. Interferons are cytokines that are upregulated in lupus patients, contributing to the proliferation of the disease. The mechanisms that modulate interferon activity are osteopontin, the protein coded for by the Spp1 gene and filtered into urine, and macrophages, immune cells that engulf cellular waste. This study applied advanced image analysis and algorithm development to kidney samples of human LN patients with the goal of quantifying macrophages and osteopontin-positive tubular cells. The results of the study show that osteopontin and macrophage quantities are correlated in lupus patients with the highest Systemic Lupus Erythematosus Disease Activity Index (SLEDAI) score, as determined by lab clinicians, suggesting that urinary osteopontin concentration could be used as a biomarker to detect risk for the onset of LN.

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