New biomarkers for active lupus nephritis discovered

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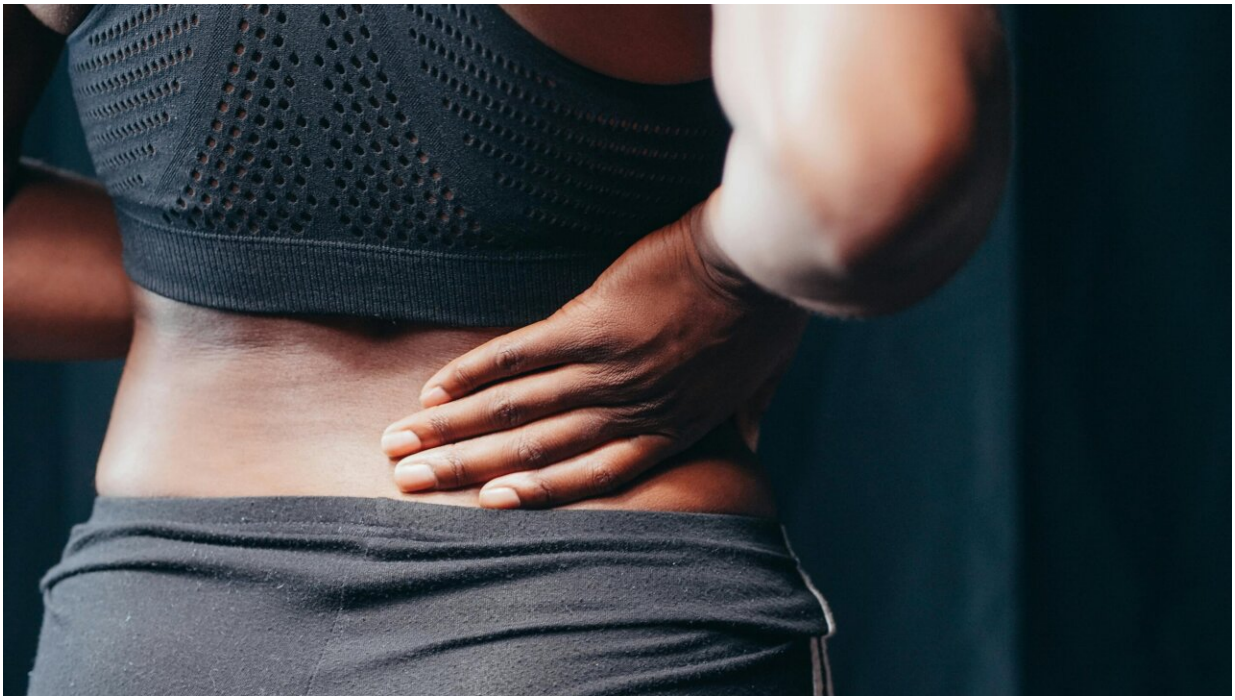

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New biomarkers with improved diagnostic performance for early detection of lupus nephritis have been discovered in the University of Houston lab of Chandra Mohan, a pioneer in lupus research. Early identification of renal involvement in lupus and prompt treatment are essential in reducing the pain, suffering and eventual mortality it causes.

Systemic Lupus Erythematosus (SLE), commonly called lupus, is an autoimmune disease that occurs when the body attacks its own tissues and organs. Inflammation from the disease can impact many different parts of the body including joints, skin, kidneys, blood cells, brain and heart. Lupus nephritis is one of the most frequent and severe clinical manifestations of SLE, and the leading cause of death.

As reported by Mohan, the University of Houston Hugh Roy and Lillie Cranz Cullen Endowed Professor of Biomedical Engineering, in the *Journal of Autoimmunity*, "These studies add at least six novel urine biomarkers of active renal lupus validated across two ethnically diverse patient cohorts.

"We and others have reported several urine proteins that can serve as harbingers of renal involvement in lupus. Here, we report on a novel technique based on the use of antibodies and DNA amplification that can detect even low concentrations of proteins. This technique is called Proximity Extension Assay (PEA)," said Mohan.

By applying PEA proteomics (the study of protein interactions, function, composition and structures) to urine samples, Mohan and team identified several proteins that were significantly elevated in the urine of lupus patients with active renal disease.

The study offered independent validation of several previously reported urine biomarkers for active renal lupus, including proteins such as ALCAM, CD163, MCP1, SELL, ICAM1, VCAM1, NGAL and TWEAK. The researchers also identified additional urine protein biomarkers not previously reported, including ICAM-2, FABP4, FASLG, IGFBP-2, SELE, and TNFSF13B/BAFF.

Examining the renal expression of these molecules suggests that both immune cells and non-immune cells in the kidneys may be releasing

these biomarker proteins into the urine.

"These studies have expanded the repertoire of urinary proteins that can be used to monitor renal status in a patient with lupus," said Mohan, whose team includes lead author and post-doctoral fellow Yaxi Li; Dr. Ramesh Saxena, UT Southwestern, Dallas; Dr. Chi Chiu Mok, Tuen Mun Hospital, Hong Kong; and Claudia Pedroza and Kyung Hyun Lee, UTHealth Houston.

More information: Yaxi Li et al, Proximity extension assay proteomics and renal single cell transcriptomics uncover novel urinary biomarkers for active lupus nephritis, *Journal of Autoimmunity* (2024). DOI: 10.1016/j.jaut.2023.103165

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