Researchers find disease-related gene changes in kidney tissue

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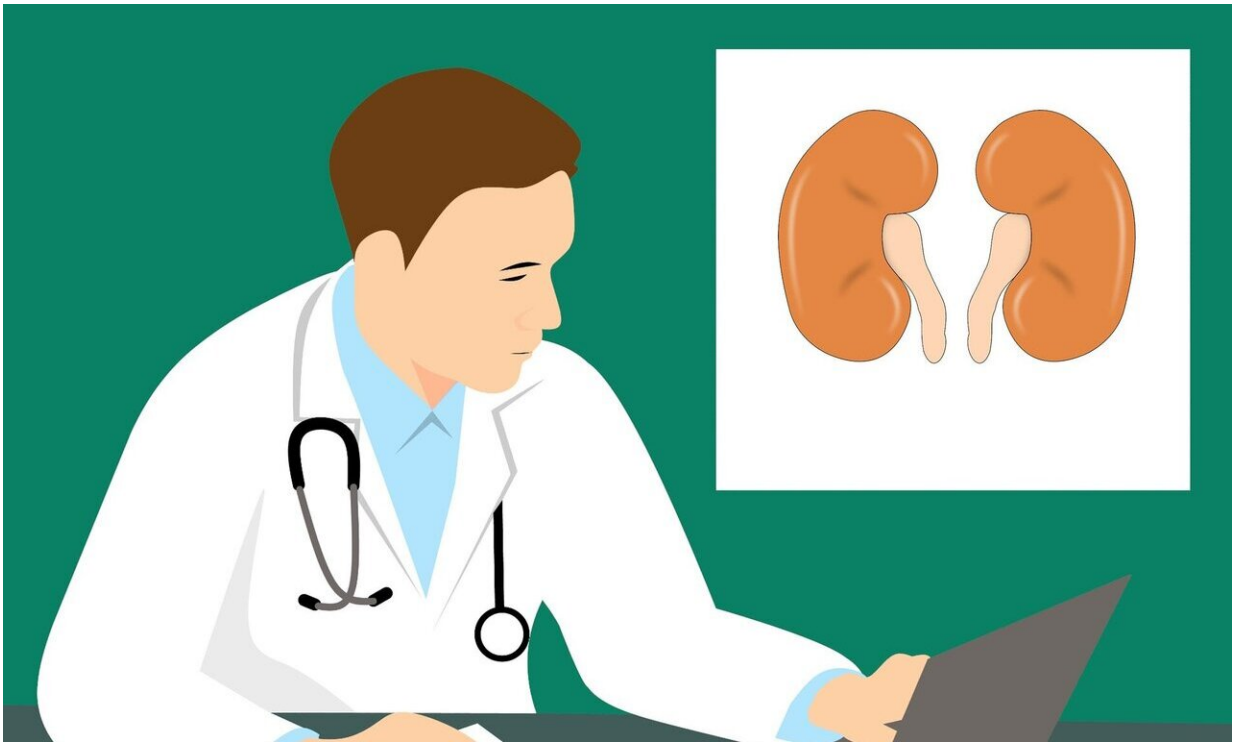

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Researchers from Indiana University have identified key genetic changes in the interstitial kidney tissue of people with diabetes, a discovery that signifies the potential for a revolutionary new genetic approach to the treatment of kidney disease. They will contribute their findings to the Kidney Precision Medicine Project's (KPMP) "cell atlas," a set of maps

used to classify and locate different cell types and structures within the kidney.

They shared their groundbreaking findings in a study published on February 10, 2021, in *Science Advances*.

In the study, researchers investigated the kidney tissue of healthy people and people with diabetes using a technique called "regional transcriptomics." This technique involves a rapid stain of kidney tissue, and then using a laser to cut out microscopic regions of interest.

They found that important genes change when a scar forms on the interstitium, said Daria Barwinska, Ph.D., the lead author of the study and an Assistant Scientist in the Department of Medicine at Indiana University School of Medicine.

"The interstitium is the 'glue' that holds the kidney together. It is one of the least characterized parts of the kidney, but scars in the interstitium caused by diseases such as diabetes can contribute to kidney disease," said Barwinska.

Acute kidney injury (AKI) and chronic kidney disease (CKD) affect millions of people in the United States and globally. However, no effective therapies exist for AKI, and only a few are available for CKD. The KPMP, a multi-site project focused on understanding and finding new treatments to AKI and CKD, is seeking to bring treatment for these conditions "into the molecular era," according to Michael Eadon, MD.

IU is one of KPMP's many "tissue interrogation sites" across the country. Collectively, these sites are working together bring cutting-edge technologies to aid in the interrogation of human kidney biopsies.

"Many diseases can look the same under the microscope, but they have

very different causes," said Eadon, who is the study's corresponding author and an Assistant Professor of Medicine in the Department of Medicine at IU School of Medicine. "We're seeking to understanding how different genes contribute to very common kidney diseases."

This study could usher in the era of new and better treatments for millions of people with AKI and CKD.

"A personalized medicine approach that understands how different diseases affect a patient's genes will aid in finding potential treatments for kidney disease," said Barwinska. "This approach can meet any single patient's needs."

More information: Daria Barwinska et al, Molecular characterization of the human kidney interstitium in health and disease, *Science Advances* (2021). DOI: 10.1126/sciadv.abd3359

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