Pioneering UH Lupus Researcher Examining Possible Replacement for Invasive Blood and Biopsy Testing

The symptoms of systemic lupus erythematosus (known as SLE or lupus) can fool you. You might think you're tired or have a cold when, in fact, you may actually have this autoimmune disease that leads to chronic inflammation in multiple organs. Blood tests or a kidney biopsy can confirm the diagnosis and extent of organ involvement, but these tests are invasive and often uncomfortable.

At the University of Houston, Chandra Mohan, Hugh Roy and Lillie Cranz Cullen Endowed Professor of biomedical engineering, is proposing a simpler test. With a $386,599 grant from the National Institutes of Health, he'll test biomarkers for a lupus test that uses only saliva.

In a blood test for lupus, anti-double stranded DNA (anti-dsDNA) antibody markers are very high in someone who tests positive for the disease. Scientists have found that the anti-dsDNA also shows up in saliva.

"Now we need to find out if salivary anti-dsDNA is at least as good if not better to test than blood anti-dsDNA," said Mohan. "If it is, then that is great, because wouldn't you rather give saliva than blood? Testing saliva samples is particularly attractive for children and patients from whom blood is difficult to draw.

Lupus continues to be disproportionately diagnosed in the population underserved by medicine. Mohan is working to provide treatment and mitigate health risks in underserved communities, which is a growing focus of UH Health.

Preliminary studies reveal that saliva from people with SLE harbors antibodies and several proteins currently being pursued as potential blood biomarkers of SLE and lupus nephritis, or inflammation. Encouraged by these findings, the pilot study will investigate the different isotypes and specificities of autoantibodies and biomarker candidate proteins that are elevated in the saliva of SLE and lupus nephritis patients and establish their association with the disease. Clearly the easier option, saliva from a larger sample group will also be tested by Mohan while he and a colleague from Johns Hopkins School of Medicine, Professor Michelle Petri, also test
other control conditions. Other researchers include Sanam Soomro, a graduate student, and Kamala Vanarsa, a research scientist.

Their work may pave the way for a home-based kit, similar to one Mohan is developing with UH engineer Richard Willson for urinary home testing of lupus nephritis flare-ups.

"The same kit could be used to test saliva, but with urine we already know some of the biomarkers to look for," said Mohan. "In the case of saliva, this grant will help us study what to look for and how to identify the proteins that are useful as biomarkers in saliva."

Mohan, a former practicing physician, has made lupus his life's work. In the 1980s, after receiving his medical degree in Singapore, many of his first, memorable patients had lupus.

"One of the things the patients and their families would always ask me was, 'Am I going to die?' and 'Is there a treatment?' At that time we hardly knew anything about lupus, and the literature was very sparse," said Mohan.

Those patients and their questions changed Mohan's life, and he dedicated himself to changing the outcomes and treatments for patients with lupus. He quit practicing medicine to pursue a doctoral degree at Tufts University in Boston, where he focused on the cellular immunology of lupus. He's been at it ever since.

Mohan said if he was that young doctor today, he would have better answers for those patients and could offer better treatment options. And though he might not have imagined it then, maybe a way to test for the disease with, by far, the easiest bodily fluid to collect.

© University of Houston Cullen College of Engineering