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EDITOR'S PICK

UTEP researchers develop cancer detection device

By Luis Rios / El Paso Inc. reporter
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A team of UTEP researchers led by Xiujun “James” Li, right, has created a device that can detect colorectal and prostate cancer in as little as one hour.

Photo provided by UTEP

A team of researchers at the University of Texas at El Paso has invented a device that could make early cancer detection more affordable and produce results in as little as an hour.

Xiujun “James” Li, Ph.D., a UTEP professor of chemistry and biomedical engineering who led the 10-person team, said the portable device detects colorectal and prostate cancer. He is the lead author of a study describing the device recently published in Lab on a Chip, a peer-reviewed scientific journal that focuses on microscale and nanoscale devices.

In an interview with El Paso Inc. Tuesday at his office in the Chemistry and Computer Science Building, Li said traditional and advanced models for tests can cost from $10,000 to $40,000.

“How can each family or even a small clinic afford that?” Li said. “We want everybody to have access to this method that’s quicker and more accessible.”

There are many steps that need to be completed before the prototype could be sold for commercial use. Li said the prototype needs to be finalized and tested on patients in a clinical trial, a process that could take years. The device would also need to be approved by the Food and Drug Administration.

The portable device is microfluidic, meaning that it can perform multiple functions using small amounts of fluids. It has a “paper-in-polymer-pond” structure, in which the patient’s blood sample is placed into tiny wells onto a special kind of paper.

Protein biomarkers within the blood sample are captured within a few minutes. The paper changes color, and the intensity of the color indicates what type of cancer is detected and how far it has progressed.

The device can test up to 48 samples. Li said one sample in one well will cost about 10 cents.

While their research has focused on prostate and colorectal cancers, Li said the method may be applicable to other types of cancer.

New cancer cases in Texas are expected to exceed 143,300 by the end of 2024, according to Texas Health and Human Services, with 17,864 of those cases being for prostate cancer. There were 140,436 new cancer cases in 2023.

Using traditional cancer detection methods, Li said, getting the results can take about 16 hours. But the process can take longer, up to a couple of weeks, due many factors, including technical delays, the American Cancer Society states.

Slowed cancer testing can delay diagnosis and treatment options for patients, Li said.

The device Li and his team created can be used anywhere, from the doctor's office to the patient's home and doesn't require specialized instruments.

"We are trying to make them fast track the entire process," he said. "They won't need to make another appointment."

Li, who was born in China, earned his doctorate in microfluidic lab-on-a-chip bioanalysis from Simon Fraser University in 2008.

He came to El Paso and began working independently at UTEP in late 2011 to early 2012.

He and his team have been working on cancer related projects, including early diagnosis, since 2015. They are funded by a $250,000 grant from the Cancer Prevention and Research Institute of Texas.

"Personally, I have a very close relative that died due to a certain type of cancer," he said. "We want to provide people with the tools to quickly get their information before their cancer gets stronger."

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