Researchers unveil new method for detecting lung cancer

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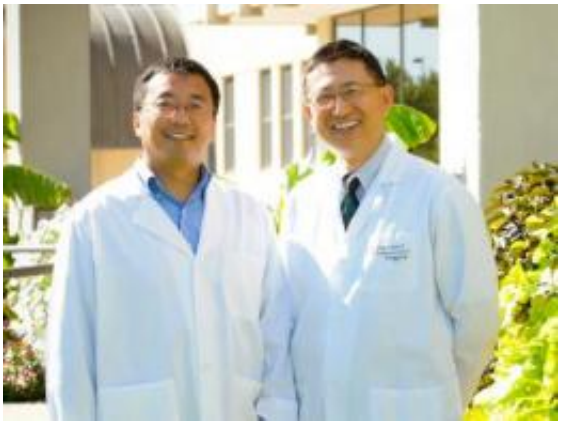

Michael Wang, M.D., Ph.D., right, assistant professor of pathology and anatomical sciences, and Li-Qun Gu, Ph.D., associate professor of biological engineering, have developed a new technology for the early detection of lung cancer. Worldwide and in the United States, lung cancer is the most common cause of cancer-related death. Credit: University of Missouri School of Medicine

When lung cancer strikes, it often spreads silently into more advanced stages before being detected. In a new article published in *Nature Nanotechnology*, biological engineers and medical scientists at the University of Missouri reveal how their discovery could provide a much earlier warning signal.

"Early detection can save lives, but there is currently no proven screening test available for lung cancer," said Michael Wang, MD, PhD,

assistant professor of pathology and anatomical sciences at MU and a corresponding author for the article. "We've developed highly sensitive technology that can detect a specific molecule type in the bloodstream when lung cancer is present."

Worldwide and in the United States, lung cancer is the most common cause of cancer-related death. In the U.S., more than 221,000 people will be newly diagnosed with lung cancer in 2011, and more than 155,000 people will die from the disease this year.

MU researchers used blood plasma samples to detect a change in a specific small ribonucleic acid (microRNA) molecule that is often elevated in lung cancer patients. The scientists put an extract of blood plasma through a protein-based nanopore, which is a tiny hole in a thin membrane that is just big enough for a single molecule to pass through. By applying an ionic current to the nanopore, the scientists measured changes in the current that occur when the microRNA molecule associated with lung cancer is present.

"That altered current acts as a signal or bio-signature that is related to lung cancer," said Li-Qun Gu, PhD, an associate professor of biological engineering at MU and a corresponding author for the article. "Our new nanopore sensor is selective and sensitive enough to detect microRNAs at the single molecular level in plasma samples from lung cancer patients .

"While there are many research labs that focus on nanopore applications, this is the first time that nanopore technology has been used to detect lung cancer," Gu added. "This technology could possibly be used in the future to detect other cancer types as well as other types of diseases with specific DNA or RNA in the blood."

Provided by University of Missouri School of Medicine