Low-cost, portable biosensor system may boost early detection of lung cancer

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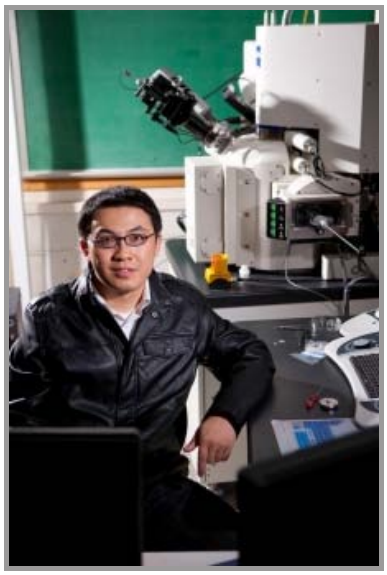
"Highly Sensitive and Portable Surface Plasmon Resonance System for Lung Cancer Early Detection"



PI Qiaoqiang Gan, professor in Electrical Engineering

Exosomal proteins have been found to be promising biomarkers for early detection of lung cancer. However, the size, complexity and expense of current technologies for biosensing these markers have hindered widespread adoption of the method. A Clinical and Translational Science Award (CTSA)-funded, two-phase pilot study is helping to refine development of low-cost, compact devices for portable, rapid bioanalytical measurement that could help remove that obstacle and improve patients' chances of surviving lung cancer and other deadly diseases.

The miniaturized portable surface plasmon resonance (pSPR) sensor the investigators envision is integrated with cell phones as a mobile health-monitoring tool which holds great promise for providing economical, real-time, label-free optical biosensing.

In phase one of the study, a team headed up by principal investigator Qiaoqiang Gan, PhD, assistant professor in UB's Department of Electrical Engineering, School of Engineering and Applied Sciences, and co-PIs Yun Wu, PhD, assistant professor in the Department of Biomedical Engineering, School of Engineering and Applied Sciences, and Daniel Gaile, PhD, assistant professor in the Department of Biostatistics, School of Public Health and Health Professions, will build and calibrate a pSPR sensor platform that matches the current state of the art in biomarker detection but at a much lower cost (under $1,000 for materials compared to $50,000 and up for current systems). The researchers will also develop statistical models to analyze the data they gather.

During phase two, the team will test their pSPR system in distinguishing serum samples from 125 subjects; 25 each presenting the disease in stages I to IV, and 25 high-risk subjects who had not developed lung cancer.

Mary Reid, PhD, an accomplished researcher at Roswell Park Cancer Institute, a research assistant professor in the Department of Epidemiology and Environmental Health, Jacobs School of Medicine and Biomedical Sciences, and the mentor of Dr. Yun Wu, will provide the human serum samples.

This $75,000 research award from the CTSA is funded by the National Center for Advancing Translational Sciences of the National Institutes of Health under Award Number UL1TR001412. The study fits well with the goals of CTSA to promote multidisciplinary research among Buffalo Translational Consortium partners and to support projects that show promise for attracting additional funding while reducing health and health care disparities.