



Yang is investigating a new way to test for cancer

RAPID CANCER DIAGNOSIS BY HANDHELD SENSOR DEVICE



Testing a patient for cancer can be a long drawn-out process requiring blood tests, biopsies and other clinical procedures. And for many cancers, detection is not possible until the cancer is well advanced, making treatment difficult.

Deakin University PhD student Yang Choon Lim is working on technology that could change how clinical tests are performed.

She hopes her work will contribute to the creation of handheld devices that can quickly identify cancer.

Working with Associate Professors Abbas Kouzani and Wei Duan, Yang is developing a biosensor capable of detecting proteins in the blood that signal the presence of cancer – so-called cancer markers.

“It’s an application that could easily be adapted to detect proteins associated with many diseases and conditions, not just cancer,” Yang says, “but cancer is a good starting point as cancer cells often produce unusual proteins.”

The critical part of the proposed system is coupling the recognition of the chosen cancer protein to a transducer, which converts the biomolecular interaction into a detectable electrical signal.

Yang is using a tiny cantilevered beam resembling a miniature diving board. The beam is coated on top with a protein molecule that can bind the cancer protein in the sample. When the cancer protein binds to the cantilever beam the beam moves either up or down, depending on the nature of the interaction. This movement is converted into an electrical signal by the transducer. An intelligent signal processing method then identifies the cancer signature within the signal.

“I am currently developing the basic detector framework required to do this,” says Yang. “The operation of the sensor can be initially studied using modelling and simulation, and by next year I hope to have a working prototype.”

The approach requires multidisciplinary knowledge, so Yang is supplementing her engineering background with an understanding of biochemistry and chemistry.

“I have to understand all aspects of the sciences involved to successfully develop the biosensor device,” she says.

FURTHER INFORMATION:

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