Rapid Cancer Test Provides Faster, Easier Method of Detection

By Anne Ferrer

July 20 (Bloomberg) -- A rapid test for **cancer** using tiny magnetic sensors was able to detect as few as two cancer cells in a sample of human tissue within 15 minutes, a study said.

The new technology, developed at the **Center for Systems Biology** at **Massachusetts General Hospital** in Boston, uses a small diagnostic magnetic resonance (DMR) chip that detects and profiles cancer cells in tissue taken from fine-needle biopsies, said a report published today in the **Proceedings of the National Academy of Sciences**.

The method was much quicker and less costly than existing methods such as Pap smears, used to detect cervical cancer, or colonoscopies, which screen for colon malignancy, said the authors from **Harvard Medical School**. The test also has the potential to monitor whether cancer is spreading and if the patient is resistant to treatment, the **researchers** said.

"One pinch to get the sample and, in less than 30 minutes, you get the results," Hakho Lee, an instructor of biomedical engineering at Harvard University and co-author of the study, said July 17 in an e-mail. The study's DMR sensor is a "simplified and smaller MRI system" that can be used to identify cancer without surgery, Lee said.

The DMR sensor was able to identify the presence of tumor cells in a sample of tissue as small as one microliter, according to the study. Lee said the technology also has the potential to measure the degree of malignancy in the cancer cells. It can quantify the strength of a biomarker in a given cancer cell such as HER2/neu, which is correlated with some types of breast cancer, he said.

Cancer Signature

Given the DMR chip's ability, a single tissue specimen from a patient may be divided into smaller units and tested for multiple characteristics that make up the cancer's "signature," yielding greater accuracy, the researchers said. The procedure may be repeated after cancer treatment to determine whether therapy should be continued or adjusted.

"It's something that can be used within the operating room or the doctor's office for the detection of pathogens or cancerous cell types," said James McCarthy, an instructor in chemistry at Harvard who studies nanoparticle technology and was not involved in the study.

"The technology could complement or eventually replace other labor-intensive and error-prone screening tools," said Filip Swirski, a co-author on the study and instructor of medicine at Harvard Medical School.

The study was led by Ralph Weissleder, director of the Center for Systems Biology, and funded by the National Institutes of Health.

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To contact the reporter on this story: **Anne Ferrer** in New York at **aferrer1@bloomberg.net**;

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