

Study: Microchip spots cancerous tumors within an hour

By Maureen Salaomon HealthDay

Updated Feb 24, 2011 12:30 PM |

[Share](#)

[Reprints & Permissions](#)

Scientists say they have developed a microchip that can be attached to a smart phone and diagnose cancerous tumors within an hour, from the patient's bedside.

The so-called microNMR chip, which uses magnetic nanoparticles to measure proteins and other chemical compounds in tumors, requires only tiny amounts of tissue to make a diagnosis, researchers said. Instead of more invasive methods, the biopsy can be done with fine needle aspiration, which withdraws cells from suspicious lesions.

"We tried to determine a molecular fingerprint, if you will," said study co-author Jered B. Haun, a postdoctoral researcher at Massachusetts General Hospital in Boston. "It was a nice surprise just how well it worked with all the protein markers. One of our big goals was not only to be able to tell patients they have cancer as accurately as possible, but as quickly as possible."

The study, which was funded by grants from the U.S. [National Institutes of Health](#), is published in the Feb. 23 issue of the journal Science Translational Medicine.

Using the microchip — which can be hooked up to smart phones such as iPhones and Blackberrys — researchers analyzed tissue samples from 50 patients with suspected malignancies, correctly diagnosing cancer in 44 patients within 60 minutes in 96% of cases by zoning in on four of nine protein markers.

In contrast, standard pathology methods typically require three or more days to produce a diagnosis and are only 84% accurate, the researchers noted.

Study participants, whose average age was 64, had suspicious lesions in a variety of organs, including the lungs, colon, pancreas, liver and breasts, and were already scheduled to receive biopsies for abnormal stomach tissue. Their results were validated with traditional pathology — which also didn't assess differences in tumor cell types as well as the microchip — along with an independent group of 20 additional patients, Haun said. The microchip diagnoses in the additional group were 100% accurate, according to the study.

"False negatives and non-diagnostic samples are both at higher incidence with standard pathology," Huan said. "Since the (microchip-tested) sample size is so small, we take small aspirants of different areas of the tumor. ... to get a more global view of the results," which can also impact treatment requirements.

Huan and the other study authors reported no financial conflicts of interest.

Recommended videos



U.S. Air Force
Boeing wins \$35B tanker contract



Carmelo Anthony
Knicks hope to win big



Pizza donations
Support shown for union protesters

[More videos](#)

[Are You Spoiling Your Child?](#)

[Click to Listen](#)

Advertisement

Most Popular

Stories

[Study: PSA rise not good prostate cancer...](#)
[Study sees benefit to early menopause hot...](#)
[Lady Gaga goes glam for a cause](#)
[More evidence ties moderate drinking to...](#)
[Dieter triumphs over emotional eating...](#)

Videos

[Air Force awards Boeing \\$35B tanker contract](#)
[Microsoft's customizable avatar](#)
[Reigning Miss Colorado now homeless](#)

Most Popular E-mail Newsletter

Sign up to get:

Top viewed stories, photo galleries and community posts of the day

Most popular right now:

[What did Charlie Sheen say to prompt CBS' 'Men' shutdown?](#)



Sign up for USA TODAY E-mail newsletters

[Helping breast health](#)

Dr. Moritz Kircher, a diagnostic radiologist at [Memorial Sloan-Kettering Cancer Center](#) in New York City, said he envisions the microchip eventually being used to diagnose an array of malignancies, both internal and external.

"I see it more as a universal method because it relies on biological markers," said Kircher, also an assistant professor of radiology at [Weill Cornell Medical College](#). "This is basically the first time they've used this in a clinical study and the results are very promising."

Haun and Kircher agreed more research would be needed before the microchip technology could be used routinely and that greater numbers of patients with more types of possible malignancies should be studied. Haun said he also hopes the microchip will one day be able to analyze blood samples to minimize invasive procedures.

Once marketed, the tool should be inexpensive to produce, Haun noted, possibly only dollars per chip.

"Like cellphones in general, the more you make, the cheaper they get," he said. "It's not an expensive device at all."

With the data at hand, however, it should be easy to convince potential investors to put the necessary cash into promoting the technology, said Dr. Jan Grimm, a nanotechnology researcher and radiologist at Memorial Sloan-Kettering Cancer Center.

"When they can claim a better result than (traditional diagnostic methods), that's pretty amazing," Grimm said. "It's better than pathology, which is considered the gold standard."

For more information about [reprints & permissions](#), visit our [FAQ's](#). To report corrections and clarifications, contact Standards Editor [Brent Jones](#). For publication consideration in the newspaper, send comments to letters@usatoday.com. Include name, phone number, city and state for verification. To view our corrections, go to corrections.usatoday.com.

Posted 2/24/2011 12:30:42 PM | Updated Feb 24, 2011 12:30 PM

[Share](#)

You might also be interested in:

[Family dog is not harmless, new study says](#) (*USATODAY.com - Your life*)

[USDA: Eggs' cholesterol level better than cracked up to be](#) (*USATODAY.com - Your life*)

[Handicapping the Oscars: Director, actors, actresses - USATODAY.com](#) (*USATODAY.com in Life*)

[BoFA denies connection to proactive tactics to silence WikiLeaks](#) (*USATODAY.com in Technology Live*)

Selected for you by a sponsor:

[How to Count Calories in Order to Lose Weight](#) (*eHow*)

We've updated the [Conversation Guidelines](#). Changes include a brief review of the moderation process and an explanation on how to use the "Report Abuse" button. [Read more](#).

What Do You Think?

To leave a comment, you need to sign up.

[Sign up](#)

[Log in](#)

powered by  Pluck

Helping Breast Health



RESOURCE GUIDE
Coping with Breast Cancer
Watch an educational series from Nurse.com

Your Life: Health