

Harvard Scientists Create Hand-Held Device to Detect Cancer at Bedside

By Pat Wechsler - Feb 23, 2011

A hand-held scanner that can detect cancer at a patient's bedside using just a speck of tissue has been created by scientists from [Harvard University](#) and [Massachusetts Institute of Technology](#).

The device, about the size of a desk telephone, is the world's smallest cancer diagnostic system, according to the scientists. Described today in the journal [Science Translational Medicine](#), the system uses antibodies and magnetic particles to seek out and flag cancer in cells, which are extracted with a needle, rather than large amounts of surgically removed tissue, researchers said.

The technique identified malignant tumors in 44 patients scheduled to have stomach tissue biopsies, the report said. It costs only \$200 to manufacture, making it affordable for clinics or in poorer countries, said Cesar Castro, a co-author of the study and a physician at [Massachusetts General Hospital in Boston](#), which holds the patent on the technology.

"We have harnessed the power of nanotechnology to get real-time assessments," Castro said today in a telephone interview. "Not only can it be used for diagnosis, but it will also allow us to see how the tumor is responding to therapy."

The device is capable of on-the-spot cancer diagnosis, delivering results in less than an hour instead of the days-long wait for biopsy results, the researchers wrote. The device can attach to monitors used by mobile phones or laptop computers to display its findings, the report said.

More Accurate Findings

The technology is also more accurate than current diagnostic tests, the scientists said. The portable diagnostic device achieved 96 percent accuracy, compared with the 84 percent rate associated with more traditional assays.

"Eventually the technology will take you to a device the size of a cell phone," Castro said. "We are still working to miniaturize this."

The journal study, which used 70 patients, was the first full-scale clinical test, Castro said. While the

device found 44 confirmed cases of cancer, it also discovered cancer in patients where the pathology reports came up negative. Later those patients ended up developing cancers that were detected by traditional technologies, Castro said

“This is superior to even the pathologists,” Castro said. “But it is still experimental and must prove itself.”

The scientists who developed the system work at the hospital’s Center for Systems Biology and are affiliated with [Harvard Medical School](#) in Boston or MIT in Cambridge, Massachusetts.

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