Device Finds Stray Cancer Cells in Patients' Blood

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Doctors typically diagnose cancer via a biopsy, which can be invasive and expensive. A better way to diagnose the disease would be to detect telltale tumor cells floating in the bloodstream, but such a test has proved difficult to develop because stray cancer cells are rare, and it's difficult to separate them from the mélange of cells in circulation.

Now researchers from Massachusetts General Hospital and Harvard Medical School say they've built a microfluidic device that can quickly grab nearly any type of tumor cell, an advance that may one day lead to simple blood tests for detecting or tracking cancer.

Similar, existing devices—including earlier versions developed by the authors of the study in Wednesday's online issue of *Science Translational Medicine* [1]—depend on tumor-specific biomarkers on the surface of the cells to pull them out of a blood sample, meaning that a given device won't work for all cancer types. What's more, the efficiency by which the tumor cells are purified from other cell types is generally low and time-consuming. In a given blood sample, circulating tumor cells are rare—there may be only one tumor cell for every billion cells.

The new device is a "substantial step forward from previous microfluidic devices," says Peter Kuhn [2], a circulating-tumor-cell researcher at the Scripps Research Institute. Kuhn was not involved in the study. The device combines existing microfluidic techniques of cell sorting into a single device, he says. The result is that the tumor cells can be pulled out of a blood sample quicker, and without prior knowledge of their molecular characteristics.

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