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Cutting Edge Without The Knife

Cynvenio Biosystems' 'liquid biopsy' system sold to research centers.
By **JOEL RUSSELL**

Monday, May 4, 2015

At Cynvenio Biosystems Inc., innovation looks like a big refrigerator with six ice dispensers and a built-in TV monitor.

Called the LiquidBiopsy Platform, the white cabinet actually contains two machines. Together, they find rare mutating tumor cells in the blood and help doctors diagnose and treat cancer without the need for a surgical biopsy. The Westlake Village company began shipping the diagnostic system earlier this year.

“This is the first complete system, from blood draw to DNA sequencing,” said Chief Executive Andre de Fusco. “If we find a number of cancer cells that are not heavily mutated, fine. But if they are mutated, those cells can be targeted by drugs from the big pharma companies.”

The technology begins with tiny magnetic particles coated with special antibodies that bond to cancer cells. The particles are mixed into a blood sample from the patient. After the magnetic particles attach to the cancer cells, the sample is passed between two magnetic ribbons that detain the cancer cells.

A typical test tube of blood – the sample size used by the LiquidBiopsy machine – contains about 8 billion cells. Of those, a few dozen or at most a few hundred will be the cancer cells needed for diagnosis, de Fusco said.

With the cells isolated, the sample is passed to a DNA sequencer from Thermo Fisher Scientific Inc., a Waltham, Mass. medical-device maker that is in partnership with Cynvenio. Its sequencer provides a DNA profile of the circulating cancer cells.

Cynvenio, founded in 2008 by former Amgen Inc. board member Frederick Gluck, UC Santa Barbara scientist Alan Heeger and de Fusco, has sold the LiquidBiopsy technology by itself since 2013. The dual machine capable of genome testing reached the market in January with a price starting at \$100,000.

For now, the Food and Drug Administration is only allowing the system to be used in advanced cancer research facilities. Cynvenio has sold one dual machine to USC and another to the Mayo Clinic, where they are being used to diagnose patients. The company, which has been venture capital funded, expects about half a dozen sales by the end of the year. Ultimately, de Fusco wants to put one in every cancer clinic.

As an example of its power, de Fusco cited a 75-year-old man with prostate cancer who didn't respond to conventional radiation treatment. The LiquidBiopsy test showed his cancer cells had mutated in a way that a drug typically used for melanoma patients might be effective, and the cancer was defeated.

“There is a big shift in oncology from traditional pathology to genetic analysis,” de Fusco said.

– *Joel Russell*



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