University of Missouri

MIZZOU

The magazine of
the Mizzou Alumni Association

Around the Columns

The sound of cancer

An MU scientist has developed a method for measuring deadly skin cancer using lasers that can detect a mere 10 melanoma cells in a blood sample.

john viator

Biological engineer John Viator is researching how to "hear" cancer at an early stage. Photo by Nicholas Benner.

John Viator, an assistant professor of biological engineering with an appointment in dermatology, won a $232,000 grant from the Wallace H. Coulter Foundation, a Florida-based not-for-profit foundation, to refine his tabletop device that zaps blood samples with laser pulses lasting five billionths of a second.

Noncancerous cells don't contain melanin, the pigment that gives skin its color, so they don't react to the laser's beam. But when melanoma cells absorb the laser's light, they heat and cool rapidly, which makes them expand and contract. This produces a popping noise wave humans can't hear but that special sensors can.

The innovative device could give oncologists information that would help them fine-tune treatment for skin cancer that has metastasized, or spread to other parts of the body. Eventually, it might be used as a routine cancer screen. It will also spare patients agonizing uncertainty: The device can read a blood sample in just 30 minutes, and the procedure, which requires just a blood sample, could be performed frequently. Today, patients typically wait six months after treatment before undergoing an MRI, which detects relatively large tumors. Clinical trials begin next year for Viator's device, which could be in doctor's offices within two to five years.

Viator is working with MU scientists in veterinary medicine and pathology to develop ways of attaching color-sensitive receptors to other types of cancer cells such as breast or lung cancer cells, so the device could "hear" those like it does melanoma. He also hopes to refine his laser so it could detect a single cancer cell.

MU's wide-ranging research areas provided the networking opportunity to spark the project. Viator developed the idea while brainstorming with Paul Dale, an associate professor of clinical surgery at Ellis Fischel Cancer Center. "This University is built in such a great way," Viator said. "There's a true spirit of collaboration. It's a fantastic place to get all sorts of researchers together."

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Published by MIZZOU magazine, 109 Reynolds Alumni Center, Columbia, MO 65211 | Phone: 573-882-5916 | E-mail: Mizzou@missouri.edu

Last updated: Feb. 15, 2013