amazing things PODCAST

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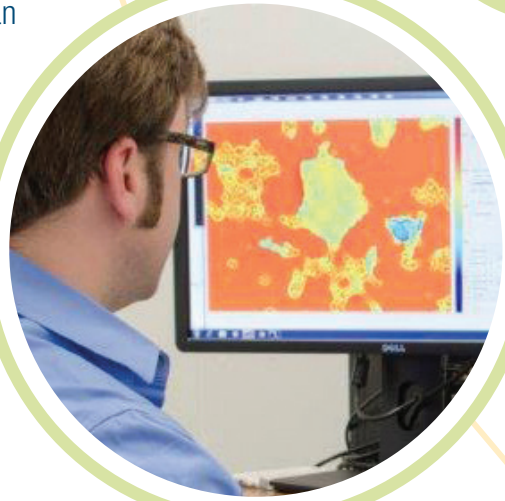
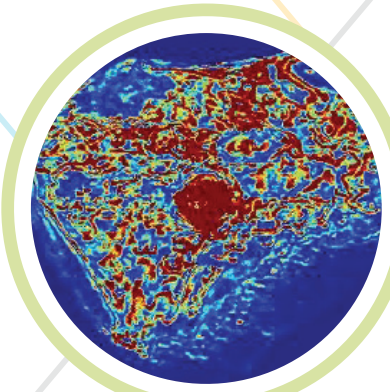
DETECTING CANCER AT ITS EARLIEST STAGES

What if you could detect cancer at its earliest stages — before there are any symptoms that would send you to a doctor? What if such a diagnostic tool existed and it was low-cost, minimally invasive and easy to use? The impact would be huge. Northwestern University professor of bioengineering and biophotonics Vadim Backman is closing in on this goal. By the end of 2017 he expects that the first of a series of cancer pre-screening tests will be available for use by physicians.



Backman and a team of researchers at Northwestern University have developed a way to identify and measure changes to a cell's genome at the nanoscale. This means identifying the signs of cancer before a tumor even develops. Cancer doesn't develop from a single rogue cell, but rather from a series of alterations at the molecular level. Thus, at its earliest stages, you should be able to see alterations in any cell from within the field of cancer. For instance, in the case of lung cancer, a swab from a patient's cheek can provide the needed cell sample to determine if cancer is present.



The challenge was developing the technology capable of working at such a small scale — a few orders of magnitude greater than existing techniques. The key, they determined was the difference between measuring such small structures and attempting to visualize them. Backman's technology doesn't try to visualize changes in the cell's chromatin, but rather detect and measure them using a combination of spectroscopy and microscopic sensing. He likens it to radar for air traffic control: Radar doesn't need to image every aspect of an aircraft to detect its presence.

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DETECTING CANCER EARLY
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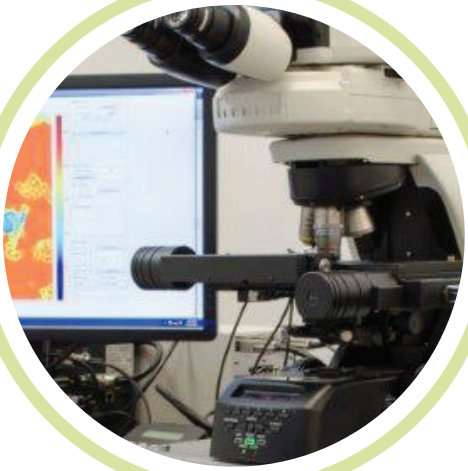

While the technological aspect of their work is impressive, what really excites Backman is the potential human impact of what they've accomplished. "You are detecting disease at the very earliest stages when it is most treatable." Moreover, treatment at this state is often less traumatic and lower cost. Physicians can incorporate this type of test into annual physicals, it can be done in settings like Walgreens or CVS, and it could even be done at home. A positive report from the lab would identify exactly who should have more comprehensive, costly and invasive diagnostic tests. Since more than $100 billion is spent each year on cancer care in the United States, the potential economic impact is significant.

Backman's research benefitted from substantial support from the National Institutes of Health, and the National Cancer Institute in particular, as well as the National Science Foundation. He says there is no other way to do this type of work without grant support from the NIH.

Backman and colleagues have formed a company, Preora Diagnostics, to commercialize their technology and bring it to market. The first test to be rolled out will be for lung cancer, with tests for other cancers to follow. The anticipated cost of a test is approximately $150.

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United for Medical Research has undertaken the Amazing Things Podcasts because America's investment in medical research — through the National Institutes of Health — is making amazing things possible. Listen to the full story of Vadim Backman's efforts to develop a universal cancer screening test at www.unitedformedicalresearch.org/amazing-things.

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