New more-sensitive blood test catches recurring breast cancer a year earlier

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A new blood test is twice as sensitive and can detect breast cancer recurrence a full year earlier than current blood tests, according to a scientist who reported here today at the 243rd National Meeting & Exposition of the American Chemical Society (ACS).

Daniel Raftery, Ph.D., who reported on the test, pointed out that breast cancer survivors — 2.5 million in the U.S. alone — face about a 1-in-5 chance that the cancer will come back, or recur, within 10 years of treatment. Research shows that early detection of these recurrences and treatment can save lives. However, currently available blood tests are not very sensitive. Perhaps the best known test for a biological "marker" protein, or "biomarker," called CA 27.29, misses many cases of recurrence and detects them late — often after symptoms, such as difficulty breathing or bone pain, surface.

"We have identified a group of nine biomarkers that signal recurrence of breast cancer," Raftery said. "Our markers detect twice as many recurrences as the CA marker does at the same specificity. They also detect cancer recurrence earlier, about 11-12 months sooner than existing tests. They accomplish this with blood samples, rather than biopsies, with less discomfort to patients."

To find these markers, Raftery's team at Purdue University and Matrix-Bio, Inc., a company he founded, analyzed many hundreds of "metabolites" in the blood of breast cancer survivors. Metabolites are small molecules, biological byproducts formed as the body's cells go

about the business of life. Some are released into the bloodstream and urine. The rapidly emerging scientific field called "metabolite profiling" seeks to understand how these metabolites relate to health and disease. Groups of metabolites already have been linked to a range of diseases. Many of Raftery's biomarkers were known to be involved in cancer. But no one knew that this group of metabolites could serve as biomarkers for breast cancer recurrence, he said.

The markers are detected with an instrument called a mass spectrometer, which is common in clinical laboratories. Raftery explained that these markers would be used in combination with results from CA 27.29 blood tests.

"We take both of those results together and roll them into the profile so that the score we generate is a combination of the CA value and our nine metabolites," he said. "If the score indicates that the cancer probably has returned, the patient would then likely undergo imaging tests to locate the tumor."

Raftery hopes that the new test will become available later this year. In the meantime, the researchers are conducting another clinical study with the test. He also said that, in the future, the test might be useful in the early detection of breast cancer, not just recurrences.

More information:

Abstract

The need for improved diagnostics in oncology is driving efforts to develop advanced methods for molecular based medicine. For example, the detection of recurrent breast cancer is limited by poorly performing CA markers that are both insensitive and late markers. Because of their sensitivity to biological status, metabolite markers may provide better diagnostic performance and earlier detection, which should result in improved therapy outcomes. We have found that combining MS and

NMR methods improves the ability to perform global metabolite profiling, and has revealed a set of biomarkers that are very sensitive and specific for detecting early breast cancer recurrence. The derived metabolite profile is twice as sensitive as the CA 27.29 assay, and detects recurrence 12 months earlier. The profile has been ported to a single MS platform and validated using an independent set of ~100 patient samples. Assay performance, and an outlook of the approach will be discussed.

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