

Initial trials on new ovarian cancer tests exhibit extremely high accuracy

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Scientists at the Georgia Institute of Technology have attained very promising results on their initial investigations of a new test for ovarian cancer. Using a new technique involving mass spectrometry of a single drop of blood serum, the test correctly identified women with ovarian cancer in 100 percent of the patients tested. The results can be found online in the journal *Cancer Epidemiology, Biomarkers, & Prevention Research*.

"Because [ovarian cancer](#) is a disease of relatively low prevalence, it's essential that tests for it be extremely accurate. We believe we may have developed such a test," said John McDonald, chief research scientist at the Ovarian Cancer Institute (Atlanta) and professor of biology at Georgia Tech.

The measurement step in the test, developed by the research group of Facundo Fernandez, associate professor in the School of Chemistry and Biochemistry at Tech, uses a single drop of [blood serum](#), which is vaporized by hot helium plasma. As the molecules from the serum become electrically charged, a mass spectrometer is used to measure their relative abundance. The test looks at the small molecules involved in metabolism that are in the serum, known as metabolites. Machine learning techniques developed by Alex Gray, assistant professor in the College of Computing and the Center for the Study of Systems Biology, were then used to sort the sets of metabolites that were found in cancerous plasma from the ones found in healthy samples. Then, McDonald's lab mapped the results between the metabolites found in

both sets of tissue to discover the biological meaning of these metabolic changes.

The assay did extremely well in initial tests involving 94 subjects. In addition to being able to generate results using only a drop of blood serum, the test proved to be 100 percent accurate in distinguishing sera from women with ovarian cancer from normal controls. In addition it registered neither a single false positive nor a false negative

The group is currently in the midst of conducting the next set of assays, this time with 500 patients.

"The caveat is we don't currently have 500 patients with the same type of ovarian cancer, so we're going to look at other types of ovarian cancer," said Fernandez. "It's possible that there are also signatures for other cancers, not just ovarian, so we're also going to be using the same approach to look at other types of cancers. We'll be working with collaborators in Atlanta and elsewhere."

In addition to having a relatively low prevalence ovarian cancer is also asymptomatic in the early stages. Therefore, if further testing confirms the ability to accurately detect ovarian cancer by analyzing metabolites in the serum of women, doctors will be able detect the disease early and save many lives.

Provided by Georgia Institute of Technology

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