

Toward diagnosing diseases such as cancer in their earliest stages

March 2 2016

Detecting diseases such as cancer in their earliest stages can make a huge difference in patient treatment, but it is often difficult to do. Now scientists report in the journal *ACS Central Science* a new, simple method that could make early disease diagnosis much easier. In addition, their approach only requires a minute sample of patient blood and is 1,000 times more sensitive in detecting biomarkers for thyroid cancer than the current government-approved test.

In response to a wide range of conditions, including [cancer](#), viral infections and autoimmune disorders, the body's immune system produces proteins called [antibodies](#). Identifying specific antibodies can help physicians make accurate diagnoses. However, levels of these proteins are low at early disease stages, so it is difficult to detect them with methods currently approved by the U.S. Food and Drug Administration (FDA). Also, some of these tests involve hazardous radioactive materials and specialized facilities, making them expensive to carry out. Carolyn R. Bertozzi and colleagues wanted to come up with a simpler, more accessible approach that could detect low concentrations of these proteins.

The researchers developed a new way to detect antibodies in a fraction of a drop of blood with common lab equipment. Testing it with patient samples showed that the method, called antibody detection by agglutination-PCR or ADAP, was 1,000 times more sensitive in detecting thyroid cancer antibodies than the radioimmunoassays that are the current gold standard. The researchers say ADAP could also be

designed to look for antibodies in saliva.

More information: Cheng-ting Tsai et al. Ultrasensitive Antibody Detection by Agglutination-PCR (ADAP), *ACS Central Science* (2016).
[DOI: 10.1021/acscentsci.5b00340](https://doi.org/10.1021/acscentsci.5b00340)

Provided by American Chemical Society

Citation: Toward diagnosing diseases such as cancer in their earliest stages (2016, March 2)
retrieved 24 April 2024 from <https://phys.org/news/2016-03-diseases-cancer-earliest-stages.html>

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