

PSA test for men could get a second life for breast cancer in women

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The widely known PSA blood test for prostate cancer in men may get a second life as a much-needed new test for breast cancer, the most common form of cancer in women worldwide, scientists are reporting in a new study in the ACS journal *Analytical Chemistry*.

Chien Chou and colleagues say that the prostate-specific antigen (PSA) measured in the test also is a potential biomarker of breast cancer in women. However, levels of PSA in healthy women are usually so small that only ultrasensitive tests can measure them.

To improve PSA detection in women, the researchers built a tiny fiber-optic biosensor using [gold nanoparticles](#) and PSA antibodies to detect and report PSA levels via a fluorescent signal. The biosensor's sensitivity (its ability to detect elevated PSA levels in cases of breast cancer) and its specificity (how well it avoids false predictions of breast cancer) are comparable to those found in using PSA as a biomarker for prostate cancer. "Furthermore, these values may compare favorably with the sensitivity and specificity of the current screening methods for breast cancer such as clinical examination... and mammogram," the scientists report.

More information: "Discrimination of breast cancer by measuring prostate-specific antigen levels in women serum" *Anal. Chem.*, 2011, 83 (13), pp 5324–5328. [DOI: 10.1021/ac200754x](https://doi.org/10.1021/ac200754x)

Abstract

Prostate-specific antigen (PSA) has been reported to be a potential biomarker of breast cancer. Serum PSA of normal women is around 1 pg/mL, which is usually undetectable by current assay methods; thus an ultrasensitive measurement of PSA expression in women's serum is necessary to distinguish normal from malignant breast diseases. To enhance the sensitivity of conventional immunoassay technology for the detection of PSA in sera, we adopted a localized surface plasmon coupled fluorescence fiber-optic biosensor, which combines a sandwich immunoassay with the localized surface plasmon technique. The concentration of total PSA (t-PSA) (from 0.1 to 1000 pg/mL) in phosphate-buffered saline solution and the normalized fluorescence signal exhibit a linear relationship where the correlation coefficient is 0.9574. In addition, the concentration of additional t-PSA in 10-fold-diluted healthy women's serum across a similar range was measured. The correlation coefficient for this measurement is 0.9142. In clinical serum samples, moreover, the experimental results of t-PSA detection show that both the mean value and median of normalized fluorescence signals in the breast cancer group (155.2 and 145.7, respectively) are higher than those in the noncancer group (46.6 and 37.1, respectively). We also examined the receiver operating characteristic curve for t-PSA, and the area under the curve (AUC) is estimated to be 0.9063, the AUC being used to measure the performance of a test to correctly identify diseased and nondiseased subjects.

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