Researches discovered genes that predict whether trastuzumab will work for breast cancer patients

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Adding the drug trastuzumab to chemotherapy prevents cancer recurrence and improves survival in a large number of women with early stage HER2-positive breast cancer. But trastuzumab does not stop tumors from returning in about 25 percent of patients—and oncologists haven't been able to identify these women before treatment. This situation may soon change, according to a Mayo Clinic study being presented at the 2012 CTRC-AACR San Antonio Breast Cancer Symposium.

A team of U.S. researchers, led by oncologists at Mayo Clinic's campus in Florida, have discovered 27 genes that are significantly associated with a good outcome with concurrent use of trastuzumab and chemotherapy, as well as five other genes linked to a poor outcome using the same treatment regimen.

Results of their study—believed to be the first to use gene expression profiling to predict outcome to trastuzumab as part of adjuvant breast cancer therapy—offer a number of future potential benefits, says Edith Perez, M.D., deputy director at large of the Mayo Clinic Comprehensive Cancer Center and director of the Breast Cancer Translational Genomics Program at Mayo Clinic.

"These findings also are getting us closer to unraveling the biological factors that are relevant to patient outcome, which will help us improve clinical care," Dr. Perez says.

For example, the discovery may help scientists devise a genetic test that can help oncologists select the best treatment for their HER2-positive patients, she says.

Further analysis will illuminate the inner biological workings of individual HER2-positive tumors, which could provide clues for novel treatments, Dr. Perez adds. The researchers have already found that the genes linked to outcome can be grouped into different categories that affect tumor functioning, such as cell cycle, cell death, cell receptor signaling, and gene transcription.

Dr. Perez and her team plan to validate their findings through collaborations with researchers in the United States and Europe who have led other trastuzumab clinical studies.

"We are on our way to developing a predictive test that can define the right treatment for individual patients, and that is very exciting," she says.

Provided by Mayo Clinic