Public release date: 8-Jul-2008

Contact: Michelle Gailiun
michelle.gailiun@duke.edu
919-724-5343
Duke University Medical Center

Young women's breast cancers have more aggressive genes, worse prognosis

DURHAM, N.C. -- Young women's breast cancers tend to be more aggressive and less responsive to treatment than the cancers that arise in older women, and researchers at the Duke Comprehensive Cancer Center and the Duke Institute for Genome Sciences & Policy may have discovered part of the reason why: young women's breast cancers share unique genomic traits that the cancers in older women do not exhibit.

"Clinicians have long noted that the breast cancers we see in women under the age of 45 tend to respond less well to treatment and have higher recurrence rates than the disease we see in older women, particularly those over the age of 65," said Kimberly Blackwell, M.D., a breast oncologist at Duke and senior investigator on the study. "Now we're really understanding why this is the case, and by understanding this, we may be able to develop better and more targeted therapies to treat these younger women."

The results appear in the July 10 *Journal of Clinical Oncology*. The study was funded by the National Cancer Institute.

Duke researchers looked at samples of nearly 800 breast tumors from women in five countries on three continents, and divided them into age-specific cohorts. The investigators found more than 350 sets of genes that were active only in the tumors from women under age 45. Conversely, tumors arising in women over age 65 did not share these activated gene sets.

"The breast tumors that arose in younger women shared a common biology, and this discovery was truly remarkable," Blackwell said. "The genes that regulate things like immune function, oxygen supply and mutations that we know are related to breast cancer, such as BRCA1, were preferentially expressed in the tumors taken from younger women, but when we compared younger women's tumors to older women's tumors, we found those same gene sets were not expressed in the 'older' tumors."

Researchers have already developed compounds that target some of the activated gene expression pathways that the Duke team discovered, and many of these compounds have promise for combating young women's tumors, Blackwell said. Identifying these characteristic gene expression profiles will be an important part of finding new therapies, she said.

"Many of the gene sets we saw in 'younger' tumors distinguished these cancers from 'older' tumors but the reverse was not true -- there was nothing we saw in the older women's tumors that set them apart genomically," Blackwell said. "Identifying these distinguishing characteristics may be the first step in developing more effective treatments for these younger patients."

###

Other researchers involved in this study include Carey Anders, David Hsu, Gloria Broadwater, Chaitanya Acharya, John Foekens, Yi Zhang, Yixin Wang, Kelly Marcom, Jeffrey Marks, Phillip Febbo, Joseph Nevins and Anil Potti.