

## **Breast cancer patients who lack RB gene respond better to neoadjuvant chemotherapy**

July 26 2012

Breast cancer patients whose tumors lacked the retinoblastoma tumor suppressor gene (RB) had an improved pathological response to neoadjuvant chemotherapy, researchers at Thomas Jefferson University Hospital and the Kimmel Cancer Center at Jefferson report in a retrospective study published in a recent online issue of Clinical Cancer Research.

Many <u>breast cancer patients</u> undergo neoadjuvant therapy to reduce the size or extent of the cancer before <u>surgical intervention</u>. Complete response of the tumor to such treatment signifies an improved overall prognosis. Today, no marker is applied to identify tumors which will respond to such treatment, and as a result, only a subset of patients exhibit benefit from it.

"We found that loss of RB was associated with better pathological response rates in <u>breast cancer</u> patients—at various stages and representing multiple molecular subtypes—who were administered neoadjuvant chemotherapy," said Agnieszka Witkiewicz, M.D., Associate Professor of Pathology, Anatomy and Cell Biology at Thomas Jefferson University.

Erik Knudsen, Ph.D, Professor of Cancer Biology and the Hilary Koprowski Chair in Cancer Biology, was excited that discoveries from his life-long research on the RB-pathway were making there way into the clinic.



"This represents a potential new biomarker that could be used to tailor treatment plans for women considering neoadjuvant therapy and is a testament to the importance of cancer research," he said.

For the study, researchers, including Gordon Schwartz, M.D., Director of the Jefferson Breast Care Center and Adam Ertel, Ph.D., Bioinformatics Specialist, Department of Cancer Biology, performed a combination of gene expression profiling to identify those with RB loss and direct histological analysis in over 1,000 breast cancer patients who had undergone neoadjuvant therapy. These patients represented distinct subtypes of breast cancer and were treated with multiple different therapeutic regimens.

RB loss was associated, the team found, with an improved response to all the neoadjuvant regimens investigated in the major subtypes of breast cancer.

"Together, these data indicate that the loss of RB, which occurs relatively frequently in locally advanced disease, could be a useful tool for defining patients that experience an improved response to neoadjuvant chemotherapy," said Dr. Witkiewicz. "Based on these findings, we have initiated a prospective clinical trial at Jefferson, evaluating the association of RB and another marker, PTEN, with the response to neoadjuvant chemotherapy."

**More information:** The clinical trial is open to patients who have a diagnosis of triple negative breast cancer and are eligible for neoadjuvant chemotherapy. (clinicaltrials.gov/ct2/show/NCT01514565).

Provided by Thomas Jefferson University



Citation: Breast cancer patients who lack RB gene respond better to neoadjuvant chemotherapy (2012, July 26) retrieved 16 June 2024 from <u>https://medicalxpress.com/news/2012-07-breast-cancer-patients-lack-rb.html</u>

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