

Genetic Differences Between Caucasian & Black Women May Account for Disparities in Triple-Negative Breast Cancer

BY ROBERT H. CARLSON

Ethnic disparities in breast cancer stage at presentation and survival rates are considered to result from a combination of factors including socioeconomic and lifestyle considerations, tumor characteristics, and inherent factors such as genetic composition. A recently completed study, however, focusing on gene-expression profiling in women with triple-negative breast cancer now suggests that the underlying differences among racial groups are present not just in tumors, but in normal tissue as well.

Speaking at the AACR Annual Meeting, Lisa Baumbach, PhD, Associate Research Professor at Sylvester Comprehensive Cancer Center at the University of Miami Miller School of Medicine, noted that numerous studies have shown triple-negative breast cancer to be over-represented in African-American women.

She and her colleagues analyzed breast cancer and self-matched normal tissue samples from 10 African-American, 10 Hispanic, and 10 non-Hispanic white (i.e., Caucasian) patients from south Florida who had undergone either lumpectomies or mastectomies.

All patients had triple-negative breast cancer but no lymph node involvement.

Samples were cut from formalin fixed paraffin-embedded tissue blocks marked by pathology as normal or tumor tissue



Robert H. Carlson

LISA BAUMBACH-REARDON, MD: "We could clearly see gene-expression differences across the ethnic groups and tumors from the samples, but we also found that tissue from the same woman that is supposed to be histologically normal can in fact be pre-cancerous....As we validate this data, this may give us a new target for therapy."

and were sent to a diagnostics lab for RNA isolation, cDNA preparation, and hybridization of tumor/normal cDNAs and compared with a breast cancer focused gene expression array.

"We could clearly see gene-expression differences across the ethnic groups and tumors from the samples, but we also found that tumor adjacent normal—i.e., tissue from the same woman that is supposed to be histologically

normal—can in fact be pre-cancerous," she said.

A number of genes related to the DNA repair pathway were expressed differently across ethnicities. The Mre11 protein, for example, located within the MRN complex that is involved in double-strand DNA repair, was much more upregulated in African-American women than in the other ethnic groups.

"This becomes very interesting, because in triple-negative breast cancer, one of the pathways that is being targeted now for therapy is the DNA repair pathway, using PARP inhibitors," she said.

She said the research suggests that African-American women may be predisposed to breast cancer that is different from that in Caucasian women. "As we validate this data, this may become very exciting because it may give us a new target for therapy."