

4th Annual Conference on
Preventive Oncology
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Gynecologic Oncology, Reproductive Disorders Maternal-Fetal Medicine & Obstetrics

July 18-19, 2018 | Atlanta, USA

Novel biomarkers for BRCA1-associated women's cancer

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Breast cancer is the second leading cause of cancer-related deaths among women in US. Majority of young women with BRCA1 mutations have a so-called triple negative breast cancer (TNBC) and high grade serous ovarian cancer (HGSOC) with an aggressive phenotype. Basal-like tumors have a higher rate of brain, lung and distant nodal metastasis more than other TNBC subtypes, contributing to higher mortality rate. HGSOC accounts for 70-80% of ovarian cancer deaths, shares molecular similarities with basal-like breast cancer and the overall survival has not improved for several decades. Currently there are no reliable biomarkers for early stage detection of BRCA1-associated TNBC and HGSOC also any druggable targets for targeted therapy. Work ongoing in the lab is geared towards understanding the molecular mechanism of BRCA1 dysfunction and downstream signaling axis involved in these cancers. We have used clinically relevant patient derived BRCA1 mutant TNBC and HGSOC cell lines and found deregulated expression of caveolin-1, VEGF and SIRT1 in these cells suggesting a novel mechanism underlying TNBC and HGSOC epithelial mesenchymal transition leading to distant metastasis. This work has led to the discovery of potential mechanism-based diagnostics as well as potential targets for BRCA1-associated TNBC and HGSOC which can be used to develop drugs for targeted therapy of these cancers saving countless lives. Work supported in part by GCC Distinguished Cancer Scholar award, NIH-NCRR-RCMI grant G-12-RR003034, U54 RR02613, 5P20RR11104 and NIHMD research endowment grant 2S21MD000101, U54 CA118638, VOYA foundation and It's the Journey Inc. to V.N.R. Patent issued No. 8,372,580.

Biography

Veena N Rao is Professor and Co-Director of the Cancer Biology Program, GCC Distinguished Cancer Scholar in the Department of OB/GYN, at Morehouse School of Medicine. She completed her Ph.D. in Biochemistry at CCMB, India, Max Planck Institute, University of Edinburgh, and MIT, Boston. Her postdoctoral work was at the University of California, Yale University and National Cancer Institute. Dr. Rao has a long career beginning at University of Pennsylvania, Temple University as an Assistant Professor. She then moved to Thomas Jefferson University as Associate Professor where she identified the BRCA1 isoforms. She became Professor and Co-Director of the Division of Cancer Genetics at Drexel University and was recruited at Morehouse School of Medicine to train minority students in cancer research. Her work led to a Patent that can stratify risk for TNBC and to develop targeted therapy for TNBC, a disease which currently has no targeted treatments available.

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