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MEIG1, A TUMOR SUPPRESSOR PREDICTIVE OF BREAST CANCER IN HUMANS

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Breast cancer is the most common malignancy among women in the western world, including Israel. The etiology of the disease is not always clear, although there are cases with clear known genetic background. Women carrying a mutation in either the BRCA1 or BRCA2 genes are predisposed to developing breast or ovarian cancer. Nonetheless, only 10-15% of breast cancer patients are carriers of these mutations, suggesting that there might be some other genes playing a role in this tumorigenic process. Meig1 is an evolutionarily conserved gene, first identified as a crucial gene for proper spermatogenesis. Meig1 Knockout (KO) male mice cannot produce mature sperm, and thus are infertile. We have recently shown that the MEIG1 protein is involved in maintaining genome integrity, thus it is not surprising that Meig1 KO mice, mainly females, are predisposed to developing tumors, most characteristic breast cancer-like tumors. In this study, we used the TCGA database to analyze the Meig1 gene in 501 breast cancer patient, with divers ethnic background, and compared it to the gene sequence of about 3,000 genomes of healthy people, obtained from the 1,000 genome database. We found seven SNPs that are rather frequent in both healthy and breast cancer patients. Nevertheless, genotipically, the probability of being homozygote to the SNPs was much higher in the patients, and the differences were highly significant statistically. This was especially true for one of the SNPs that confers substitution of Lys9 to Thr. These results imply that being homozygous for these SNPs might be a risk factor for developing breast cancer, and that screening for these genotypes might improve early detection rates and thus successful treatments.

Biography

Prof. Jeremy Don has completed his Ph.D. studies at Bar-Ilan University, Israel, in 1989 and then moved to the College of Physicians and Surgeons at Columbia University, New York, where he joined the Lab of Prof. Debra Wolgemuth at the department of genetics & development, Center of Reproductive Sciences, as a post-doctorate fellow. In 1992, Jeremy returned to Bar Ilan University where he established his own research lab. Jeremy's major research interests are molecular mechanisms in reproductive processes and genome integrity. His research focuses on several genes, some of which are Atce1, Meig1 and Pim-2. Prof. Don served as a member in various international and national committees, such as the Committee of National Representatives (CNR) of ESHRE (European Society of Human Reproduction and Embryology), Executive committee of the Israeli Society of fertility research, Control committee of the Israeli Society of cancer research, and several advisory committees for scientific foundations.

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