

Turkish Journal of Medical Sciences

Turkish Journal

Molecular Genetics of Breast Cancer



of

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Abstract: Recent advances in molecular biology enable researchers to understand the basis of breast cancer much better and show that hereditary breast cancer may result from mutations on several specific gene loci including BRCA1, BRCA2, p53, ATM and PTEN. These genes are tumor suppressor genes and although their functions are different, they are all involved in the maintenance of genomic stability after DNA damage. Mutations that impair the function of these genes may adversely affect the manner in which DNA damage is processed. It is likely that the risk of breast cancer development is increased through this mechanism. Moreover, there are several predispositions, such as the androgen receptor gene (AR) and the HNPCC, that may also be involved, but further studies are required in order to understand the extent of their involvement in breast cancer. In this paper, we supply data on the general function of the tumor suppressor genes indicated above. We also review probable mutations of these genes and their relevance to breast cancer development. Furthermore, we discuss estrogen genes and estrogen receptor genes that may be involved in breast cancer development, as indicated in the recent studies.

Key Words: BRCA1, BRCA2, p53, ATM, PTEN and Estrogen

Turk J Med Sci 2001; **31**(1): 1-14.

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Other articles published in the same issue: [Turk J Med Sci,vol.31,iss.1.](#)