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Polymorphisms of estrogen receptors, ERα and GPR30: association with breast cancer susceptibility and prognosis

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The purpose of this study was to clarify the roles of polymorphisms from the classical nuclear estrogen receptor *ESR1* and from the recently described estrogen receptor coupled to G proteins *GPR30* [1], in breast cancer susceptibility and prognosis. Three single nucleotide polymorphisms (SNPs), rs2234693 and rs9340799 from *ESR1* and rs3808350 from *GPR30* were genotyped in 260 breast cancer patients and 259 controls. SNPs were analyzed by PCR-RFLP and by real-time PCR with TaqMan probes. Genotypes were correlated with established breast cancer prognostic markers. For rs9340799, our results showed a significant association between A allele and breast cancer susceptibility, particularly for homozygous (OR-7.33, 95%CI, 4.3-12.6; $p < 0.0005$). The occurrence of polymorphisms rs2234693 and rs3808350 did not differ between breast cancer patients and controls. However, for rs2234693, CC genotype was significantly associated with higher (G2/G3) tumor grade ($p < 0,05$; OR-1.01, 95%CI, 1.01-4.98) and in postmenopausal women, the TT variant was associated with lower (G1) tumor grade ($p = 0,02$, OR-1.9, 95% CI, 1.09-3.45). No significant association was found with the presence of estrogen receptors or with HER2 overexpression in tumor samples. In conclusion, our work confirms the role of *ESR1* polymorphisms in breast cancer: rs9340799 in breast cancer susceptibility and rs2234693 in breast cancer prognosis. For *GPR30* SNP rs3808350, none association was found.

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