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乳腺癌中GRP BPAG1和SFRP2间相关性的初步研究

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GRP BPAG1 and SFRP2 Expression in Breast Cancer: A Pilot Study

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摘要

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摘要 对通过生物、数学、信息学等多学科合作初步提出的GRP基因、BPAG1基因、SFRP2基因间的乳腺癌转移相关调控通路存在的假设，应用相关生物学方法加以验证。方法：以石蜡包埋组织切片，免疫组化二步法染色分别检测70例浸润性导管癌的原发灶及其相应淋巴结转移灶中GRP、BPAG1、SFRP2的表达情况；体外培养乳腺癌MCF-7细胞系并转染GRP增强质粒和GRPshRNA质粒，通过实时定量PCR及Western-blotting检测细胞中BPAG1和SFRP2的变化。结果：在人体乳腺癌组织与相应的淋巴结转移灶中，GRP基因、BPAG1基因、SFRP2基因间存在相同的变化趋势；转染GRP增强质粒和GRPshRNA质粒后，BPAG1和SFRP2基因的相对含量也同时分别增高和下降，转染GRP增强质粒后BPAG1在蛋白水平的表达量增高。结论：GRP基因、BPAG1基因、SFRP2基因间可能存在与乳腺癌转移相关的调控通路。

关键词： GRP BPAG1 SFRP2 乳腺癌 转移

Abstract: To verify the existence of a regulatory pathway for breast cancer metastasis that included the genes GRP, BPAG1, and SFRP2 using biological methods and to propose the pathway based on previous research involving a multidisciplinary approach that involved biology, mathematics, and informatics. Methods: Paraffin-embedded tissue sections were obtained to determine the expressions of GRP, BPAG1, and SFRP2 genes in metastatic lesions in the lymph nodes of 70 patients with primary breast cancer using immunohistochemistry. Breast cancer MCF-7 cells were cultured. Real-time polymerase chain reaction and Western blot were used to determine the mRNA and the protein levels, respectively, of both BPAG1 and SFRP2, following the up-regulation or down-regulation of GRP expression caused by the transfection of GRP or GRP-shRNA (small hairpin RNA), respectively, into the MCF-7 cells. Results: The expressions of the GRP, BPAG1, and SFRP2 genes were significantly higher in the lymph node tissues than in the corresponding primary breast cancer tissues. The mRNA levels and protein expression of BPAG1 in MCF-7 cells where GRP was either up-regulated or down-regulated were higher and lower, respectively, compared with the untreated controls. Moreover, the mRNA levels of SFRP2 followed a trend similar to that of GRP. Conclusion: A possible signal transduction pathway regulated by the GRP, BPAG1, and SFRP2 genes may play an important role in the metastasis of breast cancer.

Key words: GRP BPAG1 SFRP2 Breast cancer Metastasis

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