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# 模拟乳腺癌骨转移微环境中CGRP对成骨细胞OPG和RANKL表达影响

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摘要：

目的：以乳腺癌细胞与成骨细胞共培养模拟乳腺癌骨转移微环境，观察在此微环境中降钙素基因相关肽( calcitonin gene related peptide，CGRP)对成骨细胞护骨素 （osteoprotegerin，OPG）及细胞核因子κB受体活化因子配体（receptor activator of nuclear factor kappa B ligand, RANKL；又称破骨细胞分化因子）表达的影响。方法：将转移性乳腺癌细胞MDA MB 231或MDA MB 435与成骨细胞MG63共培养，建立模拟乳腺癌骨转移微环境。行CGRP(1×10 8 mol/L)干预，应用RT PCR和Western Blotting技术检测干预后OPG和RANKL在mRNA和蛋白水平表达的变化。结果：MG63与MDA MB 231或MDA MB 435共培养环境中，RANKL mRNA及蛋白水平升高，而OPG mRNA和蛋白水平表达下降；CGRP处理后，共培养环境中RANKL mRNA及蛋白水平降低，OPG mRNA和蛋白水平升高(均 P <0.05)。结论：乳腺癌细胞能调节成骨细胞OPG/RANKL轴的表达，进而可能促进破骨细胞的活性,造成溶骨性破坏；CGRP 干预可逆转此调节作用，在乳腺癌骨转移的治疗中有潜在应用价值。

关键词：降钙素基因相关肽 乳腺癌细胞 成骨细胞 护骨素 破骨细胞分化因子

# Effects of calcitonin gene related peptide on osteoprotegerin and RANKL expressions in osteoblast cells in bone metastasis microenvironment of breast cancer in vitro

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Abstract:

Objective:To observe the effect of calcitonin gene related peptide (CGRP) on the expression of osteoprotegerin (OPG) and receptor activator of nuclear factor kappaB ligand (RANKL) in osteoblast cells through an in vitro breast cancer cell and osteoblast cell co culture system.Methods:The metastatic breast cancer MDA MB 231 or MDA MB 435 cells were co cultured with osteoblast MG63 cells to establish an in vitro microenvironment of bone metastasis of breast cancer. After treated with CGRP(1×10 8 mol/L), OPG and RANKL mRNA and protein expressions in osteoblast MG63 cells were examined by RT PCR and Western blotting. Results: Expression of RANKL in osteoblast MG63 cells was up regulated at both mRNA and protein levels when osteoblast MG63 cells were co cultured with breast cancer MDA MB 231 or MDA MB 435 cells, while those of OPG in osteoblast MG63 cells were both down regulated ( P <0.05). After treatment with CGRP, expressions of RANKL in osteoblast MG63 cells were down regulated at both mRNA and protein levels, and the expressions of OPG mRNA and protein were both up regulated ( P <0.05). Conclusion: Breast cancer MDA MB 231 and MDA MB 435 cells can promote osteolysis of osteoclast cells via regulating the expression of OPG/RANKL axis in osteoblast cells. CGRP can reverse the osteolysis of osteoblast cells induced by breast cancer cells and may serve as a potential therapeutic agent for treatment of bone metastasis of breast cancer.

Keywords:calcitonin gene related peptide(CGRP) breast cancer cell osteoblast cell osteoprotegerin(OPG) receptor activator of nuclear factor kappaB ligand (RANKL)

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