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TGF-beta1-induced Collagenase-3 Expression

[Molecular mechanism(s) responsible for bone degradation and breast cancer cell growth]

Matrix metalloproteinases (MMPs) appear to play an important role in the multiple steps of breast cancer development and metastasis. According to 'soil and seed' theory, the bone microenvironment is enriched with several growth factors and cytokines, which facilitate tumor growth and progression. Since collagenase-3 (MMP-13) is characterized by its potent ability to degrade extracellular matrix (ECM), it is likely that collagenase-driven ECM proteolysis supports cancer cell growth both biochemically by exposing mitogenic factors and physically by providing space for the proliferating cells. Also the release of biologically active peptides from bone (e.g. TGF-*B1*) transforming growth factor beta1 by the activity of collagenase further up-regulate expression of collagenase-3 in the human breast cancer cells. In order to target the expression of collagenase-3, it is important to identify the molecular mechanisms mediating this induction of collagenase-3 by TGF-*B1* in the human breast cancer cells. This information could ultimately prove useful in the prevention of bone invasion and metastasis of breast cancer cells by identifying potential targets for drug-based therapy.