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Adenovirus-Mediated Gene Delivery of Tissue Inhibitor of Metalloproteinase-1 Inhibits Migration of B16F10 Melanoma Cell in Wound Migration Assay

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Tumor cell invasion and metastasis are a complex multistep process that involves the degradation of extracellular matrix proteins by matrix metalloproteinases (MMPs). Tissue inhibitor of metalloproteinase-1 (TIMP-1) acts as a negative regulator of matrix metalloproteinase and thus prevents tumor cell invasion and metastasis by preserving extracellular matrix integrity. The TIMPs limit the activity of MMPs, which suggests their use in gene therapy. In this work, we constructed a recombinant adenovirus vector, Ad5CMVTIMP-1. The recombinant adenovirus Ad5CMVTIMP-1 was successfully rescued in 293 cells. We have used adenovirus-mediated gene delivery of TIMP-1 to examine their effect on the invasion capacity of metastatic B16F10 melanoma cells. The transduction efficiency was 60%-80% at 200 multiplicity of infection(MOI) in B16F10 melanoma cells. Ad5CMVTIMP-1 inhibited B16F10 melanoma cell migration in wound migration assay. In conclusion, our findings support the potential of adenovirus-mediated TIMP-1 gene therapy for the prevention of metastatic melanoma.

Keyword : tissue inhibitor of metalloproteinase-1,adenoviral vector, gene therapy