The urokinase receptor (uPAR, CD87) as a target for tumor therapy: uPA-silica particles (SP-uPA) as a new tool for assessing synthetic peptides to interfere with uPA/uPA-receptor interaction.

Abstract:
Many different processes in the physiology and pathophysiology of human beings are regulated by protein/protein interactions such as receptor/ligand interactions. A more detailed knowledge of the nature of receptor/ligand binding sites and mechanisms of interaction is necessary as well in order to understand the process of cancer spread and metastasis. For instance, the cell surface receptor uPAR (CD87) and its ligand, the serine protease urokinase-type plasminogen activator (uPA), facilitate tumor invasion and metastasis in solid malignant tumors. Besides its proteolytic function in activating the zymogen plasminogen into the serine protease plasmin, binding of uPA to tumor cell-associated uPAR initiates various cell responses such as tumor cell migration, adhesion, proliferation, and differentiation. Hence, the tumor-associated uPA/uPAR system is considered a potential target for cancer therapy. Here we briefly describe a new technology using micro-silica particles coated with uPA (yields SP-uPA) and reaction of SP-uPA with recombinant soluble uPAR (suPAR) to test the competitive antagonistic potential of synthetic uPA peptides by flow cytofluorometry (FACS). We discuss the data obtained with the SP-uPA system from two different points of view: (1) The
enhanced potential of improved uPA-derived synthetic peptides compared to previously described peptides, and (2) comparison of the new technique to other test systems currently used to identify uPA/uPAR or other protein/protein interactions.

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