Albany State University

Faculty Capabilities and Interests

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Discipline: Biology
Subdiscipline(s): Cell Biology/ Cancer Biology
Areas of Research Interests: Prostate Cancer

Skills:

Research Summary ***(current, performed in the past 5 year; 300 words or less)***

Epithelial-mesenchymal transition (EMT) is a process by which cancer cells acquire mesenchymal properties, such as induction of N-cadherin, while epithelial-associated genes like E-cadherin are lost. This enables the cells to be more invasive, migratory and metastatic. Factors that can induce EMT include growth factors like transforming growth factor -□ (TGF-□) and epidermal growth factor (EGF), and transcription factors like Snail1. Snail1-induced EMT promotes migration and invasion and we hypothesized that this may be mediated by urokinase (uPA) and its receptor (uPAR) activities. uPA, a serine protease, may be activated by integrin engagement to bind to its receptor, uPAR, and initiate a signaling cascade that regulates a variety of biological pathways including invasion. Androgen-dependent LNCaP and 22Rv1 and androgen-independent ARCaP human prostate cancer (PC) cells were stably transfected with empty vector control (Neo) or constitutively active Snail1 which led to increased cell migration and invasion. Superarray analysis revealed an upregulation in uPAR expression in Snail transfected cells as compared to Neo control. Next, the protein expression levels of Snail1 , uPA, and uPAR were measured by Western Blot analysis. uPA activity in conditioned media was measured using the Elisa uPA activity assay kit. Also, uPAR was transiently silenced in ARCaP cells using uPAR siRNA. Additionally, cells were treated with MAPK inhibitor, UO126, at set time points. The data suggests that overexpression of Snail1 increased uPA and uPAR protein levels and uPA activity was elevated in conditioned media from LNCaP, 22Rv1 and ARCaP cells. Also, the silencing of uPAR decreased cell invasion in ARCaP cells. Additionally, MAPK inhibitor, UO126, inhibited ERK1/2 activity in the cells and decreased uPA activity. Therefore, Snail-mediated cell invasion in human prostate cancer cells may occur via the regulation of uPA/ uPAR utilizing the MAPK pathway.

Keywords ***(5 maximum)*** Snail, EMT, uPAR, Prostate Cancer, invasion