

# Amniotic membrane as a multimodal therapy of bladder cancer: targeting the growth and invasive potential of urothelial cancer cells

EB-02-2

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The human amniotic membrane (hAM) is a multi-layered membrane that comprises the innermost part of the placenta. It possesses many properties that make it suitable for use in regenerative medicine, namely promotion of epithelization and decrease of scarring, low immunogenicity, immunomodulatory properties and also antimicrobial and anticancer properties. The aim of this study was to investigate the effect of hAM-derived preparations, namely hAM scaffolds, hAM homogenate and hAM-derived cells, on the urothelial cancer cells. We demonstrated that all hAM-derived preparations diminished the proliferation of urothelial cancer cells. Moreover, hAM scaffolds also altered the dynamics of urothelial cancer cells' growth, decreased expression of N-cadherin, Snail and Slug and hindered their muscle-invasive potential. Individual urothelial cancer cells even began expressing epithelial markers E-cadherin and occludin. We demonstrated that the hAM homogenate induced detachment of urothelial cancer cells and limited their attachment to the surface. Furthermore, the hAM homogenate also disrupted the architecture of 2D and 3D urothelial cancer models. In conclusion, our results demonstrate the detrimental effect of hAM-derived preparations on urothelial cancer cells and provide important fundamentals for further research of hAM potential as a novel anticancer therapeutic.