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Keratinocyte growth factor alters signaling factors to transform mammary fat pad adipose stem cells isolated from Korean black goat to epithelium

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The effects of epithelial-mesenchymal transitioin (EMT) have been studied immensely with respect to mammary gland diseases progression during the past decades. However, the hypothetical question which arose on its reverse process that mesenchymal-epithelial transition (MET) could prevent the clinical expression of many diseases in the mammary glands has never been answered till date. The present research has been conducted to differentiate Mammary Fat Pad Adipose stem cells (MFPASC's) to epithelial lineage. Mammary Fat Pad Adipose stem cells (MFPASC's) was isolated through enzymatic digestion of mammary fat pad adipose tissue from Korean black goat and stemness was established by analyzing the expression of several stemness specific genes and transcription factors (CD13, CD34, CD44, CD106 and Vimentin). Thereafter, the cells were differentiated to the epithelial lineage using an epithelial induction medium (DMEM 2% horse serum, 1.1% P/S, 5μg/ml insulin, 1μg/ml hydrocortisone and 10ng/ml EGF) for 48 hours followed by differentiation medium (DMEM 2% horse serum, 1.1% P/S and 10ng/ml KGF) for 10 d. The differentiated cells showed significant ($p<0.05$/$p<0.01$) up regulation of all four epithelial-specific genes (K8, K18, EMA and ESA). Furthermore, the ayoub shklar staining (specific to cytokeratin) revealed significantly higher ($p<0.01$) keratin formation in the treated cells compared to the control. These findings explored the potential of using Mammary Fat Pad Adipose stem cells (MFPASC's) for the therapeutic treatment of various mammary diseases and disorders.

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