Regulating Cell Fate of Human Amnion Epithelial Cells Using Natural Compounds

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Video Byte

Keywords: 3,4,5-tri-O-caffeoylquinic acid (TCQA), human amniotic epithelial stem cells, hAECs, cell cycle arrest, differentiation, pigment cell, neurogenesis, inflammation, Cell Communication and Signaling

Posted Date: October 16th, 2021

DOI: <https://doi.org/10.21203/rs.3.rs-978983/v1>

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Abstract

Stem cells are a promising source for regenerating damaged tissue and treating disease, but finding a safe, reliable, effective source of stem cells is a major challenge. Stem cells derived from discarded placenta present fewer ethical, legal, and technical challenges than embryonic and mesenchymal stem cells, making them of particular interest in the development of stem cell-based treatments. A recent study examined the development of human amniotic epithelial cells (hAECs), a placental stem cell type that is able to differentiate into cells from all germ layers. Researchers analyzed the ability of a natural compound - 3,4,5-Tri-O-Caffeoylquinic Acid (TCQA) – to induce hAEC differentiation in vitro. They found that TCQA treatment enriched pigment and neural cell gene expression along with genes linked to neurogenesis, oxidation-reduction, epidermal development, and metabolism. TCQA also stimulated signaling pathways related to cell cycle arrest and differentiation while also decreasing interleukin and cytokine expression. While further studies are needed to fully understand the effects of TCQA on the morphology, physiology, and protein expression patterns of hAECs, these results highlight the important role of hAECs in regenerative medicine and suggest that natural compounds may be used to regulate stem cell fate.