Long-term differentiating primary human airway epithelial cell cultures – how far are we?

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Video Byte

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Abstract

Human respiratory diseases are one of the most common causes of death worldwide. Culture models play an important role in medical research, but the models of human airway are limited. Immortalized airway cells are a potential model, but they do not differentiate well in culture, and thus their physiology may not reflect the physiology of native epithelium. Induced pluripotent stem cells (iPSCs) tend to lose epigenetic modifications, which are important for studies of environmentally-induced airway disorders. Primary HAE cells collected from patients are an accurate model, which retains epigenetic marks, but until recently, their biggest limitation was a limited proliferative lifespan in culture. Several conditionally reprogrammed cell (CRC) HAE models have been developed which allow for longer proliferation and differentiation of airway epithelium. Each CRC model is slightly different and has unique methodologies that need to be considered during the experimental design phase. However, at least until the current limitations of other models are alleviated, primary CRC HAE cultures may be a useful model in respiratory research.