

Innovations in In Vitro Tissue Modeling - Hepatic and Airway Organoids

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Abstract:

Advances in tissue modelling techniques are increasing the breadth of scientific questions researchers can address in vitro. In this presentation we will introduce new culture systems for hepatic and airway cells. In the context of hepatic tissue modelling, we describe a workflow for the generation of hepatocyte-like cells in 2D, as well as our solutions for initiating liver organoid cultures from both primary tissues and PSCs. These models can be employed for various applications, including investigating human liver development and disease, and assessing hepatotoxicity. We further describe establishing a complex air-liquid interface (ALI) co-culture model consisting of human bronchial epithelial cells (hBECs) and blood-derived macrophages. hBECs were also used to generate apical-out airway organoids in an extracellular matrix-free, serum-free, and easily scalable workflow. These two new human airway models allow both the study of infectious disease pathogenesis in vitro, and the assessment of antiviral drug effects.