9 - Molecular Cell Biology

PO-084 - (23970) - THE MECHANISMS OF BRANCHING MORPHOGENESIS IN EPITHELIAL TISSUES

N. Penar (United Kingdom)[1]; J. Davies (United Kingdom)[1]

1 - University of Edinburgh

Natalia Penar
Edinburgh

Jamie Davies
Edinburgh

None
Branching morphogenesis is crucial for exchange of nutrients and waste products in a number of organs, such as kidneys. However, the mechanism behind the branching initiation in development is unclear. Recent studies indicate that in kidneys, branching might begin from cells that protrude beyond others due to cytoskeletal changes. Cytoskeletal shape changes can be induced by a number of genetically modified cells, including light-activated OptoShroom3 cells and cells with doxycycline-inducible RhoA, both of which act on the Rho-ROCK pathway, inducing apical contraction in cells. Our aim was to incorporate these cells in the kidney development model, prepared by culturing cysts from Madin-Darby Canine Kidey (MDCK) cells in collagen hydrogels.
Wild type MDCK cells were mixed in proportion of 1:100 with transfected cells and cultured in collagen hydrogels to form cysts. The transfected cells used included OptoShroom3 cells and cells with doxycycline-inducible RhoA.
The resulting cysts were composed mostly of wild type cells, and contained singular transfected cells. Currently, the constructs are treated with either blue light or doxycycline to induce shape change in transfected cells to test, whether the cells that change shape are the ones that lead branching morphogenesis.
The model will allow us to test the mechanism behind initiation of branching morphogenesis.

Palavras-chave : branching, kidneys, morphogenesis