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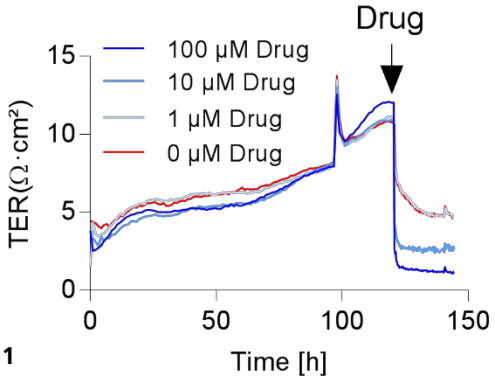

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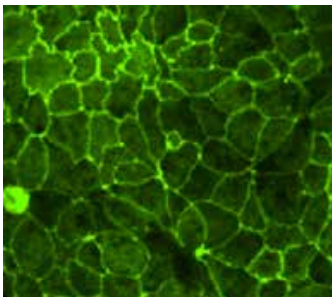

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1 *Transepithelial electrical resistance after drug treatment @ Fraunhofer IME / Thomas Ulshöfer*

2 *Tight Cell-Cell Junctions @ Fraunhofer IME / Thomas Ulshöfer*

CELL BARRIER MODEL

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Cell barrier assays are used to investigate the pharmacokinetic potential of drug candidates. The cell barrier assay is able to mimic the blood brain barrier or the intestinal barrier. This model allows to determine the apparent permeability coefficient (P_{app}) and whether compounds influence functionality of tight cell-cell junctions.

For the generation of an intestinal cell barrier human colon epithelial cells (Caco-2 cells) and for the blood brain barrier endothelial cells (bEND3 cells) are seeded on top of permeable membrane supports. By culturing on porous membranes, the cells develop the specific features that are also found in intact tissues, such as the formation of dense layers with tight cell-cell junctions. An excellent tool to assess the barrier function on reconstructed epithelial cells is the transepithelial resistance (TER) measurement by the cellZscope device. Compounds which destroy tight cell-cell junctions, such as EGTA, lead to a reduction of TER. By measuring the amount of compound that pass through the cell barrier the P_{app} can be calculated.

Cell Barrier Models

- Blood Brain Barrier Model
- Intestinal Cell Barrier Model

Read-Outs:

- Detection of tight junctions stability by measuring of the TER value using cellZscope device
- Determination of permeability by detection of compound concentration in the basolateral compartment using fluorescence, UV/VIS or LC-MS/MS

Reference

Feczkó T., Piiper A., Ansar S., Blixt F.W., Ashtikar M., Schiffmann S., Ulshöfer T., Parnham M.J., Harel Y., Israel L.L., Lellouche J.P., Wacker M.G. (2018) Stimulating brain recovery after stroke using theranostic albumin nanocarriers loaded with nerve growth factor in combination therapy. J Control Release. 293:63-72. doi: 10.1016/j.jconrel.2018.11.017