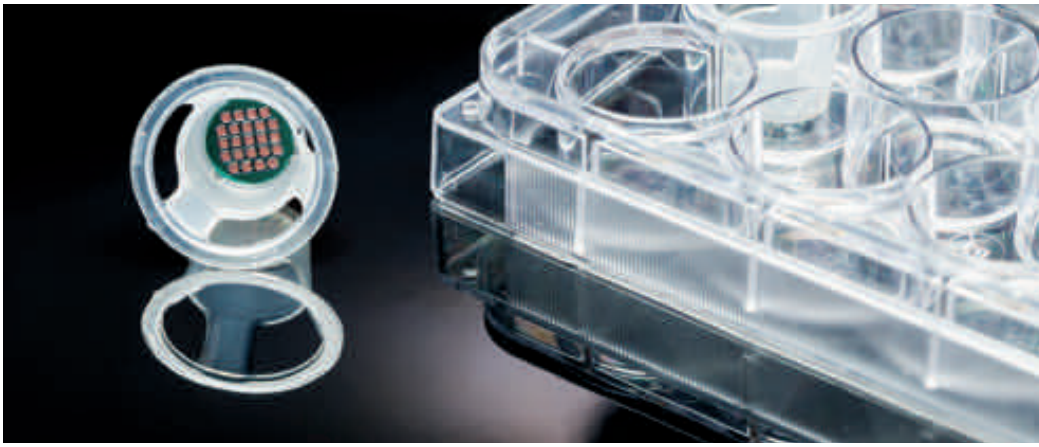
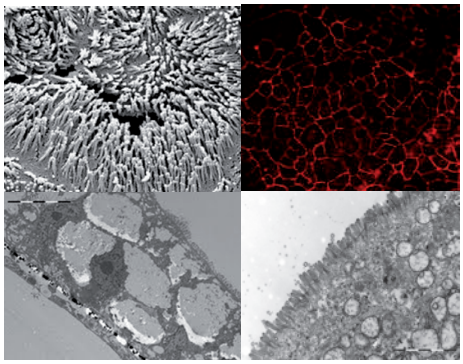
SiMPLI



Advancing Life Sciences through Innovation and Ergonomics

Intestine

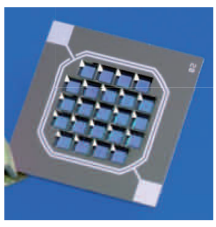
A Caco2 model of the intestinal epithelium

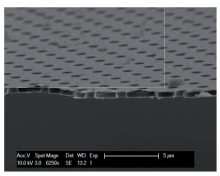


- Good differentiation of monolayers of C2Bbe1 (Caco-2 clone) on ultrathin silicon nitride support

Integration in a fluidics bioreactor for a more physiological environment

- Trans-epithelial electrical resistance measurements quasi-continuously over days
- Transport of NPs can be studied





membrane 500nm thick
1µm pore

In collaboration with
Eva Collnot, Julia Susewind, Fransisca Leonard, Claus-Michael Lehr

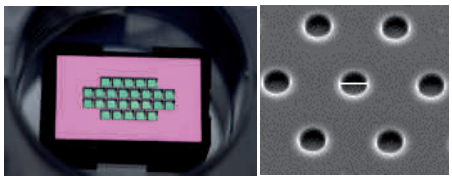
MEDITRANS

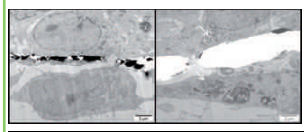
invivotox
Toxicity of Ingested Nanoparticles

UNIVERSITÄT DES SAARLANDES

Blood Brain Tumor Barrier

A model to study nano particulate drug delivery

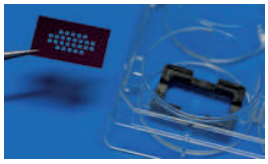




TEM images of HCEC cells (upper layer) and LN229 cells (lower layer) after 72 h co-culture on the porous membrane Clusters of NPs (white arrows) are visible.

Higher magnification images show clusters of NPs (white arrows) in HCEC cells (left) and LN229 cells (right).

- Co-culture of human cerebral endothelial cells (HCEC) and human glioblastoma cells (LN229) on a microfabricated porous silicon nitride cell culture support to model the BBTB.
- Ultrathin porous cell culture supports allow close contact between endothelial and glioblastoma cell types.
- Transfer of nanoparticles (USPIO NPs) from pre-loaded endothelial to gliablastoma cells is observed using both TEM and staining.



In collaboration with
Lucienne Julierat-Jeanneret, Blanka Halamoda Kenzaoui, CHUV- UNIL, Lausanne, Switzerland

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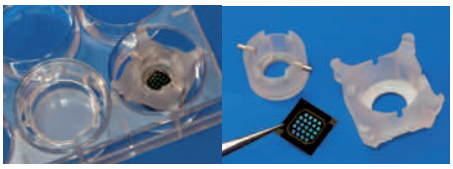
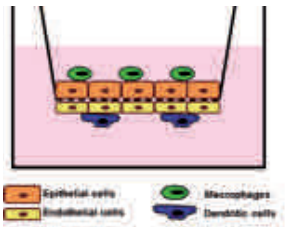
Lungs

An improved model of human alveoli

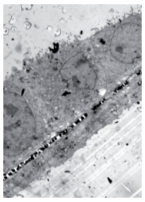


Endothelium and epithelium co-culture on CSEM SiMPLI



Scheme quadruple co-culture

- Microfabricated ultrathin cell culture supports can be used like conventional porous microplate inserts (SIMPLI-well)
- The supports are 20x thinner than conventional supports
- The resulting alveolar model is more physiological: thinner and with closer contact between cell types



Rothen-Rutishauser et al. Am J Respir Cell Mol Biol 2013

In collaboration with
Barbara Rothen-Rutishauser, Corinne Jud, Alke Petri-Fink

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