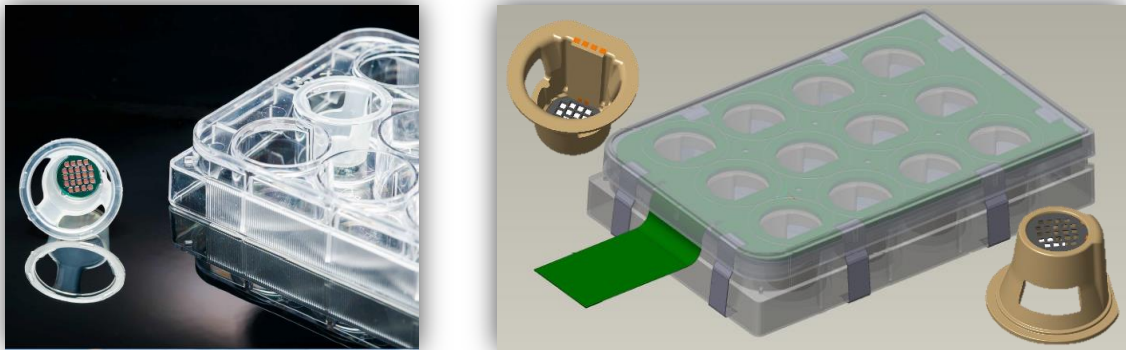


## Show-Case “Smart well plates for tissue engineering”

Smart system for cell and tissue culture with integrated electrode for TEER measurements



Cell culture insert with  $\text{Si}_3\text{N}_4$  microporous membranes and design of the smart insert with integrated electrodes to be use with a smart 12 well microtiterplate connected with TEER electronics

For cell and tissue culture, it is important to place the cell in a situation that is close to the in vivo case, therefore an adapted support for cell culture is necessary. 500 nm thick  $\text{Si}_3\text{N}_4$  membranes with high density of submicron pores, constitute an excellent cell support with an excellent capacity to transport the cell nutriment through the membrane. The cells have the possibility to interact with the medium on both side, a condition close to the in vivo situation.

For testing the effect of compound or situation on different type of cell culture, it is important to monitor the integrity of the cell layer. This can be done by measuring the Trans Epithelial Electric resistance (TEER). The TEER is affected by the condition of the cells and can be monitored.

The goal of this project is to develop a smart cell culture insert and multiwell plate for use inside a cell culture incubator using microporous  $\text{Si}_3\text{N}_4$  membrane (**CSEM** building block). The electrodes for TEER measurement are integrated on the membrane and in the inserts that are connected via an interconnection plate and PCB (**Ikerlan** building block) towards the electronics that will perform sequentially the TEER measurement on the desired well in an automated fashion (**Tyndall** building block). The data will be collected automatically and will be available via USB connection for analysis.

Two SME partners will benefit directly from the project to a) broaden its portfolio (SIMPLInext) and b) expand its services in complex cell and tissue culture analysis (Vitroscreen).