

## Project in the spotlight: EpiSense

Besides providing hardware and software for impedance spectroscopy, we are actively involved in several innovative projects. One of the projects is EpiSense, where a consortium develops an EPIthelial SENSing, or EpiSense, solution that accurately measures the barrier function of skin constructs. This enables researchers to improve their scientific output and CRO's or companies to accurately test pharmaceutical and cosmetic applications.

### Background and goal

The number of people with a (chronic) skin disease is rising and the demand for skin care products is increasing. In vitro skin models are an alternative for animal testing to study these skin-related topics. The skin barrier function is a key aspect of the overall skin function. Currently, this is measured via immunofluorescent assays (accurate, but time consuming and end-point measurements) or via single probe measurements (inaccurate and time consuming as well). The EpiSense platform enables its user to real-time accurately measure the in vitro skin barrier function. This results in costs savings due to high accuracy, and less labor and materials.

### Partners

#### **Locsense**

Within the EpiSense project, Locsense develops a module that is capable of monitoring short-term skin barrier effects within the millisecond range and analyzing the long-term barrier effects. With the collected data from the platform, Locsense will develop skin analysis software. For this purpose, Locsense develops algorithms, based on equivalent electrical circuit models, that are able to relate the acquired data to barrier integrity, skin thickness and surface area.

#### **StratiCELL**

StratiCELL develops an in vitro human skin culture, where a slight reversible barrier disruption is acquired through various methods, that is thoroughly tested and validated. These approaches include tape stripping the corneal layer of the reconstructed human epidermis (RHE) with organic solvents, and remodel the skin construct to disrupt the skin barrier. Upon completion, the model validates the improvement of the barrier function with reference benchmarks, to fulfil pharmaceutical and cosmetic criteria for preclinical development.

#### **Radboudumc**

Radboudumc creates organotypic models that mimic skin diseases. The barrier function is mostly interpreted based on gene and protein expression, but quantitative analysis of true barrier function that resembles in vivo skin is unavailable. EpiSense enables the translation from in vitro studies towards the patient population and provides information on the biological relevance of effects that certain compounds pose on the skin.

### Societal impact

The societal impact of the EpiSense project is significant, as it contributes to the advancement of dermatological research, ethical testing methods, and improved healthcare solutions. By providing a real-time, accurate, and cost-effective way to measure skin barrier function,



EpiSense enhances scientific research quality and accelerates the development of skincare and pharmaceutical products. This innovation supports the transition from animal testing to more ethical in vitro models, aligning with global efforts to promote cruelty-free research. Additionally, as the prevalence of chronic skin conditions rises, EpiSense helps drive the creation of more effective treatments, ultimately improving patient outcomes and quality of life. The platform's efficiency also benefits companies and research organizations by reducing costs and resource consumption, fostering a more sustainable approach to skin research and product development.

### Join the conversation

Are you using or developing highly accurate in vitro skin models to reduce animal testing?