



1 Light microscopy of a typical histological stained section of a paraffin embedded 3D skin model

THREE DIMENSIONAL SKIN MODELS

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Background

Cell compatibility tests are necessary during the development of materials for medical devices or for biomedical applications. For this purpose and besides the standard 2D tissue engineering methods, the Fraunhofer IMWS has developed a three-dimensional, organ-like *in vitro* skin tissue model.

3D skin equivalents resemble the phenotype of the human skin, including cellular signaling, cell migration, cell attachment, and drug response like *in vivo*.

Technology

Using the *in vitro* skin model, harmful effects of substances and materials on tissues can be tested at the cellular and molecular level. In addition, positive influences, e.g. on tissue regeneration, can be investigated on pre-damaged skin models. Depending on the research question, the existing model can be modified for specific tissues

and applications to develop targeted test protocols.

The model consists of human dermal fibroblasts embedded in a collagen matrix mimicking the natural dermal extracellular matrix (ECM) and an epidermis of human keratinocytes.

The following properties can be investigated:

- Cytotoxicity / cell viability
- Histology / microstructure
- Biochemical evaluation of the ECM
- Regeneration / tissue repair



2 Skin models ready for application after 27 days of incubation with air lifting