Research internship in the field of skin regeneration (6 months, MSc student)

Development of informative scaffolds for scarless skin regeneration

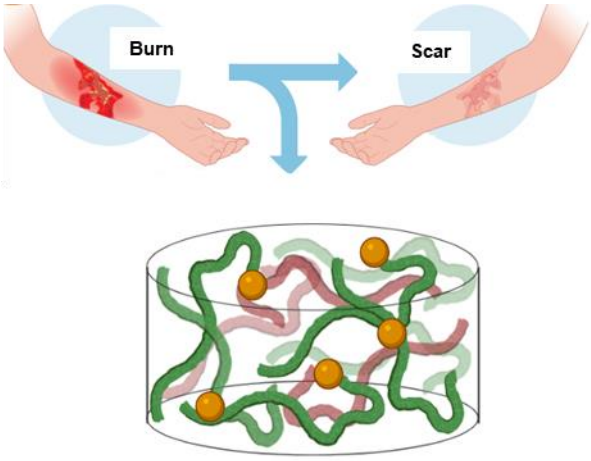
The Skinterm project (Home - SkinTERM) at the Matrix Biochemistry group by dr. ir. Willeke Daamen is currently developing scaffolds that mimic the fetal microenvironment for scarless healing.

After a full-thickness skin (burn) injury in adults, the end stage of wound healing is characterized by contractures and fibrotic tissue. However, human skin can regenerate without a scar before 24 weeks of gestation. The main different remain in its extracellular matrix in the skin with and abundancy of type III collagen, hyaluronan and effector molecules such as sonic hedgehog (SHH). It is know the immune system plays a key role in regeneration depending on the macrophages polarization. This behaviour will be explore in this study.

This internship will consist on the construction and evaluation of type I collagen scaffolds in combination with components such as type III collagen, heparin/RGTA and effector molecules. Later on, the student will focus in the *in vitro* analysis of macrophages in the different scaffolds to observe if the macrophages polarize to pro-inflammatory (M1) or pro-regenerative (M2) type.

Techniques and methos applied:

- Type III collagen isolation and characterisation
- Scaffold construction and characterisation
- Scanning electron microscopy
- Amine group quantification
- Immunostaining
- Cell culture with macrophages
- SDS-PAGE and Western blotting
- RT-qPCR
- Possible flow cytometry



Type I collagen scaffold + regenerative components

Illustration by Manon Zuurmond, LUMC

We are looking for a motivated student with a special interest in skin regenerative medicine. The intended starting date is in September/October 2023. Experience with cell culture is seen as an advantage. If you are interested in this position, please send your CV and motivation letter to Nancy Avila Martinez (Nancy.AvilaMartinez@radboudumc.nl).