

Bachelor's thesis at the Department of Neurology

Who we are: We are a young and successful scientific Team in “Translational Somatosensorics” focusing on pain research and are located at the Department of Neurology, University Hospital of Würzburg.

Aim: Characterization of calcium activity in small fiber neuropathy patient-derived keratinocytes and keratinocyte-sensory neuron co-cultures.

Background: Keratinocytes are predominantly known for their skin barrier function. However, they also detect external stimuli and actively transduce these towards sensory nerve endings in the skin. Small fiber neuropathy (SFN) patients have morphological and functional impairments of sensory nerve endings, often leading to chronic pain. We want to determine whether hyperactive keratinocytes represent a factor contributing to small fiber neuropathy. Therefore, we derived primary keratinocytes from skin punch biopsies and generated and characterized hiPSC-derived sensory neurons. Now, via calcium imaging, we aim to compare baseline and PIEZO1 stimulated keratinocyte cell activity of SFN patients versus healthy controls. Furthermore, via co-culture with sensory neurons, we want to decipher the spatiotemporal characteristics of their signal transduction.

Tasks:

- Cell culture of primary keratinocytes and hiPSC-derived sensory neurons
- Fluorescence live cell imaging (calcium imaging)
- Analysis of recorded calcium activity (Calima2/ImageJ)
- Labeling of specific cell markers in fixed cultures via immunohistochemistry

Requirements: We are looking for a student (m/f/d) of Life Sciences or related Faculty who is motivated to engage himself/herself in this exciting project and to become part of our enthusiastic research team!

Start and duration: From now on for four months (six weeks Praktikum + ten weeks Bachelor Thesis)

PI and contact: Please send your application including a motivation letter to Prof. Dr. N. Üçeyler ueceyler_n@ukw.de.