Master's thesis at the Department of Neurology

Aim: Uncovering the impact of bortezomib on patient-specific iPSC-derived Schwann cell identity and inflammatory signaling

Background: Schwann cells play a crucial role in maintaining peripheral nerve function and exhibit remarkable plasticity in response to injury. Upon stress or damage, they undergo phenotypic changes characterized by loss of differentiation markers and activation of repair-associated programs.

Human induced pluripotent stem cell (iPSC)-derived Schwann cells (iSC) represent a powerful model to study these processes in a controlled human *in vitro* system.

Bortezomib, a proteasome inhibitor used in the treatment of multiple myeloma, frequently induces peripheral neuropathy. While its neurotoxic effects on neurons have been studied, much less is known about how bortezomib affects Schwann cells and their contribution to neuroinflammation.

This project aims to establish and characterize iSC and to investigate how bortezomib alters their identity and inflammatory profile, with a focus on chemokine signaling.

Tasks:

- Differentiation and characterization of patient-derived iSC
- Assessment of bortezomib effects
  - Investigation of changes in Schwann cell phenotype and marker expression
  - Evaluation of potential loss of cellular identity
- Analysis of inflammatory signaling
  - Measurement of chemokine release (e.g., CCL2) using ELLA
  - Cytokine panel
- Data analysis and interpretation

Techniques: Cell culture, qRT-PCR, immunocytochemistry, Western blot, ELLA

Requirements: We are looking for a student (m/f/d) of Life Sciences or related Faculty, who is motivated to get engaged in this exciting project and to become part of our enthusiastic research team! Prior hands-on experience in cell culture is mandatory. Experience with molecular biology techniques (e.g., qRT-PCR or immunocytochemistry) is advantageous.

Start and duration: Start is possible from September on for nine months.

Team of supervisors: Prof. Dr. Nurcan Üçeyler, Dr. Julia Grüner (gruener_j@ukw.de). Please contact Dr. Julia Grüner if you have questions about the project.

Contact: Application documents (CV and motivation letter) to Prof. Dr. N. Üçeyler: ueceyler_n@ukw.de