Department:	Institute for Stem Cell Biology
Job site:	RWTH Aachen Medical School, Helmholtz Institute for Biomedical Engineering
Description of the position:	**PhD student: Mechanical and epigenetic stimulation to direct differentiation of iPSCs towards MSCs**
Job description:	**Our profile:** The Institute for Stem Cell Biology explores how epigenetic mechanisms govern cell fate decisions. Through interdisciplinary research, we investigate how biomaterials and mechanical forces direct cellular differentiation (www.stemcellbiology.ukaachen.de). You will be part of the DFG-funded graduate school Mechanobiology in Epithelial 3D Tissue Constructs (ME∃T; https://me3t.rwth-aachen.de/) working on project A1 "Mechanostimulation to direct differentiation of iPSCs and iPSC-derived embryoid bodies". **PhD project:** Generation of iPSC-derived mesenchymal stromal cells (iMSCs) raises high expectations for tissue engineering and regenerative medicine. However, achieving directed and uniform differentiation towards iMSCs remains a major challenge. In this PhD project, we aim to leverage hydrogels, cell-cell interactions, and epigenetic editing techniques to enhance directed differentiation within three-dimensional culture systems. Building upon our previous research, we will explore various hydrogel compositions to optimize the generation of iMSCs. Furthermore, we plan to analyze the DNA methylation patterns that are characteristic of MSCs and employ epigenetic editing strategies targeting specific CpG sites to support directed differentiation. This project aims to deepen our understanding of epithelial-to-mesenchymal transition processes and enhance the generation of more uniform iMSCs. **Your tasks:** • Culturing of iPSCs and differentiation toward specific lineages • Handling of hydrogels and biomaterials • CRISPR-based epigenetic editing technologies • Bioinformatic DNA methylation analysis • Cellular characterization with molecular biology methods • Functional analysis of specific epigenetic modifications
Requirements / Your profile:	**Your profile:** • Very good master's degree in either Biology, Biotechnology, Natural sciences or comparable degrees • Experience with iPSC culture is favourable (but not a prerequisite) • Bioinformatic skills and basic knowledge in R is favourable (but not a prerequisite) • Able to communicate clearly in English and willing to work in an international team • Willingness to interact with other research groups
Pay category:	TV-L 13 (65 %)
Hiring date:	July 01, 2025
Duration of employment:	3 years
Contact/Send application to:	Univ.-Prof. Dr. Dr. Wolfgang Wagner Email: wwagner@ukaachen.de phone: +49 (0)241 80-88611
Equal career prospects for women and men.	
Severely disabled applicants with equal qualification will be given preferential consideration.	
Application deadline: March 03, 2025	