



The Institute of Human Genetics (University Hospital Cologne) / CMMC is seeking applications for

PhD candidate/student (f/m/d)

ready to start at any time, applications are welcome until positions are filled.

We are searching for students interested in the area of

Neurodegeneration, Alzheimer's disease and related tauopathies, neurogenetic disease, and basic cellular neurobiology

to join the laboratory "Functional Genetics of Neurodegeneration and Neurologic Disorders" under the lead of Hans Zempel, MD PhD MSc, with currently 1 technician, 1 post-doc, 4 PhD students, and 1-2 undergraduate students. The group is embedded in the Center for Molecular Medicine Cologne (University of Cologne), and the Institute of Human Genetics (University Hospital Cologne).

The applied methods in our laboratory comprise (but are not limited to) state of the art cellular neurobiology / cell biology, molecular biology / advanced genetic engineering, biochemistry, advanced microscopy. Applicants should be enthusiastic about understanding basic disease pathomechanisms, but also to drive translation from bench to bedside, to help find treatments for currently incurable neurodegenerative and neurogenetic disease. For a brief overview of current projects, see:

<https://humangenetik.uk-koeln.de/en/research/functional-genetics-of-neurodegeneration-and-neurological-disorders-working-group/>

<https://www.cmmc-uni-koeln.de/research/career-advancement-groups/>

Your profile

- **Master of Science (or similar)** in Biology, Biochemistry, Neuroscience, Biotechnology, Molecular Medicine, or related disciplines
- High level of intrinsic motivation and reliability
- Collaborative work attitude and flexibility
- Experience in microscopy, cell culture and animal work is highly favoured, but not strictly necessary
- Good oral and written communication skills in English

Our offer

- A highly motivated international team of young researchers associated with and located in the CMMC, the University Hospital Cologne and the University of Cologne.
- Close contact to principle investigators and research groups of the above mentioned institutes
- Fast integration to an open-minded and welcoming group
- Supervised training in performing advanced laboratory work, scientific writing for publications and grants, and scientific presentations

The applicant is supposed to work on the following projects:

The microtubule-associated protein Tau is a key driver of the neurodegeneration observed in Alzheimer disease (AD) and related types of dementia syndromes, so-called tauopathies. Until today, there is no cure for these detrimental disorders, which represent a great burden for those affected, their relatives, and society. Besides its role in disease pathogenesis, Tau stabilizes neuronal microtubules and likely promotes essential functions, such as axonal growth, transport, synapse formation, and neuronal activity. Alternative splicing of the gene encoding for TAU, *MAPT*, results in the expression of six isoforms in the human brain that differ in their intracellular localization. Most models of AD and Tau pathology are based on rodents, which express a different set of Tau isoforms. We have in our lab established human wildtype and TAU-KO iPSC-derived neurons, but also primary neurons from TAU-humanized mice that express all 6 human isoforms of TAU. We have initially produced AAV for specific knockdown of individual human TAU isoforms in vivo, and aim to evaluate TAU knockdown in human cells and in-vivo in TAU humanized mice as a therapeutic approach for Alzheimer Disease and related tauopathies. Focusing on human and humanized cellular and animal models is crucial for understanding the mechanisms behind disease pathology and validating that the proposed functions of Tau are not limited to the model system used.

Further information & Contact

Application deadline: None. The positions are advertised until they are filled.

Candidates should submit a single PDF including a brief motivational letter (max. 1 page), curriculum vitae, academic transcripts and a description of previous research experience.

Please send your application **as one single**, compressed PDF-file to:

hans.zempel@uk-koeln.de

Applications from female candidates are welcome; suitably qualified women will be given preferential consideration unless other applicants clearly demonstrate superior qualifications. We also welcome applications from disabled candidates, who will also be given preferential consideration over other applicants with comparable qualifications.