Ph.D. Opportunities in Neurodegeneration and Gene Therapy

We are seeking two highly motivated and enthusiastic Ph.D. students to join our research team at **Charles University, Faculty of Medicine in Pilsen, Czech Republic**, starting in **October 2026**. The positions are offered within the doctoral program **Physiology and Pathological Physiology**.

Our laboratory investigates the molecular mechanisms underlying neurodegeneration, with particular emphasis on cerebellar pathology in polyglutamine ataxias. In parallel, we develop innovative gene therapy approaches, focusing on vector design, optimization of delivery systems, and their efficient and targeted application in the brain.

Available Ph.D. Projects

1) CRISPR-Based Gene Therapy for Neurodegenerative Diseases

The Ph.D. student will contribute to the *in vivo* component of a translational research project focused on gene-editing approaches for polyglutamine neurodegenerative disorders. The work will involve the optimization and evaluation of delivery systems in the mouse brain, including assessment of vector distribution, target engagement, and functional outcomes. The project will provide hands-on training in neurosurgical techniques, behavioral analysis, histology, and molecular methods. In addition, the student will gain experience in *in vitro* approaches, including work with human iPSC-derived neuronal cultures and cerebral organoids.

2) Primary Cilia in the Pathogenesis of Polyglutamine Ataxias

The Ph.D. student will investigate the role of primary cilia in the pathogenesis of polyglutamine ataxias. The project will combine *in vitro* studies using human iPSC-derived neuronal models with *in vivo* validation in a preclinical mouse model to elucidate how polyglutamine expansion affects ciliogenesis, cellular homeostasis, and neuronal function. The project will employ molecular, transcriptomic, quantitative imaging, metabolic, and functional approaches in both human stem cell–based systems and animal models to explore the mechanistic links between ciliary function and neurodegeneration within a translational research framework.

Requirements

Applicants should:

- Hold (or be close to completing) an M.Sc. degree in neuroscience, molecular biology, biomedicine, physiology, or a related field
- Have a strong interest in neurodegeneration and experimental biomedical research
- Demonstrate motivation, independence, and critical thinking skills
- Possess good communication skills in English (spoken and written)
- Previous experience with cell culture, molecular biology, animal work, or confocal imaging techniques is an advantage but not required

What We Offer:

- An open, inclusive, and international working environment — we strongly encourage applications from international candidates
- An inspiring and supportive research environment at Charles University
- Access to modern research infrastructure and interdisciplinary collaboration
- Career development support and conference participation
- Fully funded Ph.D. position

Charles University is one of the oldest and most prestigious universities in Europe, with a strong international reputation in biomedical research and education. The Faculty of Medicine in Pilsen offers a dynamic and research-oriented academic environment and is located in a modern, newly established campus equipped with state-of-the-art facilities. Pilsen is a vibrant and welcoming university city with a high quality of life, excellent infrastructure, and convenient access to Prague and other major European destinations.

How to Apply

Applicants should send:

- A short CV (one page)
- A motivation letter (one page)
- Contact details for two referees

to Dr. Jan Tuma (**jan.tuma@lfp.cuni.cz**)

For more information see:

https://lfp.cuni.cz/en/doctoral-study/