

**Affiliation:** Masaryk University, Faculty of Medicine  
**Study program:** PhD program Biomedical Sciences  
**Specialization:** Biochemistry and Molecular Biology  
**Workplace:** International Clinical Research Center of St. Anne's University Hospital  
**Mode:** Full-time

**Supervisor:** Gorazd Stokin, Ph.D.  
**Consultant:** Prof. MUDr. Irena Rektorová, Ph.D.  
**Lab's website:** [www.fnusa-ctm.org](http://www.fnusa-ctm.org)

**Title:** Investigating mechanisms underlying axonal transport defects in Alzheimer's disease

**Brief annotation:**

Alzheimer's disease (AD) is a major neurodegenerative disorder characterized by cognitive decline. Despite being the most common cause of dementia worldwide, the causes underlying pathogenesis of AD are poorly understood.

Accumulating evidence suggests that impairments in axonal transport play an important role in the pathogenesis of AD. Understanding of the mechanisms underlying impairments of axonal transport in the pathogenesis of AD, however, remains rudimentary at their best.

We here propose to study the mechanisms underlying impairments of axonal transport in the pathogenesis of AD by focusing on the effects of familial AD (FAD) mutations on the axonal transport in human neurons. More specifically, we propose to investigate:

1. Changes in the behavior of the axonal transport produced by FAD mutations in human neurons.
2. Outcomes of the impaired axonal transport caused by FAD mutations in human neurons.
3. Perturbed interactions between different components of the cargo motor assemblies.

The results of the proposed experiments will significantly advance our understanding of the role of FAD mutations in the axonal transport and the pathogenesis of AD.

**Funding:** FNUSA-ICRC Institutional funds

**Requirements:** master degree in biology, biotechnology or equivalent, experience with induced pluripotent stem cells, microfluidics

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