

Title: Age-related dysregulation of neuronal transport and protein localization (NCN/SONATA BIS)

Supervisor: Lidia Wrobel, PhD

Institute: International Institute of Molecular and Cell Biology in Warsaw

Laboratory: Laboratory of Cellular Proteostasis

www: <https://shorturl.at/octlf>

Project description:

Protein degradation is essential for maintaining cellular proteostasis by controlling protein levels through the ubiquitin–proteasome system and the autophagy–lysosomal pathway. Efficient protein clearance prevents the accumulation of misfolded and toxic proteins, a process that becomes less efficient with age. Aging is also associated with a decline in protein quality control mechanisms and impaired nucleocytoplasmic transport in neurons. However, it remains unclear how these age-related changes contribute to the onset of neurodegenerative diseases, where age is the primary risk factor. As a PhD student, you will generate human neuronal reporter lines to study nucleocytoplasmic transport, apply state-of-the-art mass spectrometry to map protein localization, and use CRISPR/Cas9 together with inducible degron systems to investigate protein function. You will aim to uncover mechanisms underlying observed phenotypes and define their role in early neurodegenerative processes. You will also conduct literature reviews, participate actively in lab meetings, present your work at national and international conferences, and contribute to scientific publications.

Aim:

To characterize age-related changes in nucleocytoplasmic transport and protein localization in human neurons and determine their contribution to early neuronal degeneration in Parkinson's and Huntington's disease models.

Requirements:

- Master's degree in biology, biotechnology, biochemistry or related field
- Hands-on experience with mammalian cell culture is required. Experience with stem cell culture (e.g., iPSCs) or primary cells would be an advantage but is not essential
- Experience with biochemical and molecular biology techniques
- Strong organizational skills and the ability to maintain accurate experimental records.
- Ability to work both **independently and collaboratively** in a multidisciplinary research team.
- Good communication skills and proficiency in **written and spoken English**.

Number of positions available: 1

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