Title: Nuclear proteostasis in neurodegenerative diseases (EMBO IG).

Supervisor: Lidia Wrobel, PhD
Institute: International Institute of Molecular and Cell Biology in Warsaw
Laboratory: Laboratory of Cellular Proteostasis
www: https://shorturl.at/HrRcS

Project description:

Protein degradation is a key mechanism to adapt protein levels to cellular or environmental changes. Maintenance of cellular proteostasis requires temporally and spatially controlled degradation of regulatory and erroneous proteins through ubiquitin-proteasome system and autophagy-lysosomal pathway. Efficient protein removal is crucial to avoid accumulation of misfolded and toxic protein species. The decline in protein clearance pathways is strongly associated with age-related cellular dysfunction and accumulation of toxic protein species is associated with neurodegenerative diseases, including Alzheimer's and Parkinson's diseases. However, it is not clear which cellular compartment is mostly affected as aggregates accumulate in different subcellular regions.

Aim:

In this project, using CRISPR/Cas9-mediated screening and advanced human neuronal models, we would like to understand how mutations associated with neurodegenerative diseases affect nuclear proteostasis, especially the nuclear ubiquitin-proteasome system. Results obtained within this project will reveal insights into pathogenesis and could facilitate new therapeutic approaches for restoring cellular proteostasis.

Requirements:

- Master's degree in biology, biotechnology, biochemistry or related field
- Solid knowledge in at least one of the following disciplines: molecular biology, biochemistry, cell biology, neuroscience, high-throughput screening
- Understanding of mechanisms important for cellular proteostasis
- Basic hands-on experience in one of the fields: molecular biology, cell biology, fluorescent microscopy
- Prior experience in working with human induced pluripotent stem cell (iPSC)-derived neurons would be an advantage but not essential
- Interest in cellular proteostasis and neurodegeneration
- Written and spoken fluency in English
- Willingness to learn and take on new challenges, ability to work independently, analytical thinking
- Good interpersonal skills and a collaborative attitude

Number of positions available: 1

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