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Title of the project:

CHRONOFLOW: Integrated circadian transcriptomic, microRNA, and proteomic profiling of the choroid plexus in relation to blood-cerebrospinal fluid barrier function and glymphatic rhythmicity

Competition: OPUS 29
PI: dr Aleksandra Szczepkowska

Project Information:

Why does the brain clear waste more efficiently during sleep? How do biological rhythms influence brain homeostasis?
CHRONOFLOW explores these questions by investigating one of the brain's most overlooked yet essential structures, the choroid plexus, which produces cerebrospinal fluid (CSF) and forms the blood-CSF barrier. Although the choroid plexus is essential for normal brain function, many of the molecular mechanisms regulating its circadian activity remain unknown. The project combines animal models, cell culture, advanced molecular profiling, functional assays and computational data analysis to investigate the biological mechanisms underlying circadian regulation of the choroid plexus and glymphatic system. Joining CHRONOFLOW offers the opportunity to work with cutting-edge experimental approaches and to develop interdisciplinary expertise at the interface of neuroscience, chronobiology, molecular biology and bioinformatics.

The successful candidate will be responsible for:

- Participation in animal experiments conducted across the 24-hour circadian cycle;
- Isolation of the choroid plexus and cerebral cortex, tissue verification, and downstream sample processing;
- Performing molecular biology analyses, including RNA and protein isolation, quality and quantity assessment, reverse transcription, and real-time PCR;
- Statistical analysis of circadian rhythmicity in experimental data;
- Fluorescence-based assays;
- *In vitro* barriers studies;
- Collection, analysis and interpretation of experimental data;
- Preparation of scientific manuscripts and a doctoral dissertation in the form of a PhD by publication;

Important: The project involves regular work with laboratory rodents (Wistar rats), including habituation and handling procedures designed to minimize animal stress before experimental procedures, as well as collecting tissues and biological samples for research purposes. Candidates are encouraged to carefully consider whether they are comfortable working directly with laboratory animals and animal-derived biological material before applying.

Requirements:

1. Education requirements: Master's degree in biology, biotechnology or a related field (master's degree obtained before the project start - 1 October 2026);
2. Basic understanding of animal physiology;
3. No contraindications to working with laboratory animals and biological material;
4. Basic knowledge of molecular biology, biochemical assays, cell culture techniques, and statistical data analysis;
5. Very good command of spoken and written English;
6. Strong motivation for scientific research, analytical thinking, the ability to critically analyze scientific literature, good organizational skills, and the ability to work both independently and as

part of a team;

Additional assets:

- Previous experience with *in vivo* and/or *in vitro* experiments is welcome;
- Interest in neuroscience, chronobiology, neuroimmunology, or brain barrier research;
- Practical experience in molecular biology techniques;
- Basic knowledge of statistical analysis;
- Research internships, membership in scientific societies or student research clubs, conference participation, and other scientific achievements considered relevant by the candidate will be regarded as an advantage;

Selection process:

- Applications will be assessed in accordance with the criteria set out in the regulations for awarding research scholarships in research projects financed by the National Science Centre;
- Only online applications will be considered;
- Candidates evaluated with the highest score will be invited to an actual interview, which will take place face-to-face or online;
- During the interview, the candidate will be asked to deliver a 10-minute presentation on their Master's thesis and research interests;
- The final recruitment results will be published on InLife webpage within 10 days after final decision;

Important information:

- **Application submission period:** 20 July 2026 (until 23:59 CEST)
- **Application method:** application form
- **Interviews:** July 24-31, 2026
- **Location:** Olsztyn, Poland
- **Duration of the scholarship:** 48 months
- **Expected start date:** October 1st, 2026
- **Number of positions:** 1