



## Two positions for Master students

The *Laboratory of Molecular Basis of Aging and Rejuvenation* ([www.topf-lab.org](http://www.topf-lab.org)) headed by Dr. Ulrike Topf seeks student's to join the project entitled "**Molecular function of zinc storage in ribosomal proteins of eukaryotic cells**" funded by the Polish National Science Centre under OPUS 23 grant 2022/45/B/NZ1/03714.

The overall goal of the research is to understand the involvement of ribosomal proteins in cellular zinc homeostasis during aging. Zinc ions are essential micronutrients but exist in the cell only bound to proteins. Some proteins require zinc for structural stability or zinc is part of the catalytic site of a protein. Ribosomal proteins are abundant and some bind zinc. Cysteine residues coordinate the zinc binding in ribosomal proteins. During cellular stress and ageing the production of reactive oxygen species (ROS) increases leading to the reversible oxidation of thiol groups in ribosomal proteins ([Topf et al., 2018](#)) ([Jonak et al., 2024](#)). Using protein biochemistry and spectroscopy approaches, we are studying if zinc ions can be released from ribosomal proteins and what are the consequences of such process for the ribosome and the translation process. Further, we are analysing consequences for the translation machinery of restricting zinc availability and study potential benefits of zinc supplementation during organismal aging.

### Project #1

In this project, you will work with the yeast *Saccharomyces cerevisiae* and investigate the response of cells to zinc limitation. You will use molecular biology techniques such as PCR, qRT-PCR, cloning and protein biochemistry to study changes in the expression of ribosomal proteins, zinc transporters and other abundant zinc-binding proteins. Genetic manipulations will be used to generate new yeast strains with increased sensitivity to zinc starvation. Selected yeast strains will be analysed for changes in the translational profile using ribosome profiling techniques.

### Project #2

In this project, you will work on determining the effects of zinc supplementation on the health and lifespan of nematode *Caenorhabditis elegans* using both wild-type and zinc transporter mutant strains. You will investigate the effects of zinc supplementation on lipid metabolism, cognitive functions, intestinal integrity, and tolerance to oxidative and heat stress. qRT-PCR will be used to study how zinc supplementation affects the expression of zinc-binding ribosomal proteins and zinc-dependent proteins involved in regulating metabolism, and stress response pathways.

### We offer:

Scholarship in the amount of 1500 PLN gross/ month (total 12 months)

### Requirements for the candidate:

- Being a second degree student or minimum fourth year student of the master's studies of a faculty of natural sciences;
- Excellent knowledge of written and spoken English;
- Communication and teamwork skills are essential;
- High motivation to do science (e.g. documented by involvement in research projects, conferences, non-curriculum course work, science club, etc.).

### How to apply:

- Send your application to [recruitment@ibb.waw.pl](mailto:recruitment@ibb.waw.pl)



- In the subject include "**Master`s student**" and your first and last name.
- Your application must be submitted in English and should contain:
  - Motivation letter (state your preference for project #1 or project #2)
  - *Curriculum vitae* (CV)
  - Recommendation letter (optional)
  - **Please include the following statement in your application:** "In accordance with the personal data protection act from 29th August 1997, I hereby agree to process and to store my personal data by the Institution for recruitment purposes."

The deadline for applications is **January 31<sup>st</sup> 2025**. Start date soon after completion of the recruitment. Short listed candidates will be invited for an interview. **Applications will be reviewed on a rolling-basis**. Applications submitted after the deadline will be still considered if the position is not filled.