



Instytut  
Biologii  
Ewolucyjnej



University of Warsaw  
Biological and Chemical  
Research Centre



## PhD position in the project

# Unravelling the establishment of endosymbiosis: quest for intermediate evolutionary stages among microbial eukaryotes (SYMBIOSTART)

### Project description

The phenomenon of endosymbiosis - in which one organism lives within another - led to major evolutionary transitions such as the origin of mitochondria and plastids. We currently know that there have been several independent events of endosymbiosis in early eukaryotic evolution, giving rise in some cases to major eukaryotic superclades. However, despite its significance, we still do not understand the mechanism of endosymbiotic integration. Only by examining more recent endosymbioses in various phases of integration can we make progress in our understanding of the host-endosymbiont integration process. In this regard, the endosymbioses of microbial eukaryotes, due to the unicellular nature of the host, provide the most suitable systems for studying the establishment of endosymbiosis. However, the number of such models is very limited and does not allow the reconstruction of the mechanisms of integration. Moreover, recent advances in diversity research suggest that intracellular symbioses are common among microbial eukaryotes, providing a golden opportunity to identify unicellular symbiotic systems in intermediate stages of integration.

To identify the intermediate stages of endosymbiotic integration, SYMBIOSTART will combine screening of diverse freshwater environments for microbial eukaryotes and their endosymbionts with studies on established culturable systems. The goal is to provide a wide range of systems in various stages of integration, which will be further studied to highlight the genomic and ultrastructural features that accompany endosymbiont integration using genomics, transcriptomics and microscopy. Overall, SYMBIOSTART will address the most challenging questions about endosymbiotic events: how integration occurs and what is the relative timing of the steps involved.

### Research Team

The [Genomics and Evolution of Microbial Eukaryotes](#) research team focusing on the diversity, ecology and evolution of eukaryotic microorganisms. We are interested in the eukaryotic cell's evolution, including the evolution of endosymbiotic organelles and the effect of horizontal gene transfer (HGT) on the evolution of Eukaryota. We also strive to understand the role of eukaryotic microorganisms in aquatic environments by researching their diversity and metabolic potential and their interactions with other microorganisms. We use various techniques to study those problems, such as sampling and isolation of cell cultures, microscopy and molecular biology techniques, and bioinformatic analyses of high throughput sequencing data of genomes, transcriptomes, metagenomes, and amplicons.

### Specific Tasks

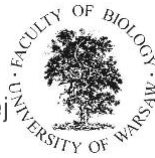
- Analysis of high-throughput sequencing data: assembly and annotation of genomes, metagenomes and transcriptomes, amplicon data analysis
- Isolation and culturing of microbial eukaryotes
- DNA & RNA isolation from environmental samples and cultures, PCR, preparation of libraries for total genome, transcriptome & amplicon sequencing, Nanopore sequencing
- Publication of the obtained results in conference talks & papers, active participation in publishing original research articles



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## Requirements

- Master's degree in biology, biotechnology or related field (obtained before September 23<sup>rd</sup>, 2024)
- Status of a doctoral student at the Doctoral School of Exact and Natural Sciences of the University of Warsaw at the beginning of the contract
- Being self-motivated, organized, and highly team-oriented
- Proficiency in English (oral and written)
- Background in bioinformatics, especially genomics, transcriptomics and metagenomics.
- Familiarity with microscopy, molecular biology techniques, and microbiology techniques will be an advantage.

## What do we offer?

We offer a scholarship for a PhD student in the National Science Centre project Sonata BIS: Unravelling the establishment of endosymbiosis: quest for intermediate evolutionary stages among microbial eukaryotes (SYMBIOSTART)

- Starting date: 1 October, 2024
- Scholarship up to 48 months.
- Scholarship from the project: 2000-5000 PLN per month (at the top of the scholarship from the doctoral school).
- Location: Institute of Evolutionary Biology, Faculty of Biology, University of Warsaw

## Application process

**Application deadline:** 3 June, 2024

Interested candidates should e-mail project leader Anna Karnkowska ([a.karnkowska@uw.edu.pl](mailto:a.karnkowska@uw.edu.pl)) with a reference in the topic Sonata-PhD. Please include: (1) CV, (2) a motivation letter, (3) contact information of two potential references, and (4) a scan of signed, written permission for recruitment-related personal data processing, which states: „I give permission to the University of Warsaw, registered at the address of ul. Krakowskie Przedmieście 26/28, 00-927 Warszawa, to process my personal data for the purposes of carrying out the recruitment procedure, choosing the employee, and entering into an employment contract with the University of Warsaw, if applicable. I have been informed about my legal rights and obligations in relation to these actions. I acknowledge that providing the aforementioned personal data is done by me on a voluntary basis.“

Selected candidates will be invited for the interview until 5 June. Interviews will be held 6-12 June via video conference, and final decision will be made until 13 June, 2024.



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