Instytut Biologii Ewolucyjnej

Position in the project

ANALYSIS OF FUNCTIONAL AND TAXONOMIC DIVERSITY OF SYMBIONTS AMONG EUGLENOZOAN PROTISTS (SYMBIOZOANS)

Project description

Symbiotic bacteria played a crucial role in the evolutionary success and diversity of eukaryotes. Through the uptake of once free-living bacteria, eukaryotes gained the mitochondrion for generating ATP at high yields as well as the photosynthetic plastid. The incorporation of bacteria into eukaryotic hosts has happened not only twice in the history of life. Numerous more recently acquired prokaryotic symbionts continue to play a major role in the evolution of eukaryotes, expanding their metabolic potential and diversifying ecological niches by nutrient provisioning, removing toxic metabolites, defending against predation and bacterial infections, and eliminating competitors. Such symbioses are extremely common among protists, which are single-cell organisms accounting for most of eukaryote diversity.

The project focuses on the analysis of the frequency and diversity of endosymbiotic (=intracellular) bacteria in euglenozoan protists that are very common and often dominant in soil, lakes, and the ocean. We will undertake a large-scale screening for endosymbionts among euglenozoans already available in culture and newly isolated strains, which we will establish from natural samples. In addition, we will evaluate the frequency and diversity of symbiont-bearing euglenozoans in natural environments, focusing on hypoxic and oxygenated freshwater and marine sediments sampled from the Baltic Sea and Masurian Lakes (Poland). For detection and characterization of symbionts, we will use a range of culturing, microscopy, and molecular methods, such as fluorescent in situ hybridization (FISH), fluorescent staining and microscopy, sequencing of 16S and 18S rRNA genes and single-cell sequencing. The most interesting protist-symbiont systems will be characterized in-depth using light and electron microscopy and sequencing genomes of symbionts and their euglenozoan hosts. With this approach, we aim to understand the nature of the symbiotic relationship and the advantages that symbionts provide to their hosts.

Specific Tasks

- Maintaining cultures of protists and algae: microscopy, preparation of media, transferring of cultures
- Isolation of DNA, PCR, Sanger sequencing
- Fluorescent in situ hybridization – preparation of samples and microscopy.

Requirements

- Previous experience in maintaining any cultures of microorganisms or cell lines
- Basic knowledge in molecular biology, including isolation of DNA with kits, PCR, gel purification, Sanger sequencing.
- Conversation level English.

What do we offer?

We offer a contract for the student within the project funded by the National Science Centre

Starting date: as soon as possible, not later than January 1, 2025

The scholarship of 2400 net/month, for 3 months. With a possibility of extension.

Instytut
Biologii
Ewolucyjnej

Application process

Application deadline: December 17 2024

Interested candidates should e-mail project leader Daria Tashyreva (d.tashyreva@uw.edu.pl) with (1) their 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 on December 18, 2024. The final decision will be made before December 19, 2024.