December 2024

BIOLOGY CENTRE CAS

Open PhD student position

at the Department of Aquatic Microbial Ecology, Institute of Hydrobiology, Biology Centre CAS, České Budějovice, Czech Republic

A PhD position is open to study viruses of protists, with an emphasis on Giant Viruses and Polinton-like viruses, using high-throughput isolation methods, genomics, transcriptomics, proteomics, and experimental approaches.

Background

Protists are susceptible to infection by viruses just like all cellular life forms. However, little is known about their defense systems. Polinton-like viruses (PLVs) exist both as transposon-like elements in protist genomes and as bona fide DNA viruses that parasitize protist-infecting Giant Viruses (GVs), limiting their spread and safeguarding protist populations. Despite their remarkable abundance in some aquatic environments and expansions in certain protists, how PLVs infect cells, interact with the GV replication machinery, and the conditions under which they might reactivate from their host's genome remains obscure. To address these knowledge gaps, we propose to combine state-of-the-art genomics, transcriptomics, and proteomics to track individual infection stages in model protist-GV-PLVs systems. To achieve this, we will first isolate freshwater protists and subsequently their GVs and PLVs. The anticipated outcomes will enhance our understanding of antiviral defense systems in microeukaryotes and microbial interactions at large.

Requirements

The announced position is within the framework of a project recently granted by the Czech Science Foundation (GAČR grant 25-15920S - Polinton-like Viruses: Guardians or Predators of Protists?) addressing the putative role of Polinton-like viruses in mitigating protist death by Giant Virus infection.
Applicants for the PhD position must have, or are expected to receive by July 2025, an M.Sc. degree in Biological Sciences (e.g. Microbiology, Biotechnology, Molecular Biology, Bioinformatics) and must show a strong interest in virus biology and eukaryotic genomics. Work is expected to be 60% computational and 40% laboratory based. Prior experience in Linux/Perl/R/Python programming might be favourably considered but is not a prerequisite for selection. Minimum practical experience with basic molecular biology methods is highly desirable. Candidates must be proficient in English.

To Apply

Please submit a detailed CV (including your grades), a brief statement of your research interests and work performed (max. 1 page), and the name and contact information for at least one referee. Preferably combine all this information into a single PDF file and send *via* email with the subject 'PhD Position' to bulzupaul@gmail.com. The position will remain open until a suitable candidate is found, applications will be evaluated monthly starting December 20, 2024 (final deadline for submissions - 31.03.2025). The target starting date is July 2025, with a later (1-2 months) date being negotiable.

About the employer

The Department of Aquatic Microbial Ecology (Institute of Hydrobiology, Biology Centre of the Czech Academy of Science) is an internationally recognized high-class institution for studying freshwater microbes. There are five well-equipped microbiological laboratories: a general wet-lab, two labs for bacterial and eukaryotic

cultivation, and two for molecular biology. Instrumentation: A fully automated fluorescence microscope with image analysis for high-throughput evaluation of CARD-FISH stained samples, three fluorescence microscopes equipped with image analysis systems, inverted microscopes, a micromanipulator and microinjector, a spectrofluorometer, basic equipment for cultivation and molecular biology, ultra-low temperature freezers, a flow cytometer. Full equipment for lake sampling is available. Seven Linux servers and five Network-attached storage (NAS) units (total 1216 threads, 9 TB RAM, ca. 1000 TB of storage) are available with all relevant software installed for omics data analyses. One MinION (Oxford Nanopore) machine is available for performing long-read sequencing of DNA. Two Nvidia Tesla T4 graphics processing units (GPU) are integrated on servers for performing basecalling of long reads, including calling of modified bases for epigenomics analyses.

About the location

České Budějovice (Budweis) is a medium-sized city ca. 150 km south of Prague with 100,000 inhabitants, a relaxed atmosphere, and a growing expat community at the Biology Centre and the University. Both the town and the surrounding countryside provide numerous opportunities for research and leisure activities. Living costs are low by international standards. PhD students have access to accommodation in dormitories at the campus shared by the Biology Centre and the University.

Contact

Please feel free to contact me for further information about the position at bulzupaul@gmail.com

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Links

Biology Centre CAS	https://www.bc.cas.cz/en
Institute of Hydrobiology	https://www.hbu.cas.cz/en/
Department of Aquatic Microbial Ecology	https://www.hbu.cas.cz/en/structure/ame/
Laboratory of Microbial Ecology and Evolution	@SmallThingsLab 𝕏 (Twitter)