Julia A. Packer

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RESEARCH INTERESTS

Evolutionary biology, genomics, protistology, molecular biology, ecology

EDUCATION

Dalhousie University, Halifax, Canada — Sep 2024—
Master of Science in Biology — Cumulative GPA: 4.3/4.3
Thesis Title: Phylogenetics of novel deep-branching eukaryotes Supervisor: Dr. Alastair Simpson

Dalhousie University, Halifax, Canada — Sep 2020 — May 2024
Honour's Bachelor of Science: Biology; First Class

PUBLICATIONS

Journal papers

- **Packer, J.A.,**; Zavadska, D., Weston, E., Eglit, Y., Richter, D.J., Simpson, A.G.B. (2025). Characterisation of *Allobodo yubaba* sp. nov. and *Novijibodo darinka* gen. et sp.nov., cultivable free-living species of the phylogenetically enigmatic kinetoplastid taxon Allobodonidae. *Journal of Eukaryotic Microbiology*, 72, e13072. doi: 10.1111/jeu.13072

- Zavadska, D., **Packer, J.A.**, Simpson, A.G.B., Richter, D.J. (2025).Phylogenomics of free-living neobodonids reveals they are a paraphyletic group from which all other metakinetoplastids are descended. bioRxiv. https://doi.org/10.1101/2025.10.03.680260

- Lee, W.J., Lax, G., Weston, E.J., **Packer, J.A.**, Hall, A., Kim, S.Y., Jeong, D.H., Simpson, A.G.B. (Accepted; minor revisions). A revised understanding of petalomonad diversity (Petalomonadida; Euglenida) enabled by a cultivation approach, with five new species and two new genera. Journal of Eukaryotic Microbiology. MS# 1203793; ecc6fdcd-b57e-4bc7-8647-56638864e791.

Theses

- The phylogeny and characterization of GEM-kin, a representative of the evolutionarily pivotal kinetoplastid taxon Allobodonidae. (2024). Dalhousie University. Bachelor's Honours. Number of Pages: 62 Supervisor: Simpson, Alastair.

AWARDS

Dalhousie FGS Scholarship — 2025, 15,000 CAD p.a.
Academic merit, internal university scholarship

Junior Gray-Doolittle Award for Research Excellence — 2025, 50 CAD
Research achievements, one award given to the top undergraduate in the institute

Holtz - Conner Award — 2024, 1,400 USD
Travel award for international conference

Faye Sobey Undergraduate Research Award — 2024, 9,500 CAD
Top undergraduate research award at Dalhousie University

MITACS RISE-Globalink Research Award — 2022, 6,000 CAD
Academic merit, external research organization

Dalhousie in course scholarship — 2021, 500 CAD
Academic merit, internal university scholarship

RESEARCH EXPERIENCE

Master's Student — Halifax, Canada
Dalhousie University — Sep 2024 — Present

- Used multi-gene phylogenomic analyses to resolve the placement of three novel deep-branching eukaryotes and created *de novo* genomes for each new isolate
- Bioinformatics: Transcriptome assembly (Illumina short reads), phylogenomics, genome assembly (long read) and decontamination, genome annotation

- Oxford Nanopore Technology: library preparation, sequencing, and assembly (gDNA, metagenomic samples)
- Single-cell genomic (MDA, PTA) and single-cell transcriptomics (Smart-Seq2) methods
- Electron microscopy chemical fixation and imaging
- Florescence activated cell sorting using florescence *in situ* hybridization, rRNA probe design
- gDNA harvesting and RNA harvesting (Phenol-chloroform)

Faye Sobey Undergraduate Researcher Halifax, Canada
Dalhousie University May 2024 — Sep 2024

- Mansucript writing (resulted in first-author paper)
- Transmission electron microscopy chemical fixation and imaging (data used in Packer et al., 2025 and Lee et al., 2025)
- 16S PacBio sequencing and microbiome bioinformatic analysis (QIIME2)

Honour's Student Halifax, Canada
Dalhousie University Sep 2023 — May 2024

- Described morphology and taxonomic position for a novel kientoplastid genus - *Novijibodo darinka*, data was used in Packer et al., 2025
- Cell culture, media preparation
- Transmission and scanning electron microscopy fixation and imaging, DIC, live microscopy
- DNA extraction and PCR, bulk RNA harvesting (Phenol-chloroform)
- Single-gene phylogenetics

Independent research student Halifax, Canada
Dalhousie University Sep 2023 — Dec 2023

- Ecological modeling of migratory bird populations. Project led to a revised understanding of common eider migratory dynamics in Atlantic Canada to improve monitoring standards.
- Data normalization and visualization in R

Self directed project Halifax, Canada
Dalhousie University 2023 — 2024

- Used Bayesian statistics to re-model population dynamics in coral reefs in Australia, assessing the effects of climate change.
- Multi-level hierarchecal modeling (STAN) and data visualisation (R)

RISE-Globalink Research Internship Rostock, Germany
University of Rostock May 2022 — Aug 2022

- Animal care and training, data collection

EMPLOYMENT

Dalhousie University Halifax, Canada
Teaching Assistant - BIOL1010 and BIOL2004 Sep 2024 —

- Lead first and second year biology labs (35 students each)
- Presentation and demonstration of techniques, provide assistance to students
- Marked assignments and answered questions

Canada Food Inspection Agency Remote, Canada
Student Data Analyst Sep 2023 — Mar 2024

- Analyzed data (R and excel) to interpret trends in pathogen testing, presence at farms, and in food recalls
- Updated food inspection models to improve food safety in Canada

PRESENTATIONS AND TALKS

Special Symposium: Predatory Protists Seoul, South Korea 2025
Symposium - Proposed, organized and chaired - *International Congress of Protistology*

Microscopy And Multi-Gene Phylogeny Of Novel Deep Branching Protist Isolates Seoul, South Korea 2025
Speaker - International Society of Protistologists PSA-ISOP-ISEP conference

Invited talk: Free-living Kinetoplastids Vancouver, Canada 2025
Speaker - Keeling Lab UBC

The Phylogeny and Taxonomic Position of Two Novel Pivotal Kinetoplastid Cultures Seattle, USA 2024
Speaker - International Congress of Protistology

TEM Reveals Endosymbiont in a Novel Kinetoplastid Clade Internal university: Halifax, Canada 2024
Institute of Comparative Genomics

The phylogeny and taxonomic position of GEM-kin, a culture representing the evolutionarily pivotal kinetoplastid taxon Allobodonidae. *Poster*

- Lett Symposium — Internal: Halifax, Canada 2024
- Biology and Applied Aquatic Science Conference — Provincial: Halifax, Canada 2024
- Cameron Conference — Internal: Halifax, Canada 2024

SKILLS

- **Programming:** R - frequentist statistics, modeling, data visualization, data manipulation (dplyr, ggplot2, tidyverse, tidyr, shiny, RMarkdown, forcats, rethinking, etc.); STAN - Bayesian model creation (C++ based); Python - bioinformatics and data visualisation; HTML - website development
- **Bioinformatics:** RNA and DNA data processing of long and short reads (*de novo* transcriptome and genome assembly, sequence data analysis, marker gene profiling, functional prediction), multi-gene phylogenomics, 16S environmental analysis (QUIIME2)
- **Miscellaneous:** Microsoft Office Suite, LaTeX, Git, Bash, Tableau

OUTREACH and OTHER PARTICIPATION

Institute of Comparative Genomics — Halifax, Canada 2023 —
Trainee

- Attend weekly meetings to discuss recent research and findings in our field. The institute provides access to workshops, networking events, and other career development opportunities.

Biology Organization of Graduate Students — Halifax, Canada May 2024 —
President and (former) Treasurer

- President: resolve funding issues for graduate students, organised retreats, social events, and advocated to the administration on behalf of graduate students (˜50 students).
- Treasurer : managed all finances and budgeting of the society. Collected funding, kept ledgers, and created audit reports for the society.

Outreach - MicroScape — Halifax, Canada 2024 —
Volunteer

- Community outreach project lead and funded by the Institute for Comparative Genomics (Dalhousie University), partnered with the Discovery Centre (Halifax, NS). Created educational and interactive science stations for kids. Lead the live sample microscopy station

Mentor for Undergraduate Students — Halifax, Canada 2024 —
Mentor

- Mentored three undergraduate students in the lab by assisting them with literature reviews, training on laboratory tasks and experiments (DNA extraction, electron microscopy preparations, PCR), and provided research guidance and advice. Trained graduate students on transmission electron microscopy preparations. Data generated will be used in future publications.

Microbiome Workshop — Halifax, Canada Jul 2024
Participant

- Attended a week-long bioinformatics workshop at Dalhousie University to develop programming skills for tools used in molecular data analyses and analysis of outputs: sequence data analysis, marker gene profiling, MGS and read based profiling, and MAG assembly and binning.

Outreach - Diversity of Nature — Halifax, Canada Jul 2023
Organizer

- Organized and lead a 2-day outreach event that aimed to help young underrepresented communities who don't usually have access to STEM education get access in their communities. We partnered with Girl Guides of Canada to teach the girls about ocean health with a shoreline clean up and a creative art project to learn about photosynthesis in the ocean.

REFERENCES

Prof. Alastair Simpson
Professor of Biology, Dalhousie University, Halifax, Canada
E-mail: alastair.simpson@dal.ca Phone: 902-494-1247

Prof. John Archibald
Director: Institute of Comparative Genomics, Professor of Biochemistry, Dalhousie University, Halifax, Canada
E-mail: john.archibald@dal.ca