



PhD position – investigating the role of the gut microbiome on the health and nutrition of salmonid fishes

Location: [Animal Biosciences Department](#), University of Guelph, Guelph, ON, Canada

Advisor Name: Prof. David Huyben (huybend@uoguelph.ca)

Start Date: May 1, 2024 but negotiable

Stipend: \$28,000/year for 4-years

Project Background: Prof. Huyben is seeking an applicant for a 4-year PhD project focused on determining the role of the gut microbiome on the health and nutrition of salmonid fishes. The project is funded by NSERC Discovery in partnership with several feed companies and functional ingredient suppliers. The goal of this research project is to use a combination of cutting-edge *in vivo* and *in vitro* techniques to assess the contribution of nutrients from the gut microbiome to fish and influences from diet, life-stage and genetic family. This project will mainly focus on farmed salmonid fishes, such as rainbow trout and Atlantic salmon, from freshwater hatcheries.

Project Activities:

- Literature review and meta-analysis on fish gut microbiome studies,
- Bench trials (*in vitro*) using a Robogut bioreactor to simulate the fish gut,
- Feeding trials (*in vivo*) to determine effects of diet and family on the microbiome,
- Sampling fish at Ontario fish culture stations, fish farm hatcheries and the Ontario Aquaculture Research Centre (35min drive north of Guelph),
- Nutritional analyses of feeds and fish (proximate, amino acids, fatty acids, etc),
- Gene expression, genotyping and 16S microbiome sequence data analyses,
- Statistical analysis in R and writing several papers for publication,
- Presenting at Ontario Aquaculture and Canadian Aquaculture conferences,

Required Skills:

- Strong background in fish biology and aquaculture with additional knowledge on molecular biology, microbiology, immunology, genetics and/or nutrition,
- MSc degree in fish biology, aquaculture, animal science or a related field,



- Experience performing a literature review, laboratory work, data analysis (Excel), statistical analysis (R) and writing up results for publication,
- Molecular lab skills that include: DNA/RNA extractions, DNA/RNA quantification (gels, Nanodrop, Qubit or tapestation), PCR library preparation and/or qPCR,
- Ability to work independently, problem-solve and think critically,
- Strong written and oral communication skills and experience presenting at workshops and/or conferences.

Preferred Skills:

- Hands-on experience feeding and dissecting rainbow trout and Atlantic salmon,
- Experience assisting technicians and graduate students with fish research trials,
- Experience coding (C, Unix or Python) and using bioinformatic pipelines on sequence data from genotyping and/or the microbiome (Mothur, QIIME, DADA2).

The University of Guelph continues to work on improving equity, diversity and inclusion (EDI) in its study programs and workplaces. See [here](#) about EDI at UoG, see [here](#) about the Office of Diversity and Human Rights and [here](#) about EDI at the ABSc department. Applications from all qualified individuals are encouraged, including from groups that are traditionally underrepresented. See [here](#) for more info on the application process from international/out of province applicants regarding Graduate & Postdoctoral Studies.

Application Instructions: Qualified candidates should send their CV, transcript and cover letter (one-page) to Prof. David Huyben (huybend@uoguelph.ca) with the subject “PhD application”.

Application Deadline: Monday March 11th 2024 at 11:59pm

Links to learn more:

- [Dr. David Huyben's faculty website](#)
- [Dr. David Huyben's lab website](#)
- [Grad Studies at ABSc website](#)
- [Aquaculture Centre website](#)