

NSERC Alliance Postdoctoral Fellowship May 2023 - October 2025

With support from the Natural Sciences and Engineering Research Council of Canada (NSERC), the Lawson Health Research Institute is offering a postdoctoral fellowship (PDF) involving medical imaging of microbiota. The trainee will join a city-wide Molecular Imaging Program equipped with state-of-the-art imaging platforms; engaged with clinicians and PhD scientists; guiding clinically translatable imaging technology for microbial therapies.

Project: Detection of Microbiota with PET/MRI

In current clinical practice, medical imaging can only see the damage to our bodies caused by infection. If instead bacteria themselves could be imaged and their species identified, then treatment could start with more selective therapy before tissue is damaged. To address this need, we are developing the means to track bacteria by directly labelling these cells with ⁸⁹Zr and using simultaneous positron emission tomography/magnetic resonance imaging (PET/MRI) to image the location, migration, and persistence of ⁸⁹Zr-labelled bacteria *in vivo*.

⁸⁹Zr is a long-lived positron emitter with a half-life of 3.3 days, that we produce on the Lawson medical cyclotron. By adapting radiochemistry developed for mammalian cell tracking, we have used a bifunctional chelator to covalently link the metal complex to protein on the bacterial cell surface. This technology will also be applied to bacteriophage, a class of virus that target specific bacteria. By labelling bacteriophage with ⁸⁹Zr, we will create a powerful tool to seek specific bacteria *in vivo* and non-invasively image them using PET and its hybrid modalities. This project entails working with a team dedicated to the *in vivo* detection of bacteria using bacteriophage; development of radiolabelling procedures; large (pig) and small (rodent) animal imaging; microbiome analyses of tissue; and translation of imaging methods to human study.

The successful candidate will join an inter-disciplinary, molecular imaging research team at the Lawson Health Research Institute, London, Ontario, Canada. The project is supported by an onsite cyclotron and radiochemistry facility; molecular biology and biochemistry research laboratories; animal use protocol and care facility; and PET/MRI dedicated to research, all enclosed within a hospital-based research institute. The team's expertise includes molecular biologists, radiochemists, imaging scientists and technologists, with staff and trainees at all stages of research career trajectories.

Required Qualifications:

- PhD in microbiology, virology, biochemistry, biophysics or related field; dissertation involving molecular biology
- Proven written and oral communication skills
- Proven laboratory skills

Preferred Additional Requirements:

- Prior experience with microbiota data analysis and/or molecular imaging is an asset.

Joint Supervisors:

Donna E. Goldhawk, PhD (dgoldhawk@lawsonimaging.ca), Medical Biophysics, Western University and Imaging, Lawson Health Research Institute

Jeremy P. Burton, PhD (Jeremy.Burton@LawsonResearch.com), Surgery, Urology, Microbiology & Immunology, Western University and Canadian Centre for Human Microbiome Research, Lawson Health Research Institute

Terms of Employment:

The Lawson Health Research Institute is committed to fostering a climate of equity, diversity, inclusion, and accessibility. This commitment is central to, and mutually supportive of, our mandate for research excellence.

We welcome and respect the diversity of all members of our community and we support an inclusive culture for our clients, families, research scientists, staff, participants, trainees, volunteers, trustees, and partners. We welcome applications from qualified individuals, including Black and other racialized persons, Indigenous Peoples, women, persons with disabilities, LGBTQ2SA+ persons, and others who may contribute to further diversification of ideas within our community.

Accordingly, the Lawson Health Research Institute is committed to fair assessment of a candidate's abilities, and consideration for diversity of thought, method, and experience, including non-traditional career paths. Accommodation will be provided in all parts of the hiring process where needed.

Please notify us of any accommodations that you require by contacting Dr. Donna Goldhawk at dgoldhawk@lawsonimaging.ca.

This statement is collectively developed by the Ontario Hospital Association (OHA) Anti-Racism Task Force.