

January 9, 2023

## Undergraduate Student Biomedical Research Assistant

The [Optical Cancer Imaging Laboratory](#) (OCIL) at the [British Columbia Cancer Research Institute](#) (BCCRI) is seeking enthusiastic students for research and development of nondestructive, high-resolution optical instruments for early cancer detection and management. The OCIL offers a unique experience for students in a multidisciplinary clinical and research environment.

The OCIL develops small endoscopic imaging tools using modalities including optical coherence tomography (OCT), autofluorescence, fluorescence lifetime, and narrowband reflectance imaging. These tools are being explored in a variety of clinical applications, including in sites such as the small airways of the lungs, the fallopian tubes, the endocervical canal, and the oral cavity. There are currently multiple imaging systems at the OCIL for both clinical and laboratory imaging, which are constantly being upgraded for increased functionality and performance.

Optical imaging systems require state-of-the-art multi-domain (optical, mechanical, electrical, computational) technologies and expertise. Previous co-op student OCT projects have included data acquisition system programming, fiberoptic probe development, data analysis algorithm development, and human and animal imaging studies.

We are looking for a student to support the following projects during Summer 2023 (May 1<sup>st</sup> -Aug 30<sup>th</sup>, 2023). Project scope may vary; successful applicants may have additional duties as required.

- 1. Lung segmentation tool:** We have discovered that airway dilation correlates with the likelihood of a lung transplant patient experiencing chronic lung allograft dysfunction (chronic transplant rejection). We are looking to develop a deep learning image processing tool to segment and quantify dilation from three-dimensional images of the small airways. Duties will include manual segmentation, processing algorithm development, feature selection, and analysis.
- 2. Lung phantom development:** we are developing novel imaging probes to detect the earliest lung cancers and need a test bench to assess our devices. We plan to develop silicon phantoms with similar material and optical properties to lung parenchyma, nodules, and other airway features. Duties will include material selection, protocol development, morphology design, and validation against previously acquired lung images.



Provincial Health Services Authority

## EXPECTATIONS

This position will be primarily **on-site** at the BC Cancer Research Institute (675 W 10<sup>th</sup> Ave, Vancouver, BC). Some work may be conducted remotely if access to the laboratory is not required, which may include virtual meetings, writing, or data analysis.

The OCIL is within a biohazard level 2 facility and will require training related to biosafety, chemical safety, and laser safety. The applicant may work with animal and/or human specimens.

BC Cancer is part of the Provincial Health Services Authority. Full vaccination against COVID-19 is a condition of employment with PHSA.

## QUALIFICATIONS

Preferred candidates will be in their senior years of an engineering or science program, though relevant previous work experience will also be considered. We welcome candidates from a variety of fields, including physics, computer science, engineering physics, mechanical engineering, biomedical engineering, electrical engineering, computer engineering, and integrated engineering.

Excellent oral and written communication and documentation skills are a necessity. Students will be expected to work with a high degree of independence and autonomy. These are very challenging positions that require a high degree of creative problem solving and non-routine work.

Experience with the following are assets:

- Image processing
- MATLAB, Python
- Data analysis, statistics
- Machine / deep learning
- Mechanics of soft tissue
- Materials engineering
- Experimental design
- Dissection, tissue work
- Lasers, optics, fiber optics
- Small mechanical assemblies
- Actuators, electronics, hardware

## TERM OF APPOINTMENT & RENUMERATION

Remuneration will be \$17-21/hr depending on experience (37.5hr workweek). The position is available for 4 months with the possibility of extension.

Applications will close **February 5<sup>th</sup>, 2023**. Suitable candidates will be contacted for virtual interviews in early March. Interested candidates should apply via their co-op board, or forward their cover letter and CV to:

Jeanie Malone, PhD Candidate  
Integrative Oncology - Imaging Unit  
[jmalone@bccrc.ca](mailto:jmalone@bccrc.ca)