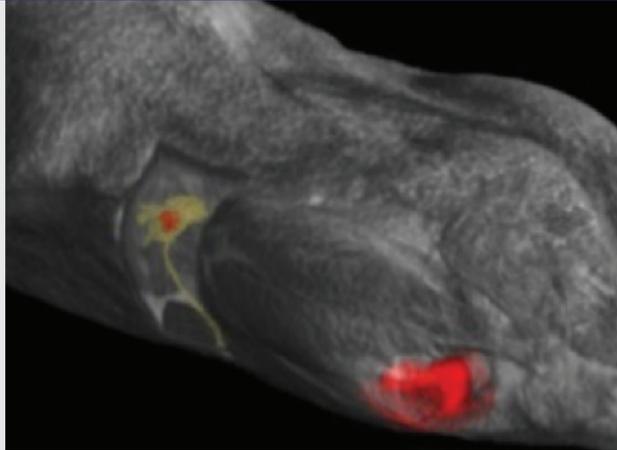


# Multi-level Integration of Pathogen Imaging

Within a high-level containment environment, ImPaKT provides an outstanding multi-modality imaging continuum, from the whole animal to the cellular and molecular level, coupled with a unique breadth of pathogen and immunology research. Our team of imaging, pathogen and immunology researchers provides the expertise to conduct and integrate multiple facets of imaging, capturing disease pathogenesis and pathogen response to treatment in real time within a whole animal, organ and at the sub-cellular level.

## PET/MRI/CT/BLI

- Identifying the co-localization of HIV and experimental anti-retrovirals
- Tracking a supermagnetic iron oxide (SPIO) nanoparticle-labeled immunotherapeutic dendritic cell (DC)-based cancer vaccine from the site of injection to the target draining lymph node by cellular MRI
- Bacterial replication and protein expression patterns during interactions of *S. aureus* with immune cells during infections



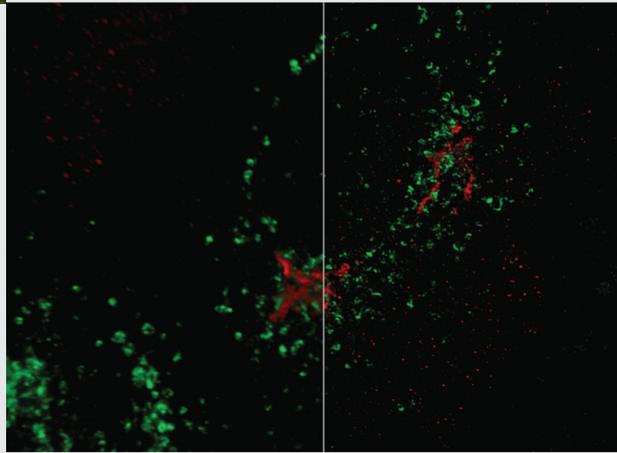
## Multiphoton Microscopy

- Tracking T-cells during latent HIV infection
- Recording B- and T-cell interactions in the brain of a murine multiple sclerosis model
- Tracking metastatic cancer, mapping tumour vascularization, and testing potential therapies that limit angiogenesis



## High Resolution Microscopy

- Defining the subcellular localization of HIV proteins and understanding how to bring HIV out of hiding
- Utilizing genetically engineered macrophages that express molecular reporters of macrophage function, tracking responses to invading bacterial and viral pathogens
- Defining the basis, at the molecular level, of how MRSA avoids immune killing



The Schulich School of Medicine & Dentistry at Western University has made a significant investment into ImPaKT, creating a fully renovated space specifically designed to meet facility requirements.

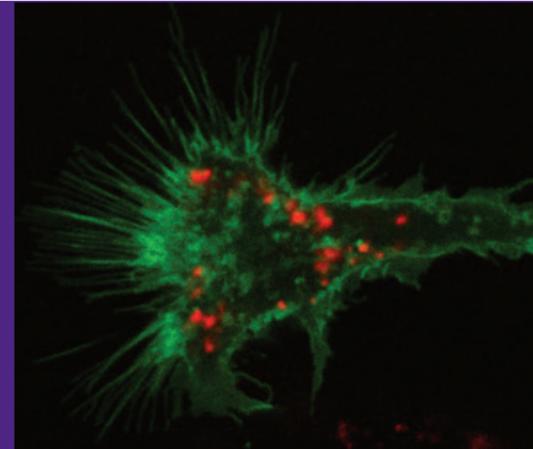


The ImPaKT team of investigators successfully competed for a large Infrastructure CFI grant. This award is being used to fund the purchase of the equipment to be used within the facility.

Researchers from Schulich School of Medicine & Dentistry, Robarts Research Institute and Lawson Health Research Institute will work collaboratively in the ImPaKT Facility.

## Partner with the ImPaKT team:

- Use a state-of-the-art facility for your experiments and projects
- Collaborate with our team of experts to advance your research
- Utilize our facility for long term imaging of animals/cells and infectious agents that require CL2+/CL3 containment



### Facility Contact

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# ImPaKT

Imaging Pathogens for  
 Knowledge Translation  
 Facility

[schulich.uwo.ca/impakt](http://schulich.uwo.ca/impakt)



# ImPaKT

## Imaging Pathogens for Knowledge Translation Facility

### State-of-the-Art Imaging of Infectious Disease

The ImPaKT Facility is ideally located at the heart of Western University at the Schulich School of Medicine & Dentistry. ImPaKT is Canada's only (CL2+/CL3) containment lab with a multi-modality imaging suite permitting cutting-edge infectious disease research with real-time tracking of infectious agents and monitoring immune responses simultaneously.

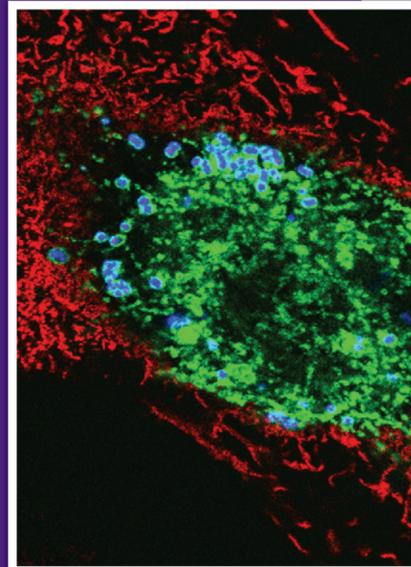
### Multi-modality Imaging and Research Tools

Imaging is the advanced tool for drug discovery in cardiovascular disease and cancers but has not been applied to its full extent for infectious diseases. ImPaKT breaks this frontier by providing advanced multi-modality imaging techniques within a level 2+/3 containment facility.

Researchers at Western University are at the forefront of developing whole body imaging technologies to revolutionize the diagnosis, monitoring and treatment of infectious diseases and immune-mediated disorders.

Imaging and research tools featured in ImPaKT:

- Inline 3T MRI/PET
- Bioluminescence (BLI)-CT Scanner
- Multiphoton Microscope
- Super High-Resolution Microscope
- Flow Cytometry
- Magnetic Particle Imaging
- Optoacoustic Imaging



### Viral Vector Core Suite

For the GLP grade production of bacterial, lentiviral, adenoviral, adeno-associated and vaccinia viral vectors for direct use within ImPaKT, enabling "infection/exposure/immunization" with pathogenic bacteria and/or viruses carrying a marker gene for imaging.

## ImPaKT Team



### Eric Arts

Dr. Eric Arts is the Canada Research Chair in HIV Pathogenesis and Viral Control, and Professor and Chair, Microbiology and Immunology. His years of research focused on HIV pathogenesis, drug and vaccine development is now greatly enhanced through the use of in vivo imaging and new animal models to cure HIV. Translation of his research discoveries has led to multiple patents, commercialization of clinical diagnostics and licensing agreements with industry.



### Jimmy Dikeakos

Dr. Jimmy Dikeakos is an Associate Professor in Microbiology and Immunology. He leads a research group studying interactions between HIV-1 accessory proteins and host proteins. He received a Bachelor of Science in Biochemistry from McGill University and completed his graduate training at the University of Montreal. He completed his postdoctoral studies at the Vollum Institute in Portland, Oregon, specializing in HIV pathogenesis.



### Mansour Haeryfar

Dr. Mansour Haeryfar is a Professor in Microbiology and Immunology. He investigates conventional and unconventional T-cell functions in the contexts of antiviral immunity and anti-tumour immune surveillance. The overarching goal of his research is to improve understanding of cell-mediated host responses to viral pathogens and tumour antigens, and to invent novel and efficacious immunotherapies for infectious diseases and malignancies.



### John McCormick

Dr. John McCormick is a Professor in Microbiology and Immunology and a Scientist at Lawson Health Research Institute. His research is focused on understanding the molecular and immunological mechanisms by how a potent group of bacterial toxins, termed *superantigens*, contribute to disease caused by the notable human bacterial pathogens *Streptococcus pyogenes* and *Staphylococcus aureus*.



### David E. Heinrichs

Dr. David E. Heinrichs is a Professor in Microbiology and Immunology. He studies the pathogenesis of the 'superbug' *Staphylococcus aureus*. He is focusing on the discovery that multidrug resistant *S. aureus* grows within and kills macrophages, which are key sentinels of the immune system designed to kill bacteria. He is developing inhibitors of *S. aureus* strategies to counter inherent drug resistance.



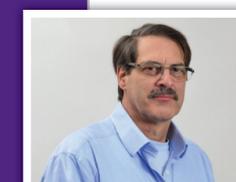
### Steven Kerfoot

Dr. Steven Kerfoot is an Associate Professor in Microbiology and Immunology. His research focuses on understanding how immune cells collaborate with each other through interactions to drive the initiation of new immune responses and maintain them in chronic inflammatory disease. This research relies heavily on several in vivo imaging modalities, including multiphoton confocal microscopy.



### Paula Foster

Dr. Paula Foster is a Professor in Medical Biophysics and leads Robarts Research Institute's Cellular and Molecular Imaging Program. Her research is focused on the development and application of MRI cell tracking techniques and iron- and fluorine- based cell labelling technologies for in vivo imaging of cells in experimental animal models. Major areas of research in the Foster lab are tracking cancer cell dormancy and metastasis, immune cells associated with tumours, and cellular therapeutics for cancer in preclinical models of a variety of cancers.



### Gregory Dekaban

Dr. Gregory Dekaban is a Professor in Microbiology and Immunology, a Scientist at Robarts Research Institute, and Director of the Molecular Medicine Research Laboratories at Robarts. His research focuses on developing anti-inflammatory therapeutics for CNS trauma and adjuvants for vaccine-based immunotherapies for infectious diseases and cancer. He has developed methods to track cells in vivo using cellular MRI to provide a non-invasive biomarker capable of assessing cell-based vaccines in vivo in real time.



### John Ronald

Dr. John Ronald is an Assistant Professor in Medical Biophysics and a Scientist at Robarts Research Institute. His research is pioneering novel molecular and cellular imaging technologies that can sensitively, accurately and non-invasively detect molecular activities within the body during an individual's life. He is focused on improved early cancer detection and treatment, as well as improved monitoring of cellular therapies for cancer and other diseases.



### Ting-Yim Lee

Dr. Ting-Yim Lee is a Professor in Medical Biophysics, and a Scientist at Robarts Research Institute and Lawson Health Research Institute. His research focuses on physiological modelling of dynamic data acquired with specific molecular probes and positron emission tomography (PET) scanning. His methodology is based on his previous successful CT Perfusion software licensed to GE Healthcare and Neusoft. The modelling can provide more accurate quantitative estimates of the activities of molecular and physiological processes occurring in normal and pathological conditions.



### Michael Kovacs

Dr. Michael Kovacs is an Assistant Professor in Medical Biophysics and the Director of Lawson Health Research Institute's Cyclotron and Radiochemistry Facility. As Director, Dr. Kovacs oversees the production of positron emitting radiopharmaceuticals (PERs) for research and clinical use, including commercially approved products. His research focuses on radionuclide production with solid phase cyclotron targets.



### Len Luyt

Dr. Len Luyt is an Associate Professor with appointments in Oncology, Medical Imaging and Chemistry, and a Scientist at Lawson Health Research Institute. He is researching peptide-based molecular imaging agents (PET, SPECT, and optical) for novel, clinically relevant targets.