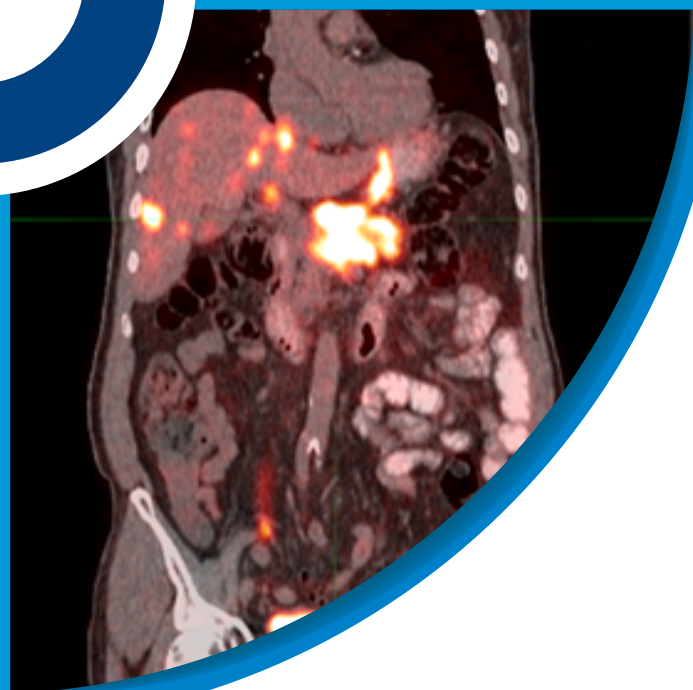
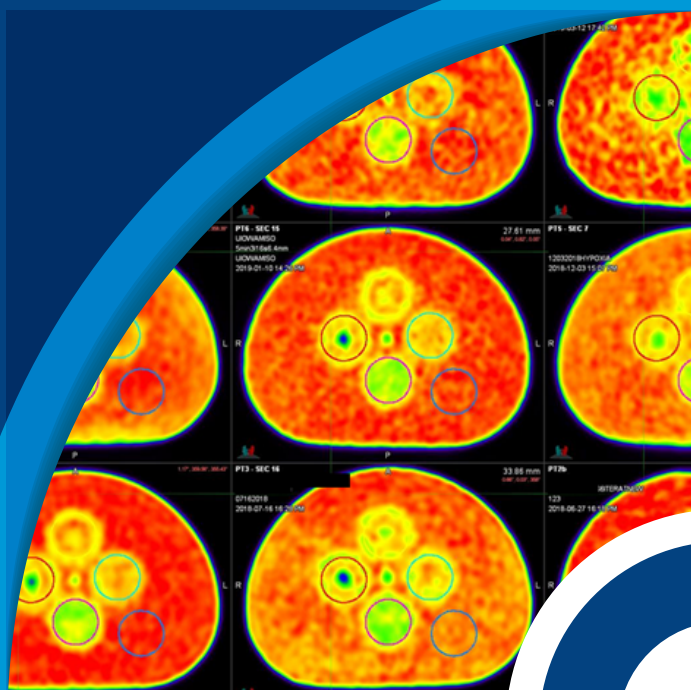


UHN Molecular Imaging and Theranostics Pipeline

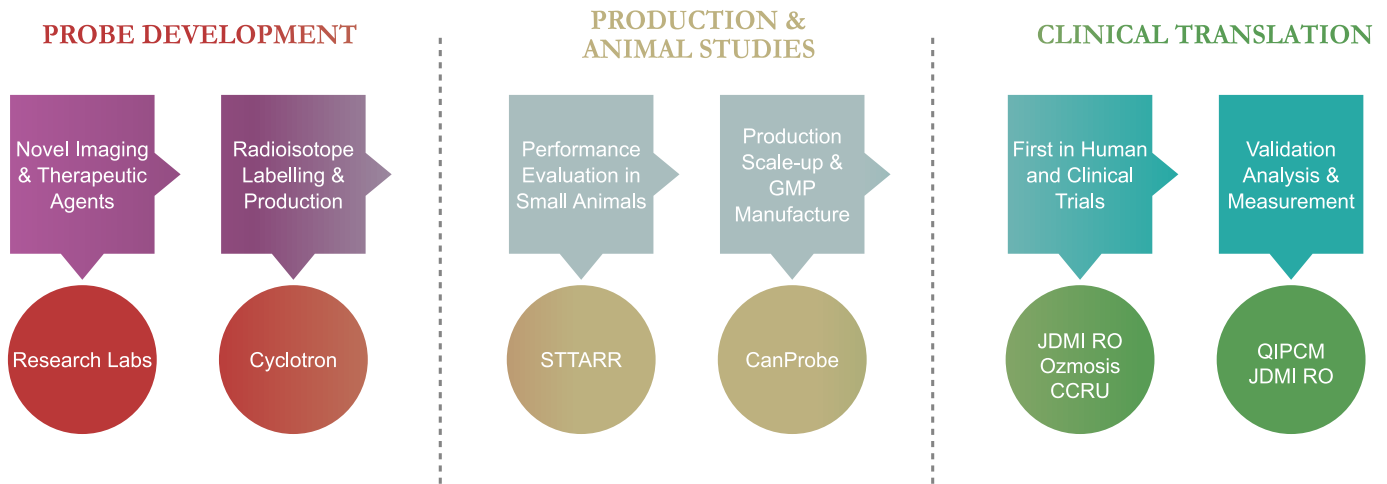


UHN

Toronto General
Toronto Western
Princess Margaret
Toronto Rehab
Michener Institute

UHN's Molecular Imaging Pipeline: From zero to world-class in 15 years

The Molecular Imaging and Theranostics Program aims to advance the development and translation of molecular imaging and therapeutic techniques and uses advanced probes that interact with a patient's biology to provide insight into specific disease processes.



The Pillars

Key infrastructure pillars support the advancement of MI and Theranostics. These pillars are available to support both academics and industry.



An imaging core lab providing image analysis, theranostic dosimetry, scanner qualifications and a centralized collaboration platform, offering the informatics infrastructure needed by researchers to share data among internal and external teams in a secure and regulatory compliant fashion.



A pre-clinical imaging facility with a suite of integrated, advanced imaging instruments and experimental capabilities including CT, MR, PET, SPECT, ultrasound and photoacoustic imaging.



A cyclotron and radiopharmacy facility developing and manufacturing imaging and therapeutic agents needed for the advancement of research.



The Research Office for the Joint Department of Medical Imaging (JDMI) provides imaging services for researchers including access to diagnostic imaging equipment such as PET/MR, PET/CT, and SPECT/CT.

This core imaging lab facilitates clinical trials in molecular imaging and theranostics. QIPCM has the infrastructure and expertise to anonymize imaging data and transfer to a central repository, facilitating image analysis and dosimetry calculations for multi-centre clinical trials.

Total # of Trials on the QIPCM Platform	61
Phase 1/2/3/other	5/17/4/35
Hospitals globally sending data	53
Patient exams on platform	35,700 patients/147,840 studies

QIPCM has the expertise and experience with theranostic dosimetry and SPECT-CT protocol development as below:

- SPECT camera sensitivity calibration
- Dosimetry for radiotherapeutic agents
- Custom workflows for contouring, review and reporting.

For more information, please visit: qipcm.technainstitute.com or contact us at: qipcm@rmp.uhn.ca



Spatio Temporal Targeting & Amplification of Radiation Response

The STTARR preclinical imaging program opened its doors in October 2007 and has since been providing a cutting-edge multi-disciplinary research platform for academic and industry partners.

The facility is equipped with over 20 complementary imaging systems, including PET, SPECT, CT, MR, optical, ultrasound, photoacoustic, intraoperative and mass spectrometry imaging. With intraoperative imaging capabilities, two fully equipped operating rooms and clinical imaging systems, STTARR provides infrastructure and offers concrete support for translational research.

A dedicated pathology and correlative image analysis team offers imaging capabilities at the tissue and cellular level, including autoradiography, radioligand binding assays, and routine and specialized staining. With a strong background in molecular imaging, STTARR staff provides full support from study conception to completion.

For more information, please visit: sttarr.com or contact us at: sttarr@rmp.uhn.ca



CanProbe Radiopharmaceuticals

CanProbe provides access to specialized expertise that supports the development of new radiopharmaceuticals, with proven experience translating products to the clinical setting, and world-class GMP manufacturing capabilities that operate in accordance with FDA, Health Canada and European regulations. Targeted therapeutic radiopharmaceuticals can be used to provide personalized treatment of cancers.

CanProbe is a joint venture between UHN and the CPDC to create a Canadian Centre of Excellence for the development, translation, utilization and commercialization of molecular radiopharmaceuticals.

 <p>Founded in 2011</p>	 <p>Contract Development and Manufacturing</p>	 <p>Facility Located in Large Research Hospital</p>
 <p>Provides Supply to >25 Clinical Trials</p>	 <p>Technical Expertise to Drive Solutions</p>	 <p>cGMP & Validation Specialists</p>
 <p>CMC, Regulatory Submissions</p>	 <p>Global Reach</p>	 <p>Impacted Care for Thousands of Patients</p>

For more information, please visit: canprobe.ca



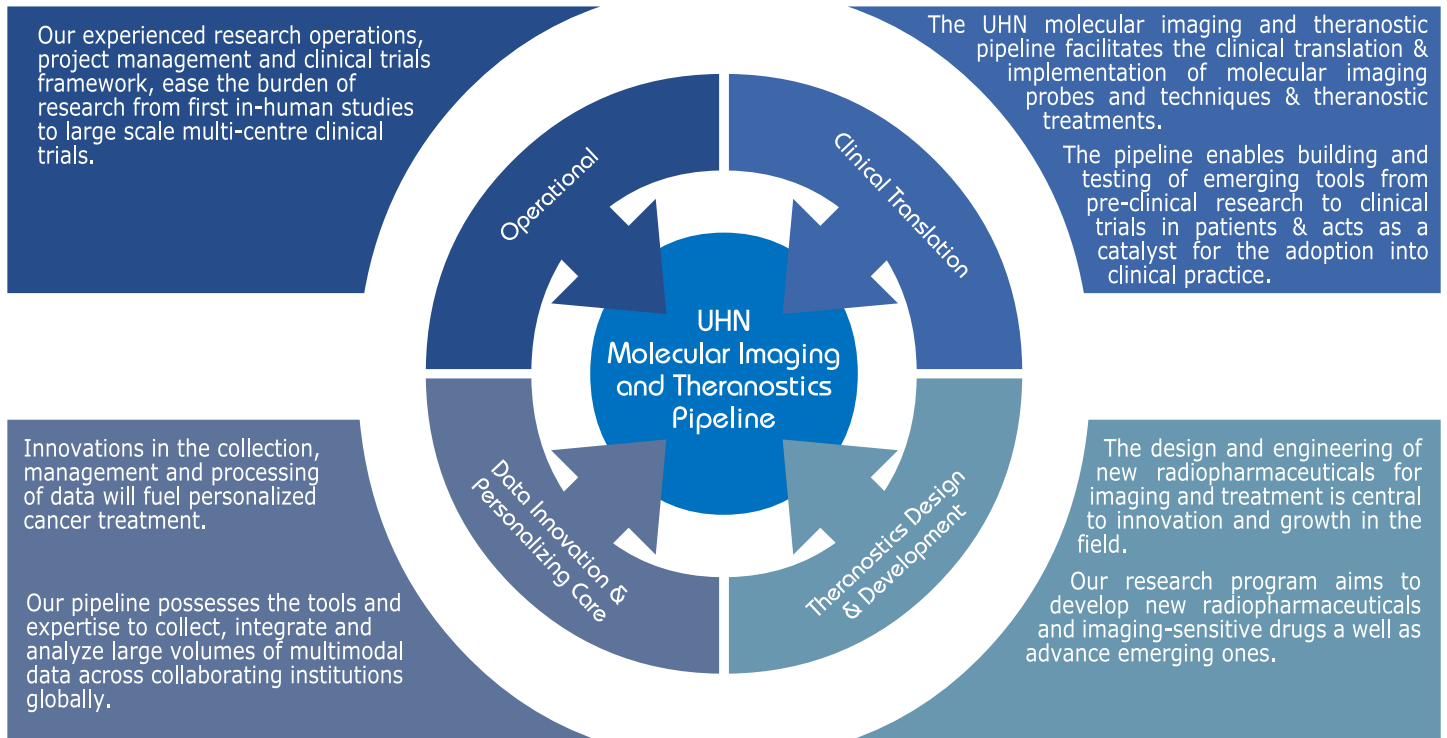
The Joint Department of Medical Imaging Research Office

The Research Office (RO) for the Joint Department of Medical Imaging (JDMI) has dedicated imaging equipment for research and access to all clinical equipment across three institutions at the University Health Network including the Princes Margaret Cancer Center, Toronto General Hospital, and the Toronto Western Hospital. In addition, the JDMI RO offers tumour measurement expertise and consultation services for imaging research.

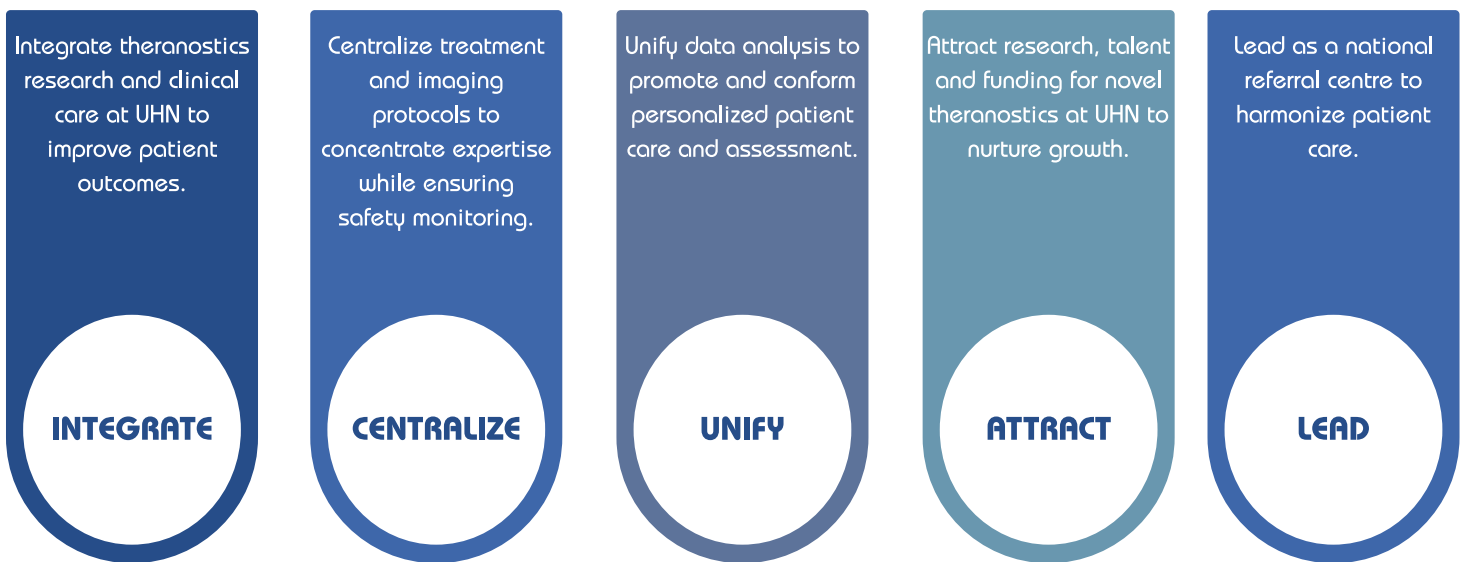
Working in partnership with JDMI's multi-disciplinary team of technologists, nurses, physicists, and radiologists, the RO supports all aspects of imaging research, innovation, and technology.

For more information, please visit: jdmiresearch.ca

Our Expertise



Theranostics Centre Vision : The Five Principles



List of Pre-Clinical Equipment- STTARR

Molecular Imaging

- Mediso nanoScan PET/MRI
- Mediso nanoScan SPECT/CT/PET
- HIDEX Gamma-Counter with integrated analytical balance
- PerkinElmer Wizard 3 Gamma-Counter

Intraoperative Imaging

- Siemens Arcadis Orbic 3D C-Arm
- Fluoptics Fluobeam

CT

- Bruker SkyScan 1276 μ CT
- GE Revolution Spectral CT (large bore)

Optical Imaging

- PerkinElmer IVIS Spectrum
- CRI Maestro

Ultrasound & Photoacoustics

- VisualSonics Vevo 2100 & LAZR

MRI

- Bruker Biospec (7T)
- Aspect Imaging M3 (1T)
- Siemens Aera (1.5T, large animals)
- IGT MR-guided HIFU (1.5T & 7T)

Radiation Therapy

- Precision X-Ray X-Rad 225Cx with Cone-Beam CT and BLI

Multiple **Radio Tracers**, **Radio-Isotopes** & **Image Analysis Software** are available.

For more information, contact us at: starr@rmp.uhn.ca

List of Clinical Research Equipment- JDMI RO

MRI

JDMI has dedicated research MRI scanners and a fleet of nine shared scanners. Our scanners are capable of various methods of advanced imaging such as functional MR, diffusion tensor imaging, MR guided therapeutics, elastography and spectroscopy.

Siemens

Model	Strength	Bore Size
Aera	1.5T	70cm
Skyra	3.0T	70cm
Avanto	1.5T	60cm
Verio	3.0T	70cm

GE

Model	Strength	Bore Size
Signa Twin Speed High Field	1.5T	60cm
Signa Twin Speed	3.0T	56cm

PET-MRI

JDMI is one of few sites in Canada with a dedicated research PET-MRI scanner. This state-of-the-art scanner combines a 3T MRI with molecular imaging in one system to significantly improve diagnostics and care.

Manufacturer	Model	Strength	Bore Size
Siemens	Biograph mMR	3.0T	60cm

CT, PET-CT, Ultrasound / X-Ray

JDMI has multiple CT & PET-CT scanners and supports ultrasound and x-ray for research studies across all sites on a large fleet of shared machines.

For more information, please visit: jdmiresearch.ca

The Impact

This year, more than 200,000 new cases of cancer and 80,000 deaths because of cancer will likely occur in Canada [Canadian Cancer Society, 2020]. Although cancer survival rates are increasing overall, many specific cancer types still have low survival rates because they are difficult to treat. Brain cancer exemplifies this, with a five-year survival rate of only 23%.

Theranostics offers the potential for localized treatments that target cancer tissue while sparing healthy tissue. Furthermore, the diagnostic value of theranostics enables treatments to be personalized and tailored to the patient, improving treatment efficacy and streamlining health care delivery. Improving the treatment of cancer will not only improve the health outcomes of patients but will also alleviate the broader burdens that cancer puts on patients and society. These burdens span from emotional, mental and financial stresses of patients and their families to the costs in delivering health care to hundreds of thousands of Canadians who have cancer.

Lastly, The Theranostics Centre will provide trainees with a state-of-the-art research environment and access to the leaders in the field. Trainees will be exposed to upcoming theranostic techniques and nascent approaches to care. In training the next generation of oncology, medical imaging and drug development experts, the Centre will be invaluable to long-term innovation.

Thank you!