2021 SELF-STUDY REPORT

Part 2: Our Impact, Community and Resources

Laboratory Medicine & Pathobiology
UNIVERSITY OF TORONTO

Temerty Medicine

"LMP provides opportunities for excellence in teaching and research and encourages innovation and growth to achieve the academic vision and mission of the university. The goal of global excellence is reachable for LMP."

— LMP Faculty

Cover image
Graduate student, Lilian Lin, "Mouse Brain", LMP Art Competition 2021 2nd place winner

Design
Green Living Enterprises

Laboratory Medicine & Pathobiology
UNIVERSITY OF TORONTO

2021 Self-Study Report

Part 2: Our Impact, Community and Resources

Temerty Medicine

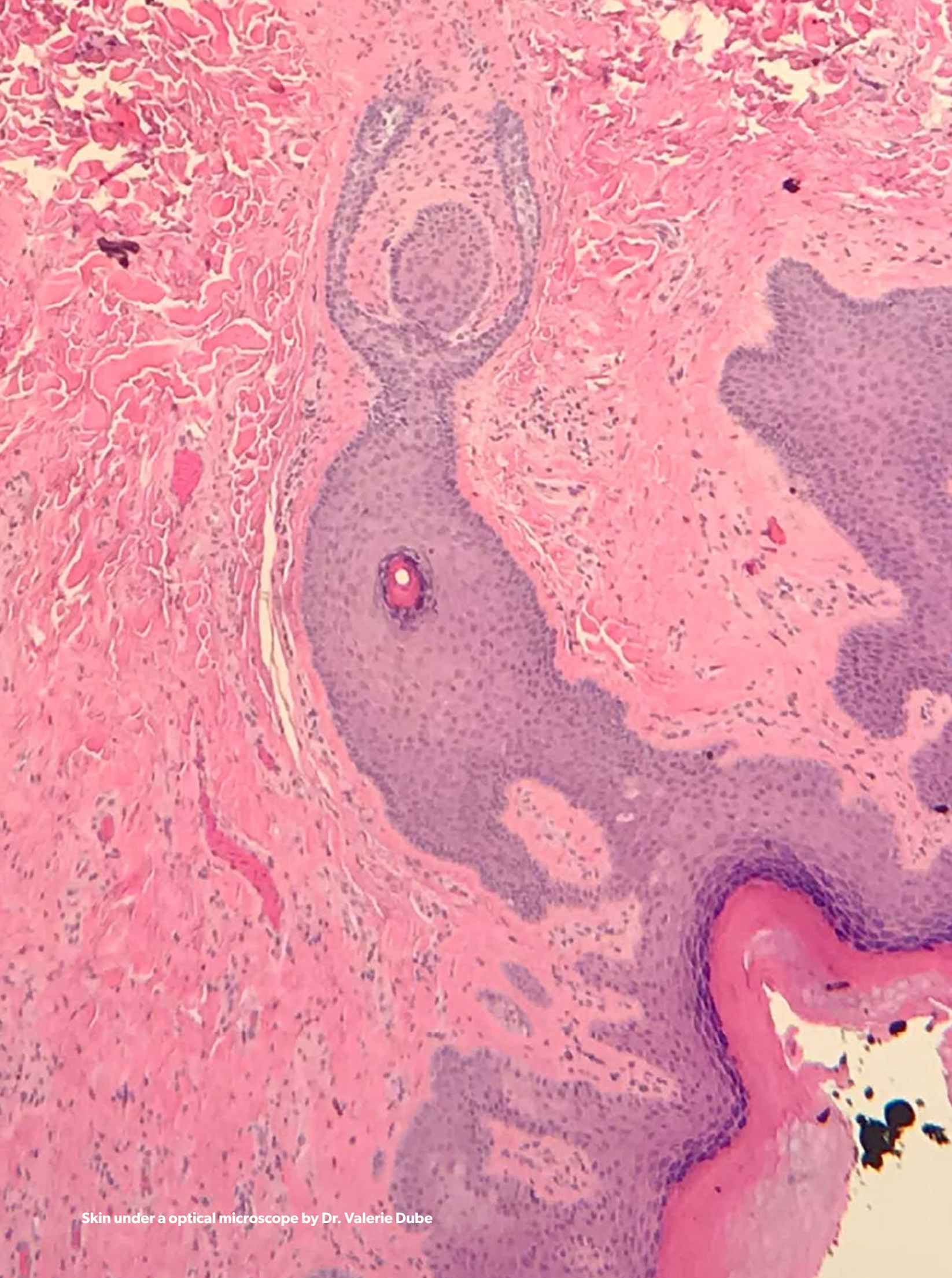
PART 2: OUR IMM COMMU AND RESOUR


PACT,
UNITY
RCES

Glossary of Abbreviations

A&S	The Faculty of Arts and Science at the University of Toronto
AACC	American Association for Clinical Chemistry
ABCC	American Board of Clinical Chemistry
AFC	Area of focused competence
AHD	Academic Half Day
AI	Artificial Intelligence
AP	Anatomical Pathology
ARC	TRP Anti-Racism Committee
ARCDO	Anti-Racism and Cultural Diversity Office
ART	assisted reproductive technology
ASC	Academic Success Centre
ASCP	American Society for Clinical Pathology
CACB	Canadian Academy of Clinical Biochemistry
CanMEDS	a framework that identifies and describes the abilities physicians require established by the RCPSC
CANPREPP	Canada's portal for residency program promotion
CAR	Continuing Appointment Review
CaRMS	Canadian Residency Matching Service
CBD	Competence by Design
CBL	Case-based Learning
CBME	Competency-Based Medical Education
CBS	Canadian Blood Services
CCBR	The Donnelly Centre for Cellular and Biomolecular Research
CCR	Co-Curricular Record
CE	Clinical Embryologist
CEO	Chief Executive Officer
CESDL	Clinical Embryology Skills Development Laboratory
cGPA	culmulative grade point average
CIHR	Canadian Institutes of Health Research
CLAMPS	Confederation of Laboratory Medicine and Pathobiology Students – LMP Student Union (graduate)
CLTA	contract-limited term appointed
CME	Continuing Medical Education
CMPA	Canadian Medical Protective Association
COD	Core of Discipline (elements of Competence by Design)
COI	Communities of Interest
CPA	creative professional activity
CPC	Concepts, Patients and Communities course
CPD	Continuing Professional Development
CPSO	College of Physicians and Surgeons of Ontario
CQI	continuous quality improvement
CRC	Conflict Resolution Centre
CRC	Canada Research Chair
CSCC	Canadian Society of Clinical Chemists
CV	Curriculum Vitae
DAC	Department Appointments Committee
DCM	Division of Comparative Medicine
ddPCR	Droplet Digital Polymerase Chain Reaction
DDS	Doctor of Dental Surgery
DLM	Digital Laboratory Medicine Library
DNA	Deoxyribonucleic acid
DPC	The LMP Departmental Promotions Committee
DRCPSC	Diplomate of the Royal College of Physicians and Surgeons of Canada
DVM	Doctor of Veterinary Medicine
EDI	Equity, Diversity and Inclusion
EEE	Enriching Elective Experiences
EPA	Entrustable Professional Activity
FCE	full-course equivalent
FOD	Foundation of Discipline (elements of Competence by Design)
FOE	PhD Final Oral Examination
FoM	Faculty of Medicine (now Temerty Faculty of Medicine)
FTC	Fellowship Training Committee
FTEs	Full Time Equivalents
GCAC	Graduate Centre for Academic Communication
GPA	Grade point average
GPS	Graduate Professional Skills program
GTA	Greater Toronto Area
HC	Hospital Chief
HIP	High Impact Practices
IDP	Individual Development Plan
IMS	Institute of Medical Sciences
IPAC	Institute of Public Administration of Canada

ITAR	In-Training Assessment Report
ITER	In-training Evaluation Reports
KPIs	Key performance indicators
LMIG	Laboratory Medicine Interest Group
LMP	Department of Laboratory Medicine & Pathobiology
LMPSU	LMP Student Union (undergraduate)
LOA	Leave of Absence
LSF-CBL	Longitudinal Specialty-Focused Case-Based Learning
LPI	leading practices and/or innovations
MaRS	Medical and Related Sciences (Discovery District)
MCCQE	Medical Council of Canada Qualifying Examination
MD	Medical Doctor
MedSoc	The Medical Society
MOH	The Ontario Ministry of Health
MOU	Memorandum of Understanding
MPH	Master of Public Health
MSc	Master of Science
MSH	Mount Sinai Hospital
NSERC	Natural Sciences and Engineering Research Council of Canada
NSSE	National Survey of Student Engagement
OB-GYN	obstetrics and gynecology
OFPS	Ontario Forensic Pathology Service
OSCC	Ontario Society of Clinical Chemists
PA	Pathologists' Assistant
PFPU	Provincial Forensic Pathology Unit
PGME	Postgraduate Medical Education
PharmD	Doctor of Pharmacy
PhD	Doctor of Philosophy
PLI	Canadian Medical Association's Joule Physician Leadership Institute
POSt	Program of Study type (code in ROSI)
POWER	Postgraduate Web Registration System
PTR	Progress Through the Ranks
QA	Quality assurance
QI	Quality improvement
RCPSC	The Royal College of Physicians and Surgeons of Canada
RE	Rotation Evaluations
REB	Research Ethics Board
ROSI	Repository of Student Information (University's Student Information System)
RPC	Residency Program Committee
RTE	Required Training Experiences
SGS	School of Graduate Studies
SHSC	Sunnybrook Health Sciences Centre
SickKids	The Hospital for Sick Children
SMH	St. Michael's Hospital (Unity Health)
SSAB	Seminar Series Advisory Board
SURE	The LMP Summer Undergraduate Research Experience
TAC	Thesis Advisory Committee
TAHSN	Toronto Academic Health Science Network
TAs	Teaching Assistants
T-CAIREM	Temerty Centre for Artificial Intelligence Research and Education in Medicine
TE	Teacher Evaluations
TGH	Toronto General Hospital (University Health Network)
THP	Trillium Health Partners
THPPA	Toronto Hospitals' Postgraduate Payroll Association
TMC	Temerty Medicine Connect
TRP	The Translational Research Program
TTD	Transition to Discipline, elements of Competence by Design
TTF	Toronto Translational Framework™
TTP	Tech Talent Pipeline
TTP	Transition to Practice, elements of Competence by Design
U of T	The University of Toronto
U15	the top 15 research universities in Canada
UHIP	University Health Insurance Plan
UHN	University Health Network
UHN-TGH	University Health Network-Toronto General Hospital
UME	Undergraduate medical education
USCAP	United States and Canadian Academy of Pathology
USRA	Undergraduate Student Research Awards
UTL	University of Toronto Library
WHMIS	Workplace Hazardous Materials Information System
WOHS	William Osler Health System



Skin under a optical microscope by Dr. Valerie Dube

Table of Contents

1 Research 10

2 Quality Council 32

3 Global Health and Outreach 36

4 Advancement and Alumni Relations . . 40

5 Organizational Chart 44

6 Administration and Facilities 46

7 Financial Report 50

8 Committees 54

9 Wellness, Inclusion, Diversity & Equity (WIDE) 60

10 Our Faculty 64

11 Our Learners 92

12 Mentoring 112

13 Library Services 120

1 Research

The research carried out by our faculty elucidates etiology and mechanisms of disease and includes fundamental basic science, translational research as well as development of novel diagnostics and prognostic biomarkers through genomics, proteomics, and other state-of-the-art approaches.

The ultimate goal is to translate knowledge into improved medical practice and health outcomes and to inform health policy.

We are a large, diverse, and widely geographically distributed department. We have over 300 primary faculty members who span a broad spectrum of expertise and activity from full-time basic scientists performing discovery research, clinician investigators, and to clinical laboratorians involved in the practice of all laboratory medicine disciplines. Clinical expertise includes all pathology subspecialities, genetics and genomics, chemistry, point-of-care, microbiology, forensics and transfusion medicine, with these areas reflected in our research programs. Over 100 cross-appointments from other departments enhance and strengthen our expertise, collaborations, and education.

Our faculty are spread throughout the city: a core group of tenured basic scientists is located on the St. George campus primarily in the Medical Sciences Building (MSB) and the MaRS West Tower, while all other faculty are located at over 19 sites which include the Toronto Academic Health Science Network (TAHSN), research institutes, and community-affiliated hospitals, as well as various government institutions, such as the Ontario Centre of Forensic Sciences, Public Health Ontario and the Ontario Institute for Cancer Research.

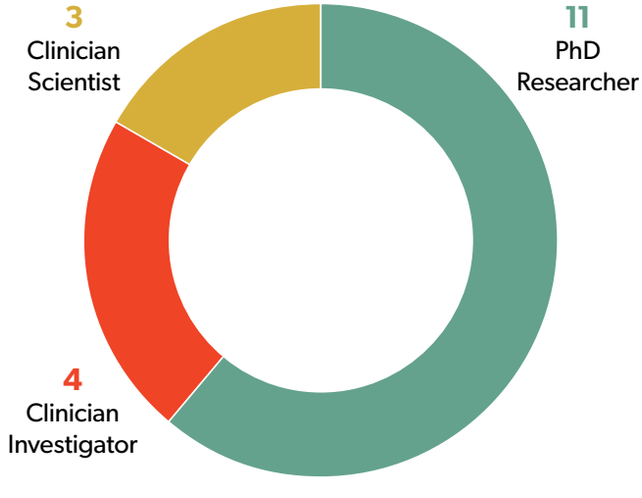
LMP has experienced significant change during the last five years. The four main areas of growth include:

- incorporation of the **Translational Research Program (TRP)** into the department in 2018 (see Part 1, MHSc in Translational Research, page 70)
- development of and implementation in 2020 of the **MHSc in Laboratory Medicine** program with Pathologists' Assistants and Clinical Embryologists streams (see Part 1, MHSc in Laboratory Medicine, page 92)

- Formation of, and home to, the **Temerty Centre for Artificial Intelligence Research and Education in Medicine (T-CAIREM)**. A number of key T-CAIREM faculty are cross-appointed to LMP.
- development of a computational medicine and biology program. Jointly with the Department of Computer Science. We have hired Dr. Bo Wang and Dr. Rahul Gopal Krishnan, tenure-stream faculty with expertise in Artificial Intelligence (AI) and who are members of T-CAIREM.

We recruited Dr. Scott Yuzwa in 2019 to a new tenure-stream basic science faculty position. He rapidly established his neuroscience lab in the MSB, and this year was awarded his first CIHR project and NSERC grants.

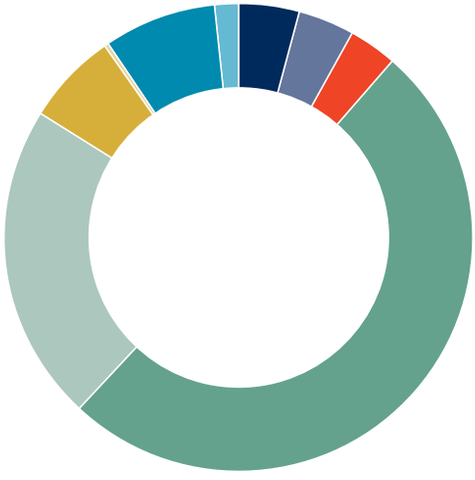
We have also recruited new primary faculty in positions with a greater emphasis on research (i.e. Clinician Scientist, Clinician Investigator, and PhD Researchers), based in research institutes at the affiliated hospitals and various government institutions since 2013.



Campus and city-wide footprint of LMP research activity

It is important we maintain on-campus research activities to provide an academic focus and cohesion for our geographically dispersed department, and to strengthen our research presence at the university. Importantly, this group provides a solid base for our research-oriented teaching activities in the undergraduate and graduate programs.

A full list of where our investigators are located is in Appendix 2.1.1.



17	Primary	Campus
15	Cross	
13	Primary	Community-Affiliated Hospitals
0	Cross	
197	Primary	Fully-affiliated hospitals
86	Cross	
25	Primary	TAHSN Associate Hospitals
1	Cross	
30	Primary	Other LMP Affiliated Organizations
6	Cross	

Research leadership

Dr. Myron Cybulsky and Dr. Stephen Girardin were appointed as Vice-Chairs Research, Clinical and Life Sciences respectively, to provide a coherent and structured research strategy in the department.

They provide navigational assistance to department members via a single point of entry, to:

- enhance ability to compete for research grants
- partner with affiliated research institutes, enhancing linkages, resources and to foster collaborations
- relay concerns and suggestions from investigators, regarding research activity and funding to the LMP Chair and the Vice-Dean of Research at Temerty Medicine
- report back to the department on strategic research discussions occurring at the level of the Tri-Council, the TAHSN or Temerty Medicine.

Grant Peer Review and Pathway Grants

Through the monthly LMP Departmental meetings involving investigators on campus, we identified a need to set up a strong internal peer review system for grant competitions, something already successfully implemented at various institutions such as SickKids.

Spearheaded by Vice-Chair Research, Dr. Stephen Girardin, he consulted with all basic research departments on campus, and decided this would be best suited and more sustainable if it was launched at the Faculty, rather than departmental level. Temerty Medicine approved the proposition to launch an internal peer review system in 2019.

The Faculty established a College of Internal Reviewers: a pool of investigators willing to serve as internal reviewers of grants from their colleagues, which is now composed of over 60 members. Temerty Medicine was highly supportive of the initiative and has provided funds to retribute reviewers of successful grants. The Faculty launched a complementary initiative, the Temerty Faculty of Medicine Pathway Grants, which provides $100,000 for the top three grants just below the CIHR funding cut for each competition (twice a year).

LMP has been instrumental in the creation of both the internal grant review system and the Pathway Grants and we will continue to play a major role in communicating the needs and feedback of the investigators to the Faculty.

A community of support helps a new researcher gain CIHR funding

Assistant Professor Scott Yuzwa has been awarded funding for five years by the Canadian Institutes of Health Research (CIHR) for his work studying stem cells in the brain and their potential application in brain recovery after stroke - a grant that would not have happened without the support he received in LMP and Temerty Medicine. He set up his first research lab in 2019 and attributes his grant success to the Faculty peer review system, initiated in LMP, and pathway grants.

Read more about Assistant Professor Scott Yuzwa

Research themes

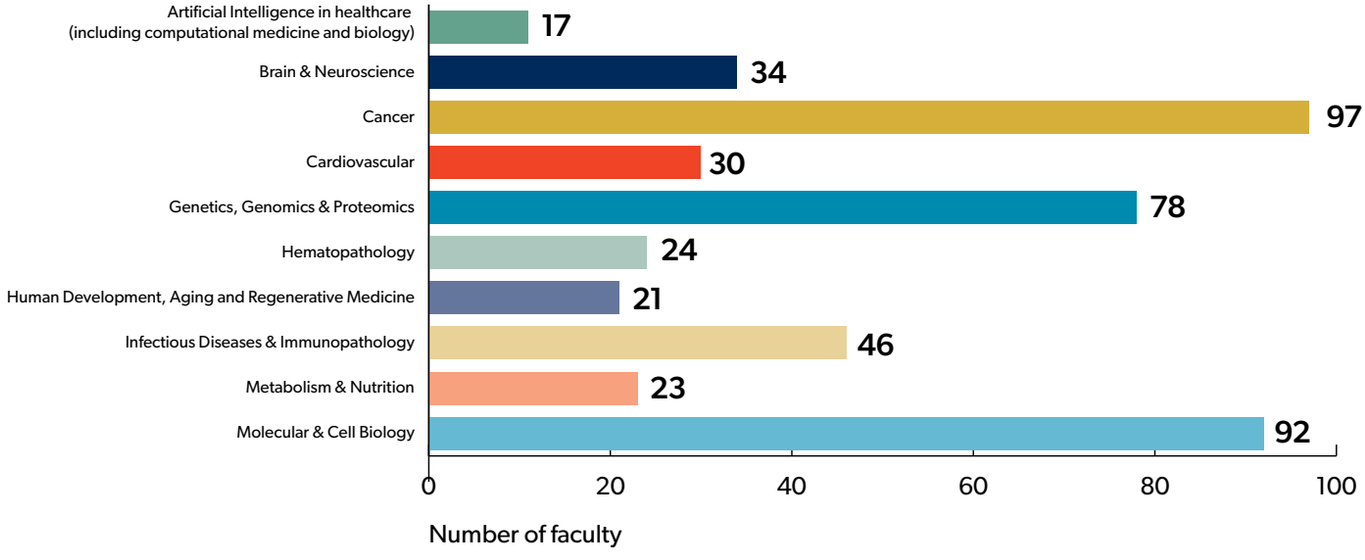
In keeping with our large and diverse faculty, we enjoy a diverse set of research areas and expertise, organized into ten themes. These themes provide a framework to encourage the development of smaller working groups to communicate, collaborate and share expertise. It also helps us to clarify and revitalize the department website, making it easier for students to find supervisors and outside researchers to find collaborators.

Research themes for the LMP student seminars (LMP1001)

LMP1001 is a mandatory graduate course consisting of oral presentations by MSc and PhD students. After consultation with students in 2016, Dr. Paul Hamel and Dr. Stephen Girardin restructured this into specific research themes, so that our graduate students could better feel the strength of our department within specific research areas.

Students can now choose to join one of five groups to present their work. The five groups were designed to have a roughly equal distribution of students and to encompass all the research themes at LMP. We will be expanding this to include computational medicine in the future.

A recent survey performed by the LMP Student Union (CLAMPS) reported that students were overall extremely positive about this restructuring and have a better sense of the research community within LMP. We expect to see more collaboration between LMP laboratories, prompted by students as they gain awareness of related projects in our department.



Our research themes

Artificial Intelligence in healthcare

17 faculty members

From machine learning to computational medicine and biology, Artificial Intelligence (AI) is the future of healthcare. By establishing the Temerty Centre for Artificial Intelligence Research and Education in Medicine (T-CAIREM), we are integrating AI, such as machine learning, and analytics into our research and education. Far from replacing humans at the forefront of healthcare and science, AI enables our clinicians to enhance patient diagnosis and care, and our researchers to mine data to reach new boundaries in research. Areas include:

- Machine learning and medical imaging for diagnostics and research
- "Omics" dataset analysis
- Natural language processing to predict outcomes from clinical notes
- Advancing cardiovascular and other programs
- Computational pathology
- Point-of-Care Testing (POCT) monitoring

Brain and Neuroscience

34 faculty members

Our Brain and Neuroscience researchers study neuropsychology, neuroimmunology, neurogenetics, proteomics, neuro-oncology, and neurological disease mechanisms. Their investigations, and study of their respective pathobiological networks, aim to better understand and treat neurodegenerative diseases, and all diseases related to the brain and nervous system such as Alzheimer's and brain cancer.

Our broad spectrum of research includes:

- the role of ion channels
- receptors and signal transduction
- synapse formation and plasticity
- neural cell fate
- neuronal guidance
- neuronal networks
- tumour genomics and genetics
- brain changes in degenerative disease

Cancer

97 faculty members

Cancer is the leading cause of premature death in Canada. Each year, there will be more than 175,000 new cases and approximately 75,000 deaths from this disease. This means that every day, an estimated 500 Canadians will be diagnosed with cancer and another 200 will die. To improve cancer diagnosis and treatment and reduce the burden of this disease, our researchers strive to expand their understanding of cancer biology. By using multi-disciplinary approaches, they elucidate the underpinnings of cancer hallmarks and translate these discoveries into novel cancer therapeutics.

Our researchers focus on various aspects related to key hallmarks of cancer such as:

- genome instability and alterations
- cell death resistance
- proliferative signalling
- evasion of growth suppressors
- invasion/metastasis
- replicative immortality
- angiogenesis
- energy metabolism
- cancer stem cells
- inflammation and immune evasion

Cardiovascular

30 faculty members

How does the heart and vascular system develop and how do these systems respond to physical and biochemical stresses during disease development? Our researchers answer these pivotal questions by studying the influence of hemodynamics, inflammatory and thrombotic mechanisms in atherosclerosis. They also investigate the remodelling of the extracellular matrix and signalling between cells and matrix in vascular disease. Research is conducted at the molecular, cellular, organ, and organism level using models ranging from zebrafish to mice and, ultimately, to humans. We foster collaborations within the department and encourage basic and clinical scientists to translate their research into new discoveries and potential treatments.

Areas of investigation include:

- cardiovascular disease
- atherosclerosis
- aneurysms
- cardiac repair

Genetics, genomics and proteomics

78 faculty members

From the identification of genetic alterations underlying disease, to the development of prognostic technologies that impact health care delivery, this area of research is critical to the pursuit of personalized and translational medicine. Our researchers uncover how relationships between genes and/or proteins are organized and integrated within large molecular networks. These networks ultimately determine the fate of cells and organisms. Our laboratories encompass a wide array of biological and clinical settings related to the understanding of diverse health and disease states.

These laboratories investigate processes such as:

- molecular evolution
- chromatin structure and function
- epigenetics
- structural analysis of nucleic acids and proteins
- repetitive DNA
- genome stability
- copy number variation

Hematopathology

24 faculty members

Researchers of hematopathology study diseases of hematopoietic cells which originate from the bone marrow and contribute to the cellular components of blood. These components include red blood cells, white blood cells, and platelets. Our researchers also investigate the nature of disease of the hematopoietic system and related organs, including the bone marrow, spleen, thymus, lymph node, and vasculature. Diseases of this system are myriad and include hereditary and congenital disorders as well as acquired disorders. Complicating matters further, hematopathology disorders may also be immunological in nature. It is not surprising that researchers involved in hematopathology possess a diverse expertise critical to the study of, but not limited to:

- transfusions and transplants
- drug delivery
- immunity
- cancer, and
- blood clots

This expertise also extends to our understanding of strokes and heart attacks which are the leading cause of morbidity and mortality worldwide.

Our researchers focus on various aspects of hematopathology, including:

- platelets and blood coagulation system in bleeding disorders and cardiovascular diseases
- the role of the immune system in hematological disease
- molecular and cellular aspects of hematopoiesis
- myelodysplastic syndromes
- diagnostic research

Human development, aging and regenerative medicine

21 faculty members

Within this decade, and for the first time in Canada, people under the age of 15 will be outnumbered by people who are 65 and older. In the hopes of discovering interventions that promote health and longevity, our researchers study the molecular and physiological changes that occur during the developmental and aging process. Can we control these processes? Studies conducted in model organisms and in human stem cell models indicate that the answer is yes. Using human, mouse, yeast, and other model systems, investigators study these developmental and aging mechanisms at the molecular/genetic/epigenetic, environmental, and behavioural level. The ultimate goal is to promote healthy longevity and prevent/cure age-related diseases. Regenerative medicine strategies are also being pursued, with the ultimate goal of therapeutic organ regeneration.

Our laboratories investigate processes such as:

- senescence and stem cell aging
- physiological and premature aging
- telomeres, telomerase, and related therapeutics
- Hutchinson-Gilford Progeria Syndrome and related laminopathies
- neurodegenerative and cognitive diseases
- metabolic syndromes
- musculo-skeletal diseases
- stroke and cardiovascular disease
- cancer
- regeneration of liver, pancreas, joints, spine and stem cells

Infectious diseases and immunopathology

46 faculty members

Viral, bacterial, fungal, and parasitic pathogens are major threats to Canadian and global public health infrastructures. Our researchers use a variety of leading-edge microbiological, biochemical, immunological, and biophysical techniques to discover important model principles of microbial pathogenesis. From uncovering the molecular mechanisms of bacterial antibiotic resistance, malarial infection, effects of toxins on cellular function, viral entry and replication to the immune restriction of microbial pathogens, researchers in this area bring a diverse breadth of focus that is key to the development of new countermeasures, such as vaccines, antibodies, therapeutics, and diagnostics.

Researchers in this area focus on various aspects including mechanisms of:

- infection processes
- host-pathogen interactions
- cellular and organismal immune systems
- immune surveillance
- innate immunity
- viral entry and replication
- microbial pathogenesis
- antibiotic resistance
- bacterial toxins
- vaccine development
- microbial diagnostics

Metabolism and nutrition

23 faculty members

Metabolism and nutrition encompasses the molecular basis of biological processes as they relate to endocrine, reproductive, metabolic, and nutritional disorders. Our researchers study the mechanisms in diabetes, endocrine function and dyslipidemias. Others are investigating the role of nutrients and of toxic substances such as metals in our environment. The effects of hormones on tissues such as the thyroid, bone, and reproductive organs are also included in this area of research. Experimental approaches include investigations of gene structure and function, cell signaling, transcriptional regulation, metabolomics, mouse genetics, and animal physiology.

Faculty members are involved in innovative clinical and basic research that focuses on:

- the pathogenesis of obesity and Type II diabetes
- identification of autoimmune markers and mediators of Type I diabetes
- pancreatic stem cells and islet transplantation
- metabolic disorders of blood lipids that lead to hypercholesterolemia and dyslipidemia
- insight into metabolic factors that contribute to bone loss, osteoporosis and renal failure
- endocrine derangements that accompany conditions of the thyroid, pituitary and reproductive glands

Molecular and cellular biology

92 faculty members

Researchers involved in molecular and cellular biology decipher an incredibly wide array of molecular and cellular processes. This area is the foundation for the vast majority of basic and clinical research. Research ranges from deciphering basic pathways of the cell to understanding how these pathways impact various physiological and pathological settings. Laboratories in this area utilize various approaches including genomic sequencing, microscopy, and genetic models as diverse as yeast, fruit flies, worms, mice, and mammalian systems.

Some of the areas investigated by our researchers include:

- chromosome structure and dynamics
- gene expression
- cell polarity and division
- intracellular trafficking and compartmentalization
- cell morphology and the cytoskeleton
- morphogenesis
- signalling
- extracellular communications
- tissue organization
- stem cell differentiation
- embryogenesis
- cellular/organismal aging
- cellular transformation
- tumourigenesis
- host/immune interactions
- apoptosis
- structure of viral proteins
- molecular evolution

Department seminar series (Monday seminars)

We hold weekly seminars, integral to the academic life of the department, on campus at the MSB during the academic year which are attended by faculty and trainees from across the GTA. Speakers include U of T faculty from LMP and other departments, as well as external invited speakers who have an opportunity to meet with attendees. The program includes several named annual lectures held each year both on campus and at affiliated hospitals, and we have endowed funds to support several external speakers.

The LMP seminars:

- provide a window into cutting-edge research both locally and across the globe.
- bridge gaps between our diverse faculty members across the city and create community.
- expose graduate students to leading scientists as potential supervisors of future postdoctoral studies
- foster collaboration.
- promote the strengths of our department to leaders in their respective fields.

Each year, the list of weekly seminars is established by our Seminar Series Advisory Board (SSAB) following suggestions by our faculty.

The SSAB choose speakers for equal representation of research themes, compliance to the mandates of Equity, Diversity and Inclusion, geographical distribution (local, provincial, national and international), and seniority level (early, mid-career and senior investigators).

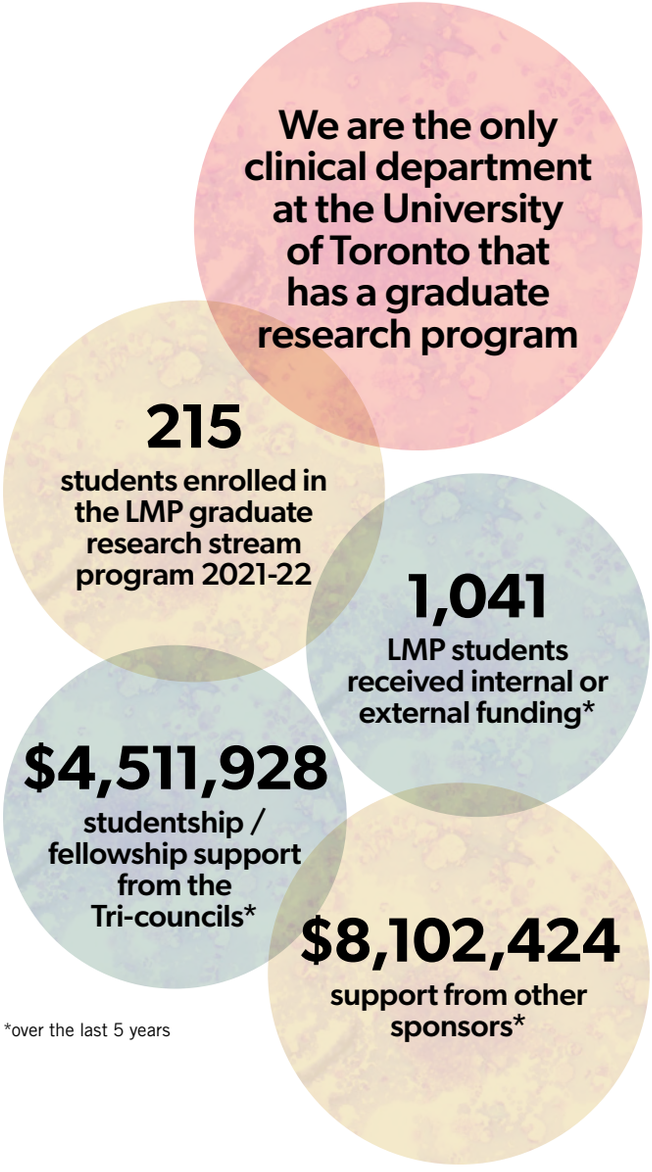
Seminar Series Advisory Board (SSAB) 2019–2024

- Jason Fish, Chair since 2019
- Stephen Girardin, Co-Chair since 2019
- Avrum Gotlieb, Member
- Michelle Bendeck, Member
- Myron Cybulsky, Member
- Scott Yuzwa, Member
- Allison McGeer, Member
- George Yousef, Member
- Susan Done, Member

As a result of the pandemic, the 2020-2021 LMP research seminar series was held virtually. The virtual format benefited us by increasing attendance and ease of attracting external speakers. However, networking and question periods were more challenging. Invited speakers often held lunch meetings with trainees or faculty dinners which we have had to cancel. We are considering live-streaming the in-person seminars in the future to enable increased participation by faculty and trainees based at distant sites.

See Appendix 2.1.2 for the full list of weekly LMP Seminar Series over the past five years.

Supporting learning



*over the last 5 years

Our research plays a significant role in our education programs.

Our graduate students and postdoctoral fellows receive significant levels of support in the form of scholarships and awards as outlined below.

Laboratory Medicine & Pathobiology Graduate Unit

Year / Fund Type	Award (Sum of Net Total)	Count of Students
2015–16	**$ 2,561,536.81**	**192**
External	$ 542,041.42	26
Provincial Government	$ 426,333.34	29
Tri-Council Agencies	$ 713,775.00	29
UT Internal	$ 879,387.05	108
2016–17	**$ 3,171,981.50**	**237**
External	$ 596,138.23	32
Provincial Government	$ 413,333.34	28
Tri-Council Agencies	$ 923,707.32	43
UT Internal	$ 1,238,802.61	134
2017–18	**$ 2,283,338.79**	**197**
External	$ 209,008.86	12
Provincial Government	$ 371,666.67	24
Tri-Council Agencies	$ 891,627.14	36
UT Internal	$ 811,036.12	125
2018–19	**$ 2,089,257.85**	**183**
External	$ 155,331.20	8
Provincial Government	$ 310,000.00	22
Tri-Council Agencies	$ 903,820.52	32
UT Internal	$ 720,106.13	121
2019–20	**$ 2,508,236.75**	**232**
External	$ 305,217.74	13
Provincial Government	$ 285,000.00	20
Tri-Council Agencies	$ 1,078,998.00	37
UT Internal	$ 839,021.01	162
Grand Total	**$ 12,614,351.70**	**1,041**

Postdoctoral fellows

Over the past few years, we have made significant progress in integrating postdoctoral fellows within departmental activities. We:

- have held annual Postgraduate Research Days that included residents and postdoctoral fellows which now has been merged into the LMPRC since 2019.
- have a separate stream of presentation awards for postdoctoral fellows, whose research projects are often longer and more in-depth than the residents.
- offer (since 2012) an annual award to support Post Docs travelling to national or international meetings to present their research. This award is named in memory of a late faculty member, Dr. Wolfgang Vogel, and is supported by funds donated in his memory.

35 postdoctoral fellows training with campus-based faculty were successful in obtaining 77 awards to support their salary since 2013 (46% female, 55% male). View Appendix 2.1.3 for details.

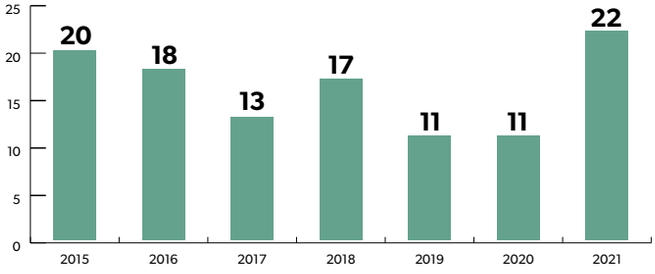
Undergraduate research

Several research-related activities are incorporated into our undergraduate Pathobiology Specialist Program.

4th year research project course (LMP 405Y)

Students spend a minimum of 10 hours per week in a research lab conducting experiments. At the end of the year, they hand in a written report on their work, and give a presentation which is graded by the course coordinator, the supervisor and one other researcher. 90 students have taken part 2015 – 2020.

Participants in LMP 405Y



LMP Summer Undergraduate Research Experience Program (SURE)

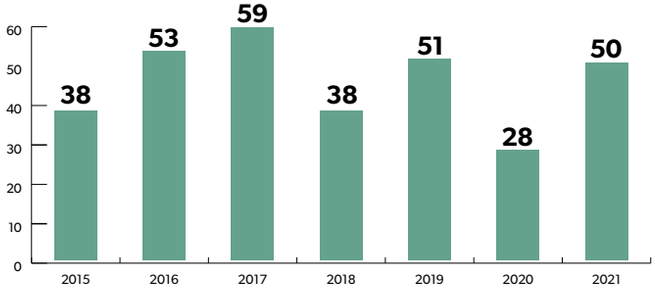
Students:

- attend 12 weeks of full-time laboratory-based research.
- present their research at a poster day in early August (The LMP SURE Research Day).
- attend monthly Lunch & Learn one-hour sessions from 12.00-1.00 pm in May, June and July.

Students in the department are supported by a variety of summer scholarship awards including the University of Toronto Research Opportunity Program, Banting and Best Diabetes Centre, the Canadian Association for Gastroenterology, the Heart and Stroke Richard Lewar Cardiovascular Centre, and NSERC summer studentships.

317
students have taken part in SURE since 2015

Participants in the LMP SURE program



Translational Research Program

The Translational Research Program (TRP) is a two-year innovative professional master's program that focuses on applied research using problem-based experiential learning. See Part 1, MHSc in Translational Research, page 70, for full details on this program.

The integration of this program into LMP has seen new opportunities and collaboration between LMP faculty who have served as committee members and project advisors, LMP students who have engaged with TRP modules and initiatives, and LMP alumni who have become research project mentors. The TRP offers a unique focus for LMP to help train students and support faculty in mobilizing knowledge into innovations.

Benchmarks of research success

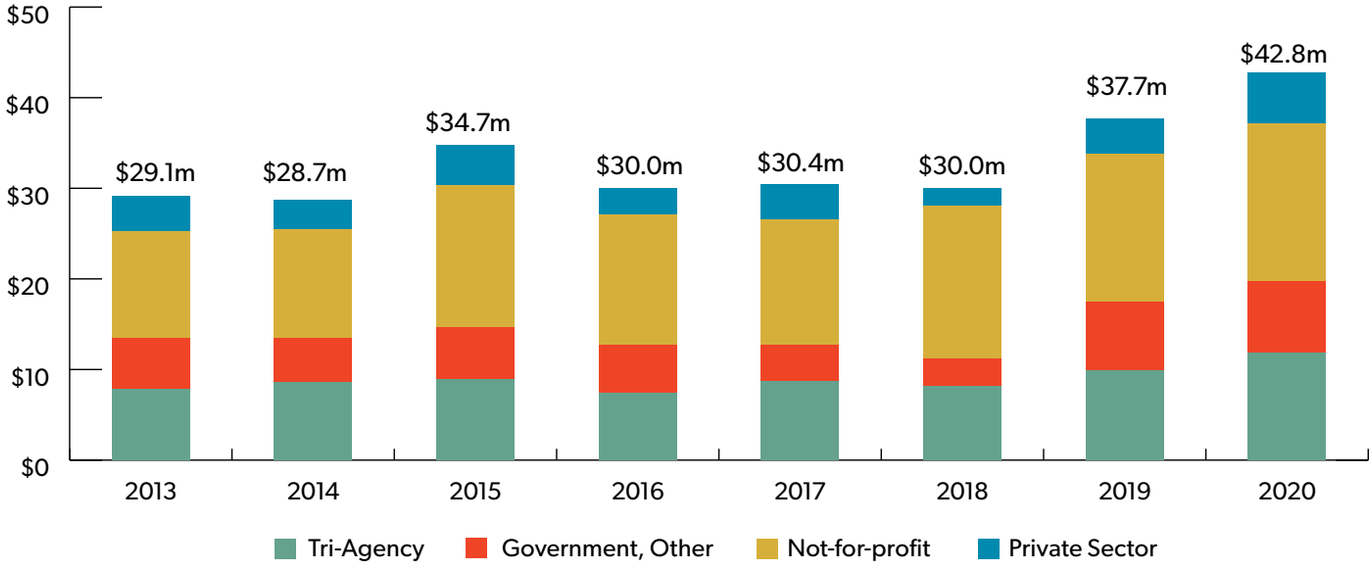
Funding

$263,424,000
total funding 2013 - 2020

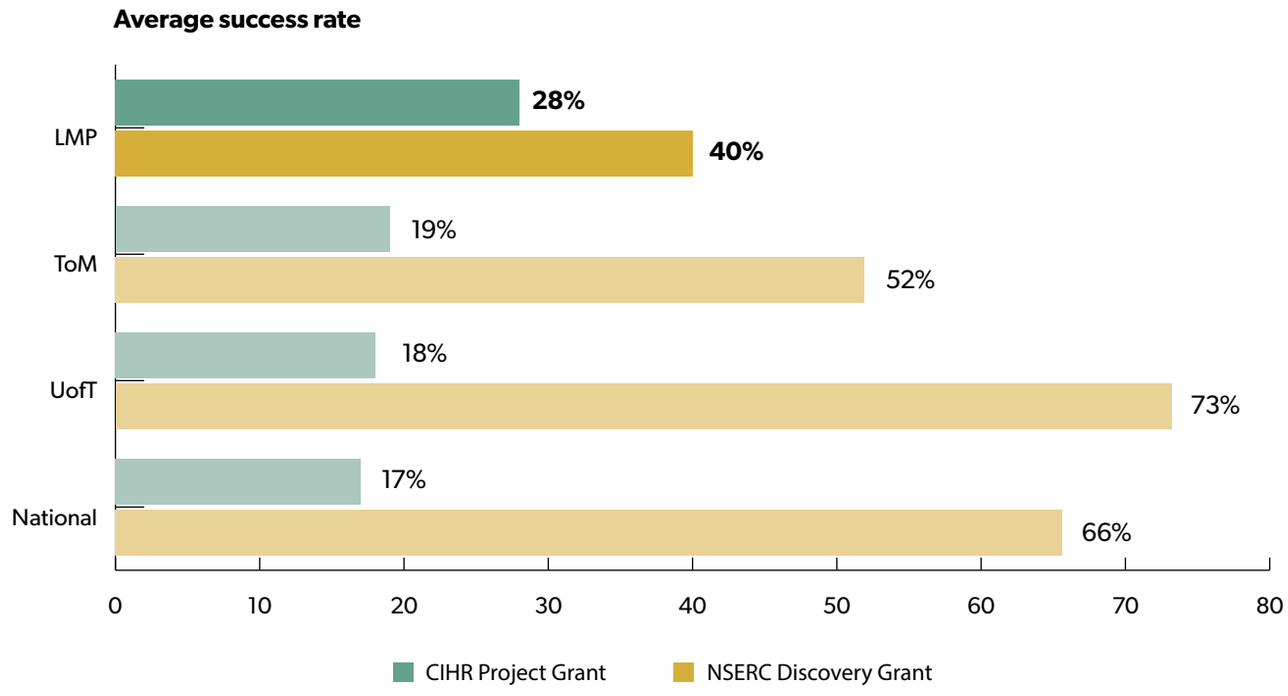
47%
increase in research funding from 2013 to 2020: $29.1m ⇢ $42.8m

Budget Installment Amount by Grant Year (April to March). A full breakdown of these funding sources is in Appendix 2.1.4.

Funding 2013 – 2020 in $ millions



Below is a table summarizing the number of LMP grant applications to the Tri-Agency, and the success in securing funding for the 2016-2020 period (for CIHR) or 2013-2020 (for NSERC), relative to Temerty Medicine and the university. This is limited to grants administered by U of T and not by hospitals.



Data source: Data for Unit, Faculty and U of T derived from Research Information Systems data. National data from CIHR reports.

Salary/Career Awards and Named Chairs

In the period 2013–2020, LMP faculty have been successful in securing numerous Salary/Career Awards.

List of Awards won by faculty members 2013–2020 of which we were informed

Name	Award	Organization	Award Start Date
Khosrow Adeli	Award for Innovation in Laboratory Medicine	Canadian Society of Clinical Chemists	2015-01-01
Khosrow Adeli	Lifetime Achievement Award	Ontario Society of Clinical Chemists	2015-01-01
Khosrow Adeli	Academy Award for Outstanding Contributions to Clinical Chemistry in a Selected Area of Research	American Association for Clinical Chemistry	2019-06-01
Kenneth Aldape	Abhijit Guha Award	Society for Neuro-Oncology	2014-07-01
Carmen Avila-Casado	Edmond L. Dubois Memorial Lectureship	Rheumatology Research Foundation	2015-01-01
Jagdish Butany	Distinguished Achievement Award	Society for Cardiovascular Pathology	2014-03-01
Jagdish Butany	Leadership in Patient Safety and Quality Assurance Award	Canadian Association of Pathologists	2017-01-01
Jagdish Butany	The Gold Headed Cane	World Association of Societies of Pathology and Laboratory Medicine	2017-11-01
Elizabeth Demicco	Junior Scientist Award	Canadian Association of Pathologists	2018-01-01
Eleftherios P Diamandis	Carl R. Joliff Award for Lifetime Achivement in Clinical Diagnostic Immunology	American Association of Clinical Chemistry	2013-01-01
Eleftherios P Diamandis	Award for Outstanding Contributions to Clinical Chemistry	Canadian Society of Clinical Chemists	2014-01-01
Eleftherios P Diamandis	Morton K. Schwartz Lectureship Award	American Association for Clinical Chemistry, New York Metro Section	2014-01-01
Eleftherios P Diamandis	Distinguished Award for Laboratory Medicine and Patient Care	International Federation of Clinical Chemistry and Laboratory Medicine	2017-01-01
Eleftherios P Diamandis	Lifetime Achievement Award	Ontario Society of Clinical Chemists	2017-01-01
Phedias Diamandis	George Grannis Award for Excellence in Research and Scientific Publication	American Association for Clinical Chemistry	2018-01-01
Phedias Diamandis	Lucien J. Rubinstein Award – Honorable Mention	American Association of Neuropathologists	2018-01-01
Bojana Djordjevic	ASCP 40 under Forty Honoree – Top 5	American Society of Clinical Pathology	2018-07-01
Jason Fish	Springer Junior Investigator Award	North American Vascular Biology Organization	2014-10-22

Name	Award	Organization	Award Start Date
Jason Fish	Young Investigator Award – Basic Science	Canadian Cardiovascular Society	2015-01-01
Avrum Gotlieb	President's Award	Canadian Association of Pathologists	2013-10-01
Cynthia Hawkins	Lucien J. Rubinstein Award	American Association of Neuropathologists	2013-01-01
Cynthia Hawkins	Lucien J. Rubinstein Award	American Association of Neuropathologists	2016-01-01
Cynthia Hawkins	Lucien J. Rubinstein Award	American Association of Neuropathologists	2017-01-01
Cynthia Hawkins	Lucien J. Rubinstein Award	American Association of Neuropathologists	2020-01-01
Lili-Naz Hazrati	10 Torontonians to Watch	Toronto Star	2014-12-28
Carlo Hojilla	Leadership in Education Award	Canadian Association of Pathologists	2021-01-01
Carlo Hojilla	Leadership in Education	Sinai Health System, Division of Education	2019-01-01
Carlo Hojilla	Donald W. Penner Award	65th Annual Canadian Association of Pathologists Meeting	2014-01-01
Rita Kandel	Fellow	Canadian Academy of Health Sciences	2013-01-01
Rita Kandel	Honorary Fellow	International Cartilage Repair Society	2016-10-01
Rita Kandel	Marshall R. Urist, MD Award	Orthopaedic Research Society	2019-02-01
Kevin Katz	Dr. Lindsay E. Nicolle Award	The Canadian Journal of Infectious Diseases & Medical Microbiology	2018-04-01
Vathany Kulasingam	Award for Innovation in Laboratory Medicine	Canadian Society of Clinical Chemists	2017-01-01
Vathany Kulasingam	Research Excellence Award	Canadian Society of Clinical Chemists	2019-01-01
Michael Laflamme	Inventor of the Year Award	University Health Network	2018-06-01
Jeffrey Lee	Merck Irving S. Sigal Memorial Award	American Society for Microbiology	2015-01-01
Viliam Lustig	Outstanding Contribution Award in the Profession of Clinical Chemistry	Ontario Society of Clinical Chemists	2015-01-01
Sonya MacParland	Bhagirath Singh Early Career Award in Infection and Immunity	Canadian Institutes of Health Research – Institute of Infection and Immunity	2019-03-01
Allison McGeer	May Cohen Award for Women Mentors	Canadian Medical Association	2015-01-01
Karim Mekhail	Maud Menten New Principal Investigator Prize	Canadian Institutes of Health Research	2013-01-01
Karim Mekhail	College of New Scholars, Artists and Scientists	Royal Society of Canada	2021-09-01

Name	Award	Organization	Award Start Date
David Munoz	Alzheimer Award	Spanish Society of Neurology	2013-01-01
David Munoz	Cotzias Award	La Sociedad Española de Neurología	2017-11-01
Heyu Ni	Armand Keating Award for Paper of the Year	University of Toronto Department of Medicine, Division of Hematology	2019-04-01
Heyu Ni	Fellow	Canadian Academy of Health Sciences	2020-09-18
Carlos Parra-Herran	ASCP 40 under Forty Honoree	American Society of Clinical Pathology	2017-05-01
Michael Pollanen	Distinguished Pathologist's Award	Ontario Association of Pathologists	2015-01-01
Robert Riddell	Harvey Goldman Lifetime Achievement Award	Rodger C. Haggitt Gastrointestinal Pathology Society	2017-01-01
Clinton Robbins	Dr. Subhash C. Verma Young Investigator's Award	Heart & Stroke/Richard Lewar Centre of Excellence, University Health Network	2017-01-01
Clinton Robbins	New Investigator Award	Canadian Society for Immunology	2017-01-01
John Srigley	President's Award	Canadian Association of Pathologists	2014-01-01
Hoon-Ki Sung	Sanofi-Cell Research Outstanding Paper Award	Cell Research	2018-10-28
Ming-Sound Tsao	Mary Matthews Pathology Award	International Association for the Study of Lung Cancer (IASLC)	2015-03-01
Ming-Sound Tsao	Dr. Joseph Pater Excellence in Clinical Trials Research Award	Canadian Cancer Trials Group	2017-01-01
Ming-Sound Tsao	Highly Cited Researcher	Web of Science	2019-11-19
Ming-Sound Tsao	Fellow	Royal Society of Canada	2020-09-09
Ming-Sound Tsao	Fellow	Canadian Academy of Health Sciences (CAHS)	2021-09-13
Theodorus van der Kwast	Leopold Koss Medal	International Society of Urological Pathology	2017-01-01
Daniel Winer	Top 10 Breakthroughs of the Decade	Cell Metabolism	2015-01-01
George Yousef	E.K. Frey – E. Werle Commemorative Gold Medal	E.K. Frey – E. Werle Foundation	2017-01-01
George Yousef	College of New Scholars, Artists and Scientists	Royal Society of Canada	2017-09-12
George Yousef	Biomedical Innovation Award	St. Michael's Hospital Foundation	2018-11-14

Canada Research Chairs

12
Canada Research Chairs awarded since 2017

Since 2017, twelve of our department's faculty have been awarded Canada Research Chairs (CRC), of which four are Tier I and eight are Tier II (listed below in chronological order by year awarded).

Jeff Lee	Structural Virology*	Tier II
Jason Fish	Vascular Cell and Molecular Biology*	Tier II
Daniel Winer	Immunometabolism	Tier II
Karim Mekhail	DNA organization in genome function and disease states	Tier II
Myron Cybulsky	Arterial Wall Biology and Atherogenesis	Tier I
Adam Shlien	Childhood cancer genomics	Tier II
Isabelle Aubert	Brain Repair and Regeneration	Tier I
Joanne McLaurin	Alzheimer Disease Therapeutics	Tier II
Stephen Girardin	Intestinal Inflammation	Tier I
Michael LaFlamme	Cardiovascular Regenerative Medicine	Tier I
Sonya MacParland	Liver Immunobiology	Tier II
Kelsie Thu	Lung Cancer therapy response	Tier II

*renewed for a second term

Research Productivity

Departmental scholarly output 2015 – 2020

382
faculty actively publishing (2015-2020)

10,848
scholarly output

382 of our current and former faculty members have been actively publishing during 2015–2020 (data source: Scopus), of which 368 are, or were, primary appointed faculty.

Despite increased clinical workloads and reduced protected time for academic activity and research, our clinical (MD) full-time faculty had the highest scholarly output of our faculty collectively and on a per capita basis. They are closely followed by our basic scientists (i.e. PhD researchers, non-budgetary, tenured, and status only appointments). They are fewer in number (125 faculty in total) but obviously have high rates of publications.

Appointment type	No. faculty on list	Scholarly output per appt type	Average scholarly output per faculty
Clinical (MD) Full Time Appt	189	6714	35.5
PhD Researcher	49	1620	33.1
Non-Budgetary	12	390	32.5
Tenured	12	282	23.5
Status only	52	1107	21.3
Adjunct: Lecturer	14	185	13.2
Clinical (MD) Part Time Appt	42	476	11.3
Adjunct Professor	2	18	9.0
Clinical (MD) Cross-Appt	2	16	8.0
Clinical (MD) Adjunct Appt	8	34	4.3

Bibliometric data source: Scopus

For a full listing of bibliometric data on each of our department's faculty members, please refer to Appendix 2.1.5.

Below provides a group summary on our department's scholarly output, citation count, international collaborations, and academic-corporate collaborations, from 2015–2020:

International Collaboration (%)	48.7
Academic-Corporate Collaboration (%)	4.8
Citation Count	214,610
Field-Weighted Citation Impact	2.27
Output in Top 10% Citation Percentiles (%)	28.7
Publications in Top 10% Journal Percentiles by CiteScore Percentile (%)	48.1
Citations per Publication	25.1
Views Count	220,033
Output in Top 10% Views Percentiles (%)	11
Views per Publication	25.7
Field-Weighted Views Impact*	1.48

*The field-weighted citation impact number is a ratio of citation performance to expectations, where the expectation is calculated based on the document type, the field of study, and the date of publication. A number higher than 1 means that the citation performance of the publication/author/etc… is above the global average when compared to similar groups of publications. A score of 2.5 means the publication(s) have performed two-and-a-half times better than expected. The global averages are calculated for each field by Elsevier (Scopus).

Global comparisons 2015–2020

It is challenging to compare our department directly with others due to the unique and diverse nature of our research portfolio.

The table below has been pulled from Incites using research subject areas of biochemistry and molecular biology, microbiology, pathology, and cell biology, which represents our department's research areas without being over-inclusive. However, this data does include all faculty within the University who publish in these subject areas, regardless of which department they are appointed to.

The University of Toronto ranks within the top 10 global institutions for number of times our publications have been cited and we rank 3rd after Harvard and Johns Hopkins in number of publications during that time period. We are the lead Canadian institution in these fields of research. Considering we operate within a publicly funded healthcare and education system we have proven to be successful contributors in research and scholarly activities both nationally and internationally in these areas.

Name	Web of Science Documents	Rank (in publications)	Times Cited	% Docs Cited	Rank (in citations)	Category Normalized Citation Impact
Harvard University	22,185	1	645,715	77.66	1	2.218
Massachusetts Institute of Technology (MIT)	5,886	25	264,957	87.22	2	2.933
University of California San Francisco	7,510	7	230,261	73.77	3	2.265
Stanford University	7,531	6	224,332	78.18	4	2.163
University of California San Diego	7,763	5	210,172	77.19	5	1.955
Johns Hopkins University	9,591	2	199,858	73.84	6	1.678
University of Cambridge	6,589	17	182,460	85.14	7	1.986
Cornell University	7,463	8	178,637	76.43	8	1.820
University of Toronto	**8,514**	**3**	**172,092**	**75.09**	**9**	**1.703**
University of Pennsylvania	7,462	9	171,802	76.01	10	1.829
McGill University	4,371	51	89,431	81.99	51	1.540
University of British Columbia	4,655	46	86,586	78.30	55	1.615

Data source: Incites / Web of Science

Response to 2013 External Review

Areas highlighted by the external reviewers included the following.

1. LMP had strategic planning and focused its departmental research directions – one such direction is translational research

With many of the LMP faculty being based at hospitals, translational research is an important component of many research programs. This is a challenge given the constrained fiscal funding and grant support for such activities. Additionally, our clinical faculty has increasing workloads as attempts to increase funded positions have not been fully successful to date. We anticipate that translational research will continue to flourish within the department, given the academic focus of our faculty, and will be strengthened by inclusion of new faculty with expertise in Artificial Intelligence.

Another challenge that remains is to better integrate basic researchers based at the University into translational research programs that are based at hospitals (see point 5 opposite).

2. Hospital-based pathologists may be encouraged to take a leading role in translational research

A key challenge faced by hospital-based pathologists is an increased workload and consequently decreased protected time for academic pursuits, including research. Various hospital departments have incentivized translational research by providing small internal grants. Budgets for these types of initiatives are limited and alternative solutions will be required.

We initiated a pilot program to support the salary of a postdoctoral or clinical fellow who would spearhead a research project that involved collaboration between different hospitals. The purpose was to break down silos between the hospitals and promote translational research. Two fellowships were awarded for the 2019–2020 academic year and were planned to present their research

at the annual LMP Research Conference, which was cancelled due to the pandemic. Funding for this program is limited and the program will be reevaluated prior to further competitions.

3. A major challenge is potential pressure on research funding – especially due to changing CIHR funding model

CIHR has abandoned the Foundation Grant scheme and has returned to support research through Project Grant competitions with traditional grant panels. There will be some challenges reintegrating Foundation Grant holders back into the Project Grant system, but this is unlikely to impact LMP significantly. Some Foundation Grant holders will retire after completion of their grant term, others will apply for multiple Project Grants.

Research funding remains a major challenge. Over the last five years, CIHR Project Grant competitions funding rates averaged below 17%, and it is highly unlikely that funding will improve in the future. Over years of low funding, applicants with weaker research programs have dropped out of CIHR competitions and thus the quality of applicants and applications has actually improved. Securing consistent CIHR funding will be difficult in the coming years. Government spending during the pandemic to support businesses has created large deficits and a climate of uncertainty. Research will have to rely increasingly on support from charitable foundations or alternative funding sources. Many of these do not provide any indirect funds to support essential research infrastructure.

4. The department may consider making a plan to support specific researchers if they lose their grants

Gaps in research funding can dramatically affect research programs. Highly qualified personnel, such as research technicians and research associates, whose salaries are usually supported through peer-reviewed grant funding, will be lost permanently because of a funding gap, together with their unique skills and support for research programs as well as training of graduate students and postdoctoral fellows. Departmental bridge funding would be highly desirable for this reason; however, departmental budgets have been downsized over the years and finances for this type of support simply do not exist.

Junior faculty have adjusted their research programs to rely more on trainees and less on FTEs because support for trainee salaries can often be achieved through various salary awards. However, trainee salaries are relatively low and this creates social problems relating to food insecurity and availability of lodgings.

5. The department translational research agenda can be moved forward with increased interaction with U of T based researchers, hospital-based researchers and pathologists

We strongly agree with the above statement, however, in practice fostering interactions between faculty based at hospitals and the university has been difficult. There simply are not many opportunities for spontaneous interactions and cross-fertilization. Most of the hospital-based faculty with a substantial research program have protected time for research and are members of hospital research institutes where they can readily establish collaborative projects. Furthermore, impediments are in place with respect to transfer of patient materials between institutions. Interactions potentially could be fruitful between university-based faculty and faculty at institutions lacking basic science faculty, such as the Ontario Forensic Pathology Service, Public Health Ontario and Community-Affiliated Hospitals. These opportunities will be explored. We have integrated our annual research day to include all our learners from graduate, clinical training, and professional programs with the goal to stimulate exchange of knowledge and, hopefully, collaborations.

6. Interactions may be stimulated using inter-institutional rounds, research seminars etc. – use of videoconferencing may also be considered to save on travel time

The time that hospital-based faculty can devote to seminars and conferences is limited by increased workloads. Few hospital-based faculty attend the LMP weekly research seminars. We started a pilot project to live-stream seminars given by hospital-based faculty but it was difficult to track attendance and interactions, and we found that the exchange of ideas is limited. In response to the pandemic, all LMP seminars are currently being live-streamed. The plan is to continue doing this even when we return to in-person seminars in 2022.

In the past, LMP has organized in-person conferences that focused on departmental research themes. Over the years, the attendance of these conferences decreased dramatically and they have been discontinued.

Inter-institutional activity has flourished in areas outside of research. For example, specialty pathology groups, e.g. breast and gynecological pathology, have been interacting virtually (see Part 1, Continuing Professional Development, page 146). The Quality Council has also experienced excellent participation and engagement by faculty from many institutions (See Quality Council, page 32). It is obvious that faculty at different institutions find these activities of value and are willing to make time in their busy schedules to participate. The challenge facing us is to identify a research-centered forum that also provides value and will engage faculty at different institutions to actively participate.

Some hospitals have established virtual research conferences where faculty and fellows present research projects to their colleagues and trainees. We will encourage organizers of these conferences to engage faculty at other hospitals to promote exchange of information, cross-fertilization of ideas and collaboration.

In-person and recently virtual annual conferences organized by LMP students have drawn good attendance of students as well as trainees and faculty. Promoting of “grass-roots” types of conferences organized by students, trainees and faculty is another avenue that will be pursued.

Future challenges and opportunities

Challenges

- Low research funding by CIHR
- Uncertainties created by the COVID-19 pandemic
- High clinical workloads, lack of time for research activities, faculty burnout
- Breaking down of geographic silos through research-related activities such as research conferences and seminars
- Future recruitment of laboratory medicine clinician-scientists at TAHSN hospitals due to lack of funding for protected time for research
- Equity and diversity of faculty involved in research

Opportunities

- Wide-spread enthusiasm to pursue AI projects through collaboration with T-CAIREM
- Mentorship of junior faculty is contributing to the success of their research programs

Research funding will remain a major challenge in the next five years. The internal review process we initiated in Temerty Medicine helps move grants into the fundable range, however, faculty will also have to rely increasingly on support from charitable foundations or alternative funding sources.

An increase in clinical workloads and reduction of hospital budgets has limited the growth of clinical faculty, reduced protected time for academic activity and research, and contributed to stress and burnout. Since patient care is a priority, clinical faculty have had little time for research conferences and seminars, which in the past was a means to break down geographic silos through research-related activities. We have seen some success with organ-based case conferences in bringing faculty from different hospitals together. It is our hope that over time these may evolve into a forum that initiates collaborative translational research projects. Our WIDE Committee is running wellness initiatives to help with stress and faculty burnout (See WIDE, page 60).

Reduction in hospital budgets has also impacted the hiring practices of hospital-based LMP faculty. Previously, clinical faculty who had appropriate research training were hired as clinician-investigators or clinician-scientists, with 50% or 80% protected time for research. These individuals were successful in establishing an academic research program that was supported by peer-reviewed grants and salary awards. Currently, several residents in the Anatomic Pathology program either hold a MD/PhD degree or have enrolled in PhD program at U of T, and thus have the potential to become clinician-scientists. The challenge is to secure funding to hire them as junior faculty with adequate protected time that would enable the development of an independent and well-funded research program. It may be necessary over the next few years to explore if practice plans at various hospitals can support protected time for research for highly qualified junior faculty.


TORONTO
MAXIMUM
20
km/h
TORONTO

2 Quality Council

We formed the LMP Quality Council in 2018, which aims to:

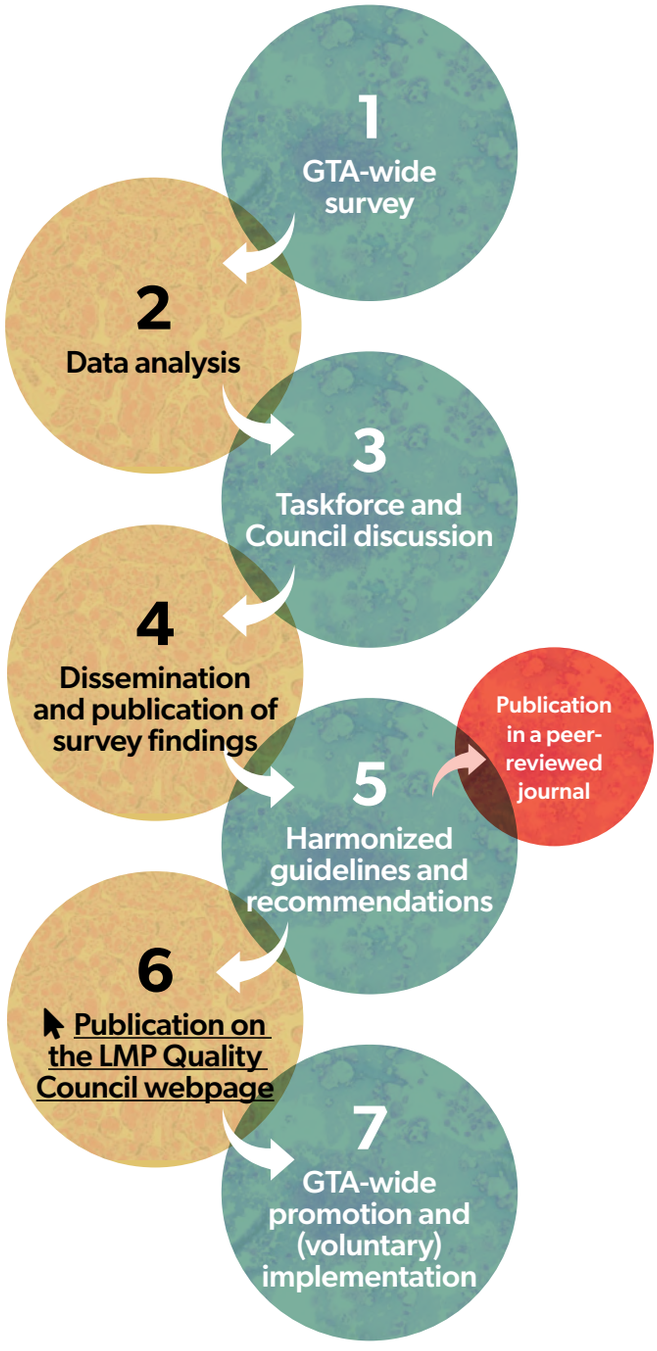
- Promote alliances between hospitals affiliated with the University of Toronto, including community hospitals across the Greater Toronto Area (GTA)
- Develop novel quality programs or initiatives that will enhance quality laboratory services and improve patient care
- Harmonize lab testing systems across the GTA to enhance quality.

We promote city-wide groups and support collaborative initiatives across the Toronto Academic Health Science Network (TAHSN hospitals), by having a Council composed of representatives from several teaching and community hospitals across the GTA. These members have expertise in various disciplines, including chemistry, pathology, cytopathology, hematopathology, microbiology, immunohistochemistry, and genetics.

Strategic overview of project milestones

Each project follows the pathway below. In the next phase, we aim to focus on integrating quality with clinical practice, education, continuing professional development, and research.

Strategic overview/roadmap of the major steps in each project



Current projects

1. Clinical laboratory quality indicators and harmonization across the GTA hospitals

Quality indicators allow laboratories to quantify the quality of laboratory processes, which is fundamental to patient safety. Harmonization of quality indicators is necessary to ensure that all clinical laboratories define, report, and benchmark according to defined quality standards.

This aligns with our strategic plan to increase the focus on quality and performance measurement in health care delivery.

Quality Indicators taskforce
Corwyn Rowsell - Anatomical Pathology - SMH
Paul Yip - Clinical Chemistry - SHSC
Zeinab Ghorab - Cytopathology - SHSC
Susan Poutanen - Medical Microbiology - MSH

Project objective

To harmonize quality indicators across hospital-based clinical laboratories in the GTA that identify areas for quality improvement and enable sharing of best practices.

Project delivery

2018: the project began with a review of documents on quality assurance (QA) and key performance indicators (KPIs), which led us to identify common quality indicators.

2020: we surveyed hospital-based clinical laboratories across the GTA to assess the potential for harmonization of such quality indicators. 9 out of 11 hospitals responded.

Based on these responses, we developed a list of proposed harmonized quality indicators and have now drafted interim guidelines for core lab quality indicators. The guidelines will provide details on key quality indicators for monitoring, definitions for each indicator, and description of the frequency of performance evaluation for each indicator.

We will disseminate the survey data and guidelines by publishing on our website and publishing in peer-reviewed journals, as well as making it available on the LMP website. We will then focus on implementing these harmonized quality indicators across the GTA.

How we will measure the impact of this project

- The number of hospital-based clinical laboratories participating in survey response and implementation.
- For laboratories that participate in implementation, pre-analytic, analytic, and post-analytic errors can be used as indicators of the impact of guideline implementation.
- Further research can also be carried out to understand how these indicators correspond to patient care and safety.

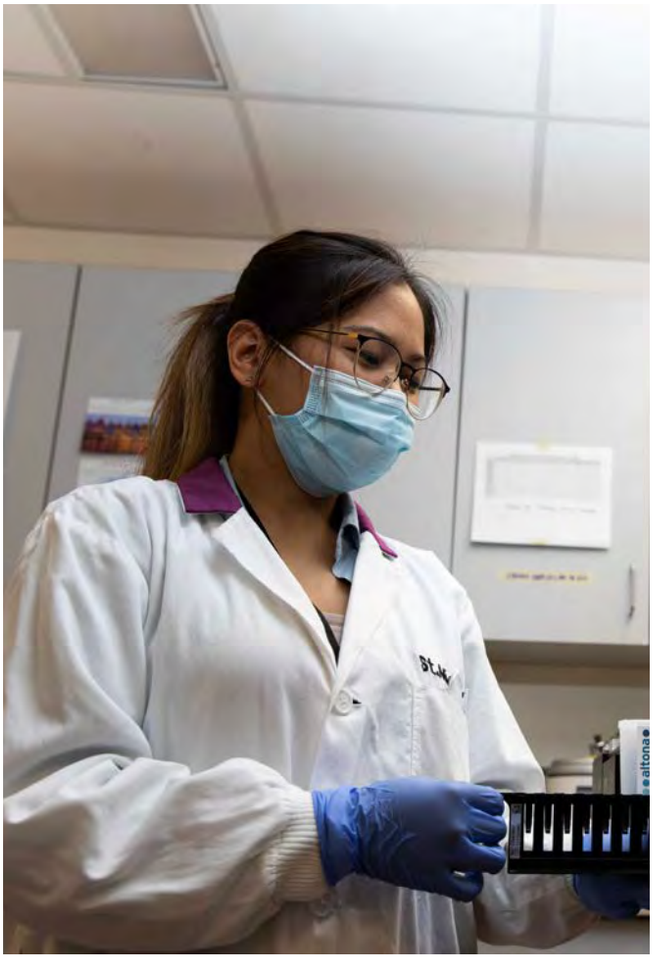


Photo: Katie Cooper at Unity Health Toronto

2. Appropriate laboratory test utilization to enhance patient safety and reduce waste

Efficient and appropriate laboratory utilization can contribute to patient safety and improve stewardship of limited resources. Additionally, fewer unnecessary tests may reduce testing demand and decrease healthcare costs associated with laboratory testing.

This supports our strategic plan to assist system change initiatives that align LMP with laboratory utilization.

Lab test utilization taskforce
Michelle Sholzberg - Lab Hematology - SMH
Daniel Beriault - Clinical Chemistry - SMH
Lusia Sepiashvili - Clinical Chemistry - SickKids

Project objective

To evaluate the appropriateness of testing in several areas of laboratory medicine to minimize the amount of inappropriate or redundant testing orders placed by physicians.

Project delivery

We are currently evaluating the appropriateness of laboratory test utilization for the top ten popular order sets. To do so, we are reviewing various materials, sharing methodology across disciplines, and initiating collaboration with colleagues from other departments.

We recently sent a survey to hospital-based clinical laboratories across the GTA to learn more about ongoing test utilization projects as well as foster collaboration, harmonization, and consistency of lab utilization approaches and tools across the region.

Going forward, we plan to disseminate survey findings and continue to work towards the development of guidelines for appropriate test utilization for application across the GTA.

How we will measure the impact of this project

- The number of hospital-based clinical laboratories participating in survey response and implementation.
- Following implementation, various indicators such as testing costs will inform the impact of guideline implementation.

3. Harmonization of critical values across the GTA hospitals

Critical values aid in the interpretation of patient test results. Harmonization of critical values used by hospitals and their associated clinical laboratories across the GTA is essential to ensure consistency in the definition and identification of 'critical state' patients.

Similar to the Council's initiative to harmonize clinical laboratory quality indicators, this initiative also supports our strategic plan to increase the focus on quality in health care delivery.

Critical values taskforce

Elaine Goh - Medical Genetics - THP

Felix Leung - Clinical Chemistry - MSH

Davor Brinc - Clinical Chemistry - TGH-UHN

James Stavropoulos - Molecular Genetics - SickKids

Saranya Arnoldo - Clinical Chemistry - WOHS

Project objective

To harmonize critical values across hospital-based clinical laboratories in the GTA.

Project delivery

We have surveyed various hospital-based clinical laboratories across the GTA, including genetics, chemistry, hematology, and pathology, to assess the feasibility for the harmonization of critical values. We have analyzed the results and will disseminate them soon. We will use the results to develop guidelines for the harmonization of critical values, following which we will begin implementing these harmonized critical values across the GTA.

How we will measure the impact of this project

- The number of hospital-based clinical laboratories participating in survey response and implementation.
- Indicators such as the number of correctly identified critical patients will inform the impact of implementing harmonized critical values on patient care and safety.

Lab tests that impact lives: harmonizing critical values

Dr. Elaine Goh, a member of the critical values taskforce, has published the first study of Ontario genetics laboratories' practice of reporting critical values to help define standards for the industry. Published in the Journal of Applied Laboratory Medicine, the study had an 82% response rate and outlines some of the current practices.

Read more about the study and paper.

3 Global Health and Outreach

Our current global outreach initiatives are coordinated through our Forensic Pathology programs. With our new strategic plan, we are exploring ways to broaden our outreach activities across LMP.

We have been a partner of the Ontario Forensic Pathology Service (OFPS) and the Provincial Forensic Pathology Unit (PFPU) since 2018. Our joint goal is to train the next generation of forensic pathologists and forensic medicine practitioners for Canada and the world to support public death investigations, criminal justice and human rights.

Training Clinical Fellows in Forensic Medicine

Our Forensic Pathology Residency Training Program primarily caters for Canadian graduates, but our training for Clinical Fellows attracts international candidates with various backgrounds in pathology and forensic medicine.

Some nations do not have a robust system of forensic medicine to support human rights and justice. Together with the PFPU, we are committed to developing global forensic medicine and have outreach activities and training collaborations with Jamaica, Sri Lanka, Chile and countries in the Middle East and Africa. We have also trained Indigenous forensic pathologists.

Key facts

- 16 international fellows have trained with us since 2007
- Since 2016 clinical fellows can write the Royal College examination in Forensic Pathology, through the Subspecialty Examination Affiliate Program
- 7 international fellows have benefited from the G. Raymond Chang Forensic Pathology Fellowship since 2015

The G. Raymond Chang Forensic Pathology Fellowship

The Raymond Chang Foundation is named after the late Toronto-based businessman and philanthropist who had a passion for adult education. Born in Jamaica, Mr. Chang was a proud and active member of the Caribbean-Canadian community. He was appointed to the Order of Jamaica in 2011 and as an officer of the Order of Canada in 2014.

Raymond Chang understood the relevance of forensic pathology as a truth-seeking tool for justice. His legacy lives on through the dedication of his children, Andrew Chang and Brigette Chang-Addorisio. Their generosity and shared vision have ensured a sustainable fellowship international training program at U of T.

This is the first fund anywhere that enables young physicians from the developing world to train in forensic medicine and ultimately strengthen forensic capacity in their own countries. This fellowship provides financial support to trainees whose countries may not be able to fund a year of training in Canada, particularly those from the West Indies.

A report on our graduated fellows and their achievements is in Appendix 2.3.1.

The G. Raymond Chang Forensic Pathology Catalyst Fund

In keeping with the Chang Foundation's philanthropic vision, the partnership was enhanced in 2017 through the addition of a Catalyst Fund, which has enabled us to broaden our strategy to focus on supporting critical infrastructure development and extension to other global areas in need.

The fund continues to provide seed funding for a wide-ranging and multi-year approach to building capacity, accelerating activity, and advocacy for improvements in forensic practices around the world.

This has funded or supported the following initiatives.

Jamaica

We have continued our work in Jamaica with an inter-institutional collaboration with the University of the West Indies to strengthen their forensic pathology capacity.

Our goal is to help Jamaica become the Centre of Excellence for Forensic Pathology in the Caribbean region. It is our hope that they will develop their own fellowship training program to train forensic pathologists in the region, which we believe will be possible within the next decade.

As part of this we:

- have trained four forensic pathologists from Jamaica in our one-year clinical fellowship training program.
- are involved in training forensic autopsy technicians and other staff in Jamaica via short-term training missions.
- have advocated with the Jamaican government for the development of facilities to support the work of the forensic pathologists. As a result of this advocacy, the Jamaican government has budgeted $309 million for the construction of a Forensic Pathology Autopsy Suite. The Ministry of National Security aims to increase the forensic capacity of the Jamaica Constabulary Force and reduce the backlog in criminal and other cases. It is anticipated that 40% of construction activities will be completed for the fiscal year 2021/22.

In recognition of our collective contributions, Dr. Michael Pollanen, Chief Forensic Pathologist of Ontario and Deputy Chief Coroner and Director of our Forensic Pathology Fellowship Program, received the University of the West Indies Vice Chancellor's Award in 2018.

We now call this the "Jamaica model", which we are applying in other countries. This successful model has three important elements:

1. Clinical fellowship training at the University of Toronto with the candidates returning to their home countries to lead service delivery;
2. Sustained in-country capacity development, facilitated by exchanges between forensic pathologists, aimed at educating the stakeholders in death investigation in their home countries; and
3. Ongoing advocacy by Canadian forensic pathologists to support the development of facilities and equipment in the countries to support autopsy services.

This allows the application of forensic pathology in these countries to protect human rights through proper death investigation, management after natural disasters, and the support of the criminal justice system.

Zambia

We have applied the "Jamaica model" to Zambia over the last year. Our first fellow returned home in summer 2019.

We will continue to support the development of forensic pathology capacity in Zambia and hope that Zambia will become the focal point for educational activities in forensic pathology in Africa.

Uganda

We have had significant progress specifically in Kitgum, a district of northern Uganda near the border to South Sudan. We are part of a collaboration to explore the pathology, cause and pathophysiology of Nodding Syndrome, an epidemic young-onset epilepsy-dementia complex. The disease started as an outbreak in internally displaced person camps in northern Uganda, following internal armed conflict.

This is a multi-layered research program that is also aimed at developing capacity in pathology, forensic pathology and research in Uganda.

Central African Republic

The Central African Republic is one of the world's least-developed countries with most of the population living in poverty. Due to heavy internal armed conflict and political instability, there is a UN peacekeeping force present. The civilian population is highly vulnerable to disease, injury and violence. Life expectancy is short, infectious disease is rampant and gender-based and ethnically motivated crime is high. There is currently an epidemic of measles.

Dr. Pollanen visited Bangui in March 2020 on a multinational forensic operational mission, which provided an opportunity to assess whether our capacity development program could have a role in Central African Republic.

During times of political instability, forensic pathology may deliver huge societal impacts and evolving forensic pathology and hospital laboratory medicine services may benefit the civilian population. Thus, it may be beneficial to institute the most basic forensic capacity development in Central African Republic.

Other outreach activities

Our faculty and learners are highly active within our local, national and global communities, with too many activities to mention. They do in a variety of ways, such as:

- Membership of multiple academic and professional societies, many with leadership roles
- Serving on Editorial Boards of international peer-reviewed journals, and act as reviewers for other specialist journals and publications such as the WHO Blue Book
- Active presence at a broad range of conferences and events around the world, as well as speaking opportunities at other institutions and organisations
- High school outreach through the LMP CLAMPS program, as well as other Faculty, university and community-led programs
- A number of student exchange programs
- Hosting internationally renowned guest lecture series such as the Dr. Frederick Jaffe Memorial Lectureship (see Research, page 17)
- Our faculty take part in clinical case reviews held at hospitals to aid developing countries (e.g., SickKids Cancer Clinic)

4 Advancement and Alumni Relations

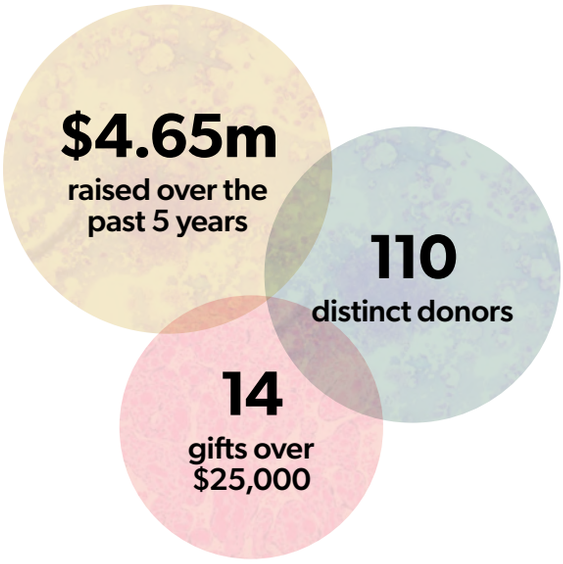
We have worked closely with the Temerty Medicine's Advancement team over the years.

The leadership of Dr. Rita Kandel, and the appointment of Dr. Michael Pollanen as Vice-Chair Innovation (with remit for advancement and alumni relations) has enabled support for our academic priorities through a focused approach to donor pipeline development, alumni engagement, and promoting the impact of the department. With the recent appointment of a communications officer, we plan to further engage alumni and enhance fundraising opportunities.

As noted in the last external review and in our Financial Report on page 50, we have several trust funds in place to support named lectures and various student and trainee awards. The review identified that fundraising, particularly for faculty and graduate student support, should be a prominent goal.

The last five years have been very successful toward these goals both in generating funds and meaningful engagement of alumni and donor pipelines. We have also had steady growth in the number of engaged alumni with the successful launch of the Temerty Medicine Connect community.

Philanthropic funding



Highlights

- $2.25m gift in 2017 from the Chang Foundation to establish Fellowships in Forensic Pathology and a Catalyst Fund to support Dr. Michael Pollanen
- $1m donation from Heather Hunter in 2018 to establish the James Hunter Family Chair in ALS Research. Dr Janice Robertson heads the James Hunter Laboratory at the Tanz Centre and is the inaugural Chair-holder.
- $1.17m from close to 200 donors to support the James Hunter Family ALS Initiative Fund over the past 5 years.

There are five faculty members in the Department of Laboratory Medicine and Pathobiology that hold University- and Hospital-University Named Chairs. Please see Our Faculty, page 64 for full details on our Chairs.

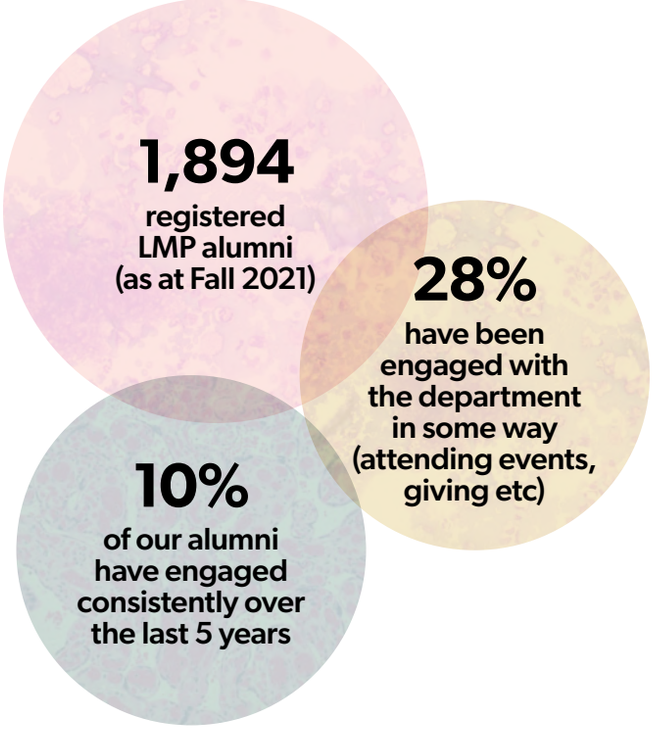
Named Chair Type	Name	Named Chair Clinical Site	Named Chair Incumbent	Named Chair Term End Date
Hospital-University Named Chair	Peter Munk Chair in Aortic Disease Research (limited term Chair)	UHN (Toronto General and Toronto Western Hospital)	Clinton Robbins	8/31/2024
Hospital-University Named Chair	J.C. Boileau Grant Chair in Oncologic Pathology (Endowed Chair)	UHN (Princess Margaret Cancer Centre)	Runjan Chetty	4/1/2020
Hospital-University Named Chair	Garron (#4) Family Chair in Childhood Cancer Research (Endowed Chair)	The Hospital for Sick Children	Cynthia Hawkins	4/12/2025
University Named Chair	James Hunter Family Chair in ALS Research (limited term Chair)		Janice Robertson	6/30/2023
University Named Chair	Temerty Professorship in AI Research and Education in Medicine		Bo Wang	6/30/2024

We are also the academic and administrative home to the Temerty Centre for Artificial Intelligence Research and Education in Medicine (T-CAIREM). Established in 2020, the Centre received $26m, as part of the Temerty Foundation's transformative $250m gift – to support the Director of the Centre, Professorships in AI and Medicine, a catalyst grant program, professional development and symposia in AI and Medicine, and support for infrastructure purchases such as computing power.

Donor identification, cultivation and alumni engagement

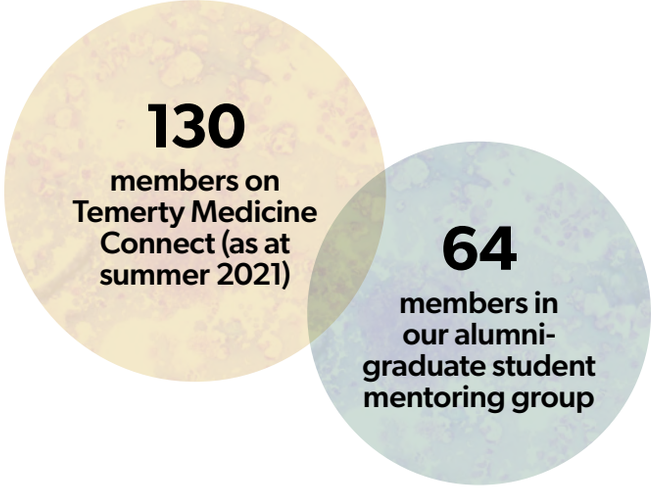
Over the last five years, we have focused on the identification, cultivation and solicitation of donors at all levels, with an emphasis on major gifts ($25,000+). We have engaged different constituent groups as prospective donors, including industry, business leaders and Temerty Medicine alumni. We developed major gift proposals (in the range of $25,000-$3,000,000) and presented these to donors with a compelling case for support and a focus on the impact of the gift.

The Advancement team also engages previous donors to the department with reporting on the impact of previous gifts. This is demonstrated in the annual stewardship reports, including detailed financial statements for endowed funds. It is a priority to provide excellent and meaningful stewardship to donors to continue to build a culture of philanthropy within the department and pipeline of donors.



Temerty Medicine Connect

In January 2021, we joined Temerty Medicine Connect, a platform that allows alumni to reconnect with classmates and expand professional networks. It is fully integrated with other social networks and is enabling engagement with alumni for the first time, deepening engagement with those already engaged, increasing contact ability with alumni and strengthening affinity of current students (and future alumni).



Communications

The Office of Advancement has made a concerted effort to produce content that demonstrates the impact of LMP and amplify stories across Temerty Medicine and University communication channels. This includes Temerty Medicine's Twitter (27,800 followers), Instagram (10,100 followers) and Facebook (7,400 followers).

In the last five years, 17 news stories featuring LMP faculty members, trainees and alumni were posted to the Temerty Medicine website and promoted on social media channels (Appendix 2.4.1).

Dr. Samira Mubareka, a LMP faculty member was also a featured panelist in one of the Faculty's signature virtual events in November 2020, moderated by André Picard, health columnist with The Globe and Mail. This was promoted widely to Temerty Medicine alumni, donors and the broader community, and was a very successful event with over 800 registrants.

With our appointment of a Communications Officer, we plan to make alumni engagement a priority in our communications strategy.

Alumni story: Unearthing an ugly past

Forensic experts on the challenge of searching former residential school sites. **Dr. Kona Williams** is a graduate of our Forensic Pathology program and Canada's first Indigenous forensic pathologist. She spoke recently about the discoveries at residential schools and how her current focus is on sharing information about how forensics can help First Nations communities uncover the truth.

Read more about this story.

Alumni Committee

We believe the best way to engage our alumni community is in a grass-roots approach. With that in mind, we are in the process of forming an Alumni Committee, led by faculty member and postgraduate program alumnus, Dr. Gino Somers. He is currently planning a career-panel alumni event for our current students which will launch this initiative in late 2021.

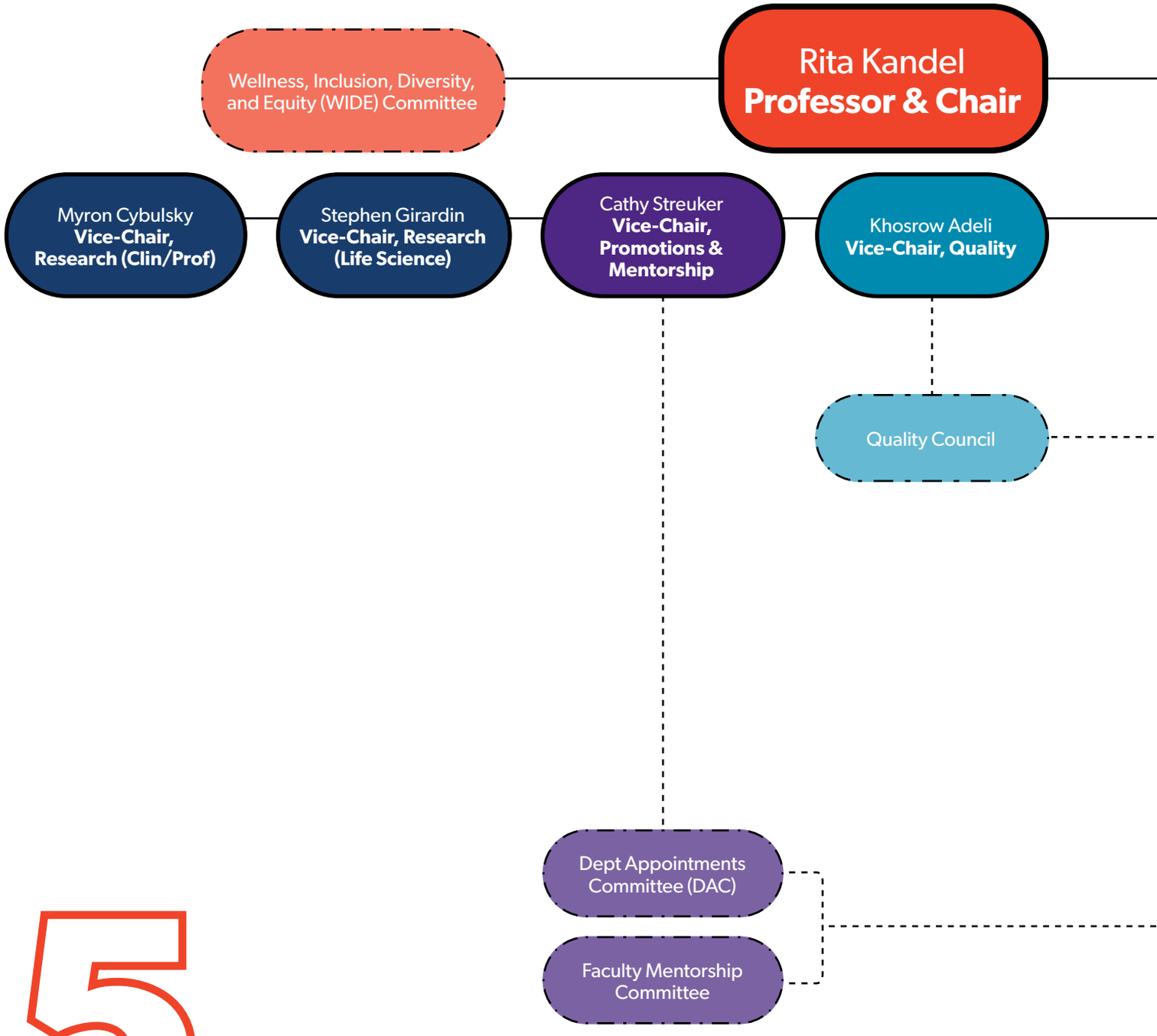
With this committee, we hope to engage more alumni in mentoring and volunteer opportunities and develop a calendar of regular events.

Transformative and collaborative gifts to the Temerty Faculty of Medicine

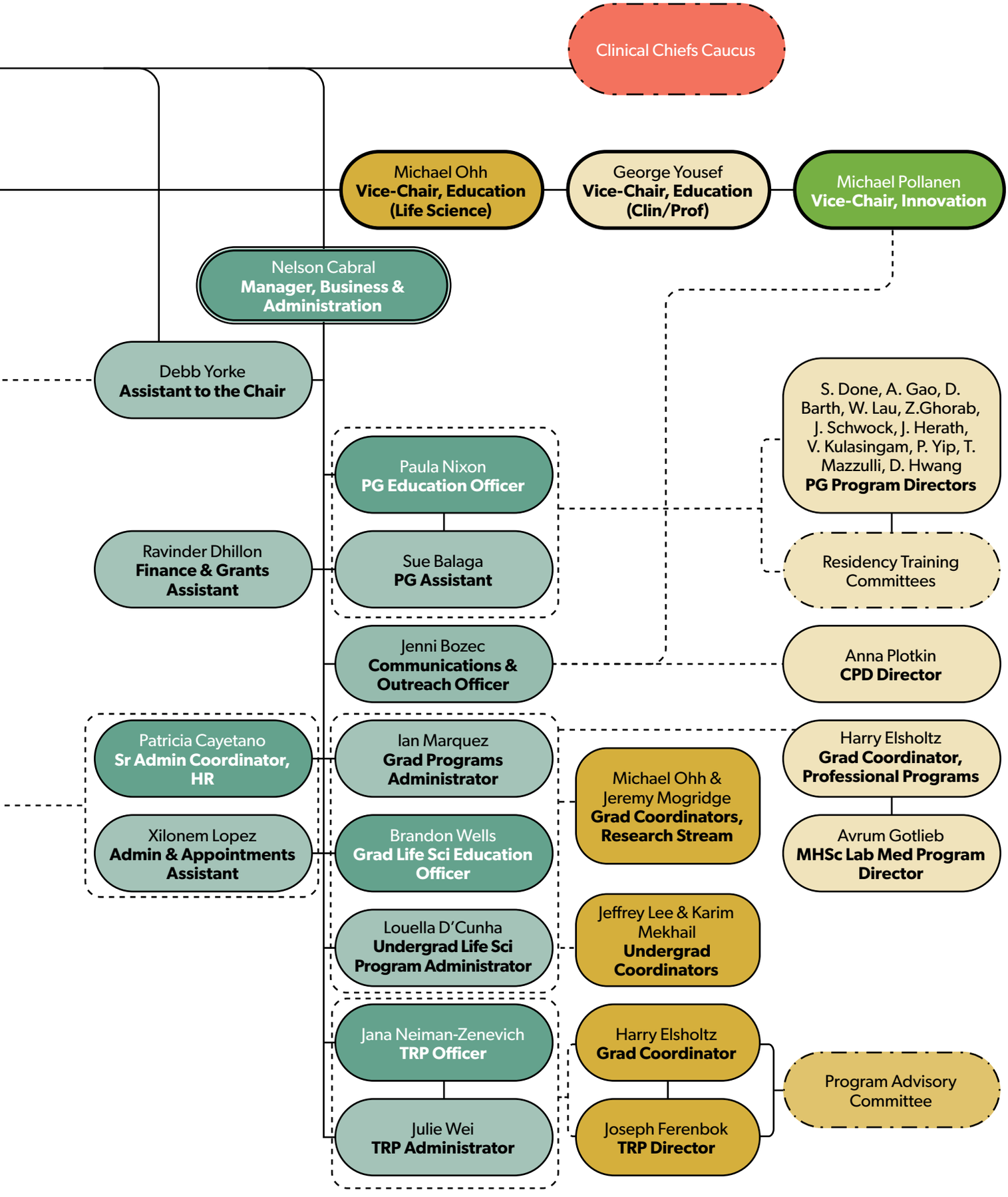
Several gifts have been received by the Faculty recently that have had a wide impact across departments, benefiting many of our faculty members and learners. As the University enters a new campaign, we anticipate these Faculty-wide gifts will become more common, to the benefit of departments such as ours.

Highlights

- $16.4m by Hold'em for Life Charity Challenge in 2019, supporting residents and clinical fellows conducting cancer research. **Two trainees, Randy Van Ommeren and Irene Xie, from our department have successfully competed for and received a $50,000 fellowship** in 2020 and 2021. We encourage our trainees to apply to the annual call for applications.
- In April 2020, the Toronto COVID-19 Action Fund was established to support more than 30 research projects by U of T and its hospital partners to contribute to the global fight against COVID-19. **Five faculty members from our department received grants from this Fund, totaling $2,445,000**. Faculty member Dr. James Scott also received an additional $250,000 grant from the Temerty Foundation gift to support his research in reusing and reprocessing N95 masks.
- On September 24, 2020, the Faculty of Medicine announced a historic $250-million gift from James and Louise Temerty and the Temerty Foundation – the largest gift in Canadian history. This gift will advance biomedical research and innovation, medical education, and health care in Toronto, Canada and beyond. Our faculty members and will benefit from this investment as there is significant funding for fundamental, translational and clinical research, including the redevelopment of the west wing of the Medical Sciences Building with a 9-storey tower, named the James and Louise Temerty Building.
- In addition to the support for the Temerty Centre for AI Research and Education in Medicine, there have been several grant competitions as a result of this gift. The Temerty Knowledge Translation Grant competition in March 2021 also had great benefit for our faculty members: **three of the five recipients of grants are LMP faculty (Dr. Vathany Kulasingham, Dr. Allison McGeer and Dr. Samira Mubareka)** and each received a grant to further research in novel antibody tools for COVID-19 diagnosis or immunotherapies. In a second round of Temerty Knowledge Translation Grants, distributed in July 2021 for research focusing on health inequities, faculty member **Dr. Laura Rosella was a successful recipient** of one of five grants.
- **Dr. Scott Yuzwa received a Temerty Pathway Grant** in September 2020, created to support faculty members that were highly ranked in the CIHR competition but did not receive a federal grant. Dr. Yuzwa subsequently was successful in the next CIHR competition receiving a $1m grant. The initial Temerty Pathway Grant enabled sustained focus on research at a critical time, helping Dr. Yuzwa compete in the future round. (See Research, page 13)



5 Organizational Chart


Clinical Chiefs Caucus
Michael Ohh
Vice-Chair, Education
(Life Science)
George Yousef
Vice-Chair, Education
(Clin/Prof)
Michael Pollanen
Vice-Chair, Innovation
Nelson Cabral
Manager, Business &
Administration
Debb Yorke
Assistant to the Chair
S. Done, A. Gao, D. Barth, W. Lau, Z.Ghorab, J. Schwock, J. Herath, V. Kulasingam, P. Yip, T. Mazzulli, D. Hwang
PG Program Directors
Paula Nixon
PG Education Officer
Residency Training Committees
Ravinder Dhillon
Finance & Grants
Assistant
Sue Balaga
PG Assistant
Jenni Bozec
Communications &
Outreach Officer
Anna Plotkin
CPD Director
Patricia Cayetano
Sr Admin Coordinator,
HR
Ian Marquez
Grad Programs
Administrator
Harry Elsholtz
Grad Coordinator,
Professional Programs
Michael Ohh &
Jeremy Mogridge
Grad Coordinators,
Research Stream
Xilonem Lopez
Admin & Appointments
Assistant
Brandon Wells
Grad Life Sci Education
Officer
Avrum Gotlieb
MHSc Lab Med Program
Director
Louella D'Cunha
Undergrad Life Sci
Program Administrator
Jeffrey Lee & Karim
Mekhail
Undergrad
Coordinators
Jana Neiman-Zenevich
TRP Officer
Harry Elsholtz
Grad Coordinator
Program Advisory
Committee
Julie Wei
TRP Administrator
Joseph Ferenbok
TRP Director

6 Administration and Facilities

Administration

13
people in our administrative team

Our administration team is located on the 6th Floor of the Medical Sciences Building (MSB), with our Translational Research Program (TRP) team, located close by on the ground floor at 263 McCaul Street, a heritage building that belongs to Temerty Medicine. Our campus-based labs are distributed across two thirds of the 6th Floor of MSB and on the 14th and 15th floors of the MaRS2 Discovery District tower, located at the southeast corner of University Avenue and College Street.

In the summer of 2018, we re-organized the administrative team structure to sunset some positions and introduce new ones which were relevant and more aligned with emerging programmatic areas and priorities. As part of the re-organization and in response to the growth in depth and breadth of our academic programs, we introduced a couple of supervisory unionized roles. We:

- combined our undergraduate programs administration with our graduate programs administration into a student services hub team, under the supervision of a graduate life sciences education officer.
- introduced a new postgraduate assistant position to better resource our postgraduate medical education programs as we transition all of our residency programs to competency-by-design (CBD) as mandated by the Royal College of Physicians and Surgeons (RCPS), supervised by our postgraduate education officer position.
- introduced an administrative and appointments assistant role to aid with the increased volume and complexity of faculty appointments, supervised by our senior administrative coordinator in human resources, who now can focus on higher-level initiatives such as our faculty mentorship and leadership development programs; establishing a faculty affairs team within our larger administrative team.

When the Translational Research Program (TRP) moved over to our department in May 2019, we established two continuing permanent administrative positions:

1. TRP administrator: handles general program inquiries and focusses on admissions.
2. The TRP officer: provides more financial and academic counselling to the students and supervises the TRP administrator

We have secured a full administrative staff complement this past year, with the recent hires of our TRP Administrator and Communications and Outreach Officer. We have one administrative staff member who will be officially retiring at the end of December 2021. We intend to replace this postgraduate assistant position with a new administrator role that will support the MHSc in Laboratory Medicine program in general program inquiries and handling applications and admissions, assist in our postgraduate programs, and coordinate our future continuing professional development courses and certificate programs.

Core research facilities and services

Below is a listing of the core research facilities and services available at Temerty Medicine. These facilities are available to any faculty member in the Faculty but are primarily used by campus-based faculty members.

For a listing of facilities and services available at clinical, hospital-based labs, please refer to Appendix 2.6.1.

Division of Comparative Medicine (DCM)

The Division of Comparative Medicine administers the animal care program for Temerty Medicine and its surrounding research network. DCM is one of the largest animal care programs in the country, serving over 150 scientists working under ~400 animal use protocols in two animal facilities within the Faculty's Medical Sciences Building (MSB) and the Donnelly Centre for Cellular and Biomolecular Research (CCBR). DCM's two facilities collectively comprise a 60,000 sq. ft. space footprint, a staff of ~50 people, and over $20 million worth of research equipment. The facility serves as an essential resource of in-vivo expertise and delivers a comprehensive training program on behalf of the entire University of Toronto that meets or exceeds the Regulations of the Animals for Research Act (Ontario), the Guidelines of the Canadian Council on Animal Care, and the Tri-Council Memorandum of Understanding.

DCM operates a multi-species vivarium housing mice, rats, rabbits, guinea pigs, and zebra fish. It offers space for behavioural testing, experimental, surgical, imaging and necropsy procedures, as well as for work with radioisotopes, and chemical/biological hazards requiring containment level 2 precautions. DCM offers a dedicated space in CCBR that houses rodents only and operates at a higher level of bioexclusion; this space facilitates experimental, surgical, imaging and necropsy procedures, as well as work with risk group 2 or 3 biological hazards. DCM also features a germ-free core to enable research into the microbiome.

Microscopy Imaging Lab (MIL)

The Microscopy Imaging Laboratory provides state of the art microscopy imaging capabilities to over 250 students, faculty, and other research personnel in basic, medical and industrial research. MIL's most critical service provided is sample imaging using transmission electron microscopes (TEM) and laser scanning microscopes (LSM). The images and analysis produced contribute data toward high impact publications in a wide range of research journals. MIL technical staff both run imaging analyses and train users on how to use the equipment themselves, making the facility not just an essential service provider but a learning environment as well.

MIL features: a TEM with cutting-edge cryo-TEM capabilities, a super-resolution spinning disc confocal microscope, a live cell imaging suite with live cell imaging epifluorescence system, a slide scanner, and workstation for post-acquisition analysis of images (colocalization, 3D rendering).

The facility also maintains a complete lab for the preparation of samples including fixation, resin embedding, thin sectioning, critical point drying and gold sputter coating.

Combined Containment Level 3 Unit

The Combined Containment Level 3 (C-CL3) Unit is a shared multi-user laboratory composed of two facilities: the in vitro lab for molecular manipulations, and in vivo lab for small animal work. It is the only facility in Toronto authorized to conduct risk group level 3 research.

The in vitro lab is a 2045 sq. ft. facility with four areas designated for contact pathogens (e.g. HIV). It has one separated room for pathogens transmitted via aerosol (e.g. M. tuberculosis) and this room is separated both physically and by dedicated air handling measures.

The C-CL3 facility provides all the operational and technical supports needed to work with high containment biologic agents, including:

- certification and training
- Disinfection, sterilization and waste management protocols
- in vitro working bays equipped with necessary infrastructure e.g. microcentrifuges, vortexes, fridges/freezers, and CO_2 incubators.

3D: Animal to Cell Imaging Facility

The 3D: Animal to Cell Imaging Facility is a centre of excellence in fundamental biology and health research with two scientific co-directors: Dr. Herbert Gaisano and Dr. Patricia Brubaker.

The facility specializes in:

- cell-based assays
- biochemical assays
- cellular, tissue/organ and small animal 3D and X-Ray imaging.

The 3D facility instrumentation is comprised of state-of-the-art equipment providing cutting-edge data acquisition and analysis in a user-friendly environment. The facility provides services on these core instruments consisting of usage, training, full assistance and assay development on a very competitive cost-recovery basis.

Flow Cytometry Facility

Temerty Medicine's Flow Cytometry Facility has served as a vital resource in supporting academic research for over 30 years by offering a wide range of services for current and prospective clients at the University, its partnered research institutes and other academic institutions.

The facility is staffed by two expert technicians, who between them have 20 years' experience in the field. The technicians are primarily responsible for the daily running of the lab, which includes conducting cell sorting and data acquisition experiments for clients, analytical instrument training, general instrument maintenance/troubleshooting,

data analysis, experimental design and general flow cytometry consultation. Their broad knowledge base can be relied upon to help users design complex polychromatic staining panels and trouble shoot common (or not so common) acquisition problems in order to achieve consistent and beautiful results.

The recent CFI award to Dr. Dana Philpott for the Host – Microbiome Research Network included funds for the facility enabling the purchase of two BD Fortessa X20's, a BD Influx Cell Sorter plus several smaller upgrades to existing equipment. There are now a total of seven Becton Dickinson brand analyzers ranging in capacity from 2-laser, 4-colour systems to 5-laser, 18-colour systems, plus three cell sorters. The newer instruments are laser and filter matched, so in the event of instrumental failure backups are available for seamless data acquisition and minimal downtime.

By using the facility, investigators gain the advantage of having access to many well-maintained instruments, a team of experts to support and advise on flow cytometry related research requirements, reliable instrumentation, competitive fees and confidence in their data.

Other centralized and shared research facilities

In recent years, Temerty Medicine has centralized, both physically and financially, core research services to provide researchers with more reliable, equitable, and cost-effective access to critical infrastructure. The Faculty manages, funds, maintains and services, trains users on, and fulfills compliance requirements for the below infrastructure:

Centralized sterilization services – all glass washing, autoclaving, and laundering of lab materials (glassware, lab coats, etc) is delivered by a central facility with dedicated technical staff and compliant with biosafety risk group 2 standards. Materials are sterilized and distributed back to shared stock rooms throughout the Medical Sciences Building for future use. Additionally, the Faculty maintains two emergency autoclaves for after-hours sterilization.

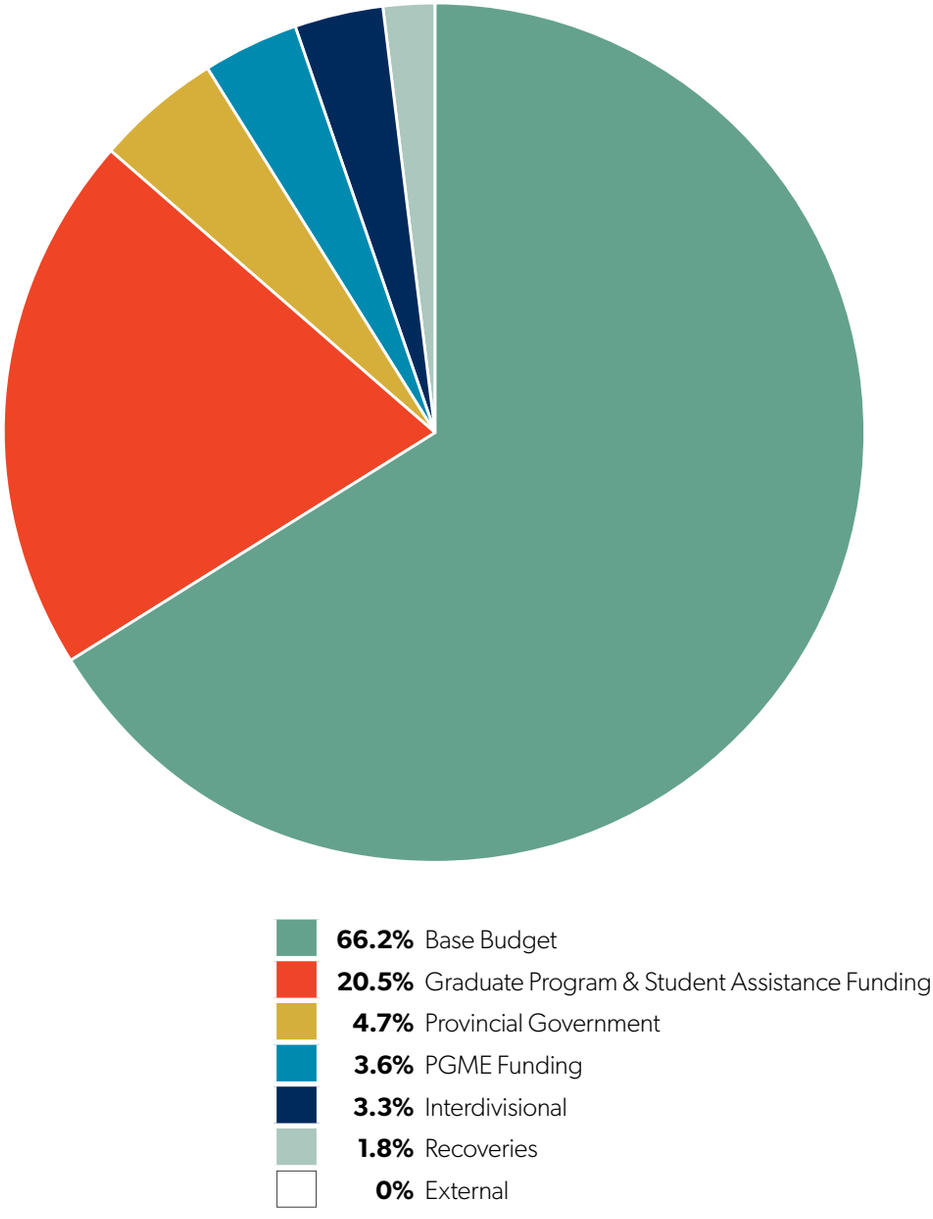
Ice machines and water purification systems – the Faculty maintains five separate rooms – one on each research floor of the Medical Sciences Building – with each room housing an ice machine and a Millipore water purification system from which researchers draw their needed supply.

Freezer farms and cold rooms – the Faculty maintains 16 newly-renovated freezer farms with capacity to hold over 180 freezers, shared by all on-campus researchers. Each farm is equipped with a dedicated backup freezer of the correct temperature (-80 or -150) and monitored by alarms providing instant updates if a freezer is failing for any reason. There are also 16 cold rooms, of which 13 are newly-renovated and CL2 compliant.

7 Financial Report

Our main revenue sources include our base budget allocation from Temerty Medicine, provincial government funding from our postgraduate medical education programs, graduate programs, interdivisional funding from the Faculty of Arts & Science, funding from the central University specifically designated to student assistance, internal recoveries, and some external funding from our events and continuing professional education.

Operating budget revenue sources



In addition to our operating budget revenue sources, we have trust funds, both expendable and endowed, to support faculty and student awards, and lectureships. The annual expendable portion of our trust funds would equal to 5% of our total operating revenues.

A significant portion of our budget goes to compensation. In the fiscal year 2016-17, our total compensation represented 74.5% of our operating budget, of which approximately 56% was for academic and educational compensation. The next significant expense category was for student awards and financial assistance at 8.7%. Temery Medicine also took approximately a 5% cut in our budget.

7 Financial Report

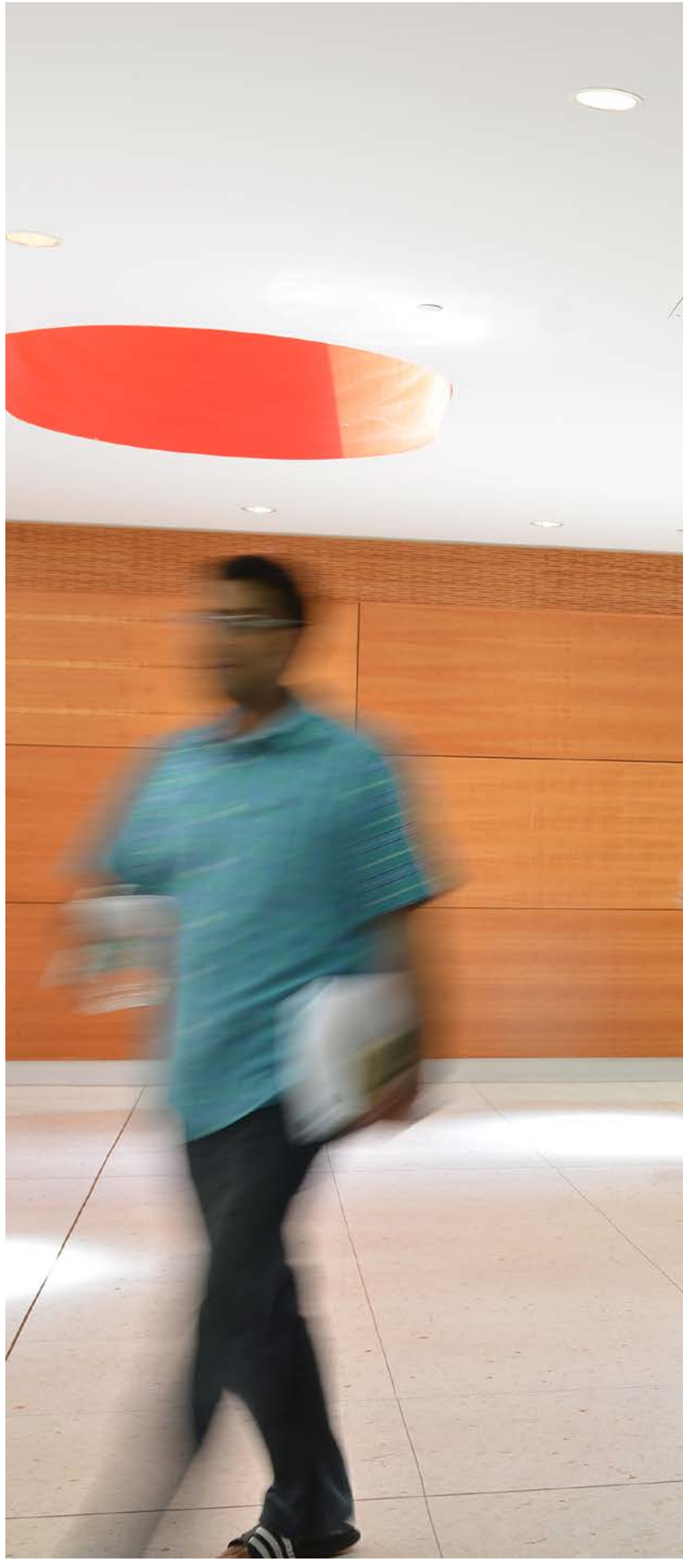
In fiscal year 2020–21, our total compensation now represents over 82% of our budget. In May 2019, the Translational Research Program (TRP) moved to our department which requires more teaching resources, especially sessional lecturers. We also recruited two new junior tenure-stream faculty. We receive annual increases in our budget to support salary increases; however, these increases do not support the impact that the salary increases have on benefits. The increased costs of benefits as salaries increase with an annual 3% overall cost-containment to our budget means that our compensation costs will obviously consume an incremental portion of our operating budget.

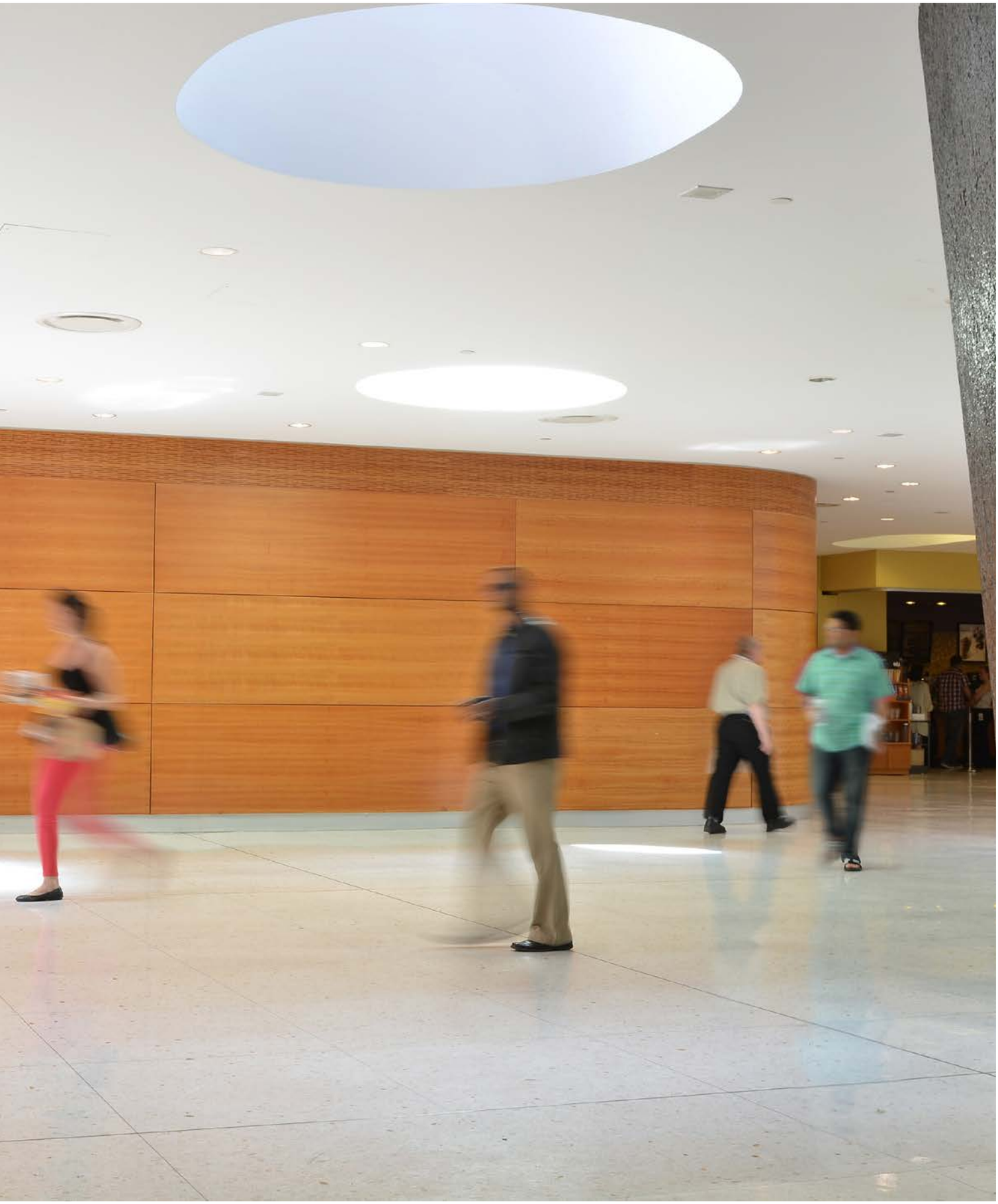
We continue to maintain a conservative financial perspective as we look to the next five years. We have some very senior tenured faculty. With no end date in sight for the 3% cost containment and suspected rising inflation as we come out of the pandemic, we are bound to have narrower margins to work with. We will be spending down our operating reserve in the first few years for one-time only expenses such as capital renovations, equipment purchases for our clinical embryology skills development lab (CESDL) that we are building to support our new MHSc in Laboratory Medicine program, start-up costs for newly recruited faculty, and for activities and initiatives aligned with our new strategic plan for 2021–2026.

Some opportunities that we are considering to increase and diversify our revenue streams include:

- Introducing a new certificate program in translational research to train advanced learners in medical science and health research in the fundamental skills and knowledge domains necessary to effectively conduct translational research.
- Via our Clinical Embryology Skills Development Lab (CESDL), we plan to have future offerings of continuing professional development courses and certificate programs for practicing clinical embryologists.
- Upgrading and enhancing our digital laboratory media library to allow for future subscription-based service for practicing pathologists to access and to be used for continuing medical education.

See in Part 1, Continuing Professional Development, page 146, for more.





8 Committees

LMP committees play an important role in the running and governance of our activities. From program committees that represent learners and teachers, to our leadership of Vice-Chairs, committees allow more voices to be heard to ensure we represent key groups.

Our Wellness, Inclusion, Diversity and Equity (WIDE) Committee will be reviewing Terms of Reference for all LMP committees to ensure all adhere to, and champion, our EDI principles. A full listing of the WIDE committee membership and its activities is on page 60.

Departmental Committees

Legend **Committee lead**

Clinical Chiefs' Caucus

Name	Site
Rita Kandel	**Mount Sinai Hospital**
Matthew Cesari	Trillium Health Partners
Jan Delabie	University Health Network
David Hwang	Sunnybrook Health Sciences Centre
Pauline Henry	Toronto East Health Network
Michael Pollanen	Ontario Forensic Pathology Service
Simon Raphael	North York General Hospital
George Yousef	Hospital for Sick Children
Cathy Streutker	Unity Health Toronto
Nadia Ismill	Lakeridge Health Oshawa

Vice Chairs' Council

Name	Position
Rita Kandel	**Department Chair**
Khosrow Adeli	Vice Chair, Quality
Stephen Girardin	Vice Chair, Research
Myron Cybulsky	Vice Chair, Research (Clinical)
Michael Pollanen	Vice Chair, Innovation
Cathy Streutker	Vice Chair, Promotions and Mentorship
George Yousef	Vice Chair, Education (Clinical / Professional)
Michael Ohh	Vice Chair, Education (Life Sciences)

Quality Council

Name	Discipline	Site
Khosrow Adeli	**Clinical Chemistry**	**Hospital for Sick Children**
Carol Cheung	Anatomic Pathology	UHN – Princess Margaret
Corwyn Rowsell	Anatomic Pathology	Unity Health Toronto – St. Michael's
Daniel Beriault	Clinical Chemistry	Unity Health Toronto – St. Michael's
Davor Brinc	Clinical Chemistry	UHN – Toronto General
Elaine Goh	Genetics	Trillium Health Partners
Felix Leung	Clinical Chemistry	Sinai Health System
James Stavropoulos	Genetics	Hospital for Sick Children
Michelle Sholzberg	Hematology	Unity Health Toronto – St. Michael's
Paul Yip	Clinical Chemistry	Sunnybrook Health Sciences Centre
Saranya Arnoldo	Clinical Chemistry	William Osler Health System
Susan Poutanen	Medical Microbiology	UHN / Sinai Health System
Zeina Ghorab	Cytopathology	Sunnybrook Health Sciences Centre

Department Appointments & Promotions Committee (DAC/DPC)

Name	Academic Rank	Position
Cathy Streutker	**Professor**	**Vice Chair, Promotions & Mentorship & Co-Chair, DAC/DPC**
Sharon Nofech-Mozes	**Associate Professor**	**Co-Chair, DAC /DPC**
Rita Kandel	Professor	Department Chair
Hong Chang	Professor	Member
Harry Elsholtz	Associate Professor	Member
Stephen Girardin	Professor	Member
Barry Hoffman	Associate Professor	Member
Julia Keith	Associate Professor	Member
Janice Lage	Associate Professor	Member
Michael Pollanen	Professor	Member
Susan Poutanen	Associate Professor	Member
Janice Robertson	Professor	Member

Program Committees

MHSc in Laboratory Medicine Core Program Committee

Name	Position
Avrum Gotlieb	**Program Director**
Heather Shapiro	Field Director, Clinical Embryology
Juan Putra	Field Director, Pathologists' Assistant (outgoing)
Fang-I Lu	Field Director, Pathologists' Assistant (incoming)
Brandon Wells	Graduate & Life Sciences Education Officer
Theodore Brown	Faculty Member, Clinical Embryology

Translational Research Program Advisory Committee

Name	Position
Joseph Ferenbok	**Program Director, TRP**
Ulrich Krull	Professor Emeritus, Chemistry, University of Toronto Mississauga
Lynn Wilson	Vice-Dean, Clinical and Faculty Affairs, Temerty Medicine
Mingyao Liu	Director, Institute of Medical Science
Gary Levy	Professor, Institute of Medical Science
Ruth Ross	Profesor and Chair, Pharmacology & Toxicology
Paul Santerre	Professor, Institute of Biomedical Engineering
Norm Rosenblum	Professor, Physiology
Paul Dugsin	Managing Partner, Magnus Associates
Jason Field	President and CEO, Life Sciences Ontario
Andris Lauris	Mentor / Entrepreneur
Rita Kandel	Professor and Chair, LMP
Richard Foty	Faculty, TRP/LMP
Avrum Gotlieb	Professor, LMP

Graduate Research-Stream Education Committee

Name	Position
Jeremy Mogridge	Associate Professor, Graduate Co-Coordinator
Michael Ohh	Professor, Graduate Co-Coordinator
Ian Marquez	Graduate Program Administrator
Brandon Wells	Graduate & Life Sciences Education Officer

Graduate Research-Stream Admissions Committee

Name	Position
Jeremy Mogridge	Associate Professor, Graduate Co-Coordinator
Michael Ohh	Professor, Graduate Co-Coordinator
Ian Marquez	Graduate Program Administrator

Note: all faculty with graduate appointment is involved in the admission process as each conditionally accepted student must match with a graduate faculty member who interviews and agrees to supervise the student's research and guarantees a full stipend for the student.

Graduate Awards Committee

Name	Position
Jeremy Mogridge	Associate Professor, Graduate Co-Coordinator
Michael Ohh	Professor, Graduate Co-Coordinator
Amy Wong	Scientist, Developmental & Stem Cell Biology, Hospital for Sick Children
Golnaz Karoubi	Assistant Professor and Scientist, University Health Network
Jeffrey Lee	Associate Professor, Undergraduate & Life Sciences Co-Coordinator
Brandon Wells	Graduate & Life Sciences Education Officer

Departmental Representatives on SGS Awards Committee

Name	Position
Jeremy Mogridge	Associate Professor, Graduate Co-Coordinator
Michael Ohh	Professor, Graduate Co-Coordinator
Harry Elsholtz	Associate Professor, Graduate Co-Coordinator, Professional Programs
Douglas Templeton	Professor, Graduate Co-Coordinator, Professional Programs
David Irwin	Professor

Postgraduate Program Committees

Anatomical Pathology

Susan Done	Program Director
Carlo Hojilla	Faculty
Eleanor Latta	Faculty
Lorna Mirham	Faculty
Miralem Mrkonjic	Faculty
Ozgur Mete	Faculty
Pauline Henry	Faculty
Rita Kandel	Department Chair
Rose Chami	Faculty
Sara Hafezi-Bakhtiari	Faculty
Seema Kudsia	Faculty
Tra Truong	Faculty
Tyler Hickey	Faculty
Wondu Kidanewold	Faculty
Susan Armstrong (PGY-5)	Trainee
Boris Virine (PGY-3)	Trainee
Paula Nixon	Postgraduate Education Officer

Cytopathology AFC

Joerg Schwock	Co-Program Director
Zeina Ghorab	**Co-Program Director**
Anna Plotkin	Faculty
Bonnie Tong	Faculty
Gita Desai	Faculty
Heather Ruff	Faculty
Hyang-Mi Ko	Faculty
Jelena Mirkovic	Faculty
John Wong	Faculty
Rita Kandel	Department Chair
Sandy Lou	Faculty
Paula Nixon	Postgraduate Education Officer

Note: no trainee representative

Fellowship Training Committee

David Hwang	Fellowship Director
Anna Marie Mulligan	Faculty
Carlo Hojilla	Faculty
Iram Siddiqui	Faculty
Jiong Yan	Faculty
Michael Pollanen	Faculty
Rita Kandel	Department Chair
Bojana Djordjevic	Faculty
Tony Mazzulli	Faculty
Zeina Ghorab	Faculty
Elan Hahn	Trainee
Paula Nixon	Postgraduate Education Officer

Hematological Pathology

David Barth	Program Director
Anita Godra	Faculty
Carlo Hojilla	Faculty
Jan Delabie	Faculty
Sasan Zandi	Faculty
Hubert Tsui	Faculty
Jacob Pendergrast	Faculty
Larissa Liontos	Faculty
Mohamed Abdelhaleem	Faculty
Raheem Peerani	Faculty
Rita Kandel	Department Chair
Rita Selby	Faculty
Qianghua Zhou (PGY-1)	Trainee
Tara Syed (PGY-1)	Trainee
Paula Nixon	Postgraduate Education Officer

Microbiology

Tony Mazzulli	Program Director
Aaron Campigotto	Faculty
Andrea Boggild	Faculty
Jeya Nadarajah	Faculty
Kevin Katz	Faculty
Larissa Matukas	Faculty
Lee Goneau	Faculty
Ramzi Fattouh	Faculty
Rita Kandel	Department Chair
Robert Kozak	Faculty
Susan Poutanen	Faculty
Vanessa Tran	Faculty
Wayne Gold	Faculty
Yvonne Yau	Faculty
Jennifer Tat (PGY-4)	Trainee
Mohammed Sarhan (PGY-3)	Trainee
Shawn Clark (ClinMicro PDT3)	Trainee
Paula Nixon	Postgraduate Education Officer

Neuropathology

Andrew Gao	Program Director
Claire Coire	Faculty
David Munoz	Faculty
Julia Keith	Faculty
Lananh Nguyen	Faculty
Lili-Naz Hazrati	Faculty
Rita Kandel	Department Chair
Randy Van Ommeren (PGY-3)	Trainee
Paula Nixon	Postgraduate Education Officer

Transfusion Medicine AFC

Wendy Lau	Program Director
Yulia Lin	Faculty
Katerina Pavenski	Faculty
Nadine Shehata	Faculty
Jacob Pendergrast	Faculty
Christine Cserti	Faculty
Rita Kandel	Department Chair
Asim Alam	Faculty
Paula Nixon	Postgraduate Education Officer

Note: no trainee representative

Forensic Pathology

Jayantha Herath	Program Director
Liza Boucher	Faculty
Andrew Williams	Faculty
Maggie Bellis	Faculty
Christopher Ball	Faculty
Michael Pickup	Faculty
Jake Yorke (PGY-6)	Trainee
Robyn Ndikumana (PGY-6)	Trainee
Paula Nixon	Postgraduate Education Officer

Clinical Chemistry

Vathany Kulasingam	Co-Program Director
Paul Yip	Co-Program Director
Dan Beriault	Faculty
Felix Yeung	Faculty
Lusia Sepiashvili	Faculty
Paula Nixon	Postgraduate Education Officer

Note: no trainee representative

Wellness, Inclusion, Diversity & Equity (WIDE)

We are committed to the principles of equity, diversity, inclusion (EDI) and wellness in all that we do.

This includes:

- recruiting and retaining learners, staff and faculty that reflect and expand the diversity of LMP members,
- creating, supporting, and maintaining a learning and working environment that is free from discrimination, harassment, intimidation, bullying, and disrespectful behavior, and
- ensuring our programs and curricula prepare LMP members to meet the needs of the diverse communities they will serve in their careers in Canada and around the world.

To enable us to achieve this, we formed The Wellness Inclusion Division and Equity Committee (WIDE) in 2019. The purpose of the WIDE Committee is to discuss, identify and address issues related to WIDE within the department.

While a safe, supportive and inclusive environment is a shared responsibility of all LMP faculty, staff, and learners, we formed the committee to coordinate departmental efforts in collaboration and alignment with the Temerty Faculty of Medicine global vision of EDI and wellness. Using its shared expertise and experience, the committee identifies EDI and wellness related concerns, points of improvement and opportunities for growth, propose initiatives and monitor the effectiveness of these efforts.

Our initiatives

Unconscious Bias: We have run three training workshops for faculty, staff and learners so far and are planning one for teaching faculty.

- **July 2019.** For Hospital Chiefs, Division Heads, Vice Chairs, Program Directors, Undergraduate and Graduate Coordinators, Appointments and Promotion Committee members, EDI Committee and senior LMP staff and led by The Toronto Initiative for Diversity & Excellence (TIDE) (which includes the Chair of LMP WIDE).
- **May 2020.** For graduate students, led by TIDE.
- **April 2021.** For all LMP learners and faculty, led by a student from the Department of Medical Biophysics.

Self-defense class for women: Isabelle Aubert, faculty and Equity and Diversity Officer led 30 women in training, including training in awareness, assertiveness, cognitive and physical techniques.

Allyship workshop. With all the social injustices today, we wanted to ensure that staff and faculty were aware of how their actions could impact fellow colleagues. Along with the Office of Inclusion and Diversity, we held a 2.5-hour workshop on February 23, 2021. We invited Hospital Chiefs, Division Heads, Vice Chairs, Program Directors, Undergraduate and Graduate Coordinators, Appointments and Promotion Committee members, and LMP staff and had over 30 attendees.

Post-Doctoral Association. We are in the unique position of having both campus- and hospital-based postdoctoral fellows. Historically, hospital-based postdoctoral fellows are not associated with the University so are often excluded from communications and activities. We formed a Post-Doctoral Association so hospital-based postdoctoral fellows now have a forum to network within the department and be included in departmental events, such as Research Conferences.

Resources. We now bring together numerous resources for faculty, staff and students in one place on the website, including unconscious bias, wellness and where to go for help if needed. We also share upcoming university seminars regarding wellness and diversity.

Words of Wellness. During COVID-19 we circulated weekly wellness tips to the department in an effort to inspire resilience and a sense of community in these difficult times. This has now moved to a monthly wellness message by our Wellness Officer, Gino Somers.

Reviewing Terms of Reference. A project team will be reviewing the Terms of Reference for all committees in LMP. To ensure EDI is at the forefront of all procedures and activities throughout the department and that our committees work well, the team has conducted research and is incorporating it throughout the department. They are also reviewing recruitment procedures, graduate admission, and outreach programs for LMP.

Humans of LMP. We are telling the stories of LMP community members, with someone being featured each month. We hope this will allow the department to get to know one another on a more personal level.

Black and Indigenous Summer Research Program. Working with Ike Okafor, Senior Officer for Service Learning and Diversity Outreach in Temerty Medicine, Dr. Paul Hamel introduced a program in summer 2021 to provide Black and Indigenous undergraduate students with laboratory and research experience. Two students took part in the 12-week program this year and it is our intention is to broaden the program so more undergraduate Black and Indigenous students can be formally trained in various LMP labs (one student accepted for this academic year), gain a deeper appreciation for science and make more competitive applications for postgraduate studies.

LMP Mentorship Committee: "LMP Life School" The LMP Faculty Mentorship Committee is planning the LMP Life School, a series of events on personal and wellness development which launches in Fall 2021. Experts will run sessions for our people on topics such as financial literacy and investing, early survival in parenthood, and buying a house in the GTA.

Dr. Samira Mubareka is our first feature for Humans of LMP

Interviewed by MSc student, Ryan Hiebert, Samira talks about her upbringing in rural New Brunswick, the best career advice she received, and how she learned to drive on an old tractor!

Read more about Dr. Samira Muberka.

Reviewing university-wide surveys

Several years ago the University embarked on conducting feedback surveys for faculty, staff and learners. Currently we have reviewed the "Voice of the Faculty" survey. Below is a snapshot of what was said and what LMP has done.

What faculty said

- Only 56% of faculty were satisfied with their professional life with 53% feeling like they were recognized by leaders.

What we have done

- Established a leadership grant for Lecturer, Assistant Professor and Associate Professor. Awarded two in 2018 and six in 2019 and 3 in 2020.
- Launched LMP's Faculty Mentorship Program in Fall 2018 with 54 faculty paired to date. The first LMP Outstanding Mentor Award was given in Fall 2019.
- Created a new teaching award, Clinical Teaching Award in UME or PGME (2020). The Raymond Chang Award in Forensic Medicine was established in 2020 and The Teaching Award for Graduate Excellence in 2021.

What faculty said

- Although scores were high for fitting in with colleagues (71%), overall health was good (68%) and eating well (75%), there were still low scores around feeling overwhelmed and exhausted (~25%) and not getting enough regular exercise (40%).

What we have done

- Appointed Dr. Maria Pasic and Dr. Gino Somers as Wellness Committee Co-Chairs in Fall 2019.

What faculty said

- Many witnessed improper behaviour in the department with 29% seeing others bullied, or experiencing some kind of disrespectful behaviour (26%).
- Some faculty also experienced it themselves, with 15% feeling discriminated against or bullied (13%) and too many suffering sexist (4%) or racist (3%) behaviour.

What we have done

- Partnered with U of T's Toronto Initiative for Diversity & Excellence group to present Unconscious Bias workshop to faculty (July 2019).
- Mandated Unconscious Bias training for Canadian Resident Matching Service (CaRMS) and UofT faculty recruitment and promotions (Jan 2020). Published Unconscious Bias information on the LMP website.
- We are strengthening values of professionalism by instituting a Professionalism Agreement to be signed by faculty.

The next step for the project team will be to review the remaining surveys (residents, graduate and undergrad students) and see where LMP can improve. We will also be looking into providing awareness and assertive training with resources on procedures to have a "no tolerance" policy on bullying.

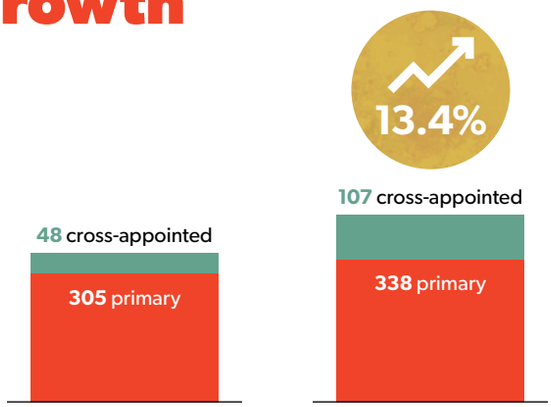
Our current committee membership

Name	Role/status
Isabelle Aubert	Chair
Debb Yorke	Administrator
Helen Yang	Alumni
Avrum Gotlieb	Faculty
David Irwin	Faculty
Gino Somers	Faculty
Julia Keith	Faculty
Maria Pasic	Faculty
Naomi Visanji	Faculty
Rashmi Goswami	Faculty
Rosemarie Tremblay-LeMay	Faculty
Tracy Stockley	Faculty
Kate Noseworthy	Undergraduate student
Matt Renaud	Undergraduate student
Ryan Hiebert	Graduate student and CLAMPS representative
Maama Darkwa	Graduate student and TRP Anti-Racism Committee (ARC) representative
Sabrin Salim	Graduate student and TRP Anti-Racism Committee (ARC) representative
Alena Zelinka	Graduate student
Anglin Dent	Graduate student
Anca Maglaviceanu	Graduate student
Anisha Hundal	Graduate student
Ashley Zhang	Graduate student
Karen Fang	Graduate student
Ariel Gershon	Postgraduate – Resident
Brandon Wells	Staff
Ian Marquez	Staff
Louella D'Cunha	Staff
Nelson Cabral	Staff
Paula Nixon	Staff
Xilonem Lopez	Staff
Rita Kandel	Ex officio

10 Our Faculty

The Department of Laboratory Medicine and Pathobiology is comprised of 445 faculty members, of whom 107 are cross-appointed and 390 are research active. They are distributed across multiple sites including the U of T campus, hospitals, public health offices and other affiliated organizations such as private clinics and laboratories.

Growth



353
2012 total

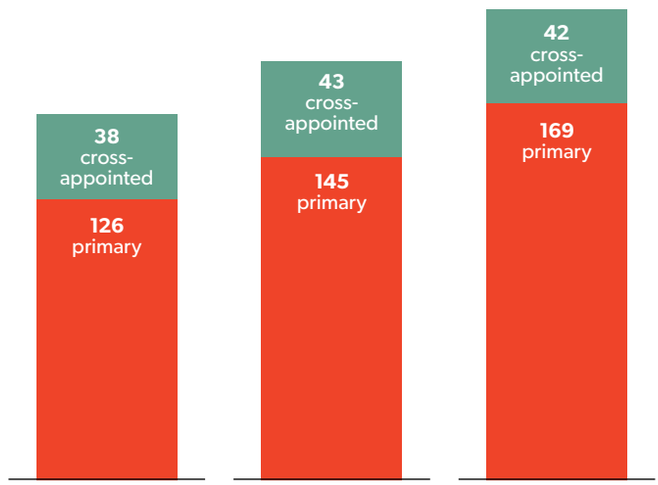
445
2021 total

Faculty breakdown by gender

43%
Female

57%
Male

Graduate appointments



164
2013 total

188
2017 total

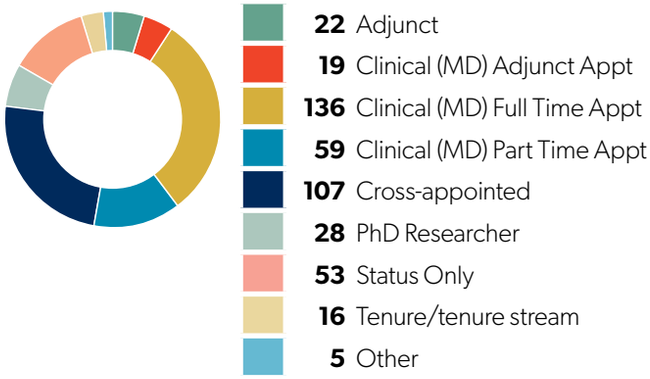
211
2021 total

Overview of faculty

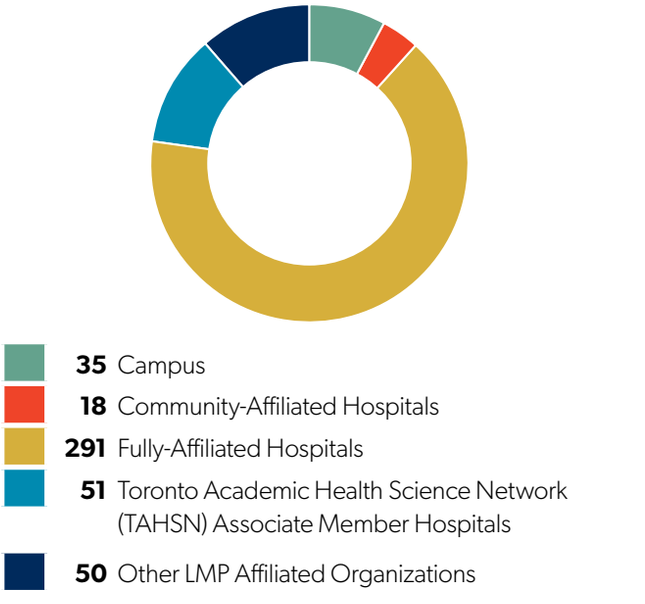
445
Total faculty

390
Research active

Appointment type

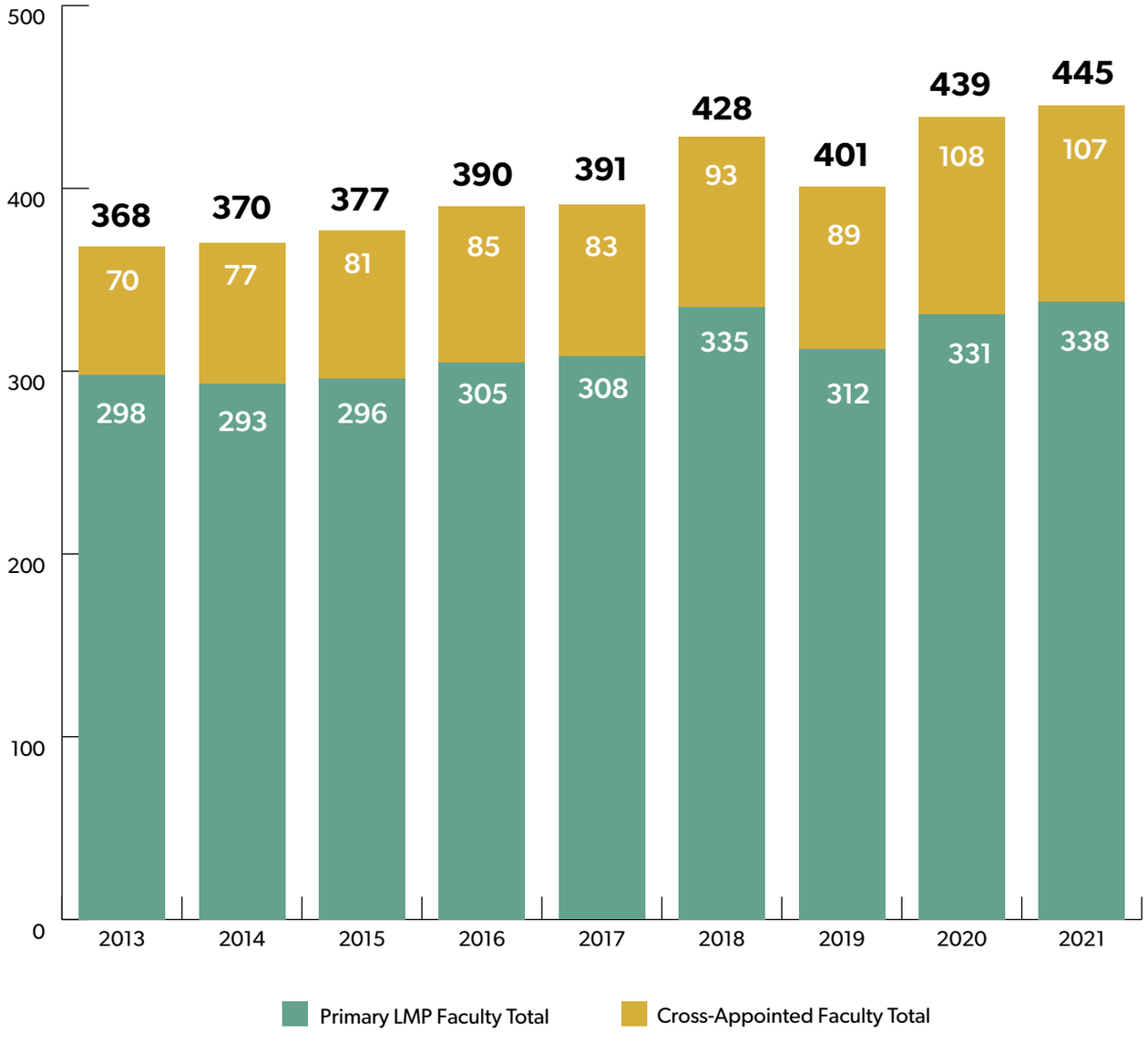


Where our people are based



Academic Appointments

LMP Academic Appointment 2013–2021



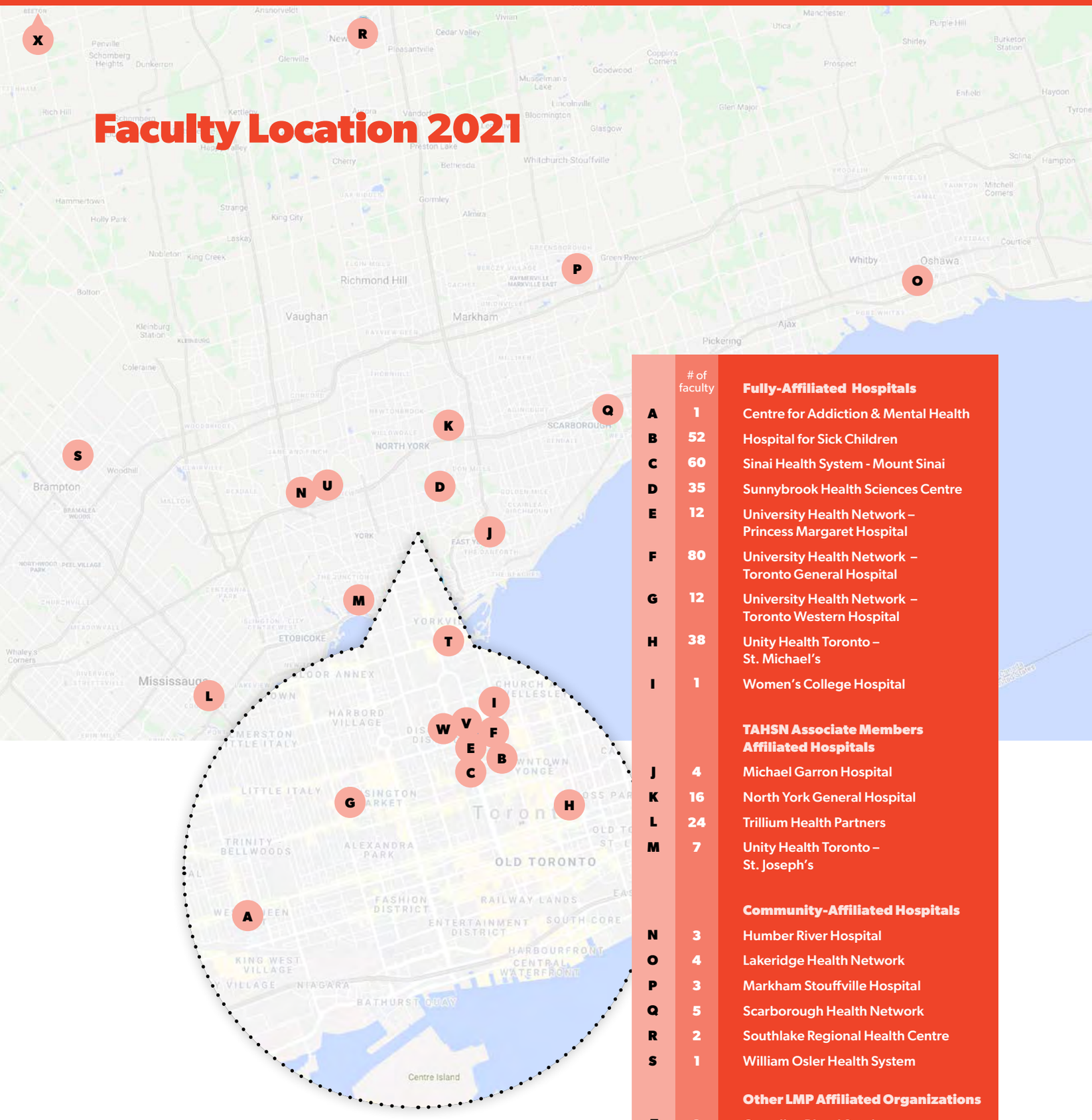
Primary LMP faculty

	2013	2014	2015	2016	2017	2018	2019	2020	2021
Campus Based									
Tenure	13	12	14	14	14	14	14	14	14
Tenure Stream	2	2		1	1	2	2		
Contractually Limited Term Appointment, Teaching Stream	1							1	
Part-Time Academic						2	2	2	2
Non-Budgetary (Contractually Limited Term Appointment)	2	2	2	2	2	2	2	2	2
Non-Campus Based									
Clinical (MD) Full Time Appt	142	141	141	143	139	151	137	140	136
Clinical (MD) Part Time Appt	42	47	49	56	56	55	54	57	59
Clinical (MD) Adjunct Appt	17	15	16	14	14	20	19	16	19
PhD Researcher	32	30	29	28	27	26	24	27	28
Status Only	40	37	38	40	47	51	47	51	53
Adjunct									
Adjunct Professor	4	4	4	4	3	3	3	5	5
Adjunct Lecturer	3	3	3	4	6	10	9	15	17
Primary LMP Faculty Total	**298**	**293**	**296**	**305**	**308**	**335**	**312**	**331**	**338**
Primary LMP Emeritus	**42**	**38**	**37**	**39**	**44**	**56**	**56**	**60**	**62**
Primary LMP Total	**340**	**331**	**333**	**344**	**352**	**391**	**368**	**391**	**400**

Cross-Appointed faculty

Temerty Medicine Departments, Institutes & Units	2013	2014	2015	2016	2017	2018	2019	2020	2021
Anesthesiology & Pain Medicine				1	1	1	1		
Biochemistry	2	2	2	1	1	2	1	1	1
Family & Community Medicine					1				
Immunology	1	1	1	1	1	1	1	1	1
Medical Biophysics	2	2	3	3	3	3	2	2	2
Medicine	24	27	29	31	29	31	30	29	26
Molecular Genetics	5	5	5	5	5	5	5	5	5
Obstetrics & Gynaecology	1	1	1	1	1	3	3	11	11
Ophthalmology & Vision Sciences	6	6	6	6	6	7	7	8	8
Otolaryngology – Head & Neck Surgery	1	1	1	1	1	1	1	1	1
Paediatrics	10	10	11	11	10	11	11	11	12
Pharmacology and Toxicology	1	1	1	1	1	1	1	1	1
Physiology	1	1	1						
Psychiatry			1	1	1	1	2	1	
Surgery	8	12	13	15	16	16	15	19	20
Div of Comparative Medicine	1	1							
Other Faculties, Institutes & Departments									
Dalla Lana School of Public Health				1	1	3	3		
Fac of Arts & Sci – Dept of Biological Sciences	1	1	1	1	1	1	1	1	1
Fac of Arts & Sci – Cell & Systems Biology					1	1			
Fac of Arts & Sci – Computer Science					1	1			
Fac of Dentistry	5	5	5	5	5	6	6	6	6
Fac of Pharmacy	1	1	1	1	1	1	1	2	2
Inst of Biomedical Engineering			1	1	1	1	1	1	
Inst of Health, Policy, Management & Evaluation					1	1			
Cross-Appointed Faculty Total	**70**	**77**	**81**	**85**	**83**	**93**	**89**	**108**	**107**
Total LMP Faculty (excluding Emeritus/a)	**368**	**370**	**377**	**390**	**391**	**428**	**401**	**439**	**445**
Total LMP Faculty (including Emeritus/a)	**410**	**408**	**414**	**429**	**435**	**484**	**457**	**499**	**507**

Faculty Location 2021



	# of faculty	
		Fully-Affiliated Hospitals
A	1	Centre for Addiction & Mental Health
B	52	Hospital for Sick Children
C	60	Sinai Health System - Mount Sinai
D	35	Sunnybrook Health Sciences Centre
E	12	University Health Network – Princess Margaret Hospital
F	80	University Health Network – Toronto General Hospital
G	12	University Health Network – Toronto Western Hospital
H	38	Unity Health Toronto – St. Michael's
I	1	Women's College Hospital
		TAHSN Associate Members Affiliated Hospitals
J	4	Michael Garron Hospital
K	16	North York General Hospital
L	24	Trillium Health Partners
M	7	Unity Health Toronto – St. Joseph's
		Community-Affiliated Hospitals
N	3	Humber River Hospital
O	4	Lakeridge Health Network
P	3	Markham Stouffville Hospital
Q	5	Scarborough Health Network
R	2	Southlake Regional Health Centre
S	1	William Osler Health System
		Other LMP Affiliated Organizations
T	3	Canadian Blood Services
U	14	Ontario Forensic Pathology Service
V	4	Ontario Institute for Cancer Research
W	7	Public Health Ontario
X	22	Other

13.4%

We celebrate our diversity as both a clinical and a basic science department. We have grown by 13.4% since the last review and the following initiatives have contributed to this growth.

Research Stream searches

Since Dr. Rita Kandel became Chair in 2017, she has completed two tenure stream searches that increased our campus-based faculty by three individuals.

1. Broadening knowledge in the pathobiology of disease

The first search was to find a scientist specializing in the pathobiology of disease where Dr. Scott Yuzwa, who had excellent training as a developmental neurobiologist, joined LMP in January 2019. Dr. Yuzwa brought unique expertise to the position by combining his strong analytical background in biochemistry, computational biology, cell biology and bioinformatics. In addition, he has knowledge of technologies not currently available in the department (e.g. single cell RNAseq) that benefit other research programs in LMP.

2. Expanding expertise in artificial intelligence

In 2019, the University of Toronto invested in three new tenure-stream positions in deep learning.

Dr. Kandel was instrumental in leading the proposal for Temerty Medicine to be at the forefront of using artificial intelligence in advancing medicine. This led to a partnership with the Department of Computer Science and allowed both departments to hire two joint positions:

- Dr. Bo Wang, who was a Scientist at the University Health Network and CIFAR Chairholder in Artificial Intelligence from the Vector Institute, joined as a tenure-stream faculty (65% LMP, 35% Computer Science) in September 2020.
- Dr. Rahul Gopalkrishnan (65% Computer Science, 35% LMP), impressed the committee for his excellent productivity during his PhD at the Massachusetts Institute of Technology, joined in August 2021.

An opportunity to hire a third senior expert in Computational Medicine and Biology has received Provost approval and the search is currently ongoing. This position will also serve as the inaugural Director for the Educational Program in Computational Medicine amd Biology at the University of Toronto which is to be jointly administered by the Faculty of Arts and Science and Temerty Medicine. The Director will be charged with developing and leading world-class educational programs in Computational Medicine and Computational Biology while fostering collaborations with relevant departments, the Vector Institute for Artificial Intelligence, and the Temerty Centre for Artificial Intelligence Research and Education in Medicine (T-CAIREM). This position will be posted at the rank of Associate Professor or Professor and will hold 51% appointment in Computer Science and 49% appointment in LMP.

The generous gift from James and Louise Temerty to support advances in human health and health care led to another current search for a 5-year Contractually Limited Term Appointment with a Professorship. This is a fourth search and the committee will be looking for a scientist with expertise in the development, application, and commercialization of machine learning/ deep learning methodologies in medicine. The academic appointment will be in LMP but the successful candidate will also be an integral member of T-CAIREM. This position will be open at all ranks (Assistant/ Associate/ Professor) to attract the best possible candidate.

Translational Research Program

In May 2019, the Translational Research Program (TRP) transferred from the Institute of Medical Sciences to LMP. This brought three core faculty to our department – Dr. Joseph Ferenbok, Dr. Richard Foty and Dr. Gabriella Chan.

We established a more stable structure for the program which included:

- Dr. Ferenbok held a Part-Time Academic appointment with the Department of Psychiatry. With support from Dr. Ferenbok, Dr. Benoit Mulsant, Chair of Psychiatry, and Dr. Kandel, the Vice-Provost Faculty & Academic Life approved the transfer of his primary academic appointment in LMP. Though Dr. Ferenbok is already involved in LMP activities, this formal connection will allow for better integration between the TRP and LMP.
- Dr. Foty, held a Part-Time Academic appointment with the Institute of Health Policy, Management and Evaluation at the Dalla Lana Graduate School of Public Health and this appointment was transferred to LMP. In 2021, following a competitive search, Dr. Foty's appointment moved from Part-Time Academic at 75% FTE to Contractually Limited Term Appointment, Teaching Stream at 100% FTE. This will allow Dr. Foty to devote more time to develop the TRP curriculum and mentor students.
- Dr. Chan already held an Adjunct Lecturer appointment in LMP prior to the transfer. As a practicing lawyer who developed curriculum related to Intellectual Property, privacy, procurement and related topics, she was appointed a Part-Time Academic appointment at 25% FTE to strengthen and solidify her connection with TRP. To align with the new Provost's policy on Part-Time faculty, Dr. Chan was reclassified to Assistant Professor, Teaching Stream as of January 2021.
- In April 2020, Dr. Harry Elsholtz was appointed as the inaugural Graduate Coordinator of Professional Programs (one of which is TRP) after he ended his tenure as the Graduate Coordinator of our graduate research stream. His vast experience in graduate administration has proven to be valuable in creating a stronger academic environment.

TRP's 17 modules are taught mostly by Sessional Lecturers. Though their appointment does not fall under the academic appointment policy, they have been provided with Graduate Associate Restricted appointments for their involvement in graduate teaching. In addition, one of their Sessional Lecturers, Alexandra (Sandy) Marshall, advanced to Sessional Lecturer II following her successful review.

Masters of Health Science in Laboratory Medicine (Clinical Embryology and Pathologists' Assistant streams)

We launched a new Masters of Health Science (MHSc) in Laboratory Medicine (Clinical Embryology and Pathologists' Assistant fields) in 2020. 16 new faculty joined the department as they are involved in curriculum development and/or teaching. These faculty members brought new expertise to the department including a biobanking specialist, clinical embryology authorities, and an assisted reproductive technology expert.

As a component of the Pathologists' Assistant program involves rotations at affiliated teaching sites, we have submitted a proposal to Temerty Medicine to allow Pathologists' Assistants (PAs) who are involved in teaching, clinical rotation, or supervision to hold a Status-Only appointment. PAs would not qualify as Status-Only faculty based on the University's current definition, as their job description is not typically academic in nature, and would only be eligible for a short term Adjunct Lecturer appointment. We worked with Temerty Medicine Human Resources to define the criteria for appointment, reappointment and promotion for PAs to be eligible to hold a longer-term appointment with a possibility of being able to advance in rank. (See Appendix 2.10.1 for detailed guidelines). Six PAs will be officially joining the department as a Status-Only faculty at the rank of Lecturer.

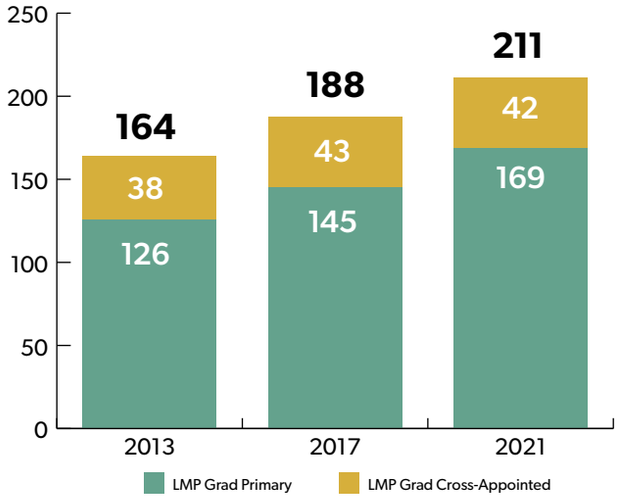
Temerty Centre for Artificial Intelligence Research and Education in Medicine (T-CAIREM)

Our creation of the Temerty Centre for Artificial Intelligence Research and Education in Medicine (T-CAIREM) in 2020 resulted in an increase in cross-appointments from diverse faculties and departments including, but not limited to, the Departments of Family and Community Medicine, Computer Science, Faculty of Pharmacy, and Dalla Lana School of Public Health.

Graduate Appointments

We have a strong history of graduate education which attracts faculty to join the department and our graduate appointments continue to grow.

Faculty with graduate appointments



Other notable changes

- The number of faculty appointed at the Ontario Forensic Pathology Services grew substantially from 2013 (5 faculty) to 2014 (14 faculty).
- Almost half of the faculty at Public Health Ontario were not replaced (15 in 2013 to 6 in 2021).
- The Departmental Appointments Committee, who is responsible for reviewing eligibility for new appointments and re-appointments (with the exception of campus-based faculty), carefully considers all dossiers to ensure that faculty members continue to contribute to advancing the department's academic mission. Several faculty from the community were appointed as Part-Time Clinical or Adjunct Clinical in 2011 when the MD Program expanded to the Mississauga Academy of Medicine. However, some faculty appointments were not renewed, in particular for faculty in hospitals that were farther from downtown Toronto, due to lack of participation in academic activities after several years of inactivity.

LMP leadership appointments

Dr. Kandel started her tenure as Department Chair in April 2017 and restructured the LMP Executive Committee to appoint six new Vice Chair roles in August 2018. The inaugural appointments include:

- Co-Vice Chairs, Research – to focus on developing opportunities to facilitate research activities and encourage integration of our clinical and research pillars.
- Vice Chair, Clinical Affairs – to help strengthen and develop administrative organizational structures in support of academic activities across the hospitals.
- Vice Chair, Education – to lead the improvement of the delivery of education in all realms, including developing new graduate program(s), while examining ways to bring the department into the molecular and high-tech environment in which we currently live.
- Vice Chair, Innovation – to seek novel opportunities to develop research and educational capacity and explore 'blue-sky' possibilities.
- Vice Chair, Promotion and Mentorship – to lead the LMP Promotions and Appointments Committee and identify initiatives to support faculty in their development throughout their academic careers, including the establishment of a mentorship program.
- Vice Chair, Quality – to build upon laboratory quality assurance programs that will be utilized to enhance consistency across the department and to build scholarly activity in this growing field.

These leadership positions have now grown as noted in the table below. They include:

- splitting the role of Vice Chair, Education into two – one responsible for the clinical/ professional programs and the other for the Life Sciences program.
- the creation of Co-Associate Vice Chairs, Life Sciences, Director of Continuing Professional Development, Chair of Wellness, Equity, Diversity and Inclusion and Wellness Co-Chairs.

In addition, Dr. Kandel established the LMP Clinical Chiefs' Caucus, which is comprised of the Department Chiefs of the fully-affiliated and community hospitals. The two committees, the Executive and Caucus, interact with each other and the academic leads.

To address the wellness of our leaders, we have appointed Senior/ Junior Director positions in some clinical leadership appointments, e.g. Co-Directors of Clinical Biochemistry, Program Co-Directors of Cytopathology (AFC), and the Pathologists' Assistant Senior and Junior Field Directors.

Name	Position
Rita Kandel	Department Chair
Vice Chairs	
Myron Cybulsky	Co-Vice Chair, Research (Clinical/Professional)
Stephen Girardin	Co-Vice Chair, Research (Life Science)
Michael Pollanen	Vice Chair, Innovation
Khosrow Adeli	Vice Chair, Quality
Cathy Streutker	Vice Chair, Promotions & Mentorship
George Yousef	Vice Chair, Education (Clinical/Professional)
Michael Ohh	Vice Chair, Education (Life Science)
Other	
Jeff Lee	Co-Associate Chair, Life Sciences
Karim Mekhail	Co-Associate Chair, Life Sciences
Isabelle Aubert	Officer, Wellness, Equity, Diversity, and Inclusion
Gino Somers	Wellness Committee Co-Chair
Maria Pasic	Wellness Committee Co-Chair
Life Sciences	
Jeff Lee	Undergraduate Arts & Science Specialist Co-Coordinator
Karim Mekhail	Undergraduate Arts & Science Specialist Co-Coordinator

Name	Position
Graduate	
Jeremy Mogridge	Graduate Co-Coordinator, Research Stream
Michael Ohh	Graduate Co-Coordinator, Research Stream
Harry Elsholtz	Gradate Coordinator, Professional Graduate Programs
Doug Templeton	Gradate Coordinator, Professional Graduate Programs
Avrum Gotlieb	MHSc in Laboratory Medicine, Program Director
Hala Faragalla	Pathologists' Assistant Field Director (Junior)
Fang-I Lu	Pathologists' Assistant Field Director (Senior)
Heather Shapiro	Clinical Embryology Field Director
Richard Ferenbok	Director, Translational Research Program
MD Program (Undergraduate Medical Education)	
Corwyn Rowsell	Coordinator, Undergraduate Medical School Education
Postgraduate	
Susan Done	Director of PGME Programs & Anatomical Pathology (Res) Program Director
Eleanor Latta	Director, Resident Competency Program Development
Jayantha Herath	Forensic (Res) Program Director
David Barth	Hematological (Res) Program Director
Patrick Shannon	Neuropathology (Res) Program Director
Andrew Gao	Neuropathology (Res) Program Director
Tony Mazzulli	Medical Microbiology (Res) Program Director
Zeina Ghorab	Cytopathology (AFC) Program Co-Director
Joerg Schwock	Cytopathology (AFC) Program Co- Director
Wendy Lau	Transfusion (AFC) Program Director
Vathany Kulasingam	Clinical Biochemistry (Dipl) Program Co-Director
Paul Yip	Clinical Biochemistry (Dipl) Program Co-Director
Tony Mazzulli	Microbiology (Dipl) Program Director
David Hwang	Fellowship Program Director

Endowed and Limited Term Chairs and Professorships

LMP has already increased the number of Endowed and Limited Terms Chairs and Professorships from one unfilled Chair in 2013 to five Chairs in 2021.

Hospital-University Named Chairs

- Garron Family Chair in Childhood Cancer Research, Hospital for Sick Children. Chairholder: Cynthia Hawkins
- J.C. Boileau Grant Chair in Oncologic Pathology, Princess Margaret Cancer Centre. Chairholder: currently unfilled (Runjan Chetty from 2019 - 2020, appointment ended early due to retirement)
- Peter Munk Chair in Aortic Disease Research, UHN (Toronto General and Toronto Western Hospital). Chairholder: Clinton Robbins

University Named Chair and Professorships

- James Hunter Family Chair in Amyotrophic Lateral Sclerosis (ALS) Research. Chairholder: Janice Robertson
- Temerty Professorship in AI Research and Education in Medicine, Chairholder 1: Bo Wang. Chairholder 2: Search ongoing

We were also awarded 12 Canada Research Chairs since 2017. Please refer to our Research section, page 25, for a full listing.

Academic Appointment process modifications

We implemented the following process related to academic appointments since the last departmental review to ensure that our faculty maintains its commitment to academic excellence.

3-year academic plan

In 2017, we started requesting a 3-year academic plan for new faculty who are requesting for Clinical (MD) Full-Time, Clinical (MD) Part-Time, Status-Only and Status-Only (PhD Researcher) appointments. This document not only helps the Departmental Appointments Committee in determining the candidate's eligibility for an academic appointment, but it also helps the candidate to focus on their academic goals and reflect on how these goals align with the department's mission. The candidate, their Hospital/Site Chief and the University Department Chair review and sign off on the 3-year academic plan and then forward the plan to the assigned faculty mentor, if applicable. Please refer to Appendix 2.10.2 for the academic plan template.

Academic Position Description – Clinician Quality & Innovation

In 2018, Dr. Kandel reviewed LMP's definition of all academic position descriptions and time distribution to ensure that it continues to properly reflect the department's expectations.

She also introduced a new academic position description of Clinician Quality and Innovation that encompasses academic interest in quality improvement, patient safety, knowledge translation, or other forms of healthcare innovation (e.g., advancing health informatics, developing new models of care). To date, there are three faculty who hold the Clinician Quality and Innovation academic position description. Please refer to Appendix 2.10.3 for the job description template.

Status-only appointments and academic position description

In reviewing appointment applications for Status-Only faculty with clinical duties (e.g. Clinical Biochemist, Clinical Microbiologist, Lab Directors, etc.), we have started requesting academic position descriptions and time distribution on the four domains of clinical, research, teaching and administration. These faculty often devote the same time commitment to academic activities (e.g. research and teaching responsibilities) as their clinical colleagues. Requesting an academic position description will hopefully assist the faculty member, their Hospital/ Site Chief and LMP guarantee them protected time for academic work.

LMP internal standards for new appointments

In March 2021, the Departmental Appointments Committee established its new requirement to be eligible for an appointment at the rank of Assistant Professor.

Temerty Medicine Faculty Appointments Advisory Committee guidelines require:

- successful completion of a recognized graduate program or an advanced training experience
- at least one or two published (or accepted) first authored peer-reviewed publications in well regarded journals

We have increased this requirement to be a minimum of two publications.

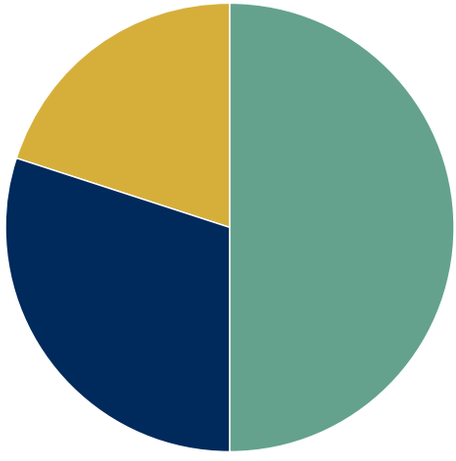
In addition, Dr. Kandel, or her designate, sits on all fully-affiliated hospital search committees. This ensures that the search is conducted following EDI principles and that the selected candidate meets eligibility for a faculty appointment and rank based on the criteria at the University of Toronto.

Reviews

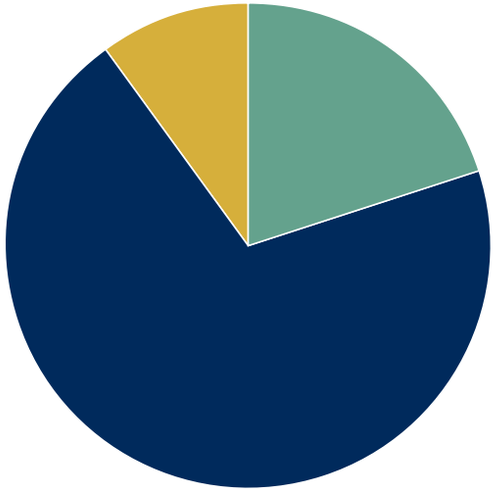
Campus-based Faculty Reviews

In 2021, we conducted a review of the 'Progress Through the Ranks (PTR)' process and modified how the PTR Committee evaluates annual academic performance for campus-based faculty. Previously, we used a descriptive rating system as a model to evaluate our faculty's performance. This year we switched to a numerical five-point system which will be multiplied by the weight for each category.

Research stream



Teaching stream



3-year Review/ Continuing Appointment Review

In LMP, all Clinical (MD) Full-Time faculty and Status Only faculty who are Diagnostic Lab Scientists are required to undergo an in-depth Continuing Appointment Review (CAR), formerly called the 3-year Review.

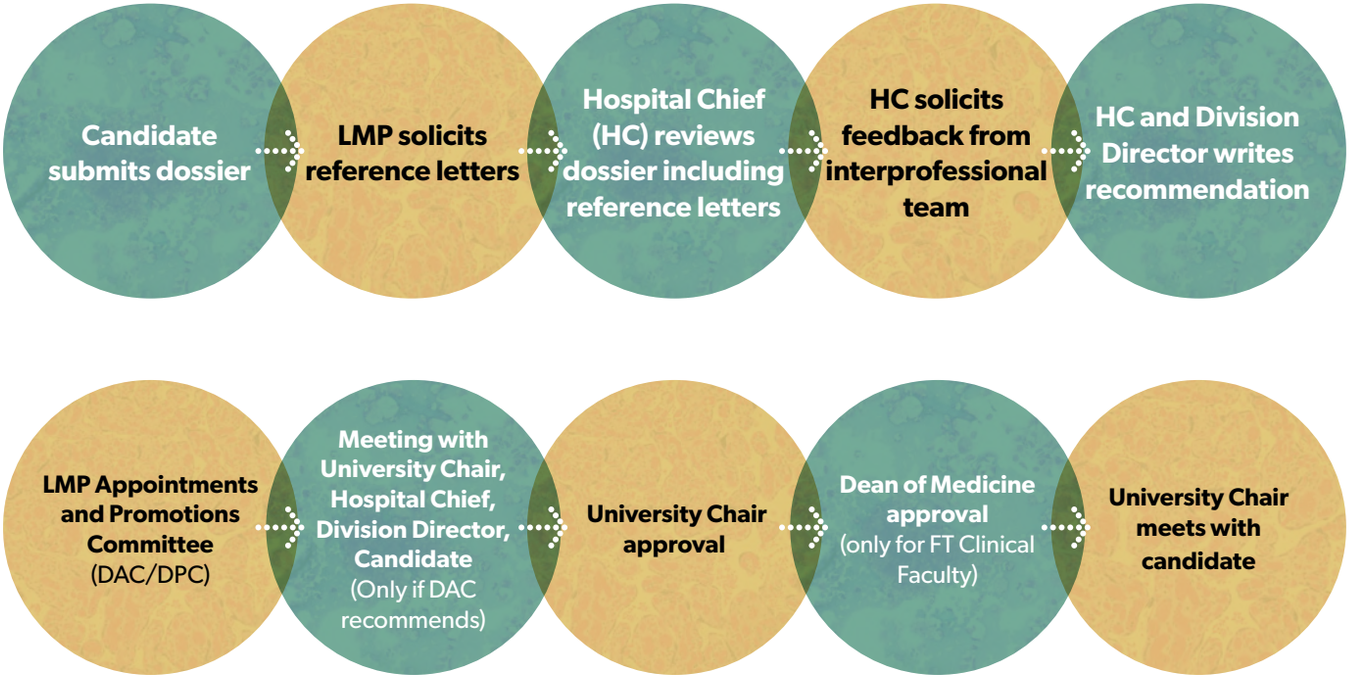
The CAR is designed to assess the faculty member's academic performance at the end of their third year of appointment and be considered for "continuing annual appointment" for MD faculty and "appointment renewal" for PhD faculty. The review process will elicit and consider all possible relevant information such as academic activities, teaching evaluations, and opinions of colleagues and trainees. We solicit written comments from department members, clinical colleagues, and the interprofessional team, formally or informally acquainted with the appointee's clinical and/or academic work. The CAR dossier is reviewed by the Departmental Appointments and Promotions Committee who will make a recommendation to the Department Chair. The Chair meets with the candidate at the end of the process to relay the outcome and recommendations.

As of 2019, faculty who hold their primary appointment in the Research Institutes are no longer required to undergo the CAR process as they already complete a similar review within their Research Institute.

In 2020, we completed a review of our 3-year review process that resulted in several changes including:

- submission of the candidate's Self-Reflection form with specific questions to address changes in time distribution in comparison to the original Academic Position Description, academic goals for the next five years, etc.
- submission of the complete review package including all letters of reference received to the Hospital/Site Chief who in turn writes a detailed assessment of the candidate's performance. (Previously, the Chief did not see these reference letters.) We created a Chief Assessment form template to standardize and obtain a comprehensive evaluation for all faculty undergoing a CAR.
- introduction of having the Departmental Appointments and Promotions Committee be able to recommend that the University Chair, Hospital Chief, Division Director (if applicable) and candidate meet if there are issues that need to be addressed.

LMP Continuing Appointment Review Process



Our HR team has recently started checking in with the Hospital/Site Chief 18 months after the faculty's appointment to remind the Chief to meet with the faculty member to ensure that they are on track for their upcoming 3-year review. This is also an opportunity for the Chief to notify us if a deferral is required, particularly to account for the additional workload brought by the pandemic.

Since 2013, the following faculty have completed their review:

Appointment Type	# completed 2013-2021	Review outcomes
Clinical (MD) Full-Time	51 + 2 waived (1 previously completed CAR and returned to Toronto, 1 senior faculty) + 1 deferred due to pandemic	49 transferred to "continuing annual appointment" 1 put on one-year probation 1 transferred to Clinical (MD) Part-Time Appointment
Status-Only	16 completed + 1 waived (senior faculty) + 1 deferred due to pandemic	16 re-appointments
Campus-based faculty reviews	In 2020, Dr. Richard Foty successfully completed his 3-year review.	

Promotions

Junior academic promotion

The Departmental Appointments Committee strives to appoint new faculty at fully-affiliated hospitals at the rank of Assistant Professor if they meet the criteria set by Temerty Medicine and internal departmental guidelines. However, there are instances when a new faculty is more appropriately appointed at the rank of Lecturer.

Appointed Lecturers from our primary faculty

4

in fully-affiliated hospitals (1.18%)

33

in community hospitals/ organizations (9.76%)

Dr. Cathy Streutker, in her role as the Vice Chair of Promotions and Mentorship, strongly encourages faculty at the fully-affiliated hospitals to attend the LMP Promotion Workshop. In addition, new faculty at the junior rank are also assigned a mentor.

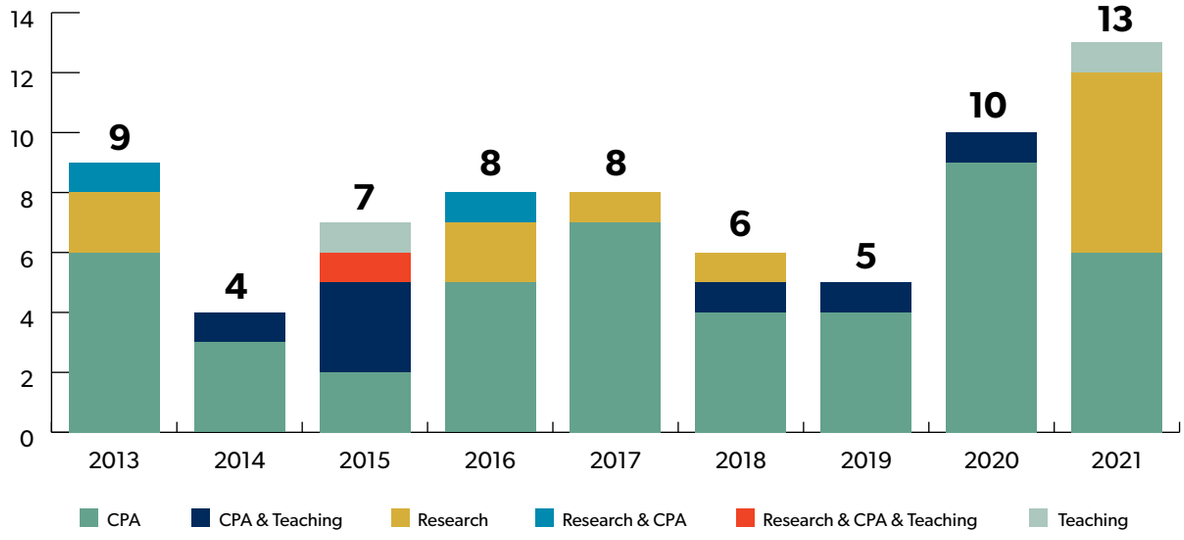
Since the last review, LMP has promoted (term used for MD faculty) or reclassified (term used for PhD faculty) 17 faculty members to the rank of Assistant Professor. Below is the breakdown by promotion/ reclassification pathway:

Pathway for promotion (for MDs) or Reclassification (for PhDs)				
	Advanced Degree	Sustained Teaching Excellence or Creative Professional Activity in Teaching/ Education	Both Pathways	Declined Applications
Clinical (MD) Full Time Appt		3	1	1*
Clinical (MD) Part Time Appt		2	2	
Clinical (MD) Adjunct Appt	1	1		1**
Status Only		3		1*
PhD Researcher		1		
Total	**1**	**10**	**3**	**3**

*Declined by the Temerty Faculty of Medicine Faculty Appointments Advisory Committee
**Declined by LMP's Department Appointments Committee

The three unsuccessful promotion applications were earlier in this 5-year review term when promotion workshops and the mentorship program were in their infancy.

LMP Promotion by Pathway



Senior academic promotion

Academic promotion recognizes and rewards excellence in scholarly activities. At the University of Toronto, excellence in research, creative professional activity, and teaching are given the greatest weight. The Departmental Promotions Committee (DPC) takes into account the candidate's achievements since their initial appointment or last promotion.

We conduct a rigorous review process which starts with the faculty member submitting a letter of intent which is reviewed, along with their CV, by the Department Chair, Vice Chair of Promotions & Mentorship and DPC Co-Chair. Candidates who are recommended to move ahead submit a full dossier which is reviewed thoroughly by the DPC.

The committee is composed of diverse membership to reflect the department's vast clinical and research specialties.

70

faculty were promoted to the rank of Associate Professor and Professor (since 2013, 57 since 2015)

99%

approval (100% since 2015) at the Temerty Medicine Decanal Promotions Committee

Promotions workshops

In 2015, LMP started to offer promotion workshops led by Dr. Cathy Streutker, Vice Chair of Promotions & Mentorship. She believed it was essential for the department to present their own workshop due to the varied and unique expertise of our faculty, which mostly falls under the creative professional activity (CPA) pathway.

Unlike the research pathway that is fairly easy to quantify, promotion based on CPA requires clear guidelines to obtain a successful outcome, as demonstrating impact for CPA can be more difficult.

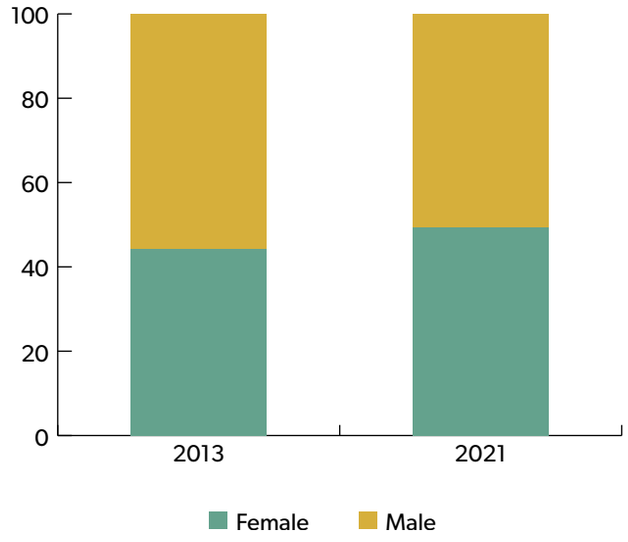
Education is also a promotion pathway that has specific requirements: the workshops focus on Decanal Promotions Committee expectations and how to develop education portfolios, and attendees are encouraged to seek out faculty development opportunities such as master's degrees in education. The program has evolved from information sharing to including a variety of exercises specific to LMP.

The full day workshop, which covers criteria and definitions, review process, required documentation and hands-on exercises, led to an increase in:

- number of applications notably from faculty who have been in their rank for 10 years or more (26.3% of the 57 promoted faculty).
- number of faculty being promoted based on the *Excellence in Creative Professional Activity* pathway. This is a significant pathway in LMP as 80% of our faculty are MDs or PhDs carrying out clinical work (of the clinicians, 80% hold an Academic Position Description of Clinician Teachers or Clinician Educator or Clinician Quality & Innovation).

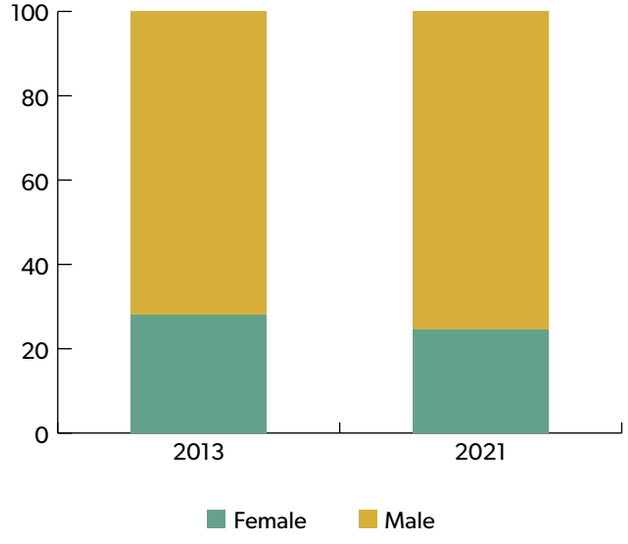
Since the launch of the workshop, the gender difference at the Associate Professor rank improved.

Associate Professor

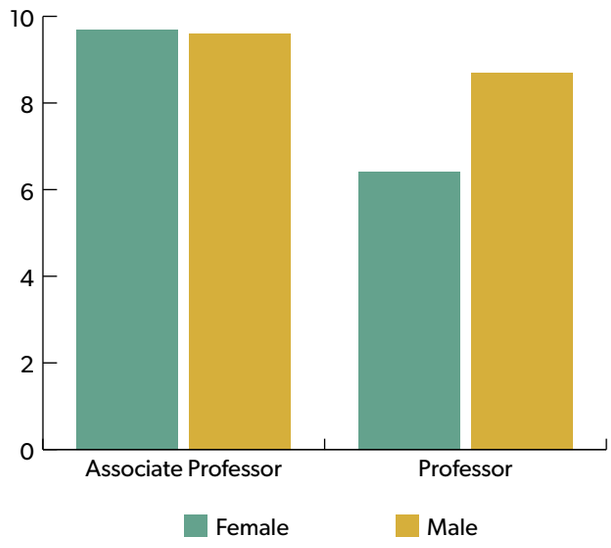


However, there remains to be a gap at the Professor level which is being addressed by the LMP Mentorship Committee.

Professor



Time taken to apply for promotion (in years)



In parallel to the promotion workshop, we started to offer Continuing Appointment Review/3-year Workshop in 2017. Faculty who will be undergoing this review are strongly encouraged to attend this workshop where they are asked to expand on their 3-year academic plan submitted at the time of their new appointment application. This workshop aims for faculty to identify their strengths, consider their academic pathways and identify opportunities to work on going forward.

Feedback from the Promotions Workshop

Feedback from faculty has been highly positive and evaluation comments noted their appreciation. Sample evaluation comments:

- "This session should be mandatory for all Assistant Professor faculty early on... it provides an excellent framework for promotion. This workshop made me feel like the department really cares, and will encourage and support academic promotion". (2018 Workshop)
- "Thank you so much for offering this outstanding event. I really like how you assembled the workshop. It was very worthwhile attending and totally hit the mark, easily saving each of the attendees days of work". (2018 workshop)
- "Awesome session... this time away from service work helps to put things into perspective... should be offered on a yearly basis to all faculty. Was great to hear what others are going through". (2018 workshop)
- "Made the audience feel encouraged and supported". (2020 workshop)
- "This was an excellent workshop. Although it might have been a bit more fun if it were done in person, the online alternative was quite fine. I felt that the people running the workshop really cared about helping members of the department get promoted. I felt at the end of the workshop that when I start the promotion process, I will be fully supported, resulting in a promotion". (2020 workshop)
- "Clearly outlined routes for promotion and how to achieve them in real practice of a pathologist. Honest assessment of the challenges". (2020 workshop)
- "Cases were presented and discussed with real and relevant information to Lab PhD Scientists". (2020 workshop)

Faculty development

Dr. Cathy Streutker has introduced more initiatives to develop new faculty since 2017.

For initiatives related to mentoring, see Mentoring, page 112.

Orientation

Faculty Orientation booklet

The Faculty Orientation booklet is designed to welcome and acquaint all new primary-appointed faculty to the department. The booklet contains information on their academic appointment, reviews, promotion, resources, academic programs and departmental contacts. See Appendix 2.10.9

One-on-one welcome meeting with the Chair

All new faculty members meet with Dr. Kandel one-on-one. This is an opportunity for the Chair to personally meet new faculty and candidly speak to them about their academic interests, how they can be involved in LMP, and how the department can help them advance in their academic career. Dr. Kandel also takes this opportunity to remind them about the Conflict of Interest and Professionalism guidelines.

LMP New Faculty Welcome Reception

Since 2017, we have hosted a welcome event for new primary-appointed faculty. Held every autumn, this meet and greet event is to inspire and get them excited about joining a dynamic department. They are given an overview of the department, a brief description of the different academic pathways and key messages on how to advance their academic career and what resources are available to them. This is also an opportunity for them to meet and network with their colleagues.

Leadership Support

After attending Harvard's Career Advancement and Leadership Skills for Women in Healthcare, Dr. Streutker was inspired to send faculty to similar conferences.

This was timely, as the Temerty Medicine 2018 Voice of the Faculty survey was released around the same time. The survey indicated that:

- 43% of LMP faculty would like to take on a more challenging/meaningful and leadership role
- 44% mentioned that they are almost fully prepared
- 28% noted that they are not ready now but will be in a couple of years.

Leadership Grant

In 2019, we launched a program to fund at least two faculty members each year to attend a leadership course or conference. The goal is to support our faculty in acquiring the knowledge and tools to become excellent leaders in the field; and in turn, help us drive innovation in LMP.

The leadership course or conference can be from a local program (e.g. Unity Health Toronto/ University of Toronto's Centre of Faculty Development or Rotman School of Management) or an international program to develop their personal leadership skills.

This competition is open to faculty who meet the following criteria:

- appointment type is Tenure/ Part-Time Academic, Full-Time Clinical, Part-Time Clinical or Status-Only,
- at the rank of Lecturer, Assistant or Associate Professor
- holds their primary academic appointment in LMP, and
- preference will be given to those who have matching funds from their Hospital Chief.

The department will cover the cost of the leadership program up to a max of $3,500. The successful applicant is required to submit a report after attending their conference/course or share their new knowledge at a faculty development event.

The awards committee consists of

- Dr. Rita Kandel, Department Chair
- Dr. Cathy Streutker, Vice Chair of Promotions & Mentorship
- Mr. Nelson Cabral, Manager of Business and Administration.

Since it launched in 2019, there have been three competitions and a total of 11 faculty have been awarded grants totaling $20,659 (72.7% female, 27.7% male)

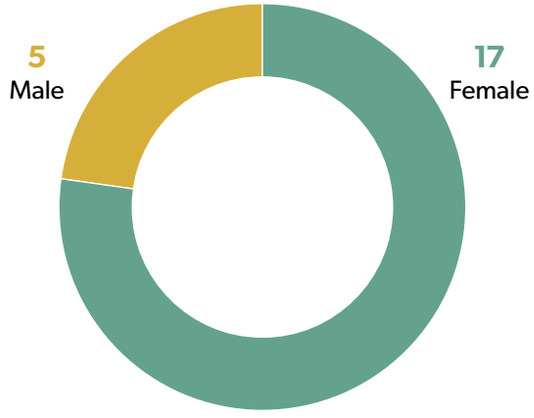
Leadership grant recipient

Dr. Daniel Beriault, Assistant Professor in LMP and Head of Biochemistry in the Department of Laboratory Medicine at Unity Health Toronto, benefited from the LMP Leadership Grant. He used the funding to attend 'Health Leadership Program: Achieving your potential' at the Rotman School of Management.

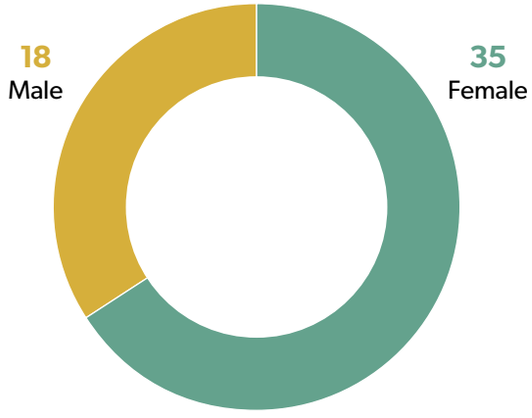
"For me, I saw this as a logical next step, explains Dr. Beriault, "I had recently been promoted to the Head of Biochemistry at Unity Health Toronto and I wanted to sharpen my skills as a leader. Our hospital network is in a unique situation, as St Michael's Hospital, St Joseph's Health Centre and Providence have joined together as Unity Health Toronto. With this comes a lot of change and anxiety, and I wanted to ensure I was knowledgeable and prepared to help lead change in my division."

Read more about Dr. Daniel Beriault.

Faculty awarded leadership grants to date



Partnership with the CMA Joule's Physician Leadership Institute



We have partnered with the Canadian Medical Association's Joule Physician Leadership Institute (PLI) to develop our faculty's leadership skills and explore their potential as an influential leader. These virtual 1.5 hour sessions are meant to give faculty an introduction to the topic and are open to all LMP faculty (MD and non-MD) including sessional lecturers.

We have offered, or will soon be offering, sessions on:

- Self-Awareness
- Emotional Intelligence
- Conflict Management
- Change Management.

	Female	Male	Total	Attendance by Appt Type
Clinical (MD) Full Time Appt	17	8	25	47.17%
Clinical (MD) Part Time Appt	6		6	11.32%
Clinical (MD) Part-Time Appt	4		4	7.55%
CLTA, Teaching Stream (PhD)		2	2	3.77%
Sessional Lecturer	2		2	3.77%
Status Only (PhD)	6	7	13	24.53%
Tenure Stream (PhD)		1	1	1.89%
Total	**35**	**18**	**53**	**100.00%**

Other faculty development initiatives

Centre for Faculty Development Programs

Our faculty have attended various programs offered such as the Stepping Stones Program and the New and Evolving Academic Leaders by the Centre for Faculty Development at Unity Health Toronto – St. Michael's and the University of Toronto. Please see Appendix 2.10.8 for a list of faculty and programs they attended.

Supporting faculty to go to the Department of Medicine Women Summit Conference

In 2018, we supported 12 female faculty to attend the Department of Medicine Women Summit Conference.

Faculty Development Day

We will be launching a Faculty Development Day in 2022. A day devoted to personal and professional development, the focus will be on professionalism.

Next Steps

We have tried to build multi-strategy approaches to faculty development.

Most of these programs have high faculty uptake (e.g. promotion workshops fill up within one hour of opening registration, the Joule PLI courses are always fully subscribed), however, it is too early to evaluate their effectiveness.

It is our goal to maintain our faculty's positive outlook about their future career path (23% Excited, 45% Good) as noted in the 2018 Voice of the Faculty Survey.

Faculty members report

"LMP has strengthened considerably during past few years, and has a very positive forward-thinking approach to the future."

As part of the departmental review for Dr. Rita Kandel's first term (2015 - present), we circulated a survey to all LMP faculty to gain an understanding of their perspectives on aspects of:

- departmental engagement
- communication
- support for research
- graduate and undergraduate education
- creative professional activities
- issues around diversity
- effectiveness of the chair

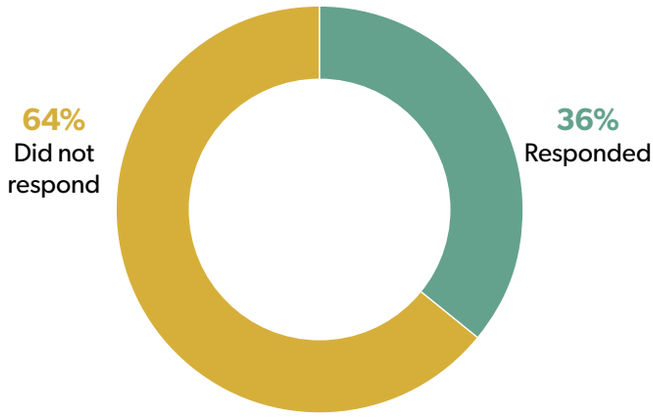
The survey was based on the previous survey of 17 questions in 2013, with updated assessments from that survey as well as additional statements focusing on diversity issues stemming from the Temerty Medicine's 'Voice of the Faculty' initiative of 2018.

Those statements for assessment arising from the Department were created by a committee of faculty members representative of all areas of the department. The responses were anonymous but linked to respondent's university affiliations (i.e. tenure stream vs clinical full-time, etc.).

The survey

The survey consists of 44 statements where the faculty were asked to select a position ranging from 'Disagree Strongly' to 'Strongly Agree', or 'Not Applicable' and 'Don't Know'. Respondents could also enter any statements they wished to make about the department in the comments section. The results were collated and reviewed by the committee, and form the basis of this report.

Faculty responses



Responses

Response rates from primary and cross-appointed faculty groups were almost identical.

We have grouped the statements into the following broad categories:

1. Diversity and Inclusion
2. Faculty engagement
3. Supporting excellence (support for research, education and creative professional activity)
4. Departmental support and communication
5. Chair effectiveness
6. Overall satisfaction

Response to the survey was relatively low, particularly considering the 81% response rate for the previous survey in 2013. This may be due to workload stress and the COVID-19 pandemic.

1. Diversity and Inclusion

We included questions in the survey to identify the range of diversity within the department.

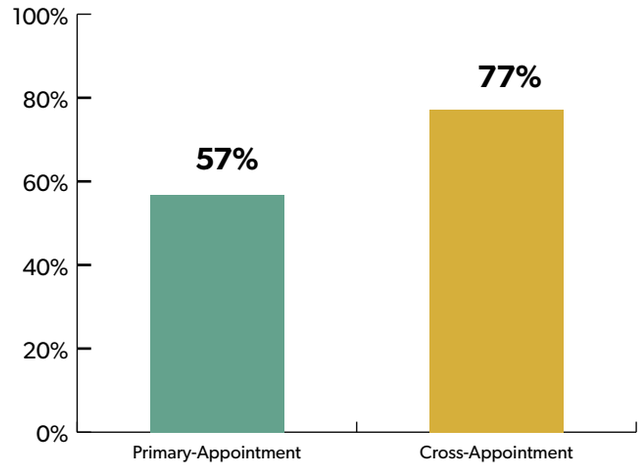
The department's faculty are primarily Canadian, however, nearly half of the respondents spent their early years outside of Canada. Racial/ethnic background shows that the department is still predominantly Caucasian. We believe that we have made progress on this front, however

there is still considerable work to be done in this area; as one respondent noted, "Since COVID-19, anti-Asian atmosphere was growing up in some areas, it is important for LMP to prevent any possible negative impact on our research community". Clearly, our departmental members are very aware of the impacts of racism in academia.

Overall, the 25 statements surveyed in this section emphasize the broad range of lived experiences in our department. One respondent commented "…I value the fact that there are so many diverse people affiliated with LMP as opposed to a very tight-knit department of 100% academics".

In contrast, another commented "Number of tenured male professors outnumber female tenured professors 2 to 1. Most leadership positions are given to male professors." This is an area of concern that we have focussed on in the past few years, with an aim to increase diversity across many fronts within the group and to mentor and sponsor more women into leadership positions within our department and beyond.

Faculty who identify as White



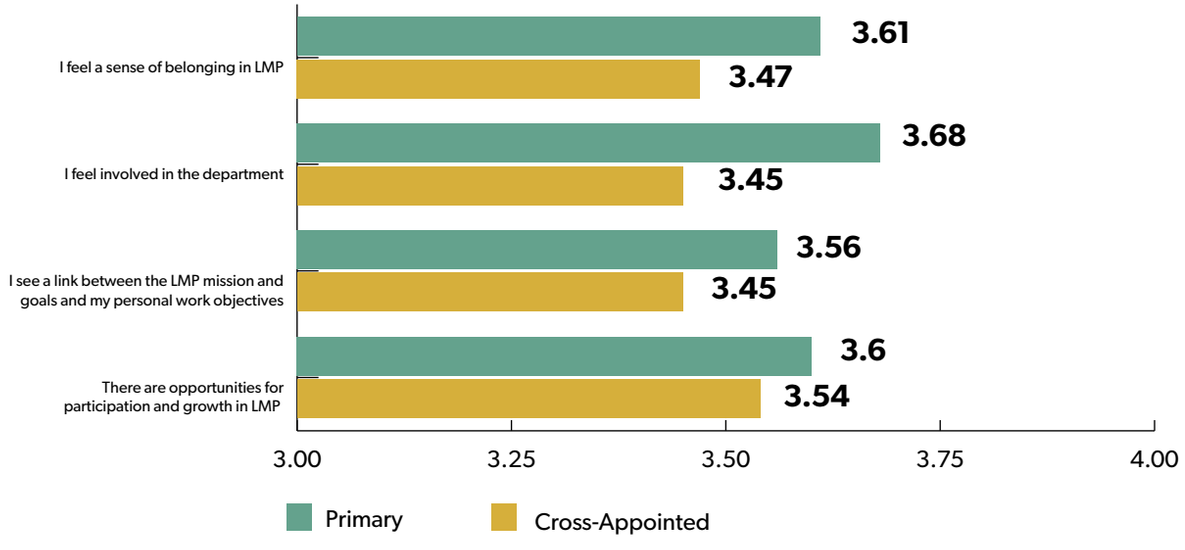
"Their stance about racism was strong, rational and inclusive."

2. Faculty engagement

Overall, our primary faculty agreed with statements evaluating faculty involvement and a sense of belonging in the LMP department and a link between the LMP mission and goals and personal work objectives.

Cross-appointed faculty, understandably, had lower agreement on these statements, as their primary appointments are in other departments, however it is notable that even for these faculty the level of agreement was still moderately high.

Faculty involvement and sense of belonging



There remain a proportion (13–18%) of both primary- and cross-appointed faculty who disagree with these statements; these numbers were quite consistent across the statements in this section, indicating that there are faculty who do not feel engaged with the department.

One respondent noted "Sometimes it is difficult to feel that I belong in LMP because I am not a basic scientist or pathologist"; this is an issue that has been raised before as we have multiple subspecialties under the umbrella of Laboratory Medicine, and the smaller groups can feel that they are outnumbered. Another noted that they had never felt included or important to LMP.

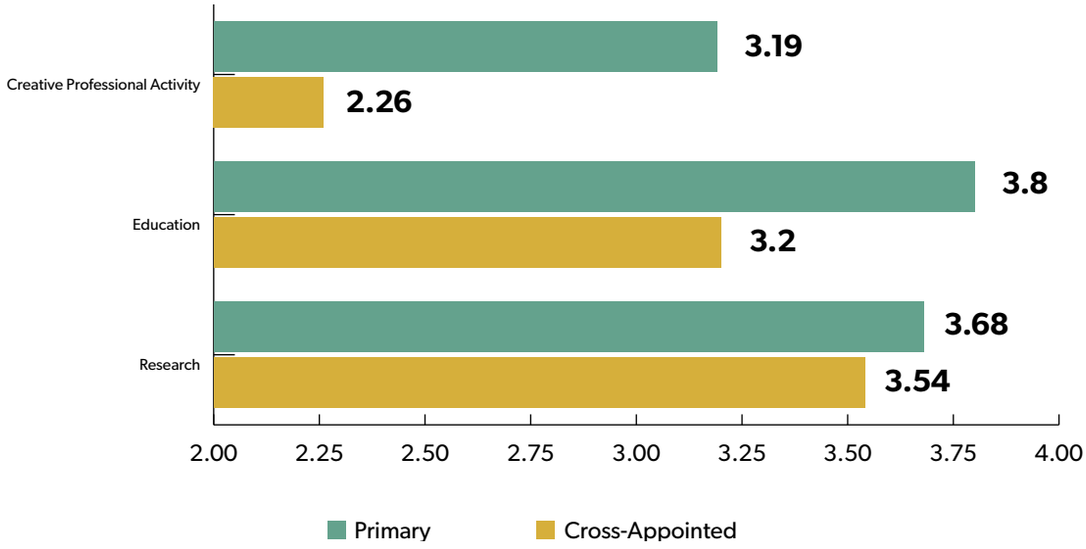
Looking at the breakdown of respondents in the primary appointment group, these concerns are primarily coming from our Clinical (MD) full time staff and status-only PhD/Clinical PhD members. Integration of clinicians and clinical PhDs into a research-intensive university department is a challenge faced by many departments with a combined research and clinical focus. Going forward, we will have to work on this to improve our faculty's experience with the department.

3. Supporting excellence

Faculty appear to agree that recognition and rewarding of excellence is valued in the department and they also showed good agreement with the statement that LMP promotes a culture of innovation and ongoing improvement (3.47 for primary and 3.3 for cross-appointed).

Disagreement for these sections was quite low, at approximately 5% and comments on this area are generally strong.

Recognition and rewarding of excellence

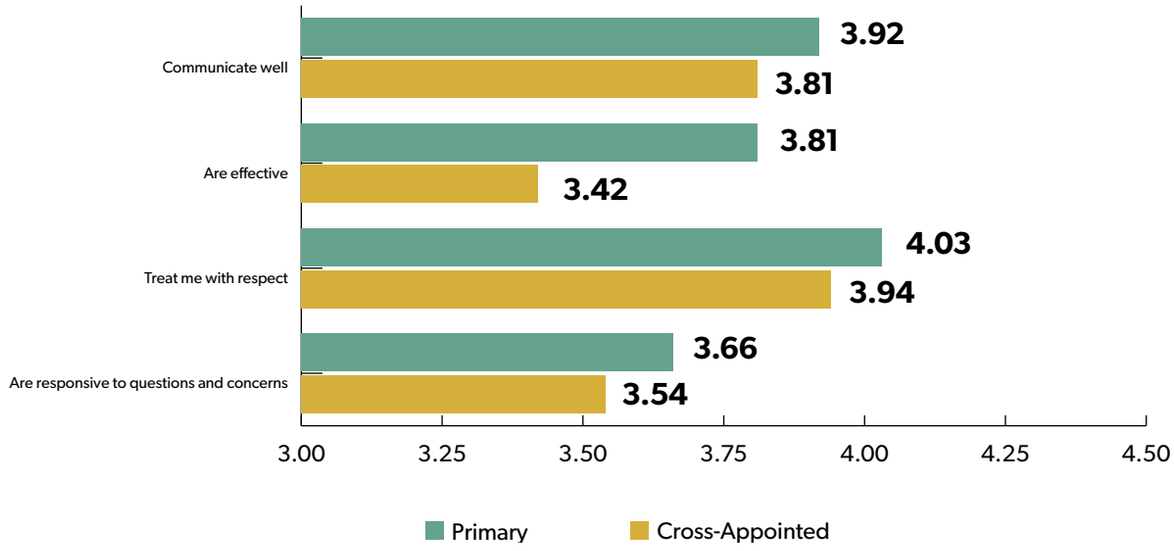


"LMP provides opportunities for excellence in teaching and research and encourages innovation and growth to achieve the academic vision and mission of the university. The goal of global excellence is reachable for LMP."

4. Departmental support and communications

Both primary- and cross- appointment faculty feel that the departmental administrative staff are approachable and helpful, and that they play essential roles in maintaining departmental function. Disagreement in this section was quite low, approximately 3–7%.

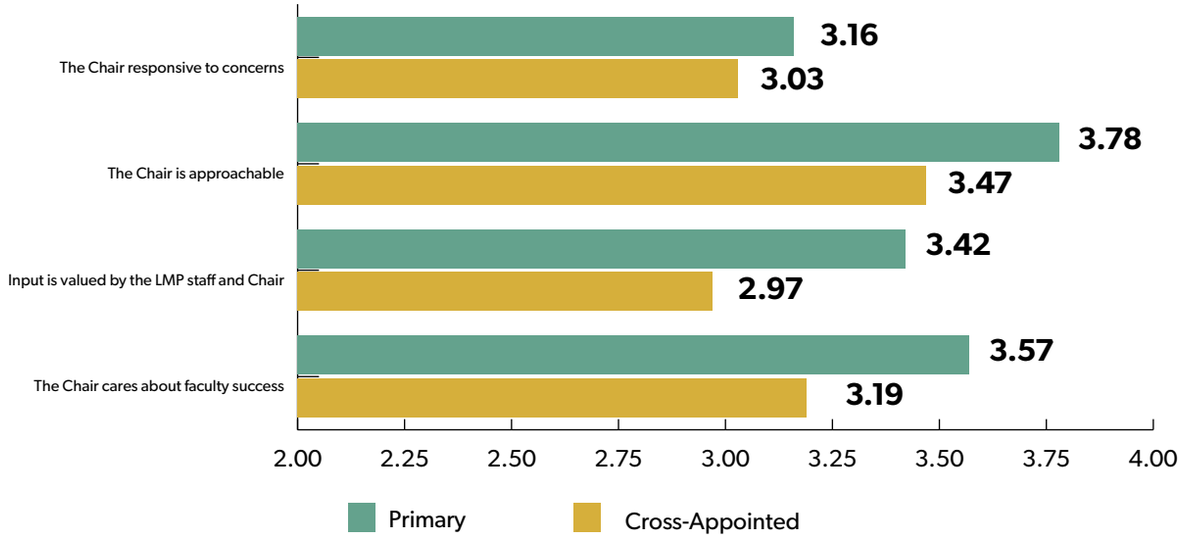
The LMP administrative staff



5. Chair effectiveness

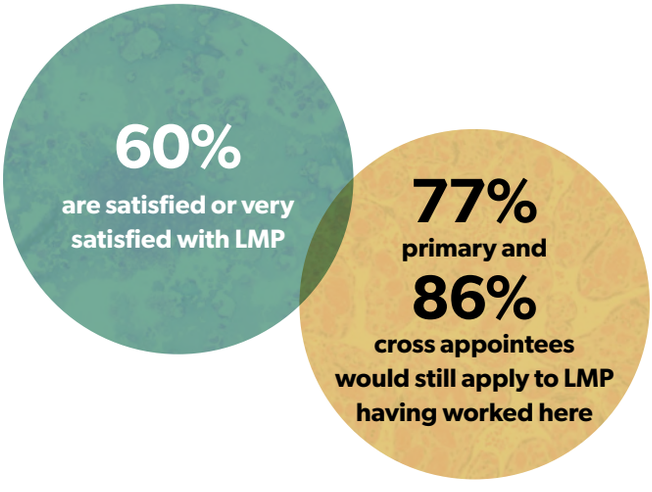
It appears that the majority of faculty believe the Chair is effective. They agreed that their input is valued by the LMP staff and Chair and the Chair is approachable with some agreement that the Chair is responsive to concerns. Though this result is somewhat concerning, the follow-up question regarding the Chair's caring about staff success showed higher agreement, and the rate of disagreement in this section is quite low.

Chair effectiveness



"The Chair is outstanding. She genuinely cares and puts in great effort to reach out to all faculty. She is one of the best academic administrators I have ever worked with."

6. Overall satisfaction



The statement on overall satisfaction showed fairly strong agreement (3.69), with over 60% of the respondents indicating agreement or strong agreement, and only a small percentage in the disagree or strongly disagree categories (8 people in total disagreeing).

When questioned about whether they would still apply for a position in LMP after having been here, 77% of faculty with primary appointments and 86% of cross-appointed faculty agree/strongly agree that they would do so, with only 6 respondents disagreeing with the statement.

Most comments were positive:

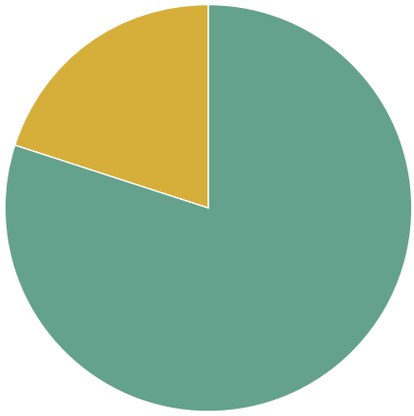
- "A complex and diverse Department that manages to pull it off"
- "LMP has strengthened considerably during past few years, and has a very positive forward-thinking approach to the future"
- "A great department and excellent colleagues"
- "Great department. There is a sense of community despite the large size. Welcoming. My personal experience has been very good so far."
- "A department that offers excellent opportunities for students, staff and faculty to enjoy a productive career in academia. A department that is well positioned to support diversity and equity in the workplace as demonstrated by the personal success shown by many members of the department in promotions, achievement awards in service, education and research and in national and international recognition."

Conclusions and going forward

The response rate for this survey was significantly lower than in past years; it is difficult to determine the reasons for the low response rate, though we can hypothesize that the increased workload in Laboratory Medicine due to the COVID-19 pandemic underlies this as well as survey fatigue.

Overall, the respondents agreed with statements on faculty engagement, supporting excellence, departmental support and communications, Chair effectiveness and overall satisfaction.

Comments



The majority of comments were positive across all of the groups with less than a quarter negative and there were a low percentage of department members who disagreed with the statements in these subgroups. These were proportionally slightly higher coming from the Clinical MD/PhD groups, which is an area to focus on going forward.

Some respondents commented on the issues between groups within the department.

Comments include:

- "LMP is a diverse department consisting of basic scientists and clinicians. It is hard to know all faculty in the department. Events or activities to connect the two streams will help to improve a better understanding of research resources/collaborations"
- "Great faculty but very specific work at the core of the research portfolio and it isn't clear if there are opportunities to collaborate on interdisciplinary teams".
- "More and better communication from the LMP department would help with awareness of activities in the department. Promotion and forums for members of the department to present research and raise awareness of specific research programs from Investigators and new developments could increase knowledge and awareness. A mechanism to identify other LMP members with similar or overlapping research interests would be beneficial and promote collaboration".

This is a significant issue in our complex department; we have been working on a departmental lecture series to include both research and clinical staff and are working on other methodologies to connect the two streams. Further development in these areas would likely aid in helping the hospital-based faculty feel included and provide them opportunities for academic progress.

In general, the responding faculty appear happy with the work done by the Chair; most responses and comments were positive and support the work she has done as Chair to be an effective and supportive leader who is accessible and responsive to the department members.

As noted above, there is still work to be done to improve diversity and inclusiveness across the department. We have been working on ensuring that hiring practices are fair and unbiased, and for people already in the department, we have developed mentorship programs and workshops on promotion to help faculty understand the university promotion process. We have also supported faculty to attend leadership development courses to help move the next generation into leadership positions.

11 Our Learners

Directly from our learners, they give feedback on their experiences in our department.

Undergraduate Learners' Report

Conducted by the Laboratory Medicine and Pathobiology Students' Union (LMPSU), they provide a report on student opinions of the Pathobiology Specialist Program.

Per request by the Department of Laboratory Medicine and Pathobiology, the Laboratory Medicine and Pathobiology Students' Union (LMPSU) has conducted a self-study on the opinions of undergraduate Pathobiology Specialists.

The first goal of this self-study is to determine how the quality of the following aspects of the Specialist program are perceived by current students:

1. Program quality
2. Courses and instruction
3. Student support

The second goal of this self-study is to determine what future improvements current students feel are necessary to improve the quality of the Specialist program.

Survey results

Most survey questions (Questions 3 through 19 out of 24) asked for responses from a set of 5 choices ranging from least satisfied with the subject of the question to most satisfied with the subject of the question. These responses were quantified by assigning a rating of 1 to the least satisfied response and a rating of 5 to the most satisfied response. Doing so allows for the overall response to each question to be quantifiably summarized by a mean and variance, indicating the overall opinion on the question and the degree of consensus of that opinion respectively. A low variance indicates that most students agree with the mean opinion and this is worth noting when looking at the data.

The number of survey responses that were received was quite low at just 24, considering that there are currently 3 classes of Pathobiology Specialists. We did not target the survey to the newest class (the class of 2024) since they were just accepted in July 2021 and did not have significant experience interacting with the department. Additionally, the class of 2021 that had just graduated would have been an excellent cohort to receive responses from since they could provide responses to questions regarding courses offered by the department. For future student opinion studies, it should be noted that the quality of responses may drastically improve by collecting responses in March or April when there would be two cohorts of Specialists that could provide responses regarding courses offered by the department.

Program quality

Students' opinions on the program quality of the Pathobiology Specialist was positive. The overall mean of responses to program quality questions was 3.65 - the department scored highest on this category of questions compared to the rest of the survey. Question 18 which asks students about the perceived workload from being in the Specialist Program has been omitted from the overall mean calculation because a high score indicating high workload does not qualify as a positive opinion.

Of the questions from this category, Question 3 and Question 18 received overwhelmingly positive responses at a mean of 4.42 and 4.46 respectively with very small variances indicating general consensus. Students in the Pathobiology Specialist program find that the courses offered by the Department are of great interest to them and strongly agree that they have high workloads.

The lowest scoring question from this section was Question 6 with a mean of just 3.00. Pathobiology Specialists feel that the overall level of organization of courses offered by the Department is neither great nor poor. As new courses will be implemented starting with the upcoming 2021-2022 school year, this statistic may change although still worth noting. Despite being a neutral response, as a Department that prides itself on offering a high quality Specialist Program to high caliber life science students, this could be considered an area for potential improvement.

The results from questions belonging to the Program Quality category can be seen below and the specific results discussed above are highlighted. Histograms of responses can be found in Appendix 2.11.1. The data is displayed in the same manner in the sections that discuss the other question categories.

Table 1: Results of Survey Questions Regarding Program Quality

Survey Question	Mean	Variance
3. I am interested in taking the undergraduate courses offered by the Department of Laboratory Medicine and Pathobiology.	4.42	0.33
4. Undergraduate courses offered by the Department of Laboratory Medicine and Pathobiology interest you more than the undergraduate courses offered by other life science departments at the University of Toronto.	3.92	0.58
5. Prerequisite courses (first and second year non-LMP courses) mandated by the Pathobiology Specialist Program are a good preparation for the content offered by LMP courses.	3.41	1.06
6. Undergraduate courses offered by the Department of Laboratory Medicine and Pathobiology are well organized.	3.00	0.76
9. You feel that the Pathobiology Specialist Program adequately prepares you for post-undergraduate career options.	3.83	0.47
16. Would you recommend the Pathobiology Specialist Program to incoming students at the University of Toronto?	3.67	0.89
18. How would you rate the workload within the Pathobiology Specialist Program?	4.46	0.25
19. Are you able to find a consistent balance between work and life outside of work?	3.29	0.62
Overall (excluding Question 18)	**3.65**	

Courses and instruction

In terms of the student body's experience with 3rd year courses, it was noticeable that students found the quality of labs and classroom lectures to be "great". The "Labs" likely refer to the two lab lectures in LMP365, which many students found to be interesting.

The quality of examinations in 3rd year courses were leaning towards the modal response of "poor". This was also evident in the additional comments made by students where a few have referred to the examinations being inconsistent and not representative of the material learnt. The marking scheme was also mentioned to be unevenly distributed, with a large weighting being placed on the final examinations. These factors may play a role in contributing towards the mean score of 2.40 for this particular question.

Table 2: Results of Survey Questions Regarding Courses and Instruction

Survey Question	Mean	Variance
7. You are satisfied by the quality of instruction provided by lecturers from the Department of Laboratory Medicine and Pathobiology.	3.24	0.66
8a. How would you rate the quality of labs of LMP courses in your 3rd year in contributing to learning?	3.90	0.89
8b. How would you rate the quality of examinations of LMP courses in your 3rd year in contributing to learning?	2.40	0.64
8c. How would you rate the quality of written assignments of LMP courses in your 3rd year in contributing to learning?	3.30	0.41
8d. How would you rate the quality of classroom lectures of LMP courses in your 3rd year in contributing to learning?	3.90	0.49
Overall	**3.35**	

Student support

Overall, students feel that the Department does a good job of supporting students who join the Pathobiology Specialist program. Only one question received a mean score less than a 3.00 and the rest scored well above a 3.00.

The highest scored question for this category was Question 14 regarding access to academic seminars. Students overwhelmingly agreed that the Department provides them with opportunities to hear about current research happening at the University of Toronto.

The lowest scored question for this category was Question 11 regarding awareness about out-of-province and international extracurricular activities. Students mostly feel that they are not made aware of these opportunities. Although it is not known how many students in the Specialist program are looking for opportunities outside of Toronto and Ontario, if the Department feels that raising awareness of such opportunities is in the best interest of their undergraduate students, this is certainly an area that can be improved in the future.

Table 3: Results of Survey Questions Regarding Student Support

Survey Question	Mean	Variance
10. The Department of Laboratory Medicine and Pathobiology adequately informs you about university-affiliated extracurricular activities.	3.42	1.24
11. The Department of Laboratory Medicine and Pathobiology adequately informs you about out-of-province and international extracurricular opportunities.	2.46	0.91
12. The Department of Laboratory Medicine and Pathobiology adequately provides students access to research opportunities.	3.96	1.04
13. The Department of Laboratory Medicine and Pathobiology adequately provides students access to career networking opportunities.	3.38	0.73
14. The Department of Laboratory Medicine and Pathobiology adequately provides students access to academic seminars.	4.17	0.72
15. The Department of Laboratory Medicine and Pathobiology adequately provides students access to learning about post-undergraduate career options.	3.62	0.48
17. The Department of Laboratory Medicine and Pathobiology provides and/or raises awareness of available resources for student support.	3.42	0.66
Overall	**3.49**	

Comments from students

Responses from students were in text form for the following questions:

- What future course topics would you like to see be integrated into Pathobiology Specialist Program's curricula?
- What changes would you make, if any, to the structure/organization of LMP courses?
- Do you have any additional comments you would like the Department of Laboratory Medicine and Pathobiology to know about the Pathobiology Specialist Program?

In terms of improvements to be made as suggested by the student body, we were able to summarize the responses into three areas: (1) **organization** of LMP courses, (2) **prerequisite** courses for the program, and (3) **examinations**.

1. Improvements in the cohesiveness of lectures within LMP courses, and more effective use of Quercus. The large number of guest lecturers was mentioned to impact the cohesiveness LMP course content.

2. To reduce the number of prerequisite courses, with particular regards to CHM220 and STA220.

3. Marking scheme to be distributed more evenly across a greater number of midterms or assignments. In addition, to make the examinations more representative of what was taught in class, and to have more consistent testing questions across all guest lecturers.

Some of these suggestions may apply more directly to the current LMP curricula and not the updated curricula for the class of 2024.

Methodology

Data was collected through a Typeform survey with 24 total questions. The Typeform survey was distributed to all students in the Pathobiology Specialist program by email with permission of the Department. Subsequently, the published Typeform survey was also announced to students through Facebook Messenger group chats and Facebook page posts for each class (class of 2022 and class of 2023).

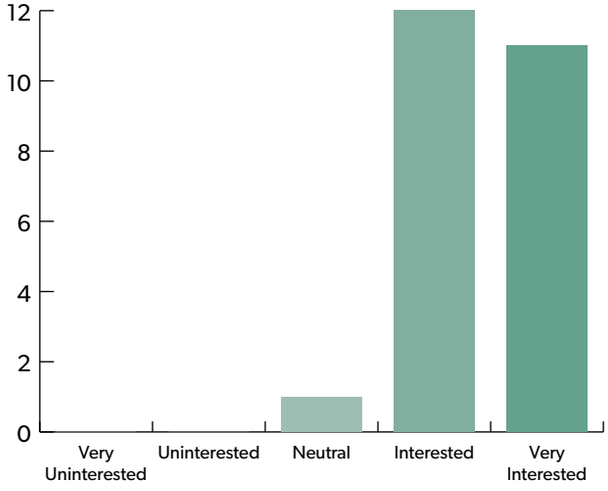
Since many of the survey questions ask students about experiences in courses organized by the Department, only members of the class of 2022 were able to answer. These questions were not required to be answered to turn in survey responses and had less respondents compared to the rest of the survey.

All statistical data and histograms were generated with NumPy (version 1.20.1) and Matplotlib (version 3.3.4) Python libraries using the Spyder IDE (version 4.2.3) running Python 3.9.1.

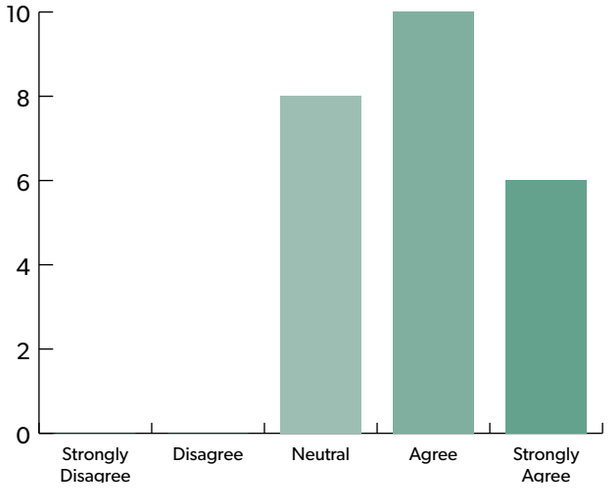
A full list of questions is in Appendix 2.11.1.

Graphs for question results 3–19

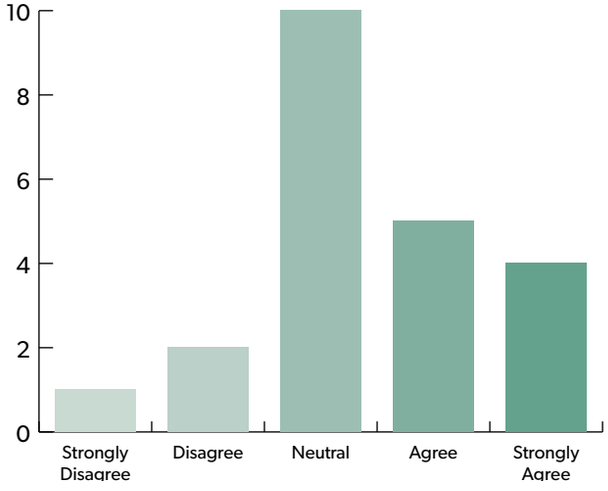
3. I am interested in taking the undergraduate courses offered by the Department of Laboratory Medicine and Pathobiology.



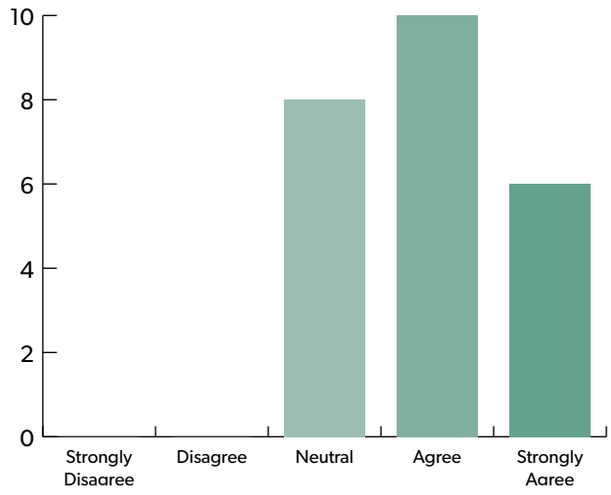
4. Undergraduate courses offered by the Department of Laboratory Medicine and Pathobiology interest you more than the undergraduate courses offered by other life science departments at the University of Toronto.



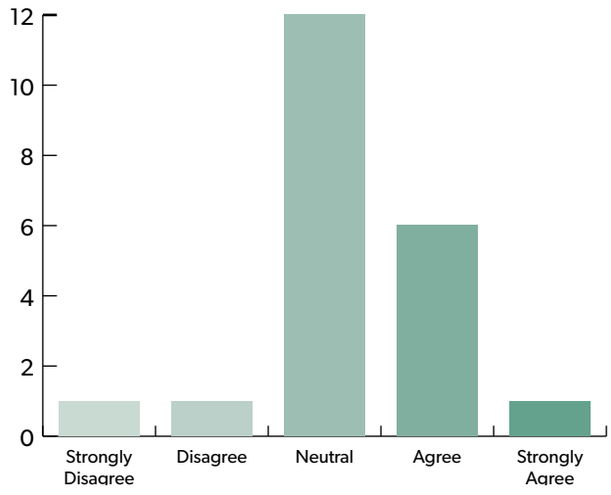
5. Prerequisite courses (first and second year non-LMP courses) mandated by the Pathobiology Specialist Program are a good preparation for the content offered by LMP courses.



6. Undergraduate courses offered by the Department of Laboratory Medicine and Pathobiology are well organized.

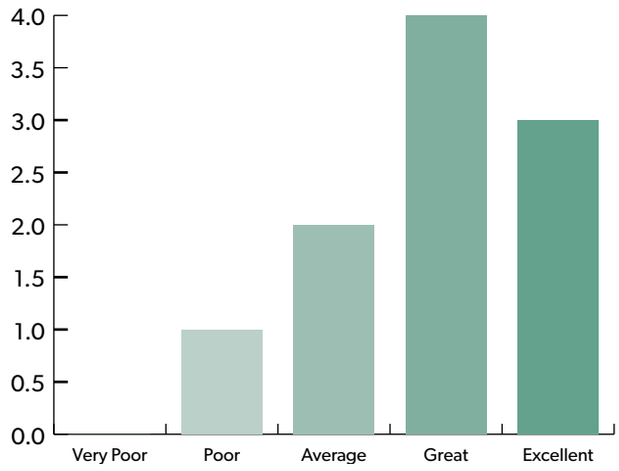


7. You are satisfied by the quality of instruction provided by lecturers from the Department of Laboratory Medicine and Pathobiology.

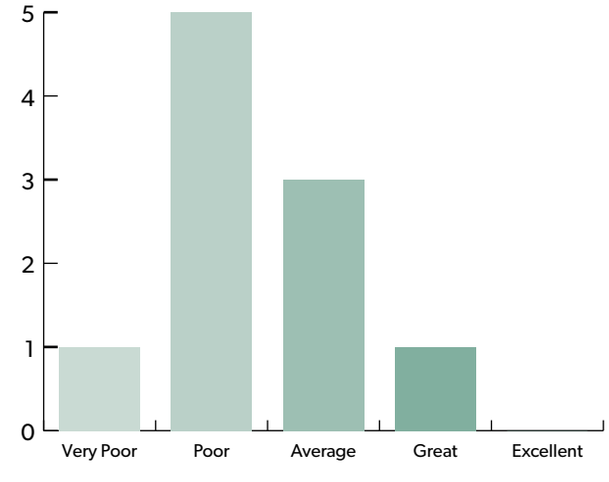


8. How would you rate the quality of the following aspects of LMP courses in your 3rd year in contributing to learning?

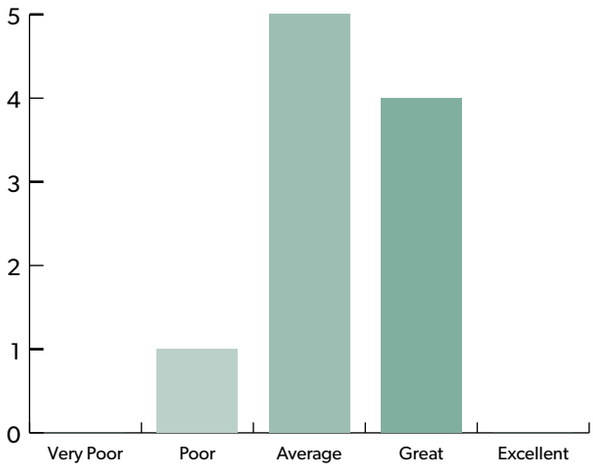
a) Labs



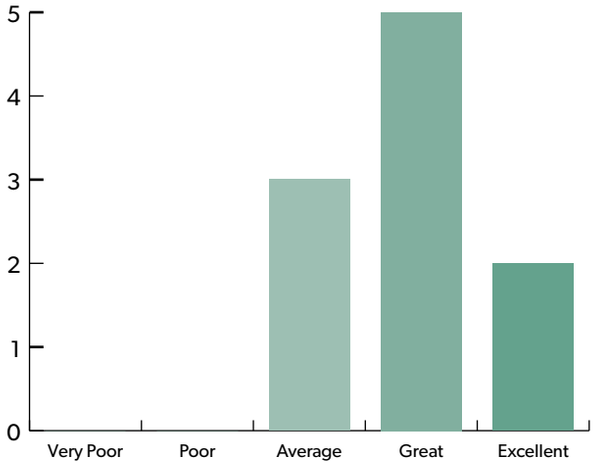
b) Examinations



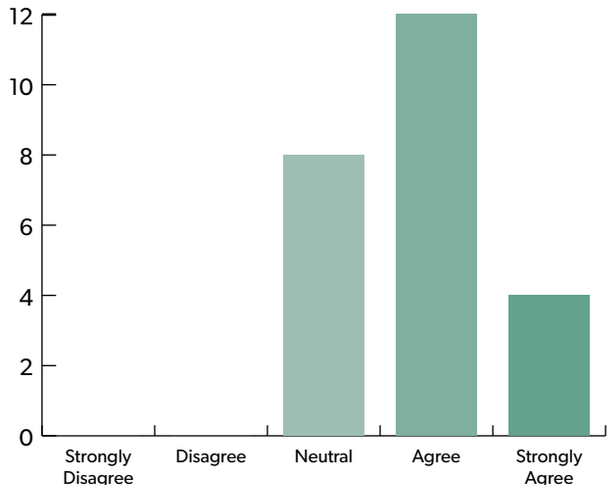
c) Written Assignments



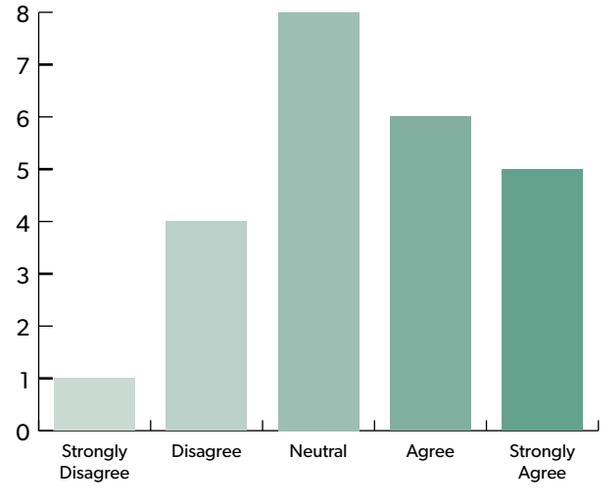
d) Classroom Lectures



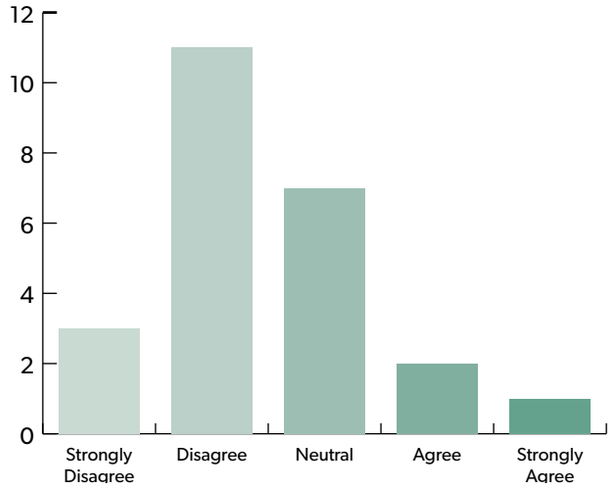
9. You feel that the Pathobiology Specialist Program adequately prepares you for post-undergraduate career options.



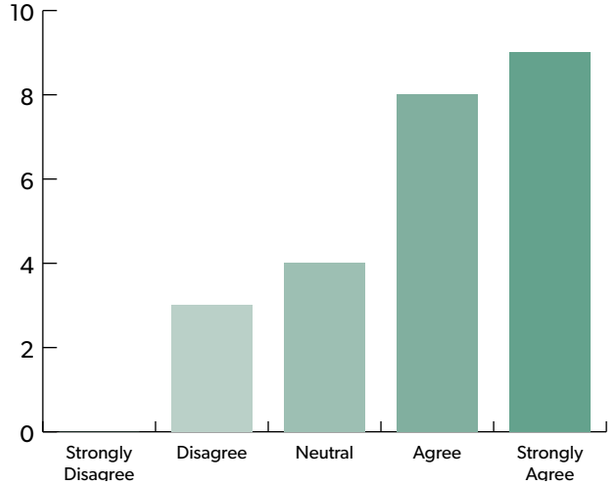
10. The Department of Laboratory Medicine and Pathobiology adequately informs you about university-affiliated extracurricular activities.



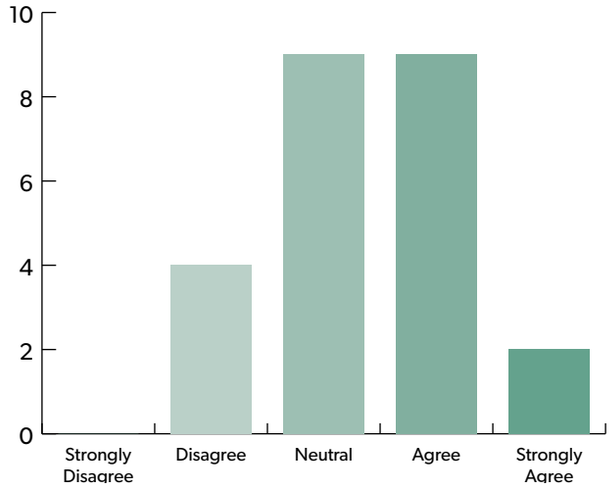
11. The Department of Laboratory Medicine and Pathobiology adequately informs you about out-of-province and international extracurricular opportunities.



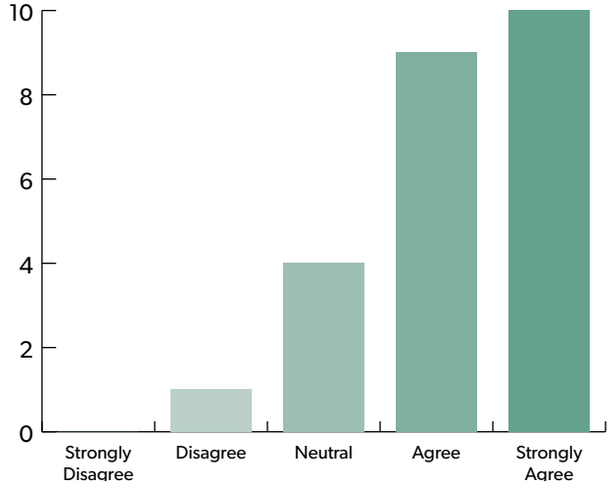
12. The Department of Laboratory Medicine and Pathobiology adequately provides students access to research opportunities.



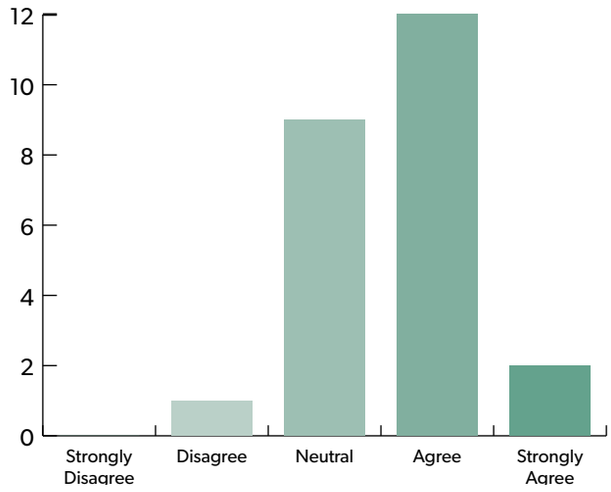
13. The Department of Laboratory Medicine and Pathobiology adequately provides students access to career networking opportunities.



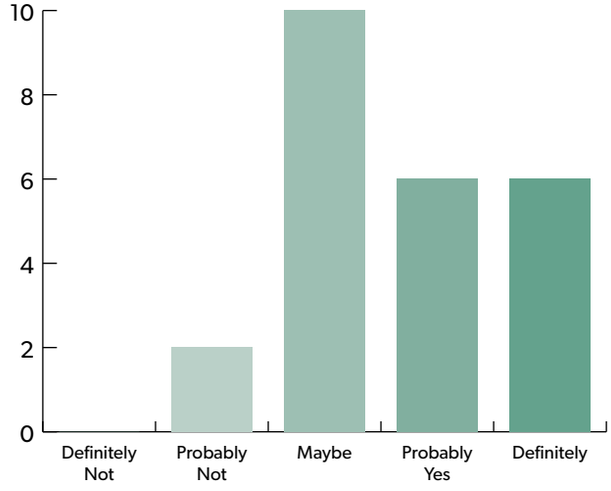
14. The Department of Laboratory Medicine and Pathobiology adequately provides students access to academic seminars.



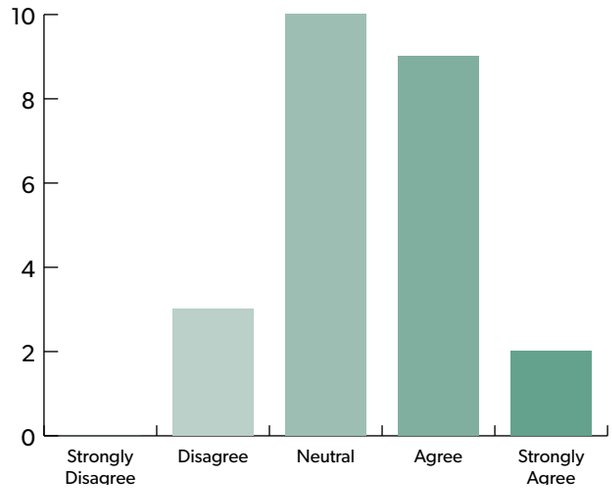
15. The Department of Laboratory Medicine and Pathobiology adequately provides students access to learning about post-undergraduate career options.



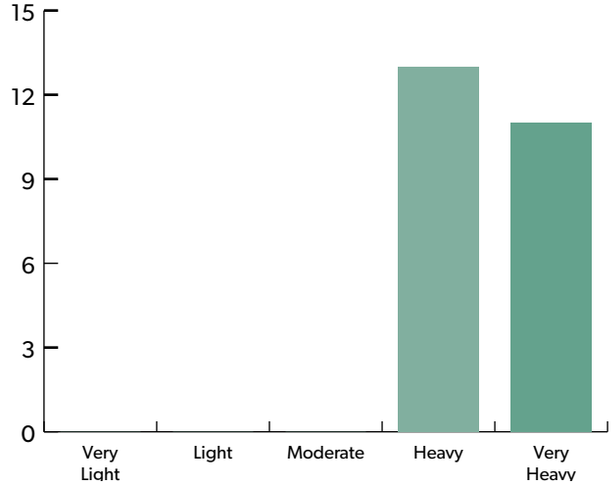
16. Would you recommend the Pathobiology Specialist Program to incoming students at the University of Toronto?



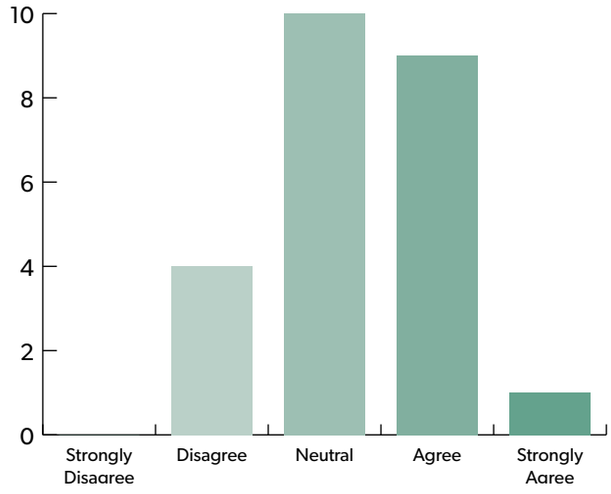
17. The Department of Laboratory Medicine and Pathobiology provides and/or raises awareness of available resources for student support.



18. How would you rate the workload within the Pathobiology Specialist Program?



19. Are you able to find a consistent balance between work and life outside of work?



Graduate Learners' Report

Conducted by Confederation of Laboratory Medicine and Pathobiology Students (CLAMPS), they provide a report on on student opinions across our graduate programs.

We are exuberant to have the opportunity to illuminate the perspectives of graduate students in the Department of Laboratory Medicine and Pathobiology (LMP). Seven graduate students serving as representatives of the LMP graduate student association CLAMPS prepared this report on behalf of the graduate students of LMP. A number of surveys, post-event feedback forms, and a town hall event was used to gauge the perspectives of the LMP students on various matters pertaining to departmental activities/ initiatives. The average response/attendance rate of the aforementioned surveys/events were ~30 students. Of note, the responses to the surveys were often anonymous as to ensure the authenticity of the responses given.

Graduate students overwhelmingly indicate that their academic experience within LMP either meets or exceeds expectation (<75%). Positive aspects outlined by the students include:

1. The diverse opportunities with regards to research discipline, and collaboration.
2. The friendly, supportive, and actively engaged administrators, chair and department coordinators.
3. The approachable nature of faculty members, and their willingness to help students.
4. The myriad of scholarship opportunities and the frequent reminders of such opportunities.
5. The autonomy of choosing class schedules to fit around research, specifically LMP1404.

The department offers many opportunities for students to develop professional skills through additional courses, workshops, and seminars. This is held in high regard by the students, who are very receptive to the idea of building professional skills throughout their graduate studies. Specifically, the students strongly indicated the positive impact of the LMP1005 course on their academic experience. Students highlighted the positive impact of the course because of its practical pedagogy and curriculum. Students specifically mentioned the scholarship writing skills, presentation skills, and networking skills as the most impact aspects of the course.

The faculty seminars have been well received by the students of LMP. The students believe that the diverse research, esteemed professionals, and welcoming nature of the seminars leads to constructive dialog and benefits their overall academic experience. Furthermore, the students have taken a keen interest in the more "non-traditional" seminars that focus on student life, skill development, advocacy, and other topics. The mix of these seminar topics has been well received and offers the students an interesting amalgamation of empirical research, life skills, and profession skills. The students have indicated that they would be interested in more seminars focusing on life after graduate school with speakers reflecting on their journeys and providing insights on their success. Almost half of the graduate student body (~48%) reported that the department should focus more on providing opportunities to enhance graduate students' professional development. The desire for a more career-oriented curriculum is highly favored by the students as many express concerns about future career prospects. This can be achieved by giving graduate students options to rotate/do internships in the field of their interest and holding seminars that explain various lab techniques such as flow-cytometry, ELISA, western blotting, RT-PCR, cell culture, genome sequencing data analysis tutorials, etcetera. Some other suggestions for a more career focused curriculum also include integrating structured internship or placement programs for graduate students.

Augmented programs focused on career counselling/ workshops, job fairs, and offering a professional development course at the graduate level.

Students within LMP have expressed some concerns with the LMP1404 course. While students appreciate the addition of grant writing within the course curriculum, students feel like the article assignments do little to help them with their academic development as they are often not related to their research and take away from their time in the lab. Students do appreciate the need to be exposed to diverse fields of research to gain a holistic view of research methodology, however, they have proposed offering courses that are more research-stream specific. Ideally, offering variations of LMP 1404 for the 5 different research streams of LMP.

The town hall events hosted by the department in conjunction with the CLAMPS provide students with an opportunity to speak with department administrators and coordinators. This direct interaction between students and the department is critical for the continued development of the department, and the student body celebrates the department's efforts in providing such opportunities. The conversations facilitated at the town hall events have led to meaningful changes to help the student access resources offered by the university/ department and updates to online interfaces.

According to many students, student-supervisor interactions have drastically decreased as a result of COVID-19. Though many students report having an overall positive experience with their supervisor, some recommend that there be more active involvement from the department to encourage supervisors to establish regular meeting times with all of their students. Whether this be regular online meetings, or informal check-ins, student-supervisor interactions are an important aspect of the graduate student experience. Furthermore, ~39% of student respondents indicated that they had either a somewhat difficult or a difficult time finding a supervisor, with 0% of respondents indicating that finding a supervisor was easy. These results suggest that further investigations on how to improve the process of finding a supervisor would be highly supported by the students. Specific solutions worth investigating could include reaching out to faculty members once initial acceptances are given to students so an updated list of supervisors who are seeking students could be circulated. This could potentially attenuate the nebulous situation many incoming students face with regards to navigating the LMP website supervisory directory tool only to find out that many of the supervisors on the directory are not currently looking for students (although they are indicated as "accepting students"). The students also understand that the issue stems in large part from faculty members not actively engaging with the supervisory directory tool, and so the department's influence may be limited.

There is no doubt that the students of LMP struggled during COVID. Particularly with developing a sense of student community. However, many students indicated that the implementation of regular virtual events helped to provide a sense of community and bring the department closer together during the restrictive milieu of COVID-19. The students appreciate the ample opportunity to get involved with the community, and to network within the department. The students believe that the department should continue to work with student groups to foster activities that focus on social connection, mental health and wellness, recreation, and community outreach.

There has been a growing demand for formal mentorship within the department of LMP. The creation of the LMP Alumni-Mentorship and Peer-2-Peer mentorship programs have been widely supported by the students. In early 2021, LMP launched the pilot program for these mentorship programs on the Temerty Medicine Connect (TMC) platform. TMC is an online platform that is specifically designed to facilitate community mentorship by showcasing and connecting individuals within the department. The strategy implemented for establishing mentorship relationships within the program involved a mentee-driven approach, where mentees are the driving force of their own mentoring relationships. Students have consistently demonstrated a desire for such programs to exist. To date, 130 members of the LMP community

have signed up for the TMC platform. Although the program is in its nascent stage, the launch event and networking events hosted for the program have garnered much positive feedback. The department has also played a key role in developing a formalized mentorship council in coordination with student leaders named the LMP Mentorship Council to manage and develop the mentorship programs within LMP. The LMP Mentorship Council has worked diligently to foster and develop the programs and are currently working towards being able to provide Co-Curricular Record (CCR) accreditation for the members of the Mentorship program (Mentors/Mentees). The students overwhelmingly support the department's efforts to develop such programs further.

Although there has been much excitement generated with the launch of the mentorship programs, some students on the platform have communicated the need for more active involvement on the platform. Some students have requested more explicit and regular direction with regards to how to start a mentoring relationship, setting up a detailed profile to facilitate matching, goal setting, and establishing a strategic plan to achieve goals. Regular communication and promotion would help to address these concerns. Specifically, the need for mentors/mentees to have well developed profiles on the platform seems to be paramount for members to be able to identify potential matches that would be of most benefit to them. Hosting semi-regular networking events and workshops where participants can learn about effective mentorship and meet people with the program has high support amongst the students. Other concerns involve the ostensibly disproportionate balance of mentors-to-mentees on the platform. The TMC platform only seems to show people who are willing to mentor, and not people looking for mentorship, this could be an area of improvement to provide clarity to the students within the program. Lastly, some students have demonstrated success in starting a mentoring relationship, however, given the nature of the program (mentee driven), the ability of the LMP Mentorship Council to gauge the number of relationships is limited. As such, the LMP Mentorship program could also consider a new approach of matching mentors and mentees to obtain a more concrete prospective on the impact of the programs. Furthermore, matching students directly has the potential to increase the active participation of the members who currently have not found a mentoring relationship.

The department's promotion of research conference grants has been of great benefit to the graduate students of LMP. These symbolize the department's commitment to exposing its students to rich academic environments. There is a strong consensus that attending research conferences lead to a robust learning experience within LMP. This year the department worked with student leaders to host a virtual research conference for the students, which received plaudits from a vast majority of attendees. This was unprecedented in the history of the department and is a testament to the innovation and adaptability of the departmental leaders. The LMP Research Conference had >400 registered attendees throughout the event, with >75% of respondents indicating that they had an excellent or good experience at the conference. Furthermore, the seminar speakers were highly regarded and offered insights on pressing research topics which the vast majority of students highly enjoyed. The department's unwavering support of such activities is highly encouraged by the student body, which looks forward to future LMP Research conferences.

Course coordinators, administrators, and the chair demonstrate an unwavering commitment to the student experience at LMP. The students applaud the efforts of the chair, coordinators and administrators in creating an inclusive, diverse, and academically challenging environment. The approachability of the departmental leaders is cherished by the students. The continued effort to improve through self-reflection and student involvement has evidently resulted in a more holistic learning experience for the students of LMP.

Clinical Trainees' Report

Anatomical Pathology

Compiled by Dr. Ariel Gershon PGY-3

At the end of the residency program, residents generally feel well prepared to enter into fellowships or jobs.

Below are specific strengths and weakness for various aspects of the program. These were collected through contacting all trainees in anatomical pathology. Data was collected using structured qualitative (ex: surveys) and personal conversations.

Training sites

Strengths:

- A relatively high number of training sites, each with unique areas of expertise.
- Excellent exposure to subspecialty practice.
- Many staff pathologists are elites in their subspecialty.
- The support provided by the admin staff maximizes the learning experience.
- A "home site" is nice for a consistent place of learning.
- Many residents feel well prepared to enter fellowship.
- Digital rounds have allowed for city-wide educational unknowns to be highly accessible.

Areas for improvement:

- There is very little exposure to "general sign out", since the vast majority of the training is subspecialized.
- Multiple hospitals often mean many on-boarding for each site, each with different logins, modules, administrative work etc. Having home sites (a strength above) does help greatly with this.
- Some have felt underprepared for fellowship and job search, especially earlier in the training program.

Voice of a Fellow: Cytopathology

"During my time in the cytopathology program, the AFC faculty was constantly seeking my feedback and was very responsive to it. For instance, during the COVID-19 pandemic, the volume of fine needle aspiration clinic patients was low and in order to supplement my experience, they offered me to attend clinics whenever I am available regardless of the scheduling.

If certain topics were not covered in the current didactic session schedule, the faculty were very eager to fill in the gaps. The graduated responsibility structure in the program was invaluable in my development of diagnostic confidence and transition to junior staff. At the beginning of the fellowship, I would require assistance in many cases and suggestions on diagnostic work-up to eventually, I was signing out independently, and seeking faculty assistance as I see fit.

The program has exposed me to the different aspects of a cytopathology's job description including lab management training (e.g., problematic specimens, contamination, etc.), quality assurance activities, [and made] me feel confident and capable to handle the workload and varying complexity of cases that a subspecialist in cytopathology would face.

The program has also exposed me to teaching of and mentorship of Anatomical Pathology residents by giving a didactic session on quality assurance in cytology, as well as preparing and giving unknown sessions and providing career planning advice at the request of residents. I felt that I was an integral part of the program and that my voice was heard. I would recommend this program to others."

Quality of materials

Strengths:

- Excellent digital library (LMP DLM) with an extensive collection of pathology.
- University of Toronto's library access gives excellent access to peer reviewed journals and many core pathology textbooks.
- Academic half day is high quality.
- The local pathology library is usually high quality at most sites, stocked by generous donation from the local staff pathologists.
- Generous annual reimbursement for tuition and others.
- A "tech kit" including a digital microscope, a webcam and headphones was distributed to all residents and was instrumental in allowing all to access digital rounds.

Areas for improvement:

- Integrate DLM into more learning activities.
- The DLM annotation is variable, and harder to navigate for complete beginners in pathology (there is no arrow pointing to histologic findings, or inconsistent microscopic description)
- There is no access through the library to some critically important pathology textbooks (in particular, the WHO blue book series). Many pathology residents pay out of pocket to access these books, although some sites do have some WHO books kindly donated by staff.

Research

Strengths:

- Highly encouraged throughout the program.
- Many opportunities for clinical, translational and basic science research through the university.
- Support and encouragement exists for residents pursuing the clinician-investigator stream.
- Financial support to attend national and international conferences, depending on clinical site.
- The LMP Residents and Fellows Research Day is an annual event where trainees may present their research project with their peers.

Areas for improvement:

- There is a perceived paucity of time for research, with most conducting it after hours on top of clinical work

Forensic Pathology

Compiled by Maliha Khara

The Forensic Pathology Fellowship (PGY-6) training program provides world-class education to prepare physicians for independent medicolegal autopsy practice. The success of this program is multifactorial and involves an excellent balance of depth and breadth of cases seen, scholarly training, and support of faculty staff.

Strengths:

- Clinical exposure: There is an enormous variety of medicolegal cases available at the training site. As the central location for the whole province of Ontario, this program is well equipped to offer unique and challenging cases as well as "bread and butter" cases. This allows for a balanced yet engaging training experience where the graduates feel adequately prepared for independent practice.
- Education and curriculum: The forensic pathology program ensures that resident teaching and education is a priority. All faculty and staff educators have a vested interest in trainee success. Informal and formal teaching is provided with opportunity to provide feedback after each session. Formal education takes place through Academic Half days, morning "body" rounds and technical postmortem suite teaching. The curriculum is set by the Residency Training committee that ensures that Royal College training objectives are met.
- Leadership: The current Program Director, Dr. J. Herath, has been an incredible leader for the program. He pioneered the competency-based curriculum for forensic pathology training in Canada. He is approachable, diligent and an excellent resident advocate.

- Facilities: The Centre for Forensic Science is a new, state of the art, and one-of-a-kind facilities in Canada that provides medicolegal autopsy services to the entire province of Ontario.
- Research and Academic Training: The state-of-the-art Centre for Forensic Science has many opportunities for research in any field of forensic science or public health, through the Office of the Chief Coroner. There are experts and mentors in every academic field available. The recent appointment of a new research director, Dr. C. Ball, has accelerated the process of research networking.

Areas for improvement:

- The current major challenge of the program is an incredible increase in the average workload. Predictably, the increase in workload could lead to decreased time that staff may have for teaching and may lead to an increased service to education ratio for the trainees. This may eventually dilute the trainee experience as there will be less time to discuss the difficult cases or read around them.
- This potential issue is being actively monitored by the Program Director and residency training committee to ensure that trainee education is always prioritized. To date, the mitigating measures put in place have been extremely effective.

Clinical Chemistry

Compiled by Jessica Miller and Ashley Di Meo

At the end of the training program, fellows generally feel well prepared to enter into jobs.

Below are specific strengths and weakness for various aspects of the program.

Training sites

Strengths:

- A relatively high number of training sites, each with unique areas of expertise such as pediatrics at the Hospital for Sick Children
- Various teaching styles that prepare fellows for both written and oral exams
- Many faculty are world-known in their field
- The adequate support provided by the medical laboratory technologists and the administrative staff maximizes the learning experience

Areas for improvement:

- None

Quality of material

Strengths:

- The program offers excellent and diverse variety of material that covers various aspects of clinical biochemistry from the common to the extremely rare entities in appropriate volume

Areas for improvement:

- None

Teaching

Strengths:

- Excellent formal and non-formal teaching
- Formal teaching
  - » Fellows take a number of courses including 'LMP 1505H: Analytical Clinical Biochemistry', 'Introduction to Medicine' (Med100H, Med120H, Med130H), and 'LMP2004H: Introduction to Biostatistics'
  - » Weekly teaching sessions including 3-hour didactic lectures, designed to cover the majority of fields of clinical biochemistry

- Informal teaching
  - » Continuous daily teaching with high fellow to clinical biochemist ratio (range 1:1 to 2:1)
  - » Continuous feedback including formal verbal and online evaluation in a timely and thorough fashion
  - » A variety of specialty and non-specialty rounds, different at different sites
  - » Continuous evaluation and feedback: all fellows have to participate in a biannual committee meeting to monitor their progress

Areas for improvement:

- None

Research

Strengths:

- Highly encouraged throughout the program
- Abundant opportunities for clinical, translational and basic science research in various sites
- Support to attend national and international conferences

Areas for improvement:

- The fellows felt that the number of research projects assigned in the first six months of the program were high. The first six months should focus on learning the core topics of the CACB syllabus. We suggest a maximum of two projects.

Program structure

Strengths:

- The program is well-structured to adapt fellows of various interests while ensuring competency in all aspects
- Ample elective time
- The number of hospitals the fellows are able to rotate through, an aspect that is unique to the University of Toronto program.

Areas for improvement:

- None

Medical and Clinical Microbiology

Compiled by Jennifer Tat (PGY-4 and Chief Resident) and Shawn Clark (Senior CM trainee)

The Medical Microbiology (MM) and Clinical Microbiology (CM) training programs support a total of 6-8 trainees.

Below are specific strengths and weaknesses for various aspects of the program. These were collected by directly contacting trainees in the program either via email or in person.

Training sites

Strengths:

- Rotations in multiple training sites, each with unique areas of expertise.
- Various practice styles preparing residents for both general practice and sub-specialized mode of practice
- Many internationally recognized microbiology staff

Areas for improvement:

- There is adequate office space and equipment for trainees, though it is often shared with other disciplines at most sites. This can make it difficult to have direct computer and telephone access for those who are on-call to the laboratory depending on the number of spaces available. Shared space is important for fostering interdisciplinary interactions and collaborations but can sometimes be crowded and/or noisy. Dedicated laboratory space for residents to perform lab-based work or research is not readily available at all sites.

- Availability of microscopes dedicated for resident use is limited at certain sites.
- The support provided by the medical laboratory technologists and assistants and the administrative staff improves the overall learning experience. At times, communication from the program to trainees can be sparse or missed. This has been improved since the creation of program handbooks, rotation goals and objectives, trainee orientation (Micro bootcamp) and access to other resources on Quercus.

Pathology residents step out from behind the microscope to help COVID patients.
During the third wave of the COVID-19 pandemic in Ontario, several pathology residents were redeployed to help frontline workers as part of their rotations. This experience proved to be eye-opening and rewarding, not just for them, but for the clinical teams they worked with.

"Seeing [diseases] from the patient's perspective gave me a new depth of understanding of these disease processes since I could see how the conditions are managed and the impact they have on the patient's life. I think this will help make me a better Pathologist", said **Susan Armstrong**.

Quality of material

Strengths:

- The program offers an excellent and diverse variety of material that covers various aspects of microbiology from common to extremely rare infections, from fundamental laboratory testing to more esoteric and specialized testing, from smaller labs to reference labs.

Areas for improvement:

- Trainees reported some challenges with accessing essential textbooks, guidelines and documents and this was communicated to the resident training committee (RTC). Earlier this academic year, we were able to access several of these resources through the University of Toronto library's purchase of a subscription to the online resource ClinMicroNow via the University of Toronto library website.

Education

Strengths:

- Excellent formal and informal education. Opportunities to learn and teach vary by training site.
- Weekly dedicated formal learning: Academic Half-Day (AHD) (Wednesday afternoons, consisting of 2-4 hours of teaching by staff, 1 hour of resident-led peer teaching), small group or one-on-one sessions with microbiology staff (Question of the Week, site-dependent, 1 hour), microbiology bootcamp for first-year trainees (Wednesdays, 2-3 hours per week in summer AHD time slot, resident-led)
- Informal learning: One-on-one, ad-hoc learning with microbiology staff while on-call.
- Educational rounds: Microbiology plate rounds (weekly, 1 hour), City-wide Infectious Diseases/Microbiology rounds, case rounds (weekly, 1 hour), Jay Keystone Tropical Disease rounds (weekly, 1 hour).
- Annual educational retreat: National Infectious Diseases and Microbiology Resident Retreat: trainees develop and host a week-long conference every August, with a dedicated two days for microbiology topics during 2020 and 2021.

Areas for improvement:

- Shared academic half day (AHD) occurs with the Infectious diseases (ID) trainees. While this permits sharpening of clinical acumen and more interaction with ID colleagues, the majority of AHD features ID-specific topics over microbiology. It would be particularly valuable for MM PGY-1–2 who may have less lab experience and would benefit from developing foundational knowledge prior to the PGY-3–4 years of the program. The RTC is aware of trainee requests to be more involved in AHD curriculum planning and in having more microbiology topics included in the curriculum.

- Trainees have advocated for weekly dedicated time for microbiology-focused seminars as a 1 hour extension of AHD, to which the RTC has granted their support. During the 2020-2021 year, these virtual sessions have primarily been trainee-led, occasionally with a few staff-led sessions. The topics have ranged from didactic to lab management to more case-based knowledge sharing.
- Trainees have requested more staff-led or staff-facilitated education sessions either in small groups or one-on-one formal or informal sessions. This may be logistically challenging and may have to be carried out specifically at each site or integrated into the joint AHD curriculum.

Research

Strengths:

- Research is highly encouraged throughout the program but especially during microbiology lab rotations with many opportunities for clinical, translational and quality improvement research in various sites.
- Trainees are required to participate in a group quality improvement project in collaboration with the infectious diseases fellows. To help Microbiology trainees lead, develop and implement their own quality improvement project, plan is to have a dedicated microbiology project from this year.
- Trainees are encouraged to attend national and international conferences
- Annual research review meeting with staff to document and advise regarding research activities.
- The LMP Research Conference: continues to be an annual event where trainees present their research.

Areas for improvement:

- Medical Microbiology trainees are less aware of research opportunities, particularly during off-service years (PGY-1–2). RTC have moved the annual research review meeting from the end to the beginning of the academic year to help highlight opportunities of research activities for new trainees.
- Trainees have expressed concern over the expectation to lead research projects at each training site. As a result, trainees may carry multiple projects over the course of the program. This can be overwhelming and time-consuming. Clinical Microbiology trainees have expressed that they feel it often comes at the expense of their clinical training. Perhaps it would be more practical to have trainees collaborate on projects together to produce data that can be published.

Program structure

Strengths:

- Structured to adapt to residents of varied training backgrounds, permissive to self-direction and pursuit of specific research interests while ensuring well-rounded competency. Trainees have allocated elective time and may seek opportunities for education abroad, in requesting dedicated time for research (e.g. research block) or clinics (e.g. one day a week tropical medicine clinic), on a case-by-case basis.
- Innovation, efficiency, stewardship, adaptability – trainees are involved in implementation of quality initiatives to improve and refine lab operations and in developing/implementing more specialized testing modalities. During the COVID-19 pandemic trainees were involved in the complex processes of implementing new institutional, local and regional policies, validating new tests and equipment, allocation of physical and human resources.
- Interpersonal relations: the program director, educational site leads, microbiology staff, lab and administrative staff are very approachable, knowledgeable and supportive. The RTC is composed of trainee representatives (chief resident, senior clinical microbiology trainee, junior MM representative) as well as staff representatives from all training sites and the RTC responds promptly to trainee suggestions and concerns.
- Wellness: the LMP department has a Wellness, Inclusion, Diversity and Equity Committee – whose periodic emails were well-received by staff and trainees. Recently, each department within LMP has designated a wellness coordinator and there is also a new resident wellness committee. The RTC and program director have been very supportive regarding trainee-led initiatives for wellness activities. Microbiology trainees have adopted an annual wellness day as part of the ID/Microbiology Resident Retreat to welcome new trainees and continue to foster a positive community dynamic amongst trainees.
- Workload and call duties: during microbiology rotations, trainees are on first call with microbiology staff as second call from Monday to Friday from 8 a.m. to 5 p.m. These calls are carried out in a manner of graduated responsibility and provide practical exposure to a range of difficult problems. The weekday-only scheduling of calls also fosters optimal work-life-study balance.

Areas for improvement:

- MM trainees have continually expressed a desire to introduce lab blocks into their PGY-1–2 years in exchange for ID blocks when they are senior trainees (PGY-3–4). In addition to providing a foundation to the specialty, it would help to have practical experience to disseminate to other specialties while off-service, to optimize other services' interactions with the microbiology lab, and to maintain clinical acumen as a senior trainee. Conversely, CM trainees have continually requested to have more clinical exposure during their rotations. RTC is aware of both but has had logistical challenges in granting these requests and thus far, requests have been made on a case-by-case basis.
- Rotations are typically designed so there is one trainee per site per six month rotation. This can be quite isolating for both MM and CM at any level of training – this was exacerbated during the pandemic. Trainees requested to be placed together (e.g. senior and junior trainee) when possible to maximize peer learning. The RTC was made aware of this request and will try to accommodate when possible. In addition, having peer education seminars and taking part in wellness and social activities have helped to establish a sense of community and well-being.

Hematological Pathology

Compiled by Sakara Hutspardol (2017–2021)

Training sites

University Health Network

- Strength: variety and complexity of cases, hands on experience
- Areas for improvement: workload can be too overwhelming, may not need to see every repetitive cases

St. Michael's Hospital

- Strength: rare bleeding disorders and advanced coagulation testing that only available there, opportunity to see real cases and managing difficult cases
- Areas for improvement: resident room is too crowded, no printer or scanner

Sunnybrook Hospital

- Strength: fresh cases with new diagnosis, young staffs that teach other aspects of being hematopathologist
- Areas for improvement: location and traffic

Hospital for Sick Children

- Strength: exclusive pediatric exposure
- Areas for improvement: no Kaluza software to practice flow cytometry analysis which is important for pediatric leukemia

Trillium Health Partners

- Strength: learning practical approach from general and anatomical pathologist, great microscope and seating area, well equipped with flow cytometry software, cheap parking
- Areas for improvement: none

12 Mentoring

We believe mentoring is a vital tool for professional, personal and academic development for all our people: across all our programs, for faculty and for staff.

In addition to the many formal and informal mentoring programs across the university, we have many opportunities within our department for mentoring. Not only is there a mixture of formal and informal programs within LMP, the small cohort sizes in programs such as the Undergraduate Specialist Program in Pathobiology, and the MHSc in Laboratory Medicine and Translational Research by nature encourage peer and faculty-student mentoring as part of the learning experience and are built into the programs.

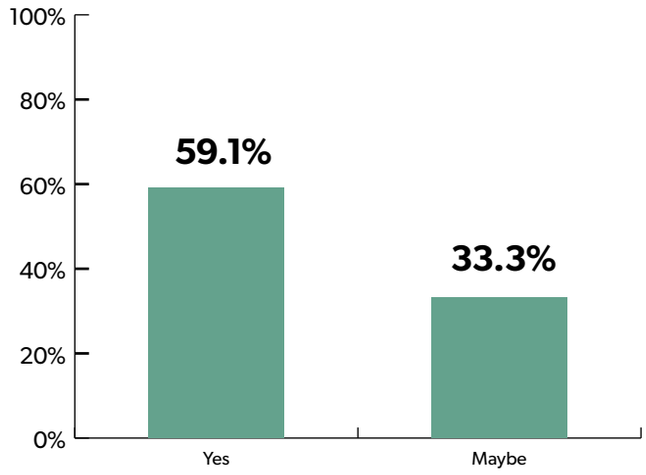
The passion our people have for mentoring is also reflected in many mentoring in external programs within their communities in their spare time.

On page 114 is an indication of some of the varied mentoring opportunities across our department.

Faculty Mentorship Program

In the fall 2016, Dr. Avrum Gotlieb, who was LMP's Interim Department Chair at that time, formed an Ad Hoc Mentorship Committee led by Dr. Susan Richardson to look at establishing a formal faculty mentorship program in the department. A survey conducted in December 2016 indicated that faculty strongly supported a mentorship program. Based on the survey response and review of other faculty mentorship programs in Temerty Medicine, the Ad Hoc Committee made several recommendations to the Chair. These were brought forward to Dr. Cathy Streutker and we launched the formal LMP Faculty Mentorship Program in May 2018.

Faculty support for a mentorship program



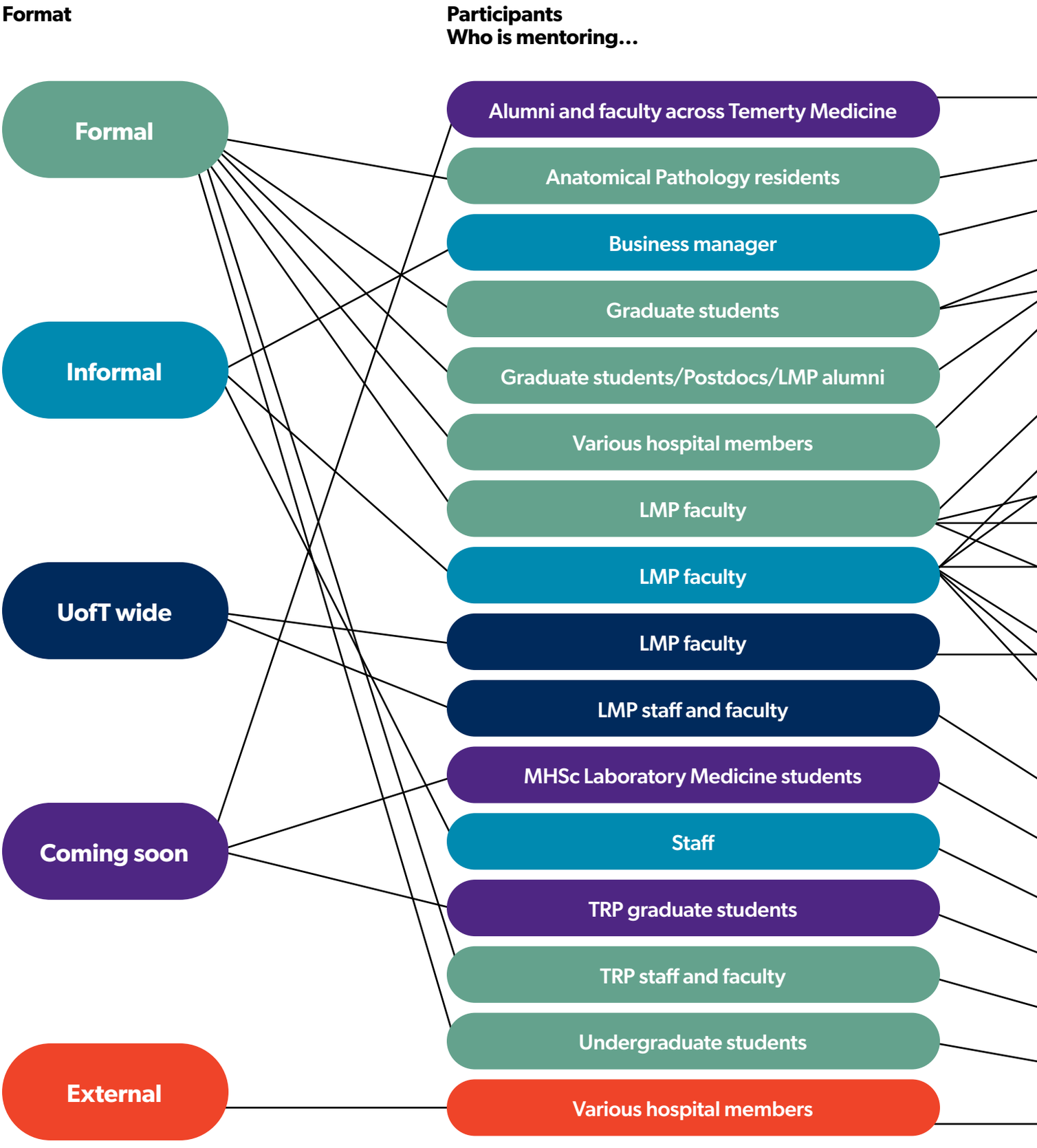
Program goals

1. To provide a welcoming atmosphere for new faculty by
   - » assisting faculty members with career planning and advancement
   - » increasing awareness and knowledge about opportunities in teaching, research and creative professional activity
2. To enhance academic productivity, career satisfaction and retention of faculty
3. To provide an introduction to LMP, Temerty Medicine and the University of Toronto.

Program highlights

- Currently, the program is mandatory for all Clinical (MD) Full-Time, Status-Only and Status-Only (PhD Researchers) at fully-affiliated hospitals at the rank of Lecturer and Assistant Professor.
- Mentee and mentors input into the matching process.
- The mentor-mentee relationship is a no-fault relationship and can be terminated at any time by either party without any repercussion to either party.
- The formal relationship ends after the completion of the Continuing Appointment Review (three years). Continuation of the mentor-mentee relationship beyond the three-year term is not mandatory.
- An LMP Outstanding Mentor Award was established to recognize a mentor who has demonstrated excellence in mentorship. To date, the committee has awarded two mentors awards:
  - » Dr. Myron Cybulsky, Clinical (MD) Full-Time/ Professor was awarded the first mentor award in 2019. He was praised for being an excellent mentor to Dr. Sonya MacParland, PhD Researcher, as he helped her transition from postdoctoral fellow to a Principal Investigator at an academic centre.
  - » Dr. Yulia Lin, Clinical (MD) Full-Time/ Associate Professor was selected in 2020 for her unfaltering commitment to mentorship as she took on the challenge of mentoring a colleague outside her specialty, Rosemarie Tremblay-LeMay, Clinical (MD) Full-Time.

Formal and informal mentoring programs in LMP



....who	Name/details
TRP graduate students	Multi-purpose and multi-disciplinary mentoring for TRP students
Anatomical Pathology residents	Upper-year residents mentoring lower-year residents
Admin staff	Business manager Nelson Cabral mentors individuals on the team
Graduate students	Upper-year students mentoring lower-year students
High school students	Graduate students connect with high schools through their REACH program
Anatomical Pathology residents	Just launching the Peer Communications Team to coach research presentation skills
Forensic Pathology and Neuropathology residents	Graduate students connect with our alumni
Graduate students	1st years are assigned a mentor and I becomes more informal later in the program
Hematological Pathology residents	No formal mentoring, but the program is very small so mentoring is part of learning
LMP faculty	Supervisors provide mentoring opportunities outwith their official role
LMP faculty	1st years must choose a mentor
Medical Microbiology residents	Faculty Mentorship Program for new faculty
Other faculty across UofT	Faculty mentor each other in different capacities
Undergraduate students	Residents request a mentor if they want one
Undergraduate summer students	Our people take part in the Office of Inclusion and Diversity 'Diversity Mentorship Program'
Undergraduate summer students on black/indigenous program	Coffee with Jeff and Karim' open mentoring sessions with the course co-ordinators
Summer students	Jeff Lee mentors summer students into further study/research
MHSc Laboratory Medicine students	Paul Hamel mentors summer students into further study/research
Graduate students	Our people volunteer for a broader summer student mentoring program
TRP graduate students	Upper-year students mentoring lower-year students
TRP graduate students	Virtual office hours for support on any topic
Undergraduate students	TRP team meets each student to provide personal, professional and academic mentorship
LMP faculty	Upper-year students mentoring lower-year students
	Various hospital sites run their own programs which benefit our people

Learning from each other: how mentoring is a two-way street for personal and professional development

Dr. Yulia Lin, Division Head of Transfusion Medicine & Tissue Bank at Sunnybrook Health Sciences Centre and Associate Professor in LMP mentors Assistant Professor and Hematological Pathologist, **Dr. Rosemarie Tremblay-LeMay**.

"Rosemarie was very interested in developing her leadership skills and taking courses which is something I definitely didn't do early in my career," comments Dr. Lin, "I was very impressed with that and it inspired me to look at my leadership skills. I ended up taking courses from the CMA Physician Leadership Institute on her recommendation."

Being in different branches of laboratory medicine proved to be a major advantage. "Being a hematologist, I could understand a lot of the context in which Rosemarie was working, but having that distance in terms of our day-to-day jobs was actually a great advantage," says Dr. Lin, "It meant we didn't get bogged down in details and looked at topics and situations more broadly that would help her career path."

Dr. Lin was awarded the LMP Outstanding Mentor Award in 2020.

Read the full story on our website.

LMP Faculty Mentorship Pairing by appointment type

	Mentee – completed formal program	Mentee – paired	Mentee who left hospital/ org prior to 3 year review
Tenure stream		1	
Part-time academic		1	1
Clinical (MD) full time appt	7	33	1
Clinical (MD) part time appt		1	1
PhD researcher		6	
Status only	2	18	2
Grand total	**9**	**57**	**5**

Mentor/mentee support

The LMP Mentorship Committee has partnered with the Centre for Faculty Development to provide mentor and mentee workshops exclusively attended by LMP faculty. To date, three mentee and one mentor (one mentor workshop is scheduled for fall 2021) workshops have been offered to the faculty. These workshops have been well received by the attendees.

- Feedback from Mentees: "Provided some useful tools for being an effective mentee." and "Great opportunity to reflect on goals."
- Feedback from Mentors: "It gave me tips/perspectives on how to provide/establish a successful mentorship." and "Understand my role as a mentor and the goal of the program."

LMP Mentorship Program evaluation

In 2019, Dr. Fang-I Lu, a member of the LMP Mentorship Committee, conducted an evaluation of the program. The survey was completed by 29% of mentees and 39% of mentors. Although it was relatively early to assess the effectiveness of the program, mentees and mentors both reported a positive impact on their academic careers.

Mentees confirmed importance of mentorship in:

- developing a well-defined academic career plan,
- building expertise in teaching, research,
- understanding the expectations for promotion,
- discuss and develop their long term career plan with the mentors,
- hearing about the mentors' experience, and
- developing a personal relationship with the mentors.

Challenges noted include:

- Time commitment/availability of the mentor
- Geographic challenges for face-to-face meetings
- Mentor's lack of expertise in aspects of the mentee's need
- Lack of understanding in aspects of the mentorship process
- Formal and mandatory nature of the mentorship program
- Need for mentorship program for mid-career faculty members
- The need for sponsorship

The LMP Mentorship Committee has tried to address some of these issues.

Though the committee had originally recommended that mentors and mentees try to meet face to face, a virtual meeting is now recommended.

We instigate reminders throughout the mentee's career to meet with their mentor to encourage them to meet.

These include:

- quarterly reminders for mentors and mentees to meet;
- reminder to meet with mentor is now part of the Hospital Chief and new faculty 1.5-year check-in;
- mentees are asked to confirm if they have met with their mentor as part of the CAR/ 3-year review Self-Reflection statement (however, no other information is requested to maintain confidentiality.)

Though the committee has solicited volunteer mentors from the current faculty complement from both primary and cross-appointed faculty, the pairing process has presented a challenge due to the lack of experts in the specific subspecialty areas of the mentee's practice. We continue to actively recruit from our senior faculty, including those recently promoted, to increase the number of potential mentors across all sub-specialties in LMP. Due to these issues, the LMP Mentorship Committee has decided to focus on the junior faculty before establishing other mentorship programs for mid-career or late-career faculty.

Graduate mentoring

Following town hall meetings organized by the Graduate Office and our student representative body, CLAMPS, it was clear that our research stream graduate students needed a formal mentoring program.

We formed a graduate student mentoring council comprised of staff and current students who gathered feedback and input from the students and our alumni. Based on this input, we created two pilot programs which ran in 2021:

- A peer-to-peer program where upper-year MSc students and PhD candidates mentor lower-year graduate students
- An alumni-graduate student program

Using a virtual platform from Graduway called Temerty Medicine Connect, we launched a program where students could proactively search the member database for potential mentors and connect.

Students and alumni were keen to join the program and we currently have 130 members on the Temerty Medicine Connect platform.

Initial feedback from students included:

- "I was really happy to hear about the initiatives being introduced, a great and much needed addition to our department"
- "This is a great initiative"

Feedback from students, alumni and the council itself has indicated that a mentee-driven approach to matching has resulted in:

- A lack of data – we cannot know who has found a mentor unless they tell us, as the platform only records data if administrators are more proactively involved in matching.
- Students find the process challenging and are not sure what to do.
- Take up has been slow due to uncertainty from participants.

Based on these insights, we are adapting and relaunching the program in Fall 2021 in a format where the mentoring council proactively matches mentors and mentees. You can read more about the program in the Graduate Learners' Report on page 102.

Alumni interested in mentoring current students

13 Library Services

The University of Toronto Library (UTL) system is the largest academic library in Canada and is currently ranked fourth among academic research libraries in North America.

Numerous, wide-ranging collections, facilities and staff expertise reflect the breadth of research and instructional programs at the University and attract unique donations of books and manuscripts from around the world, which in turn draw scholars for research and graduate work.

UTL facts

- **42** libraries
- **$41 million** annual acquisition budget
- **12.4 million** print volumes (research and special collections)
- **5.6 million** microforms
- **10,000+** print journal subscriptions
- **2.6 million** electronic books
- **150,000** electronic journals

And more rich primary source materials, manuscripts, films, and cartographic materials.

Major North American Research Libraries					
	2014–2015	2015–2016	2016–2017	2017–2018	2018–2019
ARL rank	**University**	**University**	**University**	**University**	**University**
1	Harvard	Harvard	Harvard	Harvard	Harvard
2	Yale	Yale	Yale	Yale	Yale
3	Columbia	Michigan	Michigan	**Toronto**	Columbia
4	**Toronto**	Columbia	Columbia	Columbia	**Toronto**
5	Michigan	New York	New York	Michigan	Michigan
6		**Toronto**	**Toronto**		

Top 5 Canadian Universities in the ARL Ranking of Major North American Research Libraries				
2014–2015	2015–2016	2016–2017	2017–2018	2018–2019
Rank / University	**Rank / University**	**Rank / University**	**Rank / University**	**Rank / University**
4 / Toronto	**6 / Toronto**	**6 / Toronto**	**3 / Toronto**	**4 / Toronto**
27 / Alberta	31 / Alberta	29 / Alberta	29 / Alberta	30 / Alberta
31 / British Columbia	35 / British Columbia	37 / British Columbia	33 / British Columbia	40 / British Columbia
43 / McGill	42 / McGill	40 / McGill	38 / McGill	47 / McGill
49 / Calgary	63 / Calgary	75 / Calgary	69 / Manitoba	62 / Ottawa

Space and access services

The UTL's 42 libraries are divided into four administrative groups:

1. Central
2. Departmental/local
3. Campus (UTM & UTSC)
4. Federated and Affiliated College Libraries.

The UTL provides a variety of individual and group study spaces for students. Study space and computer facilities are available twenty-four hours, five days per week at one location, Robarts Library, with additional extended hours during study and exam periods at both UTSC and UTM. Web-based services and electronic materials are accessible at all times from campus or remote locations.

Teaching, learning and research support

Libraries play an important role in the linking of teaching and research in the University. To this end, information literacy instruction is offered to assist in meeting LMP degree level expectations in the ability to gather, evaluate and interpret information.

Librarians collaborate with instructors on assignment design, provide student research consultations, and offer just-in-time student research help in person, by phone, or through online chat. Librarians are also available to support curriculum mapping initiatives.

Special initiatives, such as the Systematic & Scoping Review Service, Libraries Undergraduate Research Prize, and an annual forum for student journal editors, extend research and information literacy beyond the classroom. These services align with the Association of College and Research Libraries (ACRL) Framework for Information Literacy for Higher Education.

Program specific instructional support

The Gerstein Science Information Centre is available to facilitate formal instruction integrated into the class schedule and hands-on tutorials related to course assignments. The Library customizes online research guides on various relevant subjects, such as medicine resources, comprehensive searching, research data management, getting published, and citation management. Librarians across the University of Toronto Library can collaborate with faculty to provide resources and services to support interdisciplinary teaching and research.

Collections

Many college and campus libraries collect materials in support of LMP; the largest collection of materials is centrally located in the Gerstein Science Information Centre. Collections are purchased in all formats to meet the variety of preferences and styles of our current students and faculty.

Journals

The Library subscribes to 25 of the top 25 journals listed in Journal Citation Reports (JCR)4 in subject area “Pathology”. Of these titles, all are available electronically to staff and students of the university. We prioritize acquisition of online journals where possible.

Monographs

The UTL maintains comprehensive book approval plans with 51 book vendors worldwide. These plans ensure that the Library receives academic monographs from publishers all over the world in an efficient manner.

In support of LMP, monographs are purchased in electronic form where possible, and the Library currently receives all current e-books directly from the following publishers: Springer, Elsevier, Wiley, LWW (Books@Ovid), Cambridge, and Karger.

Preservation, digitization, and Open Access

The UTL supports open access to scholarly communication and research information through its institutional research repository (known as T-Space), its Downsview print repository, its open journal services, subscriptions to open access publications, and support for preservation of research materials in all formats.

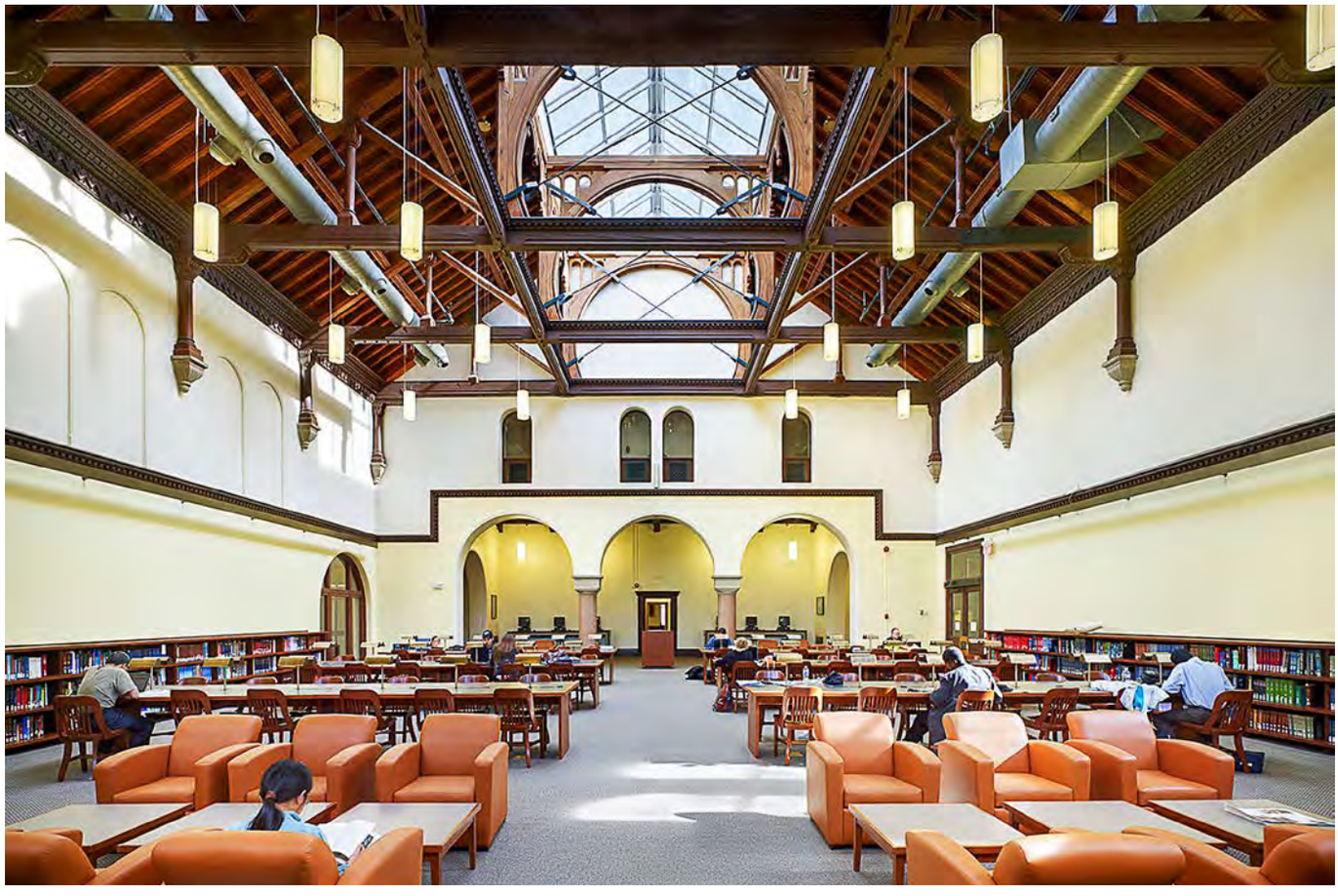
LMP has a specific space in TSpace. In addition to acquiring materials in support of LMP, the Library has digitized its monograph holdings published before 1923. These books are available without charge to any Internet user.

Key databases

OVIDE Medline, OVID EMBASE, and Scopus support the health sciences research needs of LMP.

Special Collection Highlight

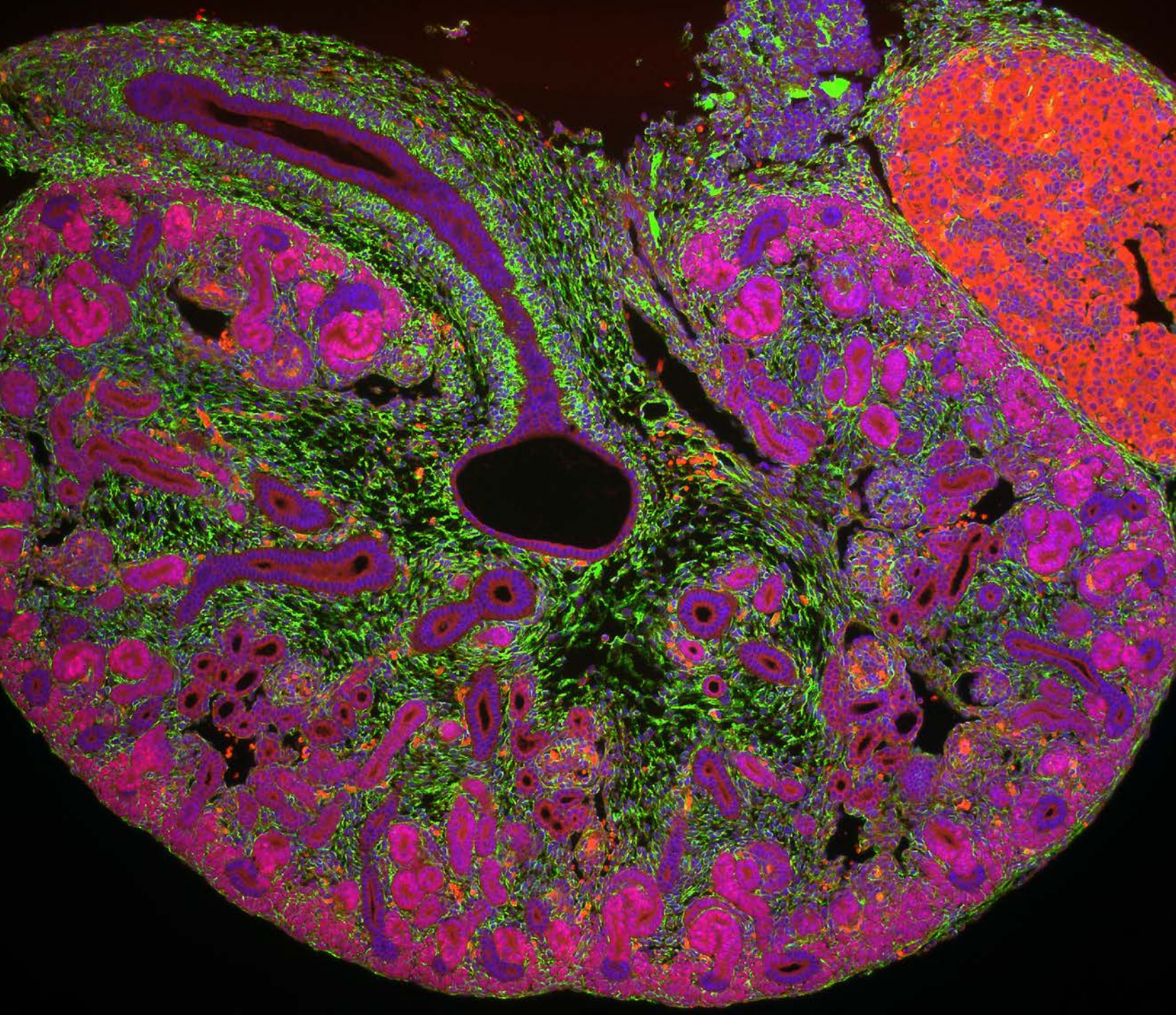
All students have access to the key evidence-based clinical care tools DynaMed Plus and UpToDate as well as the drug and natural products information tools: RxTx from the Canadian Pharmacists Association; Lexicomp Online; Micromedex; and Natural Medicines.



“This program has reshaped how I see the world of problems and given me the confidence to facilitate sustainable and meaningful change”

— TRP graduate

Back cover image
LMP art competition 2021 3rd place winner: Murine Embryonic Kidney by graduate student Robert D'Cruz



Department of Laboratory Medicine & Pathobiology

University of Toronto, Temerty Faculty of Medicine
1 King's College Circle, 6th Floor
Toronto, Ontario, M5S 1A8, Canada

@LMP_UofT • lmp.utoronto.ca

Laboratory Medicine & Pathobiology
UNIVERSITY OF TORONTO

Temerty Medicine