Clinical Embryology

Or

Pathologists’ Assistant

Master of Health Science (MHSc) in Laboratory Medicine
Department of Laboratory Medicine and Pathobiology (LMP)
Faculty of Medicine, University of Toronto

Program Overview
The Department of Laboratory Medicine and Pathobiology (LMP), in close collaboration with the Department of Obstetrics and Gynecology (OB/GYN), is offering a two year full-time professional Master of Health Science (MHSc) graduate degree program to educate clinical laboratory medicine scientists in one of two fields in Laboratory Medicine: Pathologists’ Assistant (PA) or Clinical Embryology (CE). Enrollment is 10 students per academic year (5 PA and 5 CE students), who are required to successfully complete 9.5 full courses equivalent (FCE) courses to graduate.

Pathologists’ Assistants (PAs) are involved in providing diagnostic services in anatomic pathology through the application of knowledge and expertise in the laboratory analysis of human specimens. Clinical Embryologists (CEs) provide clinical management related to assisted reproductive technology (ART) in clinical embryology laboratories. The program equips graduates to work in one of these two disciplines in hospitals, clinical laboratories, the pharmaceutical and biotechnology industry, and research laboratories.

Program Description
The Master of Health Science in Laboratory Medicine is a full-time, 6-term, two-year professional (course work and practicum) Master’s degree designed to educate and train highly skilled health laboratory scientists in one of two fields: Pathologists’ Assistant (PA) or Clinical Embryology (CE). The program is offered on a full-time basis (six sessions, beginning each September). Students are required to attend all parts of the courses and practicums. The program imparts both general core knowledge, as well as the specific basic and applied principles of anatomic pathology or of assisted reproductive technology (ART) required to work as laboratory scientists.

These principles are the foundation upon which PAs or CEs develop fundamental applied and practical knowledge and skills to function as competent, high quality clinical scientists. The nature of this graduate program equips trainees to apply their knowledge to complex decision making, to serious ethical issues, and to develop a strong sense of personal accountability, intellectual rigour and independence.

Program Requirements (Subject to Minor Changes)
- Coursework – all students in both fields are required to complete the following 4.0 FCE core courses:
  - LMP 2000H, Cell and Molecular Biology (0.5 FCE)
  - LMP 2001H, Biomedical Research Methods (0.5 FCE)
  - LMP 2002H, Clinical Laboratory Management (0.5 FCE)
- LMP 2003H, Biomedical Ethics (0.5 FCE)
- LMP 2004H, Introduction to Biostatistics (0.5 FCE)
- LMP 2005Y, Capstone Project (1.0 FCE, continuous course)
- 0.5 FCE elective

- Students pursue their field of choice and complete all these additional courses:
  - Clinical Embryology: (4.0 FCE) LMP 2100H, MSC1008H, LMP 2102H, LMP 2103H, LMP 2104H, LMP 2105H, LMP 2106H, LMP 2107H
  - Pathologists’ Assistant: (1.5 FCE): LMP 2200H, LMP 2201H, LMP 2208H

- To complete their training, students are required to complete all the following practicum courses:
  - Clinical Embryology: (1.5 FCE): LMP 2108H, LMP2109H, LMP 2110H
  - Pathologists’ Assistant: (4.0 FCE): LMP 2202H, LMP 2203H, LMP 2004H, LMP 2205H, LMP 2206H, LMP 2207H, LMP 2209H, LMP 2210H

All courses and practicums must be passed. Students who fail a course or practicum will be offered remediation in the form of additional readings, assignments, and practicum time by the Course Instructor and/or Field Director in order to pass the course or practicum. Students who fail two course/practicums and fail their remediation will be required to repeat the year.

**Minimum Admission Requirements**

*Please note that meeting the minimum requirements does not guarantee that an offer of admission will be granted.*

- Applicants are admitted under the General Regulations of the School of Graduate Studies and must also satisfy the additional admission requirements stated below.
- Admission is based on demonstrated exceptional scholarly achievement, using the following criteria:
  - One-page statement summarizing how this program will contribute to the advancement of the applicants’ professional goals and identifying their field of preference (PA or CE)
  - Curriculum vitae (CV)
  - 2 letters of reference, one of which should be familiar with the candidate’s scholarly activities
  - Review of official transcript(s)
- Applicants must have an appropriate Bachelor of Science degree (B.Sc.) from a recognized university, with a minimum average of at least B+ in the last two years of full-time studies. The students must have a demonstrated interest in human biology and life sciences, preferably with a major or specialist program in the life sciences. These programs prepare students for the study of biomedical literature. Courses in biology/life sciences, biochemistry, human anatomy and physiology are desirable.
  - All potential students will be interviews prior to final acceptance into the program. The initial selection of students will be based on a combination of their academic record, individual statement and letters of reference. These students will be asked to participate in an interview with the Program Coordinator and the Field Director to determine their fit with the goals of the program and their interest in their chosen discipline.
- The School of Graduate Studies’ policies on English-language proficiency testing must be followed ([www.sgs.utoronto.ca](http://www.sgs.utoronto.ca)). Applicants who were educated outside Canada, whose primary
language is not English, and who graduated from a university where the language of instruction was not English, must demonstrate proficiency in the English language through the successful completion of the:

- **Test of English as a Foreign Language (TOEFL)** with the following minimum scores: Internet-based TOEFL: 100/120 and 22/30 on the writing and speaking sections.
- **Michigan English Language Assessment Battery (MELAB)** Web; Required score: 95
- **International English Language Testing Systems (IELTS)**; Required score: 8.0 (Academic) with at least 6.5 for each component
- **Certificate of English Proficiency (COPE)**; Required score: 86 minimum total with at least 22 each component and 32 in writing
- School of Continuing Studies, University of Toronto, “Academic English” course Required score: a final grade of B in Level 60 (Advanced)

To be considered for admission, applicants are required to submit an official application on the University of Toronto’s School of Graduate Studies Application System (https://apply.sgs.utoronto.ca/). Applications for the September 2021 intake will be accepted until: **March 31st, 2021.**

For additional information: [http://lmp.utoronto.ca/graduate/graduate-programs](http://lmp.utoronto.ca/graduate/graduate-programs)

Contacts:

Brandon Wells, Graduate & Life Sciences Education Officer
[Imp.grad@utoronto.ca](mailto:Imp.grad@utoronto.ca)

Professor Avrum I. Gotlieb, Program Coordinator, MHSc in Laboratory Medicine
[avrum.gotlieb@utoronto.ca](mailto:avrum.gotlieb@utoronto.ca)

Professor Heather Shapiro, Clinical Embryology Field Director, MHSc in Laboratory Medicine
[heather.shapiro@sinaihealth.ca](mailto:heather.shapiro@sinaihealth.ca)

Professor Juan Putra, Pathologists’ Assistant Field Director, MHSc in Laboratory Medicine
[juan.putra@sickkids.ca](mailto:juan.putra@sickkids.ca)
About the Department of Laboratory Medicine and Pathobiology
The Department of Laboratory Medicine and Pathobiology (LMP) is a word-class academic department that maintains an excellent track record of training both laboratory physicians in anatomic pathology and doctoral graduate students in the study of pathogenesis of human disease. Our tenured, status-only and clinical faculty are enthusiastic and committed to developing and actively participating in this much-needed new professional program. The department sits at the crossroads of basic science and clinical medicine, strategically placing itself in an excellent position academically to mount a high-quality graduate clinical laboratory sciences program. This is due to the presence of well-qualified dedicated faculty, excellent pathology and infertility resources at the teaching hospitals, an outstanding mix of anatomic pathology cases at the teaching hospitals, and an excellent scholarship track record of research in basic biomedical science and clinical laboratory science.

The MHSc in Laboratory Medicine will be offered by LMP. The Department currently offers two research-focused degrees: the MSc and PhD, both in the field of Laboratory Medicine. Approximately 200 doctoral-stream graduate students (120 PhDs and 80 MSc) are currently enrolled in LMP. Our graduates are successfully employed with approximately 50% in post-secondary education, just under 30% in the private sector and 18% in the public sector (See U of T School of Graduate Studies 10,000 PhDs Project, 2000-2015). In addition, LMP has been successfully training non-physician laboratory scientists for many years in the disciplines of clinical chemistry and clinical microbiology; both programs are accredited, and trainees successfully sit for certification exams. Our graduates are working as laboratory professionals throughout North America. Thus, training clinical scientists aligns very well with the ongoing teaching in LMP carried out by our tenured, clinical and status-only faculty based at the university (St. George campus) as well as university-affiliated hospital-based research institutions.