TEMERTY FACULTY OF MEDICINE
UNIVERSITY OF TORONTO

Temerty Medicine

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Professor Nicholas Rule
Vice-Provost, Academic Programs
Division of the Vice-President & Provost

Dear Professor Rule,

INTERIM MONITORING REPORT | Department of Laboratory Medicine & Pathobiology

On behalf of the Temerty Faculty of Medicine at the University of Toronto, I am pleased to provide an interim monitoring report for the 2021-22 external review of the Department of Laboratory Medicine & Pathobiology (LMP) and its degree programs. This report was prepared in consultation with the Chair of the Department, Professor Rita Kandel. It is organized by the reviewer recommendations prioritized in the FAR-IP that was presented to AP&P in February 2023.

More Lab Courses for LMP Students

The undergraduate curriculum has been extensively revamped with six new courses and two refreshed courses. LMP initiated the curriculum review several years prior to the external review, so these changes have been in place since September 2022 and have been well received by the students. These changes address the comments made by the students as some courses were updated and six courses are new and specific to LMP interests.

LMP305Y1 is the new lab/research course introduced in September 2022 for 3rd-year LMP students. The course aims to introduce them to biomedical research while helping them develop the analytical and soft skills necessary for success as scientists. Students have the opportunity to conduct research and receive mentorship by one of LMP's research faculty, offering them a more personalized laboratory experience.

LMP305Y1 together with the existing LMP405Y1 4th-year research course, LMP now offer hands-on laboratory experiential learning to address valuable student feedback.

More Assessments

"Students in the 1st and 2nd year commented that there were too few assessments and that they are assessed mostly by multiple choice questions—they want more of a variety of assessments. Students commented that multiple choice questions could be quite difficult, depending on how they were worded and asked that more free text questions could be included in future exams. A comment was made that on-line tests were not executed as well as in-person tests, a casualty of the pandemic."

While online exams and classes were essential during the pandemic, all courses have transitioned back to 100% in-person classes and in-class examinations. LMP has made efforts to diversify assessment methods, reducing the reliance on multiple choice questions. The current assessment methods for all LMP courses in the Pathobiology specialist program, including the six new courses highlighted in red, are as follows:

LMP200H1 - midterm, essay/report and final exam
LMP310H1 - 2 midterm and final exam
LMP320H1 - participation, writing assignment, quiz 1, quiz 2 and final exam
LMP330H1 - 3 assignments, debate, final exam
LMP410H1 - midterm, research proposal, final exam
LMP415H1 - midterm, final exam
LMP420H1 - presentation, News & Views paper, weekly writing assignment, final in-class written assignment
LMP430H1 - group presentation, midterm, participation, final exam
LMP440H1 - midterm, assignment, final exam
LMP450H1 - midterm, group presentation, final exam
LMP460H1 - midterm, final exam

More Courses Focused on Technical Skill Development and Grant Writing

LMP offers several technology-based graduate courses: LMP1106H Molecular Biology Techniques; LMP1100H Cellular Imaging in Pathobiology; LMP1108H Genomic Analysis in Medicine; LMP1111H Introduction to R and the Analysis of Single Cell Data; LMP1203H Analytic Clinical Biochemistry: Basic Principles; LMP1206H Next Generation Genomics in Clinical Medicine; LMP1208H Molecular Clinical Microbiology; LMP1210H Basic Principles of Machine Learning in Biomedical Research; LMP1207H Mass Spectrometry, Proteomics and Their Clinical Applications. These graduate courses cover many of the fundamental techniques and methodologies in biomedical sciences. LMP1111H Introduction to R and the Analysis of Single Cell Data was first offered in the 2023-24 academic year and is being given again this fall (2025).

Given the diversity of research in LMP, it has not been possible to offer graduate courses for all the very specialized techniques. In 2019 LMP, therefore, implemented the Workshop Program that awards graduate students financial support to attend national or international workshops to learn advanced techniques from experts outside of LMP.

Lunch and learn sessions given by faculty who experts in the field are offered at LMP. They provide an overview of a state-of-the-art technique followed by specific examples. The Q&A that follows makes the session very practical. An opportunity to network provides additional time for interaction. Internationally renowned faculty recently discussed the topics of “Spatial transcriptomics” (Professor Sonya MacParland) and “Tissue organoids” (Professors Janice Robertson and Milica Radisic, Institute of Biomedical Engineering).

LMP continues to offer graduate thesis-based exposure to writing in its mandatory graduate course: LMP1005H Fundamentals of Research Practice. The course teaches students oral and written communication skills, including how to write scholarship applications.

Students can also access grant-writing workshops at SGS and Temerty Medicine, which are posted on the LMP website and in its monthly newsletter: https://www.sgs.utoronto.ca/resources-supports/gcac/workshops/ and https://rhse.temertymedicine.utoronto.ca/grant-writing-workshops. that students can access when they are offered.

Capstone Project Timeline & Guidelines

LMP implemented immediately the following under new course leadership:

i) The start of the capstone project course has been moved earlier to the winter term of the first year (from the second year), so students can get oriented to the purpose, structure and expectations of the course.

ii) LMP now engages faculty earlier, so project proposals have a longer “runway” for dealing with logistics such as REB approvals and related administrative requirements than in past years.

iii) LMP engages site chiefs at participating hospital sites of the MHSc program to encourage clinical faculty to supervise capstone research projects.

iv) LMP moved research-in-progress sessions to earlier in the course, to allow for early detection of issues in order to make necessary adjustments conducive to successful completion of the capstone project.

v) LMP encourages MHSc students to present their capstone projects at the annual LMP Research Conference and/or UofT Department of Obstetrics & Gynaecology Research Day, as a way of engaging with the greater community and gaining experience.

vi) LMP continues to give its session on manuscript writing and preparation focusing on expectations for the course, potential for submission to peer-reviewed journals and updating expectations with respect to responsible use of generative AI tools.

vii) LMP encourages and supports new opportunities for collaboration (e.g., with Division of Anatomy and the Department of Obstetrics & Gynaecology).

Since making these changes—

- MHSc students have won competitive awards for their capstone projects at national and international specialty society meetings.
- MHSc students have published their capstone research projects as peer-reviewed papers.
- LMP continues to strengthen the community of students and faculty in the PA and CE streams, with cross pollination of ideas, new collaborations and, in some cases, continued engagement of MHSc program graduates with capstone activities post graduation.

Maintaining Instructors

"The faculty are engaged and passionate and responsive to their students. However, maintaining faculty has been a challenge. Their program is outside of the box and it's hard to find instructors in the teaching stream when their mantra is 'we don't teach!'. Their focus is on enabling learning."

The MHSc in Translational Research utilized excellent sessional and part-time lecturers to teach courses. Different teachers teaching the course from year to year has created instability. In 2023 LMP initiated a search for teaching-stream professors and hired two, one Assistant Professor who started in January 2024 and an Associate Professor who started July 2024. A part-time (40%) faculty member was hired for dedicated TRP teaching.

LMP has achieved stability in its teaching faculty by decreasing its reliance on sessional lecturers. These educators have well developed expertise in translational research. They are teaching all the core courses except one, some modules and oversee the Capstone Project in Translational Research.

Competencies Over Grades

"The program finds the graduate level grading system challenging. They want to focus on competencies, not grades. They find it difficult to assess innovation with a traditional grading system. One faculty member remarked that 'you know innovation when you see it but how do you mark it?'"

LMP has considered many grading systems for the MHSc in Translational Research. A document articulating this competency grading vision was shared with the Office of the Vice Provost, Academic Programs who were not convinced that this type of change would help *"students' capacity to innovate and engage in creative thinking without undue hindrance."*

As an alternative, LMP also discussed with them the option of credit/no credit type evaluations. VPAP responded that *"while moving all courses to a CR/NCR model could be a novel approach for the program, the program fits into a system of higher education and within that system it is not currently the norm for a graduate program to be fully graded as CR/NCR. Indeed, in our own SGS Calendar regulations (section 6.2.10.) we say the following about courses in which students may elect to be graded using the CR/NCR scale: 'the School of Graduate Studies cannot determine how an external body may read or interpret the CR/NCR on a transcript.'* Concerned about disadvantaging students in any way, this was not implemented.

Currently the TRP employs a mix of competencies and grades for core courses. TRP is built on two fundamental principles: addressing a real-world need and actively involving end users in developing interventions. This necessitates collaboration, communication and problem-solving—skills that are difficult to measure with static grades. Innovation, by its nature, requires critical thinking, adaptability and creativity. So TRP evaluates students through a structured progression of competencies, where each assignment assesses multiple aspects of these skills at defined levels: limited (D), basic (C), proficient (B), advanced (A) and expert (A+). The core courses have a grade conversion. The modules are pass/fail courses and use "proficient" as the passing standard. To graduate, students must demonstrate at least a proficient level in all competencies, ensuring they are prepared for real-world challenges. This method allows us to assess student growth holistically, emphasizing both personal and professional development. By focusing on how students apply knowledge to solve problems and drive innovation, rather than just the final outcome, TRP ensures that graduates are not only knowledgeable but also capable of translating ideas into impact. We believe this approach addresses the faculty's concern of holistic evaluation while enabling learning.

Affordable Housing & More Scholarships, Stipends, Bursaries

The high cost of living in the GTA is an issue for graduate students across Temerty Medicine. The base stipend has increased annually by 10%; in 2024 it was $38,236 for MSc and $40,616 for PhD students. This modest improvement has become the standard PhD fellowship stipend offered by CIHR.

Temerty Medicine offsets the stipend increase with the Dean's Fund that contributes $2,000/year (2024) to the student stipend. It is also directing more endowed funds towards student stipends where possible and increased the amount of top-up money ($4,000) students can receive from external awards. Advancement is also trying to raise funds for graduate student support. This continues to be a focus for at Temerty Medicine and the University of Toronto.

Both Temerty Medicine and LMP focus on finding creative ways to address these issues. The Chair is a member of UofT Academic Board and advocates for student funding and housing in this forum. Increasing the number of students in the various programs is complicated as each of them has different requirements. For example, for Forensics, which is a 1-year program (PGY6), the number of students accepted into this postgraduate training program is decided by PGME, not LMP. LMP is informed of the number of positions it will receive for the upcoming year. LMP facilitates program advocacy for additional trainees. In 2023 the Forensics program received approval to take on an extra trainee, a request strongly supported by LMP.

In contrast, postgraduate fellowships are supported essentially by departments at the hospital level, even though LMP has administrative oversight of these positions. LMP is advocating for developing a predictable yearly funding source for PG fellowships so there can be advance planning/offers.

Professional master's such as MHSc in Laboratory Medicine are experiential programs and can only take on the number of trainees to whom LMP can offer practicums in hospitals or clinics. LMP may consider increasing the number of applicants by growing the number of hospital partners.

Improved Teaching Assistantship Assignments

"One student remarked that they had applied for 29 different Teaching Assistant positions and had not received any. There is a desire for a more open and transparent process for assigning these positions."

LMP has TAs only in the undergraduate Pathobiology Specialist and MHSc programs. TAs are members of CUPE 3902 Unit 1 and LMP abides by the collective bargaining agreement. This includes, but is not limited to, having a robust search and selection process, as well as offering guaranteed six subsequent appointments for TAs at the PhD level as long as they remain enrolled in the School of Graduate Studies. LMP continues to abide by the collective bargaining agreement stipulations that inform hiring practices, so there has been no change in this regard. TAs are selected mainly based on the level of expertise they

have in the field covered by the course. This ensures a better learning environment for the students. LMP conducts annual reviews of selected TAs with an equity lens and has not observed bias. There does not appear to be any preferential hiring of graduate students from the course instructor's lab.

The Pathobiology specialist program has a total of 13 TA positions and each year LMP hires new TAs. In the past 2 years, for example, LMP has made offers to—

2023/2024 8 returning TAs, 5 new postings (4 are new TAs to the program)
2024/2025 5 returning TAs, 8 new postings (6 are new TAs to the program)

Greater Bridge Funding

"The Temerty Pathway grants have been vital to many in the LMP tenure/tenure track faculty but according to those interviewed more funding is needed. In particular, the amount of bridge funding available could be expanded. During the pandemic the government did provide some funding assistance, but animal costing was not included."

The Temerty Pathway grants are internal bridge grants offered by the Temerty Faculty of Medicine at the University of Toronto to support top-rated, but unfunded, Project Grant proposals from on-campus applicants, to help bridge the gap between the number of meritorious proposals and limited CIHR funding. Up to six unfunded proposals, where the PI participated in a peer review panel and scored in the 89.99-75% range will receive Pathway Grants ($50,000/year with an option for 1 year extension). Funds spent must be in compliance with CIHR guidelines, so animal costs would be included. These grants are still available.

Lack of bridge funding is a short coming but is a problem across the University of Toronto. Advancement continues aggressively to try to find donors to support such an initiative. LMP advocates within Temerty Medicine and University of Toronto for more funding at every opportunity.

Greater Investment in AI

"The recently formed Centre for Artificial Intelligence (T-CAIREM) offers a tremendous opportunity to further advance the leadership role of the department in innovative education of the future workforce. Further investment in this area has great potential for significant Return of Investment through attracting international students, industry investment, and philanthropy."

Development of an education program is in progress. T-CAIREM, which has its home in LMP, is developing robust education offerings. The offering of programs/courses/workshops has been limited by the number of people available to teach. The nidus of individuals with expertise in AI in health are few in number and all have numerous demands on their time, including maintaining their own academic programs. LMP is slowly developing these opportunities as it builds a critical mass of teachers. LMP has developed, in collaboration with computer science, a master's level 16-month graduate program in AI in Healthcare as part of the MScAC (Master of Science in Applied Computing) program, which is designed to educate the next generation of world-class innovators. This is the second year of the master's and LMP has more than doubled the number of students accepted into the program from its initiation in 2023. This promises to be an excellent program.

Endowment Creation to Support the Chair

"The department should be supported to build an endowment to support the Chair in further developing the programs in an innovative manner."

Discussions are ongoing with the Office of Advancement to prioritize fundraising for LMP.

Please let me know if I can answer any questions about this report.

Sincerely,

Lisa A. Robinson
Dean, Temerty Faculty of Medicine
Vice Provost, Relations with Health Care Institutions

cc: Rita Kandel – Chair, Department of Laboratory Medicine & Pathobiology
Lisa Richardson – Vice Dean, Strategy & Governance
Nelson Cabral – Director, Business & Administration
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