UNIVERSITY OF TORONTO
FACULTY OF MEDICINE

MEETING OF FACULTY COUNCIL OF THE FACULTY OF MEDICINE

A meeting of Faculty Council will be held on **Monday, October 15, 2018**, from 4:00 p.m. to 6:00 p.m. in the **Red Room, Donnelly Centre**, University of Toronto.

AGENDA

1	**Call to Order**		Speaker
2	**Minutes of the previous meeting of Faculty Council – April 23, 2018**		Speaker
	2.1	Business Arising	
3	**Report from the Speaker**		Speaker
4	**Reports from the Dean's Office**		
	4.1	Report from the Dean's Office	T. Young
	4.2	Vice Dean, Research and Innovation	R. Hegele
	4.3	Vice-Dean, Partnerships	L. Wilson
	4.4	Vice-Deans, Education	P. Houston S. Spadafora A. Kaplan
5	**Items for Approval**		
	5.1	**The Executive Committee of Faculty Council recommends the approval of the following motion:**	
		"THAT the Academic Strategic Plan 2018-2023, *Leadership in advancing new knowledge, better health and equity,* be approved as submitted."	T. Young
	5.2	**The Education Committee of Faculty Council recommends the approval of the following motion:**	
		"THAT the proposal to establish a new MHSc in Medical Physiology be approved as submitted."	H. Miliotis
6	**Standing Committee Annual Reports**		
	Medical Radiation Sciences Board of Examiners		A. Brade
7	**Faculty Council Forum**		I. Witterick
	The Institute of Medical Science 50th Anniversary		M. Liu
8	**Adjournment**		Speaker

NEXT MEETING: February 11, 2018

UNIVERSITY OF TORONTO
FACULTY OF MEDICINE

FACULTY COUNCIL
FACULTY OF MEDICINE

Meeting Materials – October 15, 2018

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UNIVERSITY OF TORONTO
FACULTY OF MEDICINE

Faculty Council of the Faculty of Medicine
Minutes of the April 18, 2018 meeting
4:00 p.m.
Red Room, Donnelly Centre

Members Present: B. Steipe (Acting Speaker), T. Coomber, T. Young, R. Hegele, S. Spadafora, C. Evans, G. Bandiera, D. Tweed, A. Levinson, L. Wilson, M. Connell, A. Milhailidis, M. Ware, A. Zeng, V. Gupta, R. Giroux, N. Romanosky, S. McMahon, S. Schneeweiss, S. Wanger, M. Farkouh, H. Shapiro, M. Fefergrad, L. Tate, D. Philpott

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Call to Order

The Dr. Boris Steipe called the meeting to order and noted that there was a quorum. Dr. Steipe indicated that neither the Speaker nor the Deputy Speaker were available to Chair the meeting. The By-laws of Council permit any member of the Executive Committee to act as Speaker with the consent of 50% of the voting members present. Dr. Steipe put forward the following motion:

"THAT Faculty Council Executive Committee Member, Dr. Boris Steipe, convene and preside over the Faculty Council meeting of April 23, 2018."

Moved: L. Wilson, Seconded: G. Bandiera

The motion carried.

1 Minutes of the previous meeting of Faculty Council – February 12, 2018

The minutes of the meeting of February 12, 2018 had been previously circulated. They were approved on a motion from C. Evans and seconded by R. Hegele. There was no business arising.

2 Report from the Speaker

The Acting Speaker did not have a report.

3 Reports from the Dean's Office

3.1 Dean's Report

Dean Young does not have anything to report at this time.

3.2 Vice Dean, Research & Innovation

Dr. Richard Hegele indicated that the Strategic Investment Fund (SIF) project in the Medical Sciences Building would be coming to an end in one week's time. He noted that at a future Faculty Council meeting he would like to have Heather Taylor, Director of Facilities Management and Space Planning, come and provide more information on the results of the SIF project.

The microscopy and imaging lab will be receiving a new electron microscope via a successful CFI application. The current electron microscopes are past their useful life. The new machine will be able to

use the same methods for Cryo Electron Microscopy as the higher end machine currently at SickKids and will allow much of the preparatory work to be done at U of T.

The strategic planning process underway and Dr. Hegele encourages members to sign up to be a part of the process.

CIHR has yet to make an announcement on a new president but the Research and Innovation Office will make this information known when possible.

Finally, Dr. Hegele notes that the meeting was taking place on his mother's 93rd birthday and asked the record to reflect that longevity runs in his family.

Dean Young asked Dr. Hegele to mention some research metrics. The Faculty continues to progress toward a $1 billion research operation. Dr. Hegele mentioned that it is a myth U of T publishes a lot but much of it is not good. Toronto is ranked number one in Canada in highly cited, high impact journals and has a volume higher than McGill and UBC combined. In North America, Harvard is by far number one with U of T and Johns Hopkins often trading placed for second and third. There is a lot of research produced but it is of high quality.

3.3 Vice-Dean, Partnerships

Dr. Lynn Wilson noted that the academic strategic planning process began last fall with an RFQ. There is a steering committee, with representation from faculty, staff, learners, TAHSN colleagues, donors and other stakeholders that was struck and held its first meeting in December. From January to March 2018 consultations were conducted with many existing groups as well as individual interviews with a broad range of stakeholders. There have been regular updates in MedEmail. The steering committee and the Dean's Executive Committee met in March 2018 to develop broad themes and discussed specific topics for further exploration. There are six 3-hour strategy discussions which are taking place over the next few days. The six topics are:

1. Preparing the Health Sciences Leaders of the Future
2. Strengthening Collaborative Research and Research Pathways
3. Healthy Organization/Belonging and Well ness
4. Our Focus as a Leader
5. Enabling Thriving Innovation
6. The Next Level of University/Academic and Community Health Sciences Centre Collaboration

Dean Young and Dr. Wilson participated in a trade mission to the Middle East organized by the Canadian International Health Education Association (CIHEA). The mission of CIHEA is to leverage Canada's strong brand in health care and education and to facilitate mutually beneficial international partnerships in health workforce development. The trade mission was strongly supported by Global Affairs Canada through its country-based Trade Commissioners that provided invaluable advice on the local markets and potential opportunities. The main goal was to generate new partnerships by deepening the understanding of the health care system in each country as well as their needs in health workforce development. There was a consistent theme that there was a need for enhanced education in mental health for family physicians/general practitioners. There's a significant shortage of psychiatrists, and a growing awareness of the need for mental health care in primary care. The Faculty will be looking into a possibility of adding mental health training through the PGY3 program that could be a springboard to new opportunities for international learners. There was also a lot of interest in the faculty-development opportunities, particularly in 'specialty-specific' training in leadership, advocacy and professionalism as well as in Professional Master's and CPD programs.

3.4 Vice-Deans, Education

A written report from the Education Vice-Deans is included in these minutes beginning on page 5.

4 Items for Approval

"THAT the Terms of Reference of the Appeals Committee be approved as submitted."

Moved: G. Bandiera, Seconded: L. Wilson

Mr. Todd Coomber indicated that, due to an increase in the number of appeals being heard by the Faculty Council Appeals Committee, it is being proposed that the faculty compliment of the membership increase from 11 to 14 members. This, in conjunction with a reduction in quorum from 8 to 7 will make the scheduling of appeals easier, timelier, and put less burden on the members of this committee. The reduction in quorum will not impact the minimum voting number of members as the Chair only votes in the event of a tie so the minimum number of votes remains 7.

The motion passed.

"THAT the Terms of Reference of the Education Committee be approved as submitted."

Moved: C. Evans, Seconded: A. Kaplan

Mr. Coomber noted that the Education Committee reviews, and approves on Council's behalf, Minor Modifications as defined in the University of Toronto Quality Assurance Process. For the approval of trivial Minor Modifications, the addition of the option for a consent agenda will speed approval and allow more discussion time for more significant items.

The motion passed.

"THAT the Terms of Reference of the Research Committee be approved as submitted."

Moved: S. Spadafora, Seconded: R. Hegele

Mr. Coomber noted this item, though not likely to be used frequently by the Research Committee, was being assed for the sake of consistence with the Education Committee.

The motion passed.

5 Standing Committee Annual Reports

5.1 PGME Board of Examiners

Dr. Jonathan Pirie submitted the report available in these minute beginning on page 30.

5.2 Research Committee

Dr. Mario Ostrowski indicated that the Research Committee met once this year to approve the proposals to recommend to Council the establishment of new Graduate Diploma in Health Research and to close the Centre for Integrative Medicine as an Extra-Departmental Unit type 'C'. In addition, the Research Committee recommended via electronic voting that the Terms of Reference of the Research Committee be approved as submitted.

5.2 Education Committee

Dr. Cathy Evans thanked the members of the Education Committee and noted that much of the focus of the Committee this year was renewing our programs to prepare graduates for the current & future realities of health care.

Dr. Evans noted that 16 new courses were approved on behalf of Faculty Council:

- 8 New courses of the MHSc in Medical Genomics Program (MMG3001Y, MMG3002Y, MMG3003Y, MMG3004Y, MMG3005Y, MMG 3006Y, MMG 3007Y,MMG 3008Y)
- Laboratory Medicine and Pathobiology Program-Cell and Molecular Biology of Cardiovascular Diseases (LMP1504H)
- The MHSc in Translational Research in Health Sciences Program replaced KMD 1002H as a required course with Overview of Methods in Practices & Contexts (MSC 1002H).
- Advanced Topics in Cardiovascular Sciences – System Biology (JCV 3065H)
- Student Seminar Series II (IMM 2025H)
- Easton Seminar Series II (IMM 2050H)
- Collaboration and Commercialization in Physiology (PSL 4050H)
- A Quality Health System from Micro to Macro: Perspectives for Cancer Care (MSC 1515H)
- Fundamentals of Scripting for Health Science Communication (MSc 2014H)

In addition, a number of other Minor Program Modifications were approved on behalf of Council:

The Education Committee recommendations to Council the approval of the following items:

- Graduate Diploma in Health Research
- MSc in Occupational Sciences and Occupational Therapy expansion to UTM
- Terms of Reference Education Committee
- Terms of Reference Appeals Committee

6 Faculty Council Forum

Dr. Glen Bandiera and Dr. Sue Glover Takahashi presented the Faculty Council Forum on the PGME transition to competency based training.

7 Adjournment

The meeting was adjourned at 5:55pm

Council of Education Vice Deans

Faculty Council Report

April 23rd, 2018

Submitted by:
Patricia Houston, Vice Dean, MD Program
Allan S. Kaplan, Vice Dean, Graduate and Academic Affairs
Salvatore Spadafora, Vice-Dean, Post MD Education (PGME & CPD)

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A. Education Vice-Deans Integrative Activities

1. External Education and Teaching Awards | Call for Nominations

Each spring and fall, the Faculty's Teaching and Education Awards Committee has the privilege of recognizing individuals who are making significant contributions to medical education.

We are currently calling for nominations for the following awards:

AFMC - John Ruedy Award for Innovation in Medical Education
AFMC – May Cohen Equity, Diversity & Gender Award
AFMC - President's Award
AFMC - Young Educators Award
CAME - Meridith Marks Award
CMA - Award for Young Leaders
CMA - May Cohen Award for Women Mentors
RCPSC - Donald R. Wilson Award
RCPSC – The Duncan Graham Award
UofT – President's Teaching Award (University of Toronto)

Please submit the online nomination form and supporting documentation by 5PM on Thursday, May 31st, 2018. Nominations require a one-page letter of support from the nominator; this should be emailed, along with the nominee's current CV and Teaching and Education Report, to medicine.awards@utoronto.ca. It is strongly recommended that the nominee's Department Chair be in support of the nomination. For more information, contact the Office of the Education Vice-Deans at medicine.awards@utoronto.ca or at (416) 946-8067.

2. Award Announcements

Award for Excellence in Community-Based Teaching (Hospital)

- **Dr. Michael Warner, Department of Medicine, Michael Garron Hospital**

Award for Excellence in Community-Based Teaching (Office/Clinic)

- **Dr. Dennis Di Pasquale, Department of Surgery, Trillium Health Partners**

Community Based Teaching Award for Sustained Excellence

- **Dr. Kyle Wanzel, Department of Surgery, St. Joseph's Health Centre**

Award recipients will be honored at the 16th Annual Education Achievement Celebration.

3. Annual Education Achievement Celebration

The Faculty of Medicine's **16th Annual Education Achievement Celebration** will be held on **Wednesday, May 9th** from **5:30–7:30pm** in the **Great Hall at Hart House**. The C.I. Whiteside Education Achievement Keynote Address will be presented by **Dr. Ivan Silver,** Vice President, Education, Centre for Addiction and Mental Health (CAMH). Doors will open at 5:00 pm. The event itself will get underway at approximately 5:30 PM.

Please RSVP here no later than April 30th, 2018.

B. MD Program

1. CaRMS | 2018 First Iteration Match Results

The following are initial statistics; more will be available over the next few months.

89.2% (248 of 278) of U of T students who applied to Canadian residency positions were matched in the first iteration of CaRMS, which is consistent with the national average. Of the 30 U of T students who remained unmatched after the first iteration, 26 were current year (class of 2018) students and 4 were previous year students. The second iteration match is scheduled to take place on April 11, 2018.

Of the 248 U of T students who matched in the first iteration of CaRMS:

- 40.7% matched to Family Medicine
- 53.2% matched to U of T residency programs
- 83.1% matched in Ontario

We actively work with students who do not match in the first iteration to help them decide upon and prepare for next steps. These post-match supports include:

- group meeting on match day
- individual resource contacts to help students plan next steps
- re-review of application documents
- additional practice interviews
- short clinical experiences
- release from clinical duties if applying to second iteration

An option available to students who remain unmatched after the second iteration is the MD Extended Clerkship (MEC), which includes of a series of electives conducted between May 1 to December 17 of the calendar year, organized in consultation with the OHPSA career counsellors and Electives Office in order to provide students with a broad array of elective experiences to fill gaps in their clinical knowledge and experience.

Based on the information available, those students who did not match do not look significantly different than those who did. The match process is a complex system, and the reasons for not matching are multi-factoral. Efforts have been initiated on a number of fronts (both locally at the U of T and nationally by the AFMC) to better understand and address the concerning national trend regarding students who remain unmatched after the second iteration, which doubled in 2012 and has remained high ever since.

2. CaRMS | 2018 Second Iteration Match Results

Six of the 2018 cohort matched during the second iteration of CaRMS, leaving 20 of the 2018 cohort and two Students from prior years unmatched. The Ministry of Health has announced a provincial program to open new Residency positions on a one time basis to accommodate the Ontario students who have not matched. Detail of this program are currently being discussed and developed.

3. Admissions

Interviews of candidates for September 2018 entry were held on February 10, March 3, March 4, March 24, March 25, and April 8.

MD Program

	Sept 2016 entry	Sept 2017 entry	Sept 2018 entry
Applicants	3118	3167	3265
In-depth/ full file review	1934	2107	2060
Interviews	599	599*	628**

MD/PhD Program

	Sept 2016 entry	Sept 2017 entry	Sept 2018 entry
Applicants	169	178	131
In-depth/ full file review	82	78	86
Interviews	37	48	48
Offers	10	15	9
Acceptances	7	14	8

* 9 international applicants were interviewed in addition to the 599 domestic applicants for 2017 entry.

** 12 international applicants were interviewed in addition to the 628 domestic applicants for 2018 entry.

4. Clerkship Renewal

The MD Program's Longitudinal Integrated Clerkship (LInC), which was a successful four-year pilot project, has been discontinued and will not be available to MD students in the 2018-19 academic year. Though successful in many aspects, LInC was a highly resource intensive program to operate and was available to only a small number of medical students, without the possibility of scaling up to make that model of clerkship available to all students. To ensure that all our medical students get the best possible learning experience during their clerkship years, a steering committee has been established to lead a review and renewal of the MD Program's clerkship curriculum. The committee's mandate includes consideration of how to make best elements of LInC available to all clerks in a feasible, efficient and sustainable way, which will help ensure a more consistent and equitable experience for all learners. The steering committee, which held its inaugural meeting in late March 2018, is being co-Chaired by Dr. Stacey Bernstein, Clerkship Director and Dr. Molly Zirkle, Academy Director, FitzGerald Academy.

5. Awards

The MD Program introduced two new program-wide awards in 2017-18:

- The Norman Rosenblum Award for Excellence in Mentorship in the MD/PhD Program, which was established in recognition of Dr. Rosenblum's tenure as Associate Dean, Physician Scientist Training and his outstanding contributions to mentoring of MD/PhD students. The award recognizes U of T staff or faculty members who exhibit an exemplary level of leadership and commitment to mentorship and role modeling for MD/PhD students.
- The Miriam Rossi Award for Health Equity in Undergraduate Medical Education, which is named after Dr. Miriam Rossi, a pediatrician, teaching faculty, and former associate dean of student affairs in the Faculty of Medicine, in recognition of Dr. Rossi's outstanding contributions to diversity and health equity in medical education. The award recognizes U of T faculty members for their commitment to diversity and health equity in undergraduate medical education.

The inaugural recipients of these two new awards will be announced at the Faculty of Medicine's 16th Annual Education Achievement Celebration on Wednesday, May 9, 2018.

6. Governance & Leadership

- Dr. Antonio Pignatiello was appointed as Associate Dean, Health Professions Student Affairs, effective February 1, 2018. In addition to welcoming Dr. Pignatiello, we would like to thank Dr. Leslie Nickell for her commitment to the student experience, including student wellness and resilience, during her time in this role.
- Dr. Jon Novick's role as the Faculty Lead for Career Exploration came to an end at the end of the 2017 calendar year, at which time he took on a new role as Director, Career Advising System. The MD Program has identified early career exploration and support of career planning as an essential experience for all students. In this new role, Dr. Novick will oversee the development of all aspects of the career advising system within the MD Program
- Dr. Stacey Bernstein successfully completed a Clerkship Director Advisory Review and was renewed for another term as the Clerkship Director, MD Program.
- Dr. Alanna Fitzgerald-Husek and Dr. Farah Manji were appointed as the co-leads of the MD Program Public Health Theme.
- Dr. Paul Ellis was appointed as Acting Director, Clinical SCORE Program.

C. Post MD Education (PGME & CPD)

Post Postgraduate Medical Education

1. Governance & Staffing

In December 2017 Dr. Heather Flett joined the Wellness group as Associate Director and in February 2018 Dr. Anita Gupta joined the Wellness Office as a new full-time counsellor. We are confident that these additional resources will meet the growing needs of the Postgrad trainee population.

2. CBME

The programs scheduled for the July 1, 2018 launch of Competence by Design (CBD) are:

- Emergency Medicine
- Forensic Pathology
- Medical Oncology
- Nephrology (Adult and Pediatric)
- Urology
- Surgical Foundations (SF)

The Anesthesiology and Otolaryngology – Head & Neck Surgery programs are working to implement their next year building on their learning as Cohort 1 since July 2017.

Starting in July 1, 2018, the cohort 1 and 2 programs will use Entrada. Entrada is a web-based teaching and learning platform that supports a full range of medical education activities for learners, teachers and administrators in a user-friendly environment.

CBME Residency Education Implementation Award
As Competency-Based Medical Education rolls out across PGME, faculty and residents need to develop enhanced skills in feedback, coaching, and related processes. In order to encourage the involvement of both faculty and residents in developing these skills, PGME provided a funding opportunity for one-time funding grants of up to $3000 to successful residency program applicants. The 5 funded projects are all co-led by residents and faculty and come from the following residency programs: Diagnostic Imaging, Geriatric Medicine, Obstetrics and Gynaecology, Palliative Medicine, Radiation Oncology.

Faculty development has been a focus of activities through a wide range of workshops and resources. New resources are regularly added to the PGME section of the website at http://cbme.postmd.utoronto.ca. Much of the faculty development work is done at the departmental and divisional level, with the assistance of the Centre for Faculty Development.

The **BPEA Advisory Committee** was established as a subcommittee of the PGME Advisory Committee (PGMEAC) to provide guidance on CBD evaluations and assessments as they relate to the teacher, learner, and convergence of IT systems. The BPEA Advisory Committee held their first meeting in November 2017. Minimum standards or guidelines were developed for Entrustment Scales, ITER/ITAR tools, Competence Committees, Appropriate Disclosure of Learner Needs, Timing of Workplace Assessments such as EPAs, Who can be an Assessor, and Role of Self-Assessment and Self Report in CBME.

3. Accreditation & Internal Reviews

The Internal Review Committee (IRC), a standing committee of the Postgraduate Medical Education Advisory Committee, has conducted internal reviews on all of its regular stream Residency Training Programs, Area of Focused Competence (AFC) Programs and Family Medicine Programs and training sites as part of our mandated quality assurance process. In January 2018, the Brachytherapy program was accredited as a new AFC program at the University of Toronto. This is our 5th accredited AFC program with more applications in process.

The next external survey visit for the University of Toronto will be in the Fall of 2020. The University of Toronto, PGME office, Residency Programs and AFC programs will be held to the new accreditation standards at this review. In preparation for the review, the PGME Office will be conducting an external review of our office in Fall 2018. We are currently comparing the previous accreditation standards and the new standards, in order to identify which new standards need to be addressed by the PGME Office and Residency Training Programs. We are working with programs to ensure that all of the accreditation standards are met to best prepare programs for the on-site survey in 2020.

4. Conferences & Workshops, Leadership, Faculty Development, Projects, Initiatives

Conferences & Symposia
On October 18, 2017, PGME hosted the Toronto International Summit on Leadership Education at ICRE in Quebec City. The conference brought together over 100 physicians, education leaders, patient advocates and residents from across Canada and the world to create networks, discuss initiatives and new techniques for providing today's medical leaders with the tools they require.

On January 24, 2018, in conjunction with the Simulation Education Advisory Committee (SEAC) and on behalf of the Faculty of Medicine, Post MD Education hosted a Toronto wide Simulation Symposium to bring together faculty, medical trainees, simulationists, educators and health professionals to share current ideas and innovations in simulation technology at the University of Toronto. Over 125 individuals came together in the Great Hall, Hart House to hear plenary speaker, Dr. Ryan Brydges of St. Michael's hospital and discuss future plans for simulation based medical education at the University of Toronto.

On March 26, 2018, in conjunction with the Centre for Faculty Development at St. Michael's hospital and on behalf of the Faculty of Medicine, Post MD Education hosted a Toronto wide CBD/CBME Implementation Symposium on Feedback Research and Best Practices. Over 100 Program Directors, faculty members, researchers and residents attended to hear Dr. Joan Sargeant, Dalhousie University speak and participate in an interactive panel discussion.

Resident Education & Development

Two Practice Management Curriculum sessions were offered to residents by Joule of the Canadian Medical Association on Financial Management, Insurance Planning, Business processes and general practice management. The sessions were held on October 11, 2017 and February 15, 2018 at the Chestnut Conference Centre. In addition to the PMC sessions, the Canadian Medical Protective Association chose U of T to pilot a new teaching resource for residents. They launched their new one-day symposium for PGY2 specialty residents and PGY1 Family Medicine residents to disseminate a national curriculum to improve patient safety by educating residents regarding risk and consent with relevant scenarios and court cases. Over 500 residents attended over four sessions which were held on November 7 & 8, 2017 as well as March 8 & 9, 2018.

On December 6, 2017, the Chief Resident Leadership Forum brought out 20 Chief Residents to chat with PARO to allow residents to discuss their issues and ask their questions in an intimate and interactive environment as well as network with their fellow Chief Residents.

Faculty & Program Administrator Development

Faculty development sessions to orient program directors on resources available to them from Post MD Education. On December 15, 2017, the All Program Directors meeting provided Program Directors with updated information on MAID Educational Resources, Unmatched Medical Students, Resident involvement in Undergraduate teaching, CBME and the work of the Simulation Education Advisory Committee. Dr. Sarita Verma also gave the Charles Mickle Fellowship address speaking on current issues in medical education.

On March 7, 2018 Post MD Education hosted a small reception to honour the twenty-two Faculty members who provided outstanding service to in Postgraduate Medical Education and Continuing Professional Development.

The PGME Program Administrator information series ran sessions on CaRMS basics, Administrative Management practices, ICRE Preparation, BOE Remediation, Resident Wellness, Communication Techniques for Difficult Situations and an interactive workshop with both the CPSO and PARO which was also open to Program Directors and faculty members.

Voice of the Resident Surveys

The results of the second annual Voice of the Resident (VotR) survey were widely distributed in 2017. The findings with respect to diversity, discrimination and harassment led to the expansion to survey all Faculty

of Medicine faculty and staff (Voice of the Faculty / Voice of the Staff). A version of the VoTR surveys will be implemented later this year in an integrated survey for the 13 hospitals of the Toronto Academic Health Sciences Network (TAHSN). The survey is also expected to be expanded to all Faculty of Medicine learners in 2019 (undergraduate students, graduate students, postdoctoral fellows, and clinical fellows).

The findings of the VotR surveys have been presented to many audiences, including Canadian Conference on Medical Education and the International Conference on Residency Education.

5. Awards & Publications

PGME continues to recognize members who are committed to the Faculty and Postgraduate Medical Education by acknowledging their efforts through various awards.

Recipients of the Fall 2017 **Medical Humanities Grant** are Dr. Petal Abdool, Department of Psychiatry; Dr. Katrina Hui, Department of Psychiatry; Dr. Wilson Kwong, Department of Medicine and Dr. Jeremy Rezmovitz, Department of Family and Community Medicine.

Other Awards:

- Robert Sheppard Award: Dr. Stephen Hwang, Department of Medicine
- Social Responsibility Award: Dr. Meldon Kahan, Department of Medicine
- Sarita Verma Award: Dr. Janet Bodley, Department of Obstetrics and Gynaecology
- Charles Mickle Award: Dr. Kevin Imrie, Department of Medicine

To review all of the PG award winners for 2017-18, please see
http://pg.postmd.utoronto.ca/about-pgme/awards/

6. CaRMS

PGME at U of T had a successful 2018 CaRMS PGY1 match, with all PGY1 positions filling in the first iteration. Of the 407 filled positions, 337 were filled by Graduates of LCME accredited programs and 70 were filled by International Medical Graduates. The breakdown of our filled positions is below:

U of T – 2018 1st Iteration PGY1 CaRMS Match Results

Discipline	CMG Positions	IMG Positions	Total
Anesthesia	13	4	17
Cardiac Surgery	1		1
Dermatology	4	1	5
Diagnostic Radiology	8	3	11
Emergency Medicine	7	3	10
Family Medicine - GTA	115	20	135
Family Medicine - Barrie/Newmarket	14	4	18
Family Medicine - Rural	8		8
General Surgery	10	2	12
Internal Medicine	50	10	60
Lab Medicine – Anatomical Pathology	4	2	6
Lab Medicine – Medical Microbiology		1	1

Lab Medicine - Neuropathology	1		1
Medical Genetics	1	1	2
Neurology	4	3	7
Neurology - Pediatric	1	1	2
Neurosurgery	4	1	5
Obstetrics & Gynecology	10	2	12
Ophthalmology	4	1	5
Orthopedic Surgery	7	2	9
Otolaryngology	5		5
Pediatrics	16	4	20
Physical Med & Rehab	4		4
Plastic Surgery	3		3
Psychiatry	31	4	35
Public Health and Preventive Medicine	2		2
Radiation Oncology	4		4
Urology	4	1	5
Vascular Surgery	2		2
Subtotal	**337**	**70**	**407**

The 337 U of T PGME positions for LCME Graduates were filled by:

- 132 U of T graduates
- 118 from other Ontario medical schools
- 80 from other Canadian medical schools
- 8 from U.S. LCME accredited school

7. Global Health

Global Health (GH) at Postgraduate Medical Education (PGME) develops and delivers coordinated education and programming via initiatives reflecting our commitment to local and global social responsibility and accountability while supporting trainee interest in global health education, research and practice. The program is overseen by the PGME Global Health Education Sub-Committee which also adjudicates Sheppard and Social Responsibility Awards.

The program provides process and support for PGME programs and residents taking Global Health Electives.

The program continues to enhance and administer the GH Education Initiative (GHEI), now in its 9th year. This 2-year certificate program offers 25 modules annually; 100+participants per year; 100+ faculty per year (10+ new faculty this year); new Transition to Global Health Practice module; new theme on Geriatric Populations (part of Special Populations module); continuing global health education and leadership opportunities for GHEI alumni and PGME community.

The program also delivers the annual Resident Research Showcase and annual Global Health Day

Continuing Professional Development

1. CPD Academic

CPD Academic Plan
The CPD strategy development process identified 4 key strategic priority areas with goals, objectives, and short, medium and long-term action plans. CPD has been working toward realizing these outcomes. In order to remain accountable, a web-based dashboard has been developed (https://www.cpd.utoronto.ca/about-us/strategic-plan-2017-2022/strategy-progress/). This will allow CPD and its stakeholders to readily identify work that has been completed, pending and future tasks. Priority areas and action plans are reviewed at monthly CPD executive meetings as well as with CPD leaders and directors at quarterly meetings and with working groups. To date CPD is on-track with its 18 months action plans.

Leading and Influencing Change Program
After a long hiatus, CPD has re-instituted the Leading and Influencing Change Program formerly known as the Continuing Education Leadership Program. This is a unique, intensive 2-week CPD professional development program aimed to develop leadership capacity and educational skills specific to CPD that will serve to drive change and improve the quality of CPD programs. Twelve participants from across Canada and internationally have completed the first week of the program. We are looking forward to the second week of the program in October 2018.

IDEAS (Improving and Driving Excellence Across Sectors)
Over the past year, CPD has successfully run 8 cohorts of the IDEAS Foundations of Quality Improvement program with a total of 475 participants. CPD partnered with a number of organizations including the Toronto Central and South West LHIN Palliative Care Networks, Ontario Long Term Care Association, CAMH, Ontario Renal Network and CPSO Quality Management Program to customize programs for their groups.

Safer Opioid Prescribing
CPD continues its partnership with the CMPA Subsidiary, Saegis to expand the Safer Opioid Program nationally. In addition to the web-based program, plans are underway to run 2 live workshops in Alberta and Saskatchewan in June 2018. CPD partnered with La Fédération des Médecins Spécialistes du Québec to run the program for its members. The program was translated into French and well received by the participants.

Foundational Opioid CPD Program
CPD has been working with Dr. Lynn Wilson, Vice Dean of Partnerships, Dr. Mel Kahan, Medical Director of Substance Use Service at Women's College Hospital and Dr. Jennifer Wyman, Academic Project Lead, in partnership with Ministry of Health and Long-Term Care and Health Quality Ontario to advance education in opioid prescribing through the development of online asynchronous modules. Educational consultants and contents experts from Faculty of Medicine have participated in development of the modules. Dr. Suzan Schneeweiss from University of Toronto CPD and Dr. Paul Hendry from University of Ottawa are representing the CPD Ontario collaborative on the steering committee. The first of a series of modules will be available in June 2018.

2. CPD Research and Scholarship

Ongoing Projects

FMEC: CPD Project: Dr. Suzan Schneeweiss led a Working Group for the AFMC Future of Medical Education: CPD project. Dr. Shiphra Ginsburg and Morag Paton were also members of the Working Group. Along with other CPD leads, they conducted a narrative review for one of the FMEC-CPD themes –highlighting the knowledge and skills needed by those participating in the development and delivery of CPD. Findings from the narrative review will be shared at an invitational FMEC CPD Summit in early May.

AFMC CPD Research Survey: CPD recently participated in a national survey of CPD offices at all Canadian medical schools, looking to gain insight into structures, supports and opportunities for collaboration. Morag Paton was one of four members of the survey analysis team. Findings will be reported at the CPD Deans Meeting in late April in Halifax.

***CPD Environmental Scan*:** Interview phase commencing shortly. The objectives of the study are as follows: a) to understand the career trajectories of faculty engaged in CPD leadership, b) to identify CPD-related education scholarship networks and activities c) to understand how best to support the development of an education scholarship community of practice in CPD, and d) to identify potential opportunities to deliver education scholarship-related programming to enhance the professional development of our CPD community. We successfully submitted an abstract to present on initial findings at the CPD Symposium in late April in Halifax.

CPD Research and Development Grants

- The CPD Research & Development Grant competition is held twice annually (closing on April 30 2018 and October 30, 2018). Grants up to a maximum of $5,000 are awarded to fund research relevant to the mission of CPD at University of Toronto. The grants are intended to support research and scholarly activities focused on the continuing professional development of practicing healthcare professionals. The CPD Research & Development Grants support projects that either directly relate to the planning, implementation, delivery and evaluation of continuing education for health professionals (educational innovations) or that generate new knowledge in these areas (research projects). https://www.cpd.utoronto.ca/scholarship/grants/.

Recipients of the CPD Research & Development Grants

We congratulate the following projects and teams on their recent grants:

- *Understanding Continuing Professional Mentorship Needs: A Needs Assessment Study to Inform the Development of a Community of Practice* - Marlene Taube-Schiff, Department of Psychiatry
- *D2 Lymph Node Dissection Surgical Skills Course with Ongoing Mentoring* - Natalie Coburn, Department of Surgery
- *Data and Lifelong Learning (LLL): Understanding Cultural Barriers and Facilitators to Accessing and Using Clinical Performance Data to Support Continuing Professional Development (CPD) – in Radiation Oncology* - David Wiljer, Department of Psychiatry
- *Anesthesia Minute Multiple Choice Questions (AnMinMCQs)* - Peter Slinger – Department of Anesthesia

3. CPD Awards

The 2016-2017 CPD Award winners were announced as follows:

- **Fred Fallis Award in Distance Education:** *Abhimanyu Sud, Lecturer, Family & Community Medicine – Safer Opioids Prescribing*
- **Colin Woolf Awards**
    - *Teaching Excellence: Barbara-Ann Millar, Assistant Professor, Radiation Oncology*
    - *Course Coordination: Evan Propst, Associate Professor, Otolaryngology (7th Toronto International Pediatric Endoscopic/3rd Toronto International Pediatric Open Airway)*
    - *Long term Contributions to Continuing Professional Development: Diana Kljenak, Assistant Professor, Psychiatry*
- **David Fear Fellowship:** *Sandra de Montbrun, Assistant Professor, Surgery*
- **Ivan Silver Innovation Award:** *Shady Ashmalla, Assistant Professor, Surgery, Transanal Total Mesorectal Excision (TaTME) program*
- **Interprofessional Health Care Team Continuing Education Award:** *Lorna Bain (Lecturer) and Zaev Wulffhart (Assistant Professor), Medicine – 6th Interprofessional Faculty Development Workshop, Southlake Regional Health Centre*

4. CPD Enrolment & Accreditation

Enrolment

The number of accredited course offerings continues to grow. An enrolment report for 2017-2018 will be provided in the next Council report.

CACME Accreditation

CPD underwent its quinquennial accreditation review by the Committee on Accreditation of Continuing Medical Education (CACME). On March 19 and 20 we hosted two external reviewers from CACME: Dr. Jeff Sisler, Executive Director, College of Family Physicians Canada, and Dr. Vernon Curran, the Associate Dean of Educational Development, Memorial University. The reviewers met with a number of academic leaders, CPD directors, professional services staff, learners, and external partners. The review report will be received in the next few months.

National Standard

Effective January 1, 2018, the 'National Standard for Support of Accredited CPD Activities' came into effect. This joint standard of the Royal College of Physicians and Surgeons of Canada, the College of Family Physicians of Canada and the Collège des médecins du Québec governs the financial and in-kind sponsorship of accredited CPD activity by both for-profit and not-for-profit organizations.

5. Indigenous and Refugee Health

The 3rd biennial Indigenous Health Conference (IHC): Walking Together will be held May 24–25th, 2018 in Toronto at the Hilton Meadowvale. This interdisciplinary conference is designed to help health care providers understand how Indigenous ways of knowing with respect to health and well-being can be utilized in health care approaches for Indigenous peoples.

As highlighted by the Government of Canada's Truth and Reconciliation Commission's report,

reconciliation and improved health outcomes for Indigenous peoples can only be achieved through a commitment to maintaining and respecting relationships with Indigenous peoples. Indigenous ways of knowing and Indigenous language are important factors to consider in this work. With this in mind, the theme for this year's conference, Walking Together, will emphasize the importance of Indigenous knowledge in achieving this end.

Confirmed speakers include Ontario Regional Chief Isadore Day, Aluki Kotierk, Carol Hopkins, Ry Moran, Kent Saylor and Cheryl Ward. Learn more about our speakers at https://www.cpd.utoronto.ca/indigenoushealth/speakers/

A post-conference program in collaboration with the David Suzuki Foundation on the impact of environmental issues on Indigenous Health will also be held on May 26th. Topics will include mercury poisoning and how environmental contamination affects food security; Indigenous perspectives on the land, Indigenous consent and natural resource extraction.

For additional details and to register visit: https://www.cpd.utoronto.ca/indigenoushealth

D. Graduate and Life Sciences Education (GLSE)

Undergraduate Life Sciences Education

1. Events

Seventh Annual Undergraduate Research Information Fair Considering Graduate Studies
Seventh Annual Undergraduate Research Information Fair considering Graduate Studies will be held on November 1, 2018, Medical Sciences Building (10:30 am – 2:00 pm). Exhibitors in attendance will include our undergraduate and graduate units, as well as hospitals, Life Sciences Career Development Society and the School of Graduate Studies. Approximately over 1000 students visit this fair.

Discussion in Best Practices in Applying to Summer Research, Jobs and Graduate Schools
The GLSE Seminar was presented by Dr. Nana Lee. Students learned how to construct a research-focused resume or CV and enhance their academic career perspectives – for grad school, research opportunities, and beyond on January 16, 1:00 pm – 2:00 pm at the McLeod Auditorium.

Teaching Seminar Series
In collaboration with Dr. Michelle Arnot (Pharmacology and Toxicology), Dr. Michelle French (Physiology), Dr. Stavroula Andreopoulos (Biochemistry), GLSE initiated a Lunchtime Seminar Series for interested Faculty at the Faculty of Medicine in the Basic Medical Sciences (BMS) that teach/coordinate undergraduate and/or graduate courses. It is an opportunity to learn and share experiences and best-practices/strategies on topics associated with teaching once a month during a lunch time seminar (12:00 pm – 1:00 pm Fridays).

Topics:
October 13, 2017 – Students in Crisis Part 2: Q&A Session with our Expert Panel

December 1, 2017 – Looking for New Ways to Assess Student Learning? Willing to Share a Creative Assessment Strategy?
January 12, 2017 – Teaching with Online Technology
February 9, 2018 – Effective Course Management
March 9, 2018 – Flipping the Classroom

2. GLSE Recruitment Student Group Shadowing Program

2017-2018 Shadowing Program matched 30 undergraduates with individual graduate students during reading week who volunteered their time. Summer (July) Shadowing Program is in the planning process.

3. Awards

Undergraduate Faculty Teaching Awards

One award was awarded this year:
Excellence in Undergraduate Teaching in Life Sciences

- 2017-2018 - Michelle Arnot, Ph.D. – Department Pharmacology and Toxicology

GLSE Undergraduate Leadership Awards

Graduate and Life Sciences Education, Faculty of Medicine will award annual Undergraduate Student Leadership Awards in Life Sciences. The purpose of these awards is to provide opportunities for our undergraduate students in the Faculty of Medicine, Arts and Science Programs to be recognized for their leadership and scholarship. The award carries a value of $500 each. There were four award winners this year:

- Linwen Huang, Laboratory Medicine and Pathobiology
- Sonya Kim, Immunology
- Maria Tereschenko, Biochemistry
- Derek Tsang, Immunology

GLSE Undergraduate Summer Research Project Studentship

GLSE awards 7 annual summer research project studentships per summer to support third or fourth year specialist and/or major students in our Basic Science departments and in Laboratory Medicine and Pathobiology. This is a 12 full week summer program, normally between May 1 and August 31, 2018. The award carries a value of $4,800 each.

Undergraduate Research Opportunity Program (UROP)

One hundred and sixteen UROP awards were allocated to 10 departments within the Faculty of Medicine. Support is set at $2,000 per student. The students must be guaranteed at least an additional $2,000 in compensation from other sources managed by the sponsoring department/centre/institute/ program, and are expected to engage in full-time research for at least 12 weeks in the summer.

University of Toronto Excellence Awards (UTEA NSERC & SSHRC)

University of Toronto Excellence Award (UTEA) program is funded by the Vice-President Research. The UTEA program provides eligible undergraduate students with opportunities to conduct summer research projects under the supervision of eligible U of T faculty members research term required is 14 weeks.

The value of a UTEA-NSE award this year is $6,000 of which $4,875 is covered by funding from the Vice-President Research and Innovation. Divisions are required to provide minimum $1,125 top-up funding for each UTEA-NSE award. Research Services may request backup documents demonstrating this matching requirement is met at the time of award.

The value of a UTEA-SSH award this year is $6,000, all of which is covered by funding from the Vice-President Research and Innovation. Top-up funding for UTEA-SSH Awards is optional.

UTEA-NSERC (3)
Immunology
Molecular Genetics
Pharmacology and Toxicology

UTEA-SSHRC (1)
Speech-Language Pathology

4. GLSE Instagram @ScienceTOu

Social media market has brought success to fashion, technology, fitness, food and beauty industries but not used widely for science. GLSE has started an online community for trainees and scientists to come together to discuss exciting topics. We are doing this through a personal lens by sharing aspects of research via engaging explanations and relatable anecdotes about lab life. This also includes fostering international collaborations between scientists as well as international recruitment.

5. Recruitment Material

GLSE Applying to Thesis-based Graduate Programs at the Faculty of Medicine
GLSE Applying to Professional Master's Programs at the Faculty of Medicine

Graduate Education

1. Creating Mentorship Impact: Graduate Student Mentorship Program

The GLSE team is excited to introduce the Graduate Mentorship Program for mentees in year 1 and 2 to be mentored by a PhD graduate student in years 3, 4, or 5 commencing this Fall 2018. The program aims to give mentees an opportunity to appreciate the innovative research conducted in the Faculty of Medicine and a senior colleague's perspective in graduate life, developing as a scientist and career preparation. With this end in mind, we will be pairing graduate students across the 14 different graduate programs offered in the Faculty of Medicine. There will be a mandatory information session on October 16, 12:00pm- 1:00pm in the MSB 4279 presented by Dr. Nana Lee, GLSE's newly appointed Director of Mentorship and GPD, and Anita Balakrishna, Faculty's new Diversity Strategist.

2. Establishing Best Practices for Graduate Supervisors Aimed at Reducing Time to Completion (TTC): A Faculty Development Program

To optimize supervisory mentorship in graduate student research progress and professional

development aimed at reducing times to completion.

Target Audience:
1) Faculty who currently have or are planning to train graduate students.
2) Faculty who are interested in establishing their own graduate professional development workshop series, course, or program for their department.

This Innovative Graduate Faculty Development Program is being coordinated by Dr. Nana Lee, GLSE's newly appointed Director of Mentorship and Graduate Professional Development. She is also a Co-Author of Success After Graduate School 2016 with Dr. Reinhart Reithmeier.

Topics:
Mentorship Matters
Best Practices in Reducing Times to Completion
Tools for Student Engagement
Conflict Management and Student Wellness
Entrepreneurship
Highlights of Graduate Professional Development (GPD) in One Workshop

3. Graduate Awards

a) Graduate Faculty Teaching Awards

Five faculty members were awarded in the following three categories:

Early Career Excellence in Graduate Teaching & Mentorship Award

- Sunita Mathur – Rehabilitation Sciences Institute, Department of Physical Therapy
- John Sievenpiper – Department of Nutritional Sciences

Mid-Career Excellence in Graduate Teaching & Mentorship Award

- Elena Comelli – Department of Nutritional Sciences

Sustained Excellence in Graduate Teaching & Mentorship Award

- David J.A. Jenkins – Department of Nutritional Sciences
- Elizabeth Rochon – Department of Speech-Language Pathology

Each awardee will receive a framed certificate at the Education Achievement Celebration on May 9, 2018 and $1,000 cash prize.

b) Queen Elizabeth II Graduate Scholarships in Science and Technology (QEII-GSST)

The 2018-19 QEII-GSST competition deadline for student applications were due on April 3, 2018. There are 68 QEII-GSST awards at up to $15,000 per award available for doctoral-stream Master's and PhD students and clinician/surgical-scientist trainees. QEII-GSST awards are included as part of the graduate student's total stipend funding package and are accompanied by a $ 4,000 top up for the student.

c) Faculty of Medicine GSEF Merit Scholarships for International Students

The 2018-19 competition deadline for graduate units' nominations is May 1, 2018. The GSEF offers merit-based scholarships valued at $5,000 each to international master's students who have demonstrated the highest degree of academic excellence. Up to 20 scholarships will be funded by the Office of Graduate and Life Sciences Education. Each GSEF will be approved by the Awards Committee chaired by the Vice Dean, Graduate and Academic Affairs, and will be included as part of the student's total stipend funding package. The GSEF is designed to retain international students by alleviating the cost to the department.

d) Graduate & Life Sciences Education: OSOTF and Other Endowed Awards Competition

The 2018-19 OSOTF and Other Endowed awards competition deadline for graduate student applications is May 11, 2018. There is approximately $890,000 available for scholarships for graduate students (primarily M.Sc. and Ph.D.) through this GLSE competition. On average, approximately 110 students are awarded and award value is up to $25,000. OSOTF and Other Endowed awards over $2,000 are included as part of the student's total stipend funding package.

e) JJ Berry Smith PhD Supervision Award

The JJ Berry Smith Doctoral Supervision Award recognizes outstanding performance in the multiple roles associated with doctoral (PhD) supervision. Two awards are offered annually: one in the Humanities and Social Sciences and one in the Physical and Life Sciences. The awards are presented at the Governor General's Medal reception ceremony in the spring. Recipients receive a JJ Berry Smith Doctoral Supervision Award certificate, an SGS Travel or Conference Award to grant a current doctoral student to support conference participation or research travel, and have their name inscribed on a plaque housed at the School of Graduate Studies. The Faculty of Medicine nominations to the School of Graduate Studies were due on April 1, 2018.

4. Curricular Changes 2017/2018

a) Expansion to UTM – Occupational Sciences and Occupational Therapy

As of Fall 2018, the MScOT program will be establishing a second location at the Terrence Donnelly Health Sciences Complex (TDHSC), at the University of Toronto Mississauga (UTM). We anticipate an enrolment of 40 students this coming September, with 80 students at steady state. The program will be delivering some of its core curriculum via videoconferencing as well.

b) Update: MHSc in Medical Genomics

This program received final approval in early 2018 and the first cohort of approximately 15 students will begin the program in Fall 2018.

c) Update – Graduate Diploma in Health Research

This proposed program has completed university governance and is currently being reviewed by the Quality Council and Ministry of Advanced Education and Skills Development.

d) Summary of Minor Modifications for 2017/18

Type of Curricular Change	Totals
New Courses	15
Change in Program Requirements	4
Other	12

5. Update on Graduate Initiatives 2017/2018

Online Course Evaluations

A small percentage of graduate courses have been evaluated as part of the pilot study for the online graduate course evaluations. A full report will be available in the Fall.

6. Graduate Enrollment

The graduate enrolment projections for 2018/19 were approved as submitted by Planning and Budget. Below is a summary of this enrolment plan, measured by Full-Time Equivalent (FTE):

Degree Program	FTE
PhD	113
MSc (course – based and research)	396
Professional (MHSc, MScOT, MScPT, Diploma)	342.5

Starting June 2018, the Vice Dean will be meeting with each Graduate Chair and designated faculty to discuss their enrolment plans for 2019/2020.

7. Online Supervisor Evaluation Task Force

This Task Force has been established to pilot the first online supervisory evaluation system at the Faculty of Medicine. The group is comprised of faculty and students who meet monthly. Its objective is to develop and implement a standardized mechanism to evaluate the quality of graduate supervision of students in research stream programs in the Faculty of Medicine. The Task Force will be responsible for developing such a system to pilot for the 2018/2019 academic year, with the intention to fully implement this for all supervisors in the following year.

8. Change in Tuition for International PhD Students

Effective Fall 2018, all **international students in research stream PhD programs** at the University of Toronto will pay the same tuition as a domestic student. International Masters students will continue to pay the higher international tuition (e.g. for 2017/18 this was $21,560 for MSc research stream international students). This change in tuition **applies to both new, incoming international PhD students and returning/existing PhD students, regardless of their year of study**.

9. Annual Graduate Education Retreat

This year's event will take place on June 18, 2018 from 9am – 2pm. The event is meant to bring all

together all Chairs and Faculty involved in delivering and designing curriculum for graduate education to discuss overarching issues in graduate education in the Faculty of Medicine. The specific topic for this year's retreat is yet to be decided.

E. Physician Assistant Program

1. Admissions

The program goal is to admit 30 students per year. Changes were made to the admissions criteria for the September 2015 entry, to allow for a broader range of applicants and increase the applicant pool. A significant increase in applicants was realized in 2015 and has been maintained since.

The Office of Enrolment Services, Undergraduate Medical Education, began assisting with the BScPA Program admissions for the September 2015 entry and have increased their involvement each year. This has allowed for robust applicant support, including the option of face-to-face meetings, throughout the year, and for messaging consistent with that provided to MD applicants, if there are any concerns from the applicants regarding their eligibility for the program.

	Jan 2010 Entry	**Jan 2011 Entry**	**Jan 2012 Entry**	**Jan 2013 Entry**	**Jan 2014 Entry**	**Sept 2014 Entry**	**Sept 2015 Entry**	**Sept 2016 Entry**	**Sept 2017 Entry**
Applicants	160	152	236	215	259	244	413	388	515
Files Reviewed	117	71	91	90	91	107	190	251	304
Interviews	64	49	59	66	66	66	66	80	84
Admitted	24	14	21	30	30	34	29	30	30
Graduates	17	11	16	27	26	29	26	30*	

*projected

Retention

With the admissions criteria changes, the BScPA Program is committed to monitoring the admitted students over time to determine if there are any effects within the program due to the expanded admissions criteria. One monitoring point is retention. To date, there has been no decrease in retention; in fact there has been an increase in retention.

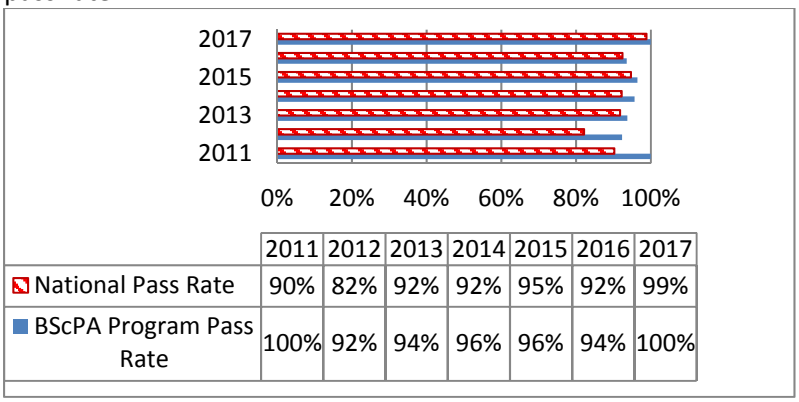
Class of	# Admits	# Graduates	Retention rate
2011	24	17	71%
2012	14	11	79%
2013	21	17	81%
2014	30	27	90%

2015	30	26	87%
2016	34	29	85%
2017	29	26	90%
2018	30	30*	100%
2019	30	29*	97%
Total	**242**	**211**	**87%**

*# of students in active cohort as of April 2018

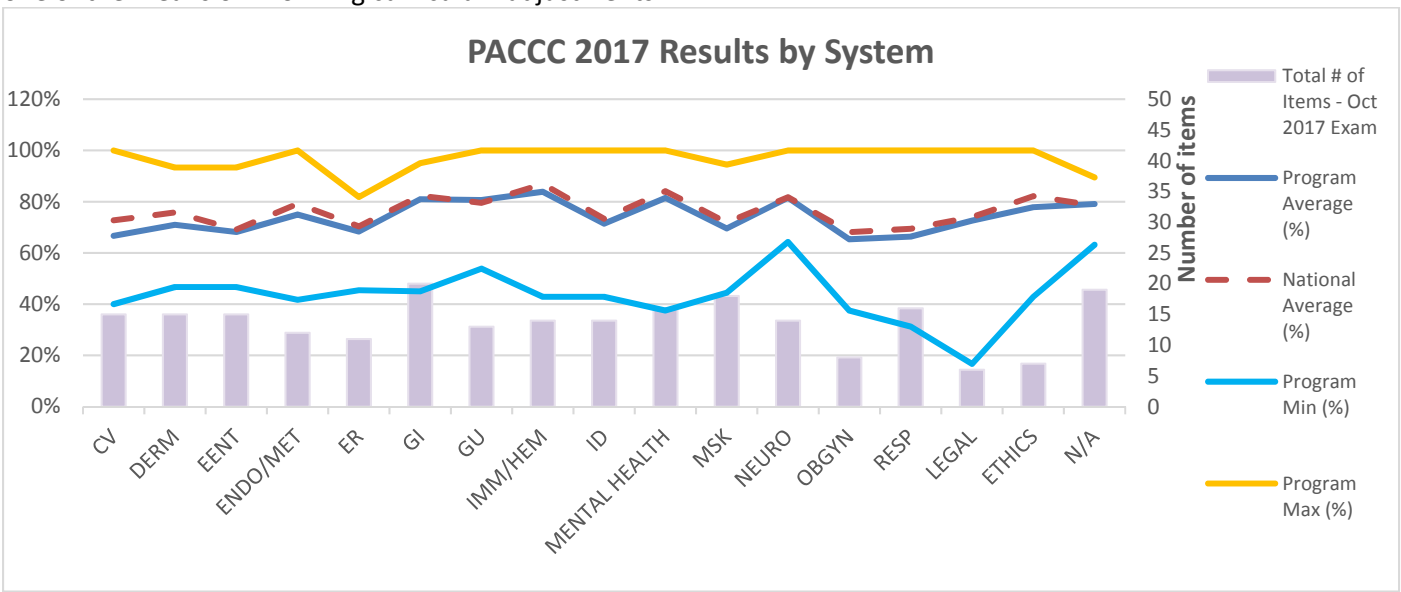
2. National Certification Results

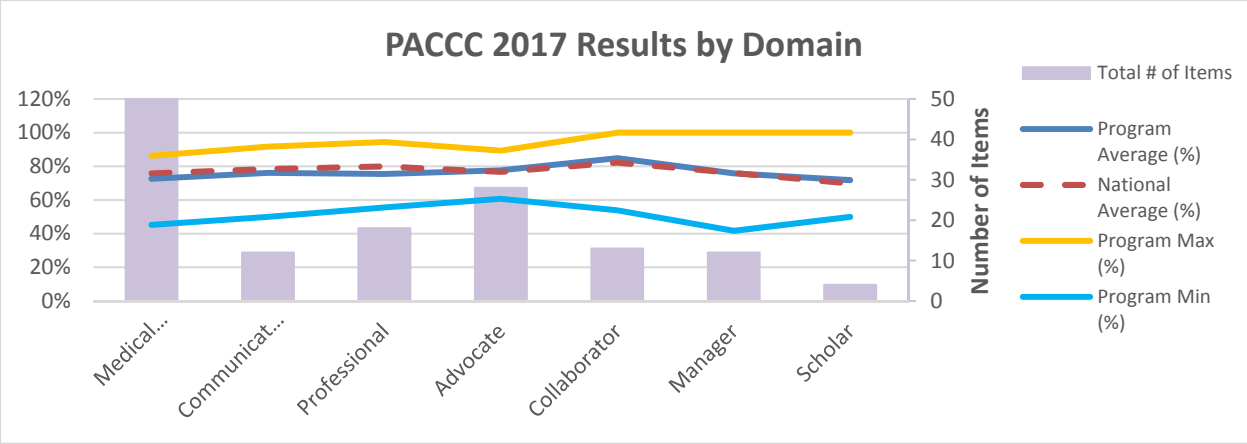
Graduates from the four Canadian Physician Assistant programs (three civilian, one military) write the national certification exam in November each year. The BScPA Program graduates encompass approximately 30% of the total number of exam writers each year, and continue to surpass the national pass rate.



	2011	2012	2013	2014	2015	2016	2017
National Pass Rate	90%	82%	92%	92%	95%	92%	99%
BScPA Program Pass Rate	100%	92%	94%	96%	96%	94%	100%

Exam data is provided by system as well as domain. The BScPA Program reviews this data each year as one of the means of informing curriculum adjustments.



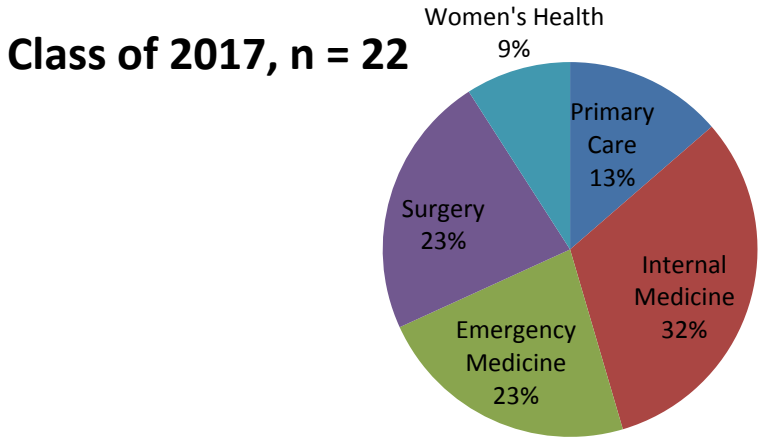


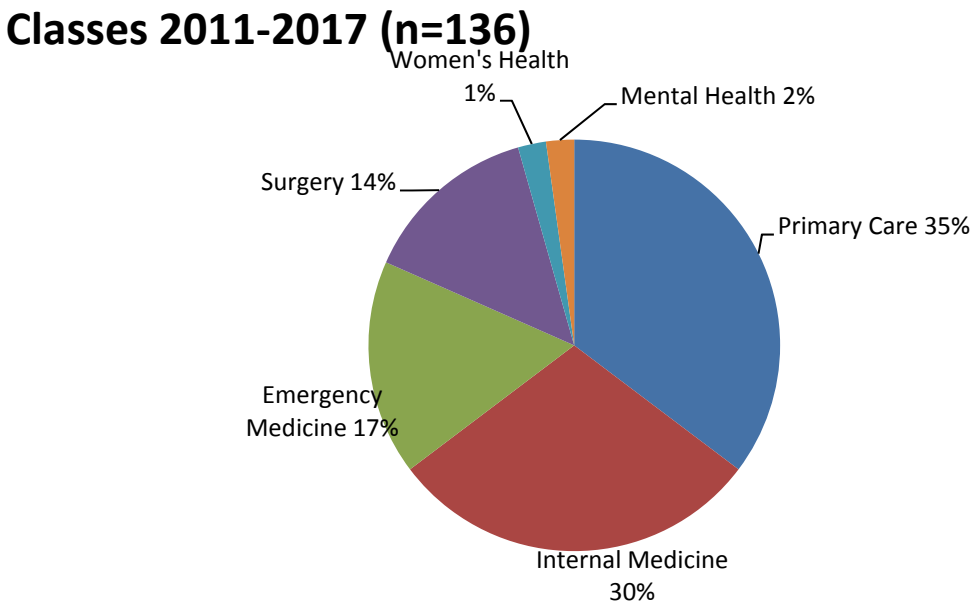
3. Graduate Employment

As of April 4, 2018, we have confirmation that 22 of the 26 graduates who completed their program August 2017 (Class of 2017) are employed as PAs. We maintain an employment rate of > 30% in northern or rural communities, which roughly matches the Ministry of Health and Long Term Care/HealthforceOntario PA Graduate Career Start opportunities by geographic area.

Primary Care has traditionally been the largest employer of our graduates. 2017 saw a shift, with an upswing in the number of graduates employed in surgery and women's health. Overall, primary care is the most stable employer of our graduates.

Figure 1. Graduate Employment dispersion by discipline: Class of 2017 vs. all Graduates





We continue to work with HFO, in collaboration with the PA Education Program at McMaster University, for further improvements in the process for both graduates and employers. HFO is making a concerted effort to ensure that employer proposals approved for the Career Start Funding include clearly articulated plans for sustained employment of PAs.

Total # Grads	# Grads employed as PA within 6 months*	Known Employment rate within 6 months
26	22	85%
29	28	97%
26	17	65%
27	26	96%
16	15	94%
11	11	100%
17	17	100%

*as known by the Program

4. Curriculum

With the announcement of the University's upcoming move to a new Learning Management Engine, Quercus, the BScPA Program became an earlier adopter. One course in the Winter 2018 semester is being delivered in a hybrid fashion, with all content on Quercus, but online synchronous meetings via Blackboard Collaborate on Blackboard. All tests for this course remain on Blackboard, although Quercus has been used for quizzes.

The Program plans to deliver three of the five Year One summer semester courses via Quercus, as well

as the introductory course for incoming students.

5. Human Resources

Dr. Maureen Gottesman, BScPA Program Medical Director, will be stepping down as of July 1, 2018. The BScPA Program is actively searching for a new Medical Director. Simultaneously, we are recruiting to replace the Academic Coordinator who will begin a research leave as of July 1, 2018. We have chosen to break down the Academic Coordinator role into component parts to be able to provide increased, focused support to our students and faculty during the transition from Blackboard to Quercus.

6. Accreditation

The BScPA Program was accorded a Canadian Medical Association 6 year accreditation status in December 201, the maximum achievable accreditation. The maintenance of this 6 year status is recognized by the Physician Certification Council of Canada (PACCC).

7. UTQAP

On March 26, 2018, the Program underwent its external review meetings for the University of Toronto Quality Assurance Process (UTQAP). Program staff, faculty, senior leaders, students and alumni participated in interviews with the reviewers, as did some employers of alumni. A preliminary, positive report has been received from the reviewers.

F. Medical Radiation Sciences Program

1. Enrollment

Currently MRS has a total of 287 in the Program, as of March 29, 2018

- Radiological Technology - 118
- Nuclear Medicine & Molecular Imaging - 53
- Radiation Therapy - 116

2. Accreditation

The MRS Program is currently accredited until April 2019. The MRS Program is preparing for the Phase I document submission on July 1st 2018, with an anticipated date of January/February 2019 for the on-site visit. This will be the first time that the MRS Program is working with the new accreditation body, Health Standards Organization (HSO), an affiliate of Accreditation Canada (AC), after the CMA divested itself of accreditation services, as February 1st 2018. In addition, the MRS Program was reviewed as a focus of the Department of Radiation Oncology review in early 2017 - with the report indicating that the MRS Program was the "jewel in the crown" of the department.

3. Curriculum Renewal

In August 2016, the MRS Program embarked on a process of curriculum renewal. With extensive stakeholder input, the program reviewed where it needs to position itself in the next few years and is proposing several changes to both design and delivery of content. As a joint program with the Michener, resources are currently being negotiated with the intention of presenting a fulsome proposal at the May 24th 2018 Education Committee

2017-18 Board of Examiners Section for PGME Annual Report

Board of Examiners – Postgraduate Programs (BOE-PG)

The BOE-PG is a committee of faculty and residents appointed by Faculty Council of the University of Toronto. The committee is currently chaired by Dr. Jonathan Pirie. Trainees in residency programs are routinely evaluated on an ongoing basis both formally and informally. This evaluation must be conducted in accordance with the policies of the University, the RCPSC and CFPC. When residents have difficulties achieving the goals and objectives of their respective residency programs, they are referred to the BOE-PG. Evaluation procedures are outlined in the Guidelines for the Assessment of Postgraduate Residents of the Faculty of Medicine at the University of Toronto (2017) http://pg.postmd.utoronto.ca/about-pgme/boards-committees/

The Role of the BOE-PG

At the request of a Program Director and/or Dr. Glen Bandiera, Associate Dean of Post-MD Postgraduate Medical Education, the BOE-PG reviews cases of residents in academic difficulty and determines the best course of action which may include remediation, remediation with probation, probation or suspension and dismissal. Assessment of residents may include an evaluation performance in their residency programs within the CanMEDS framework of physician roles, or may be based on an evaluation and recommendation from an independent process. Members of the BOE-PG also monitor residents' progress through remediation by reviewing interim and completion reports during monthly BOE committee meetings.

The Role of Post-MD Education

Post-MD provides support to programs including educational expertise related to the development of individually tailored remedial plans, effective teaching and assessment resources, as well as access to highly experienced coaches.

Successful Initiatives for 2017-2018

Successful Initiatives for 2017-2018 include the finalization and implementation of a single form BOE remediation-reporting template for Program Directors. The PostMD, Postgraduate Medical Education office also established a centralized person of contact to ensure a fair and equitable review process for previous BOE-PG residents seeking renewal and/or independent licensure and to standardize the submission of documentation to the CPSO. Additionally, the process for completion reports was formalized with a more rigorous review and required voting by members.

Plans for 2018-19

Plans for 2018- 2019 include the finalization and implementation of an *Annual Remediation Program Evaluation* that aims to measure satisfaction, learning, behavior change and results. This initiative stems from feedback received in a series of Program Director focus groups (2016-2017). The Program Evaluation will include doing surveys and interviews of Program Directors, Coaches and residents on their remediation experiences with various processes and procedures.

Table 1: BOE-PG Case Volumes and Outcomes

BOE-PG Case Volumes	2014-15	2015-16	2016-17	2017-18*
New and Re-opened Cases	14	20	18	9
(Re-open)	(3)	(3)	(2)	(1)
Continuing (open and active at beginning of academic year July 1)	21	10	15	19
Total Cases over the year	**35**	**30**	**33**	**28**
BOE-PG Outcomes				
Total closed cases over the year	26	12	15	15
• Successful completion	23	12	13	13
• Withdrawal	2	0	1	1
• Transfer	0	0	1	0
• Dismissal	1	0	0	1
Appeals	1	2	1	3 (2 pending)

Appeals = number of residents that went through the formal appeals process to appeal the BOE decision, irrespective of outcome of appeal

Table 2: BOE-PG Cases by Category

Category	Criteria	2014-15 N=35	2015-16 N=30	2016-17 N=33	2017-18* N=28
Training Level	PGY1	2	3	2	2
	PGY2	10	12	10	7
	PGY3	5	4	9	8
	PGY4	6	4	7	6
	PGY5+	12	7	5	5
Type of Resident	MOH CMG	19	20	20	21
	MOH IMG	15	7	9	5
	Visa / Other	1	3	4	2
Remediation Focus (CanMEDS Roles)**	Medical Expert	24	20	22	17
	Professional	18	18	14	13
	Communicator	16	13	6	5
	Collaborator	7	13	7	3
	Manager/Leader	8	3	5	3
	Health Advocate	0	0	0	0
	Scholar	1	4	5	3

*data up to March 31, 2018

In 2017-18, 15 out of 28 cases (53.5%) of residents were identified as having weaknesses in more than one CanMEDS Role.

Council of Education Vice Deans

Faculty Council Report

October 15, 2018

Submitted by:
Patricia Houston, Vice Dean, MD Program
Allan S. Kaplan, Vice Dean, Graduate and Academic Affairs
Salvatore Spadafora, Vice-Dean, Post MD Education (PGME & CPD)

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A. Education Vice-Deans Integrative Activities

1. External Education and Teaching Awards | Call for Nominations

Each spring and fall, the Faculty's Teaching and Education Awards Committee has the privilege of recognizing individuals who are making significant contributions to medical education.

We are currently calling for nominations for the following awards:

- STHLE 3M National Teaching Fellowship,
- AAMC Alpha Omega Alpha Robert J. Glaser Distinguished Teacher Award
- AAMC Abraham Flexner Award for Distinguished Contribution to Medical Education

Nominations should be made online by Monday, October 29, 2018.
It is strongly recommended that the nominee's Department Chair be in support of the nomination.
For more information, contact the Office of the Education Vice-Deans at medicine.awards@utoronto.ca or at (416) 946-8067.

2. 2018 Education Development Fund (EDF) Funded Projects

The Education Vice-Deans and the EDF Adjudication Committee Chair, Dr. Risa Freeman, are pleased to announce the recipients of the 2018 Education Development Fund competition:

PI Name(s)	***PI Department***	***Project title***
Dr. Peter Wu	*Department of Medicine*	*Understanding the impact of the Junior Attending role on transition to practice a qualitative study*
Dr. Samantha Green and Ritika Goel	*Department of Family and Community Medicine*	*Teaching Poverty, Social Determinants, and Social Accountability*
Dr. Julie Johnstone	*Department of Paediatrics*	*"Each little change will have a ripple effect": Lessons Learned from the Implementation of Competence By Design in the Paediatric Residency Training Program, University of Toronto*
Dr. Jennifer Hulme	*Department of Family and Community Medicine*	*Advocating for Advocacy: The state of the advocate role in Canadian Family and Emergency Medicine training programs*
Dr. Seema Marwaha	*Department of Medicine*	*Translating Patient Experiences into Immersive Video for Medical Education on Compassionate Care: A Pilot Study*

Dr. Nirit Bernhard	*Department of Paediatrics*	*THE WHOLE IS GREATER THAN THE SUM OF ITS PARTS: Exploring the integration of reflection, self-assessment and feedback through relationships in a Competency Based Undergraduate Medical Curriculum*

2019 EDF Cycle | Timeline

The Education Development Fund 2019 cycle will commence with an initial call for applications in October. The application site is expected to open on November 1 and applications will be due on February 8, 2019 at 5 PM.
For further information, please refer to the Education Development Fund website.

3. Annual Education Achievement Celebration

The Faculty of Medicine's **17th Annual Education Achievement Celebration** will be held on **Wednesday, May 15** from **4:30–6:30pm** in the **Great Hall at Hart House**.
Doors will open at 4:00 pm. The event itself will get underway at approximately 4:30 PM.

B. MD Program

1. Admissions

MD Program		
	2017 Entry	2018 Entry
Applications	3167	3262
Full file review	2107	2048
Interviews	607	639
Offers	310	301
Acceptances	261	254
Yield	84.2%	84.2%

In addition to acceptances by domestic applicants:
- 2 international applicants accepted offers for 2017 entry
- 5 international applicants accepted offers for 2018 entry, plus 1 deferral for 2019 entry

Alternative Admission Pathways (2018 entry)			
	MD/PhD	ISAP	BSAP
Applications	131	16	92
Full file review	86	7	52
Interviews	48	5	31
Offers	9	5	17
Acceptances	8	2	15 (+ 1 deferral)

2018 entry to the MD Program marked the first admissions cycle for the Black Student Application Program (BSAP). It joins the long-established MD/PhD Program and Indigenous Student Application Program as one of three alternative admission pathways to the MD Program. Applicants in these pathways need to meet all of the same academic requirements, while also needing to complete additional steps, such as submitting a personal essay.

A full admissions report will be provided to the Faculty Council Education Committee later in 2018-19.

2. Accreditation

Canadian MD programs are accredited through a partnership between the Committee on Accreditation of Canadian Medical Schools (CACMS) and the Liaison Committee on Medical Education (LCME). Full accreditation reviews of each medical school occur on an eight year cycle. The U of T MD Program's last full accreditation review was in 2011-12, resulting in full accreditation status for the maximum allowed term of eight years and a finding of full compliance with all accreditation standards. That review process contributed to a number of important initiatives, such as the creation of the Office of Indigenous Medical Education, and

allowed the program to introduce innovative educational changes, such as the Foundations curriculum.

The MD Program's next full accreditation review is scheduled to take place in 2019-20. Preparations for that review will begin in 2018-19. These preparations include an Independent Student Analysis (ISA) by our medical students. This ISA is informed by a student-led survey that features 58 core questions from CACMS, as well as additional University of Toronto specific items. We are encouraging all of our students to participate so that they have a voice in the future directions of our program.

In addition to the ISA, the accreditation process includes completion of a Data Collection Instrument (DCI) and Medical School Self-Study report, and culminates in an on-site visit by a team of external peer reviewers. The commitment and leadership of faculty and staff across the Faculty of Medicine and at our affiliated hospital partners is necessary for the successful completion of the DCI and engagement in a comprehensive self-study of all aspects of the MD Program. Over 2018-19 we will be reaching out in order to identify individuals and teams to assist in the completion of the DCI and participate as members on accreditation-related committees and self-study review teams.

3. Curriculum

***Update* – MD Program Education Goals**

The MD Program recently refreshed its overarching education goals in a consultative process with faculty, learners and staff. These refreshed MD Program education goals reflect the program's aspiration to prepare graduates who are:

- clinically competent and prepared for life-long learning through the phases of their career
- ethical decision-makers dedicated to acting in accordance with the highest standards of professionalism
- adaptive in response to the needs of patients and communities from diverse and varied populations
- engaged in integrated, team-based care in which patient needs are addressed in an equitable, individualized and holistic manner
- reflective and able to act in the face of novelty, ambiguity and complexity
- resilient and mindful of their well-being and that of their colleagues
- capable of and committed to evidence informed practices and scholarship, and a culture of continuous performance improvement

The MD Program education goals were approved by the MD Program Executive Committee on June 12, 2018. MD Program leadership is committed to supporting and enabling achievement of these education goals, which will help ensure that we continue to provide our students with the best possible medical school experience

***Update* – Foundations Curriculum**

Year 2 of the MD Program's new Foundations Curriculum, which covers the first two years of medical school, was successfully delivered in 2018-19. The first cohort of Foundations students is now settling into clerkship. Ongoing quality improvement

exercises that include the participation of both students and teachers have contributed to a number of content and delivery modifications intended to ensure that our students have the best possible learning experience and are well prepared for clerkship.

***Update* – Clerkship: Year 3 core learning sessions**
A series of core learning sessions that focus on patient safety, career planning, resilience and wellness, and medical complexity are being introduced into the Year 3 clerkship curriculum in 2018-19. Building upon material covered in Foundations, these core learning sessions will enable clerkship students to come together as a large group to reconsider material informed by their independent clinical learning experiences. We have also initiated a comprehensive review of our clerkship course objectives, which is an important first step towards the development of an integrated and longitudinal clerkship experience, including the introduction of workplace-based assessments which will demonstrate our students have achieved the Entrustable Professional Activities (EPAs) required for successful transition from medical school to residency. We are also exploring the possibility of introducing elective time and longitudinal patient panels in Year 3.

***Update* – Elentra Learning Management Platform and Curriculum Mapping**
The University ceased using the Blackboard platform (Portal) for its course websites as of August 31, 2018. While Portal was replaced by Quercus for the majority of the University, the MD Program is using Elentra for all courses across all four years of the program. MD Program students and faculty will use Elentra as their primary system for learning materials; MedSIS will continue to be used for course scheduling.

The MD Program decided to use Elentra as its learning management system because it:

- provides students and faculty with better ways to access learning materials and view the curriculum.
- enables and supports an integrated approach to curriculum mapping. This integrated approach includes the development (in progress) of processes to embed curriculum mapping into the creation, review, approval, evaluation and planning of the MD Program curriculum.
- allows for future integration with Postgraduate Medical Education, which is also using the Elentra platform.
- is an expandable platform that leverages the experiences and best practices of the medical schools that are part of the Elentra Consortium. Any innovations/enhancements made by consortium members are available for us to consider.

4. Governance & Leadership

To help support and enable achievement of the recently refreshed MD Program education goals, it is important that we continue to have education leaders who are committed to ensuring we provide our students with the best possible medical school experience. A number of changes to the MD Program's leadership team,

including the re-focusing of existing roles and creation of new positions, are in place for 2018-19.

- Dr. Nicola Jones has been appointed as Director, Integrated Physician Scientist Training Program. Thank you to Dr. Robert Chen, who more than filled in as Interim Associate Dean, Physician Scientist Training over 2017-18.
- Dr. Katina Tzanetos has been appointed to the newly created role of Associate Director, Student Assessment. In this new role, Dr. Tzanetos will work with Dr. Glendon Tait, Director, Student Assessment. Thank you to Dr. Tzanetos both for taking on this new role and her years of service as Faculty Lead, Clinical Skills
- Dr. Jon Novick's role as Faculty Lead for Career Exploration has been reconfigured as Director, Career Advising System, which will enable the further development of all aspects of the career advising system within the MD Program.
- Dr. Anne McLeod has been appointed as Course Director, Introduction to Medicine (ITM). Thank you to Dr. Eleanor Latta, whose outstanding leadership qualities in this role were integral to the successful launch of the Foundations Curriculum.
- Effective 2018-19, our Year 1 Concepts, Patients and Communities (CPC) course will be delivered as two courses (CPC1 and CPC2) in order to more effectively enable the early identification of students in academic difficulty. Dr. Lori Albert will continue on as Course Director of the reconfigured CPC1. Dr. Ashna Bowry has been appointed as Course Director, CPC2. Dr. David Chan will continue on as Course Director of the Year 2 CPC3 course (renamed from CPC2). Dr. Evelyn Rozenblyum has been appointed as Associate Course Director, CPC3.
- Dr. Danielle Bentley has been appointed as our Faculty Lead, Embryology, Foundations. Thank you to Dr. Mike Wiley for his many years of service in this role in particular and for his leadership, dedication, creativity and commitment to our students in general.
- Dr. Thuy-Nga (Tia) Pham has been appointed as our Faculty Lead, Leader Theme. Thank you to Dr. Isser Dubinsky for his admirable contributions as Integrated Leadership Theme Lead over the past several years.
- Dr. Brian Wong has been appointed as our Faculty Lead, Quality and Patient Safety, which is a new theme lead position that will enable Dr. Wong to expand upon the many curricular enhancements he has already helped integrate into the MD Program curriculum.
- Dr. Molyn Leszcz has returned as the MD Program's Faculty Lead, Consultant on Professional Matters. Thank you to Dr. Mark Halman for his excellent contributions in this role over the past year.
- Thank you to the following individuals whose terms came to an end over the course of the summer:
  - Dr. Laurence Biro, Associate Director, Integrated Clinical Experience (ICE) – Clinical Skills role
  - Dr. Rachel Forman, Pharmacology Theme Coordinator – Clinical role
  - Dr. Cindi Woodland, Pharmacology Theme Coordinator – Basic role

C. Post MD Education (PGME & CPD)

Postgraduate Medical Education

1. Governance, Staffing, Leadership

As of August 2018, Dr. Susan Glover Takahashi has taken on a leadership role for faculty development in postgraduate medical education. In this new role, she will be responsible for programming to meet the needs of faculty members' teaching roles and responsibilities in a competency-based assessment system. In partnership with the Centre for Faculty Development, she will also contribute to the enhancement of teaching clinical and communication skills and small group teaching. With this change, Dr. Glen Bandiera will be the academic lead for the activities involved in transitioning our residency programs to CBME. Caroline Abrahams, in cooperation with Discovery Commons, will be responsible for the assessment systems design work using the Elentra platform. Alison Pattern will serve as overall Project Manager for the organizational, communications, and program on-boarding activities, and Lisa St. Amant will lead the education and curriculum component of this work.

Shantel Walcott joined PGME in May 2018 as the Quality Assurance Review and Program Evaluation Officer. She will be working with Laura Leigh Murgaski and Dr. Linda Probyn with program reviews and preparation for the Fall 2020 external accreditation review. In August, the vacant Immunization Officer position was filled by Natalie Rees, a former administrator from SickKids Hospital. Also in August, Carolina Rios joined the Policy, Analysis, & Systems team as Project Coordinator to support the transition to the mobile, competency based assessment system.

2. CBME

The implementation of competency based medical education (CBME) continues to be a large focus for all residency programs. The Family Medicine programs are reviewing what works while the Royal College programs are moving forward with Competence by Design (CBD) in a multi-year staged manner. The Cohort 2 programs that launched CBD starting on July1st, 2018 were:

- Emergency Medicine
- Forensic Pathology
- Medical Oncology
- Nephrology (Adult and Pediatric)
- Urology
- Surgical Foundations (SF)

The Anesthesiology and Otolaryngology – Head & Neck Surgery Cohort 1 programs continue to implement CBD for their next year, building upon their learning since July 2017.

As of July 1, 2018, both Cohort 1 and 2 programs are now using Elentra. Elentra is a web-based assessment platform that supports a full range of medical education

activities for learners, teachers and administrators in a user-friendly environment.

Faculty Development has been an ongoing focus in the CBD implementation process, achieved through a wide range of workshops and resources. New resources are continually added to the CBME section of the PGME PostMD website at http://cbme.postmd.utoronto.ca. Much of the faculty development work is done at the departmental and divisional level, with the assistance of the Centre for Faculty Development. There will be an enhanced focus on faculty development for CBME/CBD in 2018-19, in order to build the capacity of Departments and Programs to support their residents and faculty during this educational change.

Through the Centre for Faculty Development (CFD), Dr. Susan Glover Takahashi is building two networks of people for collaboration in Faculty Development in CBD:

- CBME/CBD Faculty Development Leads' Network,
- CBME/CBD Residency Program Competence Committee Faculty Development Special Interest Group.

There are many workshops and meetings planned for the fall as we work to share ideas and resources.

The **BPEA Advisory Committee** and their subcommittee, Working Group on IT Systems Usability, are providing guidance on CBME/CBD evaluations and assessments as they relate to the teacher, learner, and convergence of IT systems. The BPEA Advisory Committee held their first meeting in November 2017. Minimum standards or guidelines were developed for Entrustment Scales, ITER/ITAR tools, Competence Committees, Appropriate Disclosure of Learner Needs, Timing of Workplace Assessments such as EPAs, Who can be an Assessor, and the Role of Self-Assessment and Self Report in CBME/CBD.

CBME Systems

- Elentra (formerly known as Entrada) was selected as the primary platform for CBME assessment for PostMD at U of T.
- It is an Integrated Teaching and Learning platform developed using a consortium based model approach. All of the Universities who are members of the consortium collaboratively developed Elentra. Each school provides code development and quality assurance of the overall application. Additional consortium members include; Queen's, University of Calgary, University of Ottawa, UBC, McGill, UCLS, Washington State, Rush and several others.
- On July 4th, 2018 PostMD staff, in conjunction with Discovery Commons, and guided by the BPEA Committee, launched the initial version of Elentra for programs onboarding to CBME for the 2018-19 academic year. Key features of Elentra include:
    - New User Interface
    - Responsive Design (Mobile Design)
    - Assessment delivery via email
    - Email confirmation of assessment completion

- POWER is continuing as the primary platform for ITERs, the new In Training Assessment of Residents (ITARs), as well as Teacher Evaluations and Rotation Evaluations.

3. Accreditation & Internal Reviews

The Internal Review Committee (IRC), a standing committee of the Postgraduate Medical Education Advisory Committee, has conducted internal reviews on all of its regular stream Residency Training Programs, Area of Focused Competence (AFC) Programs and Family Medicine Programs and training sites as part of our mandated quality assurance process. In July 2018, the Trauma General Surgery program was accredited as a new AFC program at the University of Toronto. This is our 6th accredited AFC program with more applications in process.

The next external survey visit for the University of Toronto will be in the Fall of 2020. The University of Toronto, PGME office, Residency Programs and AFC programs will be held to the new accreditation standards at this review. In preparation for the review, the PGME Office will be conducting an external review of our office in November 2018. We are working with the hospital sites to gather information on new institutional standards of accreditation. Data is also being collected from individual programs in the form of a self-study, in order to identify which new standards need to be addressed by the PGME Office and Residency Training Programs. Over the last 4 months we have run several accreditation workshops for Program Directors, Program Administrators and interested Faculty to familiarise them with the new accreditation standards. We will continue working with programs to ensure that all of the accreditation standards are met to best prepare for the on-site survey in 2020.

4. Conferences, Workshops, Projects & Initiatives

Conferences, Symposia, Meetings & Sessions

- All Program and Family Medicine Site Directors' Meeting – Friday, May 25, 2018 – Dr. Catharine Whiteside delivered the 2017 Charles Mickle Fellowship Address, Trainee Leadership Awards were presented, the agenda also incorporated updates on Accreditation Standards and Competence-by-Design/Competency-Based Medical Education as well as updates from the Program Administrator's Advisory Committee and the Board of Medical Assessors.
- Introduction to Quercus Workshop – Offered four times between April and July 2018 – As we begin the process of creating Quercus courses for each of our Residency programs, PGME hosted this workshop to help provide a basic understanding of the new Learning Management Tool.
- Quercus Features Workshop – Offered five times between May and July 2018 – A follow up to "Introduction to Quercus Workshop" focussed on the migration from Portal (Blackboard) to Quercus, PGME held a workshop which delved into the new Learning Management System's features.
- Lunch & Learn: How Simulation Developed my Professional and Personal Abilities as a Learner. Teacher and Coach – Tuesday, September 11, 2018 – Dr. Chris

Nickson, Emergency Medicine Physician, and Mr. Jesse Spurr, Nurse Educator, Emergency Medicine, from Australia were hosted by PGME to discuss their experiences with simulation with U of T faculty, staff and residents.

- Book Launch: Health Humanities in Postgraduate Medical Education – Wednesday, September 12, 2018 – The first book of its kind that provides practical advice and resources for setting up programs across specialty and sub-specialty disciplines. This book fills the gap in knowledge translation for the thousands of residency programs worldwide, allowing educators, supervisors, and residents themselves to create robust and educationally sound workshops, seminars, study groups, lecture series, research and arts-based projects, publications and events. – Editors and Authors, Dr. Allan Peterkin and Dr. Anna Skorzewska, are two faculty members from Post MD Education.
- CBD Implementation Mini-Conference #1 – Thursday, September 13, 2018 & Monday, September 17, 2018 – These mini-conferences will align programs to any changes in the CBD implementation process, provide the materials for completion during each step, and allow programs to share/discuss knowledge and ideas with colleagues. This is the first in a series of five mini-conferences. Each mini-conference will be offered twice to ensure programs have an opportunity to participate in these valuable sessions.

5. Resident Education, Development & Forums

- Resident Leadership Forums
    - Caught Between and Rock and a Hard Place – Tuesday, May 22, 2018 – A conversation with Dr. Gillian Hawker, Chair, Department of Medicine; moderated by Associate Dean Glen Bandiera
    - Power Leaders in Medicine - Tuesday, June 26, 2018 – Panel and discussion with Dean Trevor Young, Vice Dean Salvatore Spadafora, Vice Chair Education Jackie James; moderated by Associate Dean Glen Bandiera
    - Speaking Up - Wednesday, September 26, 2018 – Panel and discussion with Dr. Lisa Bahrey, Anesthesia; Dr. Martin Koyle, Urology and Dr. Helene Retrouvey, Plastic Surgery Resident; moderated by Dr. Anne Matlow, Faculty Lead, Strategic Initiatives.
- Sip n' Learn Evening for Career Starting Physicians – OMA Course – Tuesday, June 12, 2018 – Residents had the opportunity to hear from HealthForceOntario on How to Find their Dream Job, OMA on Insurance, Legal Considerations and Billing Best Practices, Ontario MD on Getting the most of your EMR, and Tucker Professional Corporation Accounting Services and MD Financial Management for a panel discussion on Financial Management. The evenings success has lead to the planning of future sessions of this kind.
- New Resident Welcome Reception – Thursday, June 28, 2018 – An informal welcome reception for residents to meet and network with their future colleagues,

program directors and Postgraduate Medical Education leadership team. The reception also provided access to helpful resources such as PARO, MD Financial Management, OMA, HealthForceOntario, Office of Advancement, Resident Wellness and RBC Wealth Management.

- 13th Annual Chief Resident Leadership Workshop - Tuesday, August 14, 2018 – Dr. Dave Williams, Retired Astronaut and Former CEO of Southlake Hospital delivered the keynote address "Striving for Excellence as a Doctor, Pilot and Astronaut: Lesson from the Edge of Space", Dr. Gillian Hawker, Chair, Department of Medicine, spoke about the "Pearls, Pitfalls and Perks of leadership". Dr. Mara Goldstein, Associate Director of Postgraduate Medical Education, Department of Medicine, gave a talk on "Generation Google: Surviving and Thriving in Multi-Generational Work Environments". Dr. Julie Maggi spoke about Resident Wellness, Dr. Jonathon Ailon shared insights from his experience as a former Chief Resident and Drs. Bruce Fage and Christopher Charles joined us from PARO to speak about the PARO-CAHO Contract in the context of the Chief Resident role.
- OHIP Billing Education for University of Toronto Residency Programs – OMA Course – Offered to all residency programs to be incorporated into their academic half-days. These sessions provide residents with an introduction to the basic principles of OHIP billing, claims, codes and payment reconciliation as well as outlining basic legal and financial requirement to starting a practice. OMA has confirmed sessions with Developmental Paediatrics, Adolescent Medicine, Family Medicine and Pediatric Rheumatology for Fall 2018.

6. Program Administrator Development and Information Sessions

- PGCorEd – Tuesday, April 17, 2018 - This session reviewed the new PGCorEd system, trainee requirements and provided a tutorial on the PGCorEd Reports site. By the end of the session attendees were able to navigate the new system and review their trainees' scores in the Reports site. This session was open to PGY1-Entry Program Administrators and Program Directors.
- Royal College: Credentials – Friday, April 20, 2018 – Representatives from the Royal College of Physicians and Surgeons of Canada presented on credentialing, examinations, forms, and important dates and deadlines.
- New Accreditation Standards Information Sessions – Tuesday, May 29, 2018 & Tuesday, August 7, 2018 - This session reviewed the new accreditation program standards. New standards were highlighted and participants had an opportunity to discuss and work through some of the most relevant standards in more detail. Updates on the new accreditation management system were also discussed. This session was open to both faculty and staff.
- Appreciation Award & Event – Friday, June 1, 2018 – The inaugural Medical Education Administrator Award was given out at this appreciation event for all of our medical education administrative support staff.

- Introducing the New Administrator to Postgraduate Medical Education – Thursday, September 20, 2018 - This session will provide a high-level overview of the following topics and will allow new administrative support staff to meet key PGME staff members: Faculty of Medicine Overview; Postgraduate Medical Education Organizational Chart & Overview; Navigating the PGME Website; Registration; Visa Trainees; Fellows; POWER; Payroll & Call Stipends; Electives; and Accreditation. Attendees will receive a booklet of resources along with a PGME contact list and a list of commonly used acronyms and definitions. This session is targeted to new administrative staff who have been in their role for less than 6 months. This session will be offered three time per year.
- ICRE Preparation for Program Administrators – Wednesday, September 26, 2018 - This workshop is designed to help ICRE attendees make the most out of their ICRE experience this year. Our presenters will outline the sessions that will provide the most insight and context to your roles supporting the trainees. There will also be an opportunity for questions and a review of the conference session schedules.

7. Awards & Publications

PGME continues to recognize members who are committed to the Faculty and Postgraduate Medical Education by acknowledging their efforts through various awards.

Recipients of the Spring 2018 **Medical Humanities Grant** are Dr. Kate Hayman, Department of Medicine and Dr. Suvendrini Lena, Department of Psychiatry.

Other Awards:

- Excellence in Postgraduate Medical Education – Development and Innovation: Dr. Lynfa Stroud, Department of Medicine and Sandra de Montbrun, Department of Surgery
- Excellence in Postgraduate Medical Education – Teaching Performance, Mentorship and Advocacy: Dr. Abhaya Kulkarni, Department of Surgery; Dr. David Tang-Wai, Department of Medicine and Dr. John Thenganatt, Department of Medicine

To review all of the PG award winners for 2017-18, please see http://pg.postmd.utoronto.ca/about-pgme/awards/

Publications & Presentations

PGME staff and faculty prepared a number of papers and posters at conferences and symposiums this year, including leading or facilitating at workshops. A complete list of the topics and authors of the 4 journal articles, 11 workshops and presentations, 7 paper presentations, 12 posters for 2017-18 can be viewed at https://pg.postmd.utoronto.ca/about-pgme/pgme-reports/2017-18-pgme-scholarly-activities/

8. CaRMS

The Pediatric Subspecialty Match (PSM) took place on May 30, 2018. All 22 of our MOHLTC funded positions were filled with an additional 6 non MOHLTC positions filled. The 2019 PSM will be the last year that this match is run in the Spring. In 2020 it will follow similar timelines to the Medical Subspecialty Match (MSM) in the fall.

The CaRMS Medicine Subspecialty Match (MSM) is currently underway with a match date of November 7, 2018.

The CaRMS Family Medicine/Emergency Medicine Match (FM/EM) is also underway with a match date of December 19, 2019.

The PGME Quotas Allocation Committee met over the summer to identify a recommended distribution of positions including the 407 positions for the CaRMS R1 Match in March 2019. The recommended distribution includes a rotating schedule of reductions of 9 entry positions for Canadian Medical Graduates, first reduced in 2016. Prior to 2016, the intake quota was 416 positions.

Best Practices in Applications and Selection

Subsequent to the release of the AFMC Unmatched Report the AFMC Executive agreed to adopt the recommendations and to report on progress of implementation for each medical school in Canada by October 2018. As a result, in August of this year, the Associate Dean requested that all PGY1 entry programs implement 10 actions from the 21 recommendations as required as best practices for this year.

In addition, CaRMS has agreed to adopt selected BPAS recommendations as part of the application process. A working group of CaRMS has been instructed to assist in the implementation.

9. Global Health

Global Health (GH) at Postgraduate Medical Education (PGME) develops and delivers coordinated education and programming via initiatives reflecting our commitment to local and global social responsibility and accountability, while supporting trainee interest in education, research and practice impacting local and global under-resourced populations.

The program reports to Dr. Glen Bandiera and is overseen by the PGME Global Health Education Sub-Committee (31 faculty, staff and trainee members) which adjudicates the Sheppard Health Equity and also the Social Justice Social Responsibility Award.

The program provides process and support for PGME programs and residents participating in GH Electives and continues to enhance and administer the GH Education Initiative (GHEI); now in its 10th year. This 2-year certificate program for residents and fellows offers 26 modules (of two or three 3-hour sessions per module) annually; 100+participants per year; 100+ faculty per year; continuing global health education and leadership opportunities for our PGME global health community which includes GHEI graduates with training and physician specialists with expertise to

contribute to critical global challenges.

Led by resident planning committees the 2nd Annual GH Resident Research Showcase takes place January 31, 2019 and the 6th Annual GH Day on May 29, 2019.

10. Other

Residency Training for Underserviced Areas Program

Ontario is helping to meet the demand for physicians in communities across the province by funding more residency positions for medical school graduates who have completed their undergraduate training at an Ontario medical school. In May 2018, the Ministry of Health and Long Term Care funded supernumerary residency positions at the six Ontario Faculties of Medicine in Family Medicine and high need specialties of Psychiatry, Internal Medicine, Pediatrics and Emergency Medicine. These positions were available to Ontario unmatched medical graduates and included a two-year return-of-service commitment in an area of need in Ontario.

We are pleased to announce that this one-time initiative resulted in an additional 16 graduating U of T medical students continuing their postgraduate residency training at U of T in Family Medicine, Psychiatry and Internal Medicine.

Saudi Residents and Fellows

On August 7, 2018, the Saudi Government terminated all scholarship programs in Canada, including sponsorships for postgraduate medical training, following a suspension of diplomatic relations between our two countries. On August 22, the Saudi Arabian Cultural Bureau identified September 22, 2018 as the date of termination. Continuing high-level advocacy resulted in the Saudi Bureau's confirmation on August 28, 2018 that all trainees in residency and fellowship programs may, at their option, remain in their postgraduate training programs in Canada until such time as they have obtained final admission into equivalent training programs in other countries. Two days later, the Saudi Bureau further clarified that all new Saudi trainees were permitted to join the residency or fellowship programs into which they had been accepted.

The situation continues to be uncertain and evolving. The status of Saudi nationals now applying for admission to postgraduate medical training that would begin in 2019-20 remains unclear, as does the status of Saudi nationals now enrolled in training programs that will continue beyond the end of the 2018-19 academic session. There are grounds for cautious optimism for a positive resolution of this situation, but clarity remains elusive at the present time.

We wish to thank all within our community for the understanding and concern that has been demonstrated as we continue to navigate this complex situation. We wish to recognize the support that has been shown for the Saudi trainees who have been so profoundly affected by the events over the last five weeks and reaffirm the University's committed to supporting trainees to the extent possible through this challenging time.

Continuing Professional Development

1. Annual Report

Post MD Education has released its annual report for 2017-18, which can be viewed here: https://annualreport.postmd.ca/

2. CACME Accreditation

In June 2018, CPD received the official report on the March site visit and approval of CACME accreditation for the next eight years (until 2026). The office was reviewed according to four main standards: 1) Responsiveness to Societal Needs, 2) Scope of Activities, 3) Planning and Implementation, and 4) Administration and Organization. CPD received seven exemplary compliances; at least one in each standard. Several strengths were also acknowledged including the evident support of the Dean and Vice Deans within the Faculty and the effectiveness of the new decanal structure and synergies in the Post MD Portfolio. The large creative mix of programs, reinvestment in research, and the office's new professional services model also received strong praise. An interim status report will be delivered in 2020.

3. Governance

The CPD Directors and Leaders Committee last met on 29 May 2018 to conclude the 2017-18 academic year. CPD wishes to thank and acknowledge the following individuals who completed their tenure this year: Dr. Terry Axelrod (General Surgery), Dr. Nadia Ismiil (Laboratory Medicine & Pathobiology), Beata Pawlowska (Centre for Faculty Development), Dr. Peter Slinger (Anesthesia), and Dr. Sanjeev Sockalingam (Psychiatry). The Committee's next meeting is scheduled for 16 October 2018.

Departmental CPD Directors and Leaders as of September 2018

First name	Last name	Representation
Anna	Banerji	Indigenous and Refugee Health PostMD Education
Yvonne	Chan	Otolaryngology
Mark	Feldman	Paediatrics
Ralph	George	General Surgery
Debbie	Hebert	Occupational Science & Occupational Therapy
Kartik	Jhaveri	Medical Imaging
Arnold	Noyek	Global Health/CISEPO
Anna	Plotkin	Laboratory Medicine & Pathology
Raj	Rasasingham	Psychiatry
Jeremy	Rezmovitz	Family and Community Medicine
Suzan	Schneeweiss	Chair and CPD Associate Dean
Allan	Slomovic	Ophthalmology
Robin	Sutherland-Harris	Physical Therapy
Ewa	Szumacher	Radiation Oncology
Martina	Trinkaus	Medical Alumni

Pascal	Van Lieshout	Speech-Language Pathology
Rory	Windrim	Obstetrics & Gynecology
Brian	Wong	Medicine

4. Enrollment and Accreditation

Enrollment

During 2017-18, CPD accredited a total of 385 programs with a total of 40,505 enrolled learners. A new model was introduced to help distinguish different programs accredited through CPD.

Stream 1 refers to programs that are Clinical Department developed & managed and CPD accredited.

Stream 2 refers to programs that are Clinical Department developed & CPD managed and accredited.

Stream 3 refers to programs that are CPD managed, CPD developed and CPD accredited.

For 2017-18, the total learners by stream were:

Total Learners in Stream 1 programs: 30,750

Total Learners in Stream 2 programs: 7,764

Total Learners in Stream 3 programs: 1,991

Accreditation

Over the past year, CPD has been working on the development of a user-friendly accreditation application system. Led by CPD Director Trevor Cuddy, a staff team has worked to deconstruct the existing application process, assess the necessity of long held practices, harmonize the CFPC and RCSPC accreditation requirements into a single application, and rebuild the application from the bottom up in an entirely new platform called CadmiumCD.

As CPD moves into the pilot test phase of this new application system, lessons learned and process development stages are to be shared with the CPD community at a poster presentation at the 10th National CPD Accreditation Conference in October.

5. CPD Academic Activity

Academic Plan

CPD continues to track its progress in four key strategic priority areas on an online dashboard: https://www.cpd.utoronto.ca/about-us/strategic-plan-2017-2022/strategy-progress/ .

CPD Foundations

CPD delivered the Certificate Program in CPD Foundations for the third consecutive year. This webinar-based longitudinal program provides fundamental theory and skill training for the development of effective CPD activities. It focuses on practical issues commonly experienced in the design, development, and implementation of CPD activities. By focusing on competencies in CPD, the aim is to encourage the delivery of high quality CPD programs across a broad range of environments that

will lead to improved practice and ultimately patient care.
In 2018, the Foundations program was honoured with the Royal College CPD Providers Innovation Award. Over the past three years, 75 participants from across Canada, United States, Europe and the Middle East have taken this program.

Safer Opioid Prescribing
CPD has continued to work with Saegus (subsidiary of CMPA) and has run Safer Opioid Prescribing workshops in Montréal, Saskatoon, and Edmonton, with a future iteration scheduled for Nova Scotia in 2019. This partnership is providing new opportunities for collaboration with Doctors Nova Scotia and FMSQ.

Opioids Clinical Primer
U of T is one of six medical schools involved in the development of the Opioids Clinical Primer. The Primer is a province wide CPD effort supported by the Ministry of Health as part of the provincial opioid strategy. It consists of a series of free, interactive, accredited online courses intended to provide physicians and nurse practitioners with concrete tools to assist with safer opioid prescribing, recognizing and managing opioid use disorder, and managing chronic pain. *Course 1: Opioid Use Disorder in Primary Care: Principles of Assessment and Management* has launched, and *Course 2: Managing Patients with Opioid Use Disorder in Primary Care with Buprenorphine* will be available soon.

6. CPD Research and Scholarship

CPD Research and Development Grants
The next cycle of applications for the CPD Research and Development Grant closes on October 30, 2018. Grants up to a maximum of $5,000 are awarded to support research and scholarly activities focused on the continuing professional development of practicing healthcare professionals.
Congratulations to Project Investigators, Dr. Abhimanyu Sud and Dr. Kathleen Doukas (Department of Family & Community Medicine), on their recent grant for their project titled: *Has Safer Opioid Prescribing Achieved its Intended Program Objectives: Participation, Satisfaction, Learning, Competence and Performance?*

CPD Environmental Scan
This research project continues under the leadership of Dr. Shiphra Ginsburg, CPD Academic Director. Phase 1 involves gathering and reporting on scholarship. The most recent count of Faculty of Medicine CPD scholarship-related activities for the 2017-18 include 75 publications, 6 grants totaling $615,127, and 29 presentations at national and international conferences. Phase 2 involves interviews. The first round of interviews is complete and data analysis has begun. A second set of interviews is underway.

Stand Up and Be Counted Too (2)
CPD is involved in a national mixed-methods survey project led by ACPAC Program Directors, Dr. Katie Lundon and Dr. Rachel Shupak. The qualitative piece of the study, in which the CPD Scholarship office is engaged, aims to understand the CPD needs, opportunities and barriers of Extended Role Practitioners who work in arthritis

and/or musculoskeletal care. A report on this work is expected early next year.

7. CPD Awards

The CPD Awards Committee, under the leadership of Dr. Miriam Weinstein, has been working to renew and refresh the suite of awards offered by CPD. Nominations for the following awards are due November 30, 2018:

- Colin Woolf Award for Sustained Excellence in Teaching of CPD
- Colin Woolf Award for Excellence in Program Development and Coordination
- Colin Woolf Award for Long-term Contributions to CPD
- Fred Fallis Award in Online Learning
- David Fear Fellowship
- Dave Davis Research Award
- Ivan Silver Innovation Award
- Excellence in Interprofessional CPD Award

For more details about updated award terms and nomination requirements, please see the awards listings on the side bar here: https://www.cpd.utoronto.ca/scholarship/.

8. Indigenous and Refugee Health

The third biennial Indigenous Health Conference (IHC) 2018: *Walking Together* was held 24-26 May 2018 in Toronto at the Hilton Meadowvale. The conference presented an opportunity to gain a better understanding of how Indigenous ways of knowing, with respect to the health and wellbeing, can be utilized in health care approaches for Indigenous peoples. Over seven hundred individuals attended including health care professionals, community partners, and others working in Indigenous Health. Over 40% of the attendees identified as Indigenous.
The initiative was led by Dr. Anna Banerji, Conference Chair and Faculty Lead, Indigenous and Refugee Health, Post MD Education, and Bernice Downey, Indigenous Health Lead for the Faculty of Health Science, McMaster University. A new addition to the 2018 conference was a collaboration with the David Suzuki Foundation to host a third day focused on health and the environment.
Work is underway for the biennial North American Refugee Health conference in June 2019.

D.Graduate and Life Sciences Education (GLSE)

Undergraduate Life Sciences Education

1. Events

Special Session for Domestic & International Students Considering Course-Based & Professional Master's Programs

The Faculty of Medicine has a captive audience of domestic and international undergraduate students at U of T (across 3 campuses). For these students, GLSE has organized a special event to meet representatives from our course-based and professional programs that are offered in the Faculty of Medicine. This recruitment session will begin with Dr. Allan Kaplan, Graduate and Academic Affairs giving opening remarks, followed by a representative from the School of Graduate Studies to talk about services for domestic and international students. Each department will present their program and field questions. The event will be held on October 5, 2018 at 12:00pm-1:00pm in the Medical Sciences Building, Rm. 2172.

Participating Programs include:

- Applied Immunology
- Medical Genomics
- Medical Physiology (Winter 2019)
- Occupational Science & Therapy
- Applied Clinical Pharmacology
- Physical Therapy
- School of Graduate Studies
- Speech-Language Pathology
- Translational Research

Seventh Annual Recruitment Fair considering Graduate Studies in the Faculty of Medicine will be held on November 1, 2018, Medical Sciences Building (10:30 am – 2:00 pm). Exhibitors in attendance will include our undergraduate and graduate units, as well as hospitals and the School of Graduate Studies. Approximately over 1,000 students visit this fair.

Discussion in Best Practices in Applying to Summer Research, Jobs and Graduate Schools

This GLSE Seminar will be presented by Dr. Nana Lee, Director of Graduate and Professional Development and students will learn how to construct a research-focused resume or CV and enhance their academic career perspectives – for grad school, research opportunities, and beyond on January 29, 2019 at 10:00am – 11:00am at the JJR McLeod Auditorium.

Teaching Seminar Series

Organized by Dr. Michelle Arnot (Pharmacology and Toxicology), Dr. Michelle French (Physiology), Dr. Stavroula Andreopoulos (Biochemistry), a lunchtime Seminar Series has been developed for interested Faculty in our Life Sciences Programs who teach/coordinate undergraduate and/or graduate courses. This is an opportunity for Faculty to learn and share experiences and best-practices/strategies on topics associated with teaching. This seminar will be held once a month from 12:00 pm – 1:00 pm on Fridays.

Topics:

September 21, 2018 - Teaching Seminar: Join our Roundtable Discussion on Academic Integrity

Other seminar dates to follow: October 19, 2018, November 16, 2018, January 18, 2019, February 8, 2019, March 22, 2019

2. Mentorship Programs | Undergraduate

GLSE Undergraduate Shadowing Program

Graduate and Life Sciences Education is committed to organizing events that will help undergraduate students discern their future career paths. The program aims to give undergraduate students in the Life Sciences an opportunity to appreciate the innovative research conducted in the Faculty of Medicine. We will be pairing senior undergraduate students from across the 8 Life Sciences and 13 different graduate programs offered in the Faculty of Medicine.

Graduate mentors will give an overview of the nature of their research and how it may relate to concepts that undergraduate students have learned in their lectures. Additionally, undergraduate students will have an opportunity to shadow graduate students as they perform their experiments and daily tasks. The upcoming shadowing program will occur during the months of February, June and July.

3. Awards

Undergraduate Faculty Teaching Awards

Four awards will adjudicated in four categories. Deadline: January 31, 2019

- Excellence in Undergraduate Teaching in Life Sciences
- Excellence in Undergraduate Laboratory Teaching in Life Sciences
- Excellence in Linking Undergraduate Teaching to Research in Life Sciences
- Sustained Excellence and Innovation in Life Sciences Education

GLSE Undergraduate Leadership Awards

Graduate and Life Sciences Education, Faculty of Medicine will award up to three annual Undergraduate Student Leadership Awards in Life Sciences. The purpose of these awards is to provide opportunities for our undergraduate students in the Faculty of Medicine, Arts and Science Programs to be recognized for their leadership and scholarship. The award carries a value of $500 each with an accompanying certificate. The winners will be announced in April.

GLSE Undergraduate Summer Research Project Studentship
GLSE awards 7 annual summer research project studentships per summer to support third or fourth year specialist and/or major students in our Basic Science departments. This is a 12 full week summer program, normally between May 1 and August 31, 2019. The award carries a value of $4,800 each.

Undergraduate Research Opportunity Program (UROP)
UROP awards will be allocated to 10 departments within the Faculty of Medicine. Support is set at $2,000 per student. The students must be guaranteed at least an additional $2,000 in compensation from other sources managed by the sponsoring department / centre / institute / program, and are expected to engage in full-time research for at least 12 weeks in the summer.

In addition, we have a new summer research award, The Dr. John P. Mitchel Award in Cancer Research. Each department will be allocated one extra award from this trust account.

University of Toronto Excellence Awards (UTEA NSERC & SSHRC)
University of Toronto Excellence Award (UTEA) program is funded by the Vice-President Research and Innovation. The UTEA program provides eligible undergraduate students with opportunities to conduct summer research projects under the supervision of eligible U of T faculty members. The value of each 2019 UTEA award is TBA, and the research term required is 14 weeks.

4. Student Engagement

GLSE Poster Competition
GLSE Poster Competition was established in July 2016 to help promote student talent for the Annual Undergraduate Research Information Fair Considering Graduate Studies.

Competition Winner:
2017-2018: Darren Cheng, Rehabilitation Sciences Institute (Graduate)

GLSE Talks: One Minute Video Competition
GLSE Talks: One-minute video competition was established in July 2016 for all undergraduate and graduate students undertaking a research project. The competition invites students to showcase their ongoing (or potential) research project in a brief and creative one-minute video presentation.

Competition winners:
Yahan Yang, Nutritional Sciences (Undergraduate)
Shocking Secret on High Sodium Foods: Relationship Between Sodium and Price

Ellen Langille, Molecular Genetics (Graduate)
Identification of Tumor Suppressor Genes in a Mouse Model of Breast Cancer

GLSE Recruitment Student Group
Graduate and Life Sciences Education Recruitment Student Group was established September 2016, which is a group of 15 undergraduate and graduate student volunteers for a yearlong commitment. Group members will deliver outreach recruitment activities to educate undergraduate students about the summer research opportunities and graduate programs (MSc & PhD) available throughout the Faculty of Medicine. Each volunteer should have 5 goals they would like to achieve after this experience. Students will received a Co-curricular record.

Graduate Education

1. Creating Mentorship Impact: Graduate Student Mentorship Program

This program, in partnership with Dr. Nana Lee, has the Director of Mentorship & GPD improve graduate mentorship at the Faculty of Medicine. We realized that almost all departments have been running a mentorship program for mentees in year 1 and 2 to be mentored by a PhD graduate student in years 3, 4, or 5. The program aims to give mentees an opportunity to appreciate the innovative research conducted in the Faculty of Medicine and learn from senior colleague's perspective in graduate life and developing as a whole scientist and career preparation. Therefore, Dr. Nana Lee will share best practices of mentorship programming with other departments and student associations so we can all learn from each other. There are three seminars as follows: September 18, 2018 at 1:00pm-2:00pm, 2:00pm-3:00pm and October 5, 2018 at 1:00pm-2:00pm

2. Establishing Best Practices for Graduate Supervisors Aimed at Reducing Time to Completion (TTC): A Faculty Development Program

To optimize supervisory mentorship in graduate student research progress and professional development aimed at reducing times to completion.

Target Audience:
1) Faculty who currently have or are planning to train graduate students.
2) Faculty who are interested in establishing their own graduate professional development workshop series, course, or program for their department.

This Innovative Graduate Faculty Development Program is being coordinated by Dr. Nana Lee, GLSE's Director of Mentorship and GPD, Director of Graduate Professional Development. She is also a Co-Author of Success After Graduate School 2016 with Dr. Reinhart Reithmeier.

Topics:
Mentorship Matters
Best Practices in Reducing Times to Completion
Tools for Student Engagement

Conflict Management and Student Wellness
Entrepreneurship
Highlights of Graduate Professional Development (GPD) in One Workshop

3. Graduate Awards

a) Faculty of Medicine (FoM) OSOTF, GSEF, PPEF, Departmental Endowed Awards and Expendable Awards

- 24 FoM-wide OSOTF, Expendable and Other Endowed Funds were adjudicated by the FoM Graduate Awards Committee chaired by the Vice Dean, Graduate and Life Sciences Education (GLSE) in June and July 2017 with over $810,000 awarded to graduate students for the 2018-19 academic year.

- 259 OSOTF, GSEF, PPEF, Departmental Expendable and Endowed Funds with over $16.7 million was distributed to 20 graduate units and centres, 11 clinical departments, and 8 affiliated hospitals (total 39) for distribution for the 2018-19 academic year.

- A total of $3,650,735 University of Toronto Fellowships was distributed in May 2018 to 10 graduate units for 2018-19 graduate students funding.

- 68 QEII-GSST (49 doctoral-steam awards and 19 clinician/surgical-scientist trainee awards) at $15,000 each were distributed for the 2018-19 academic year (total $1,020,000).

- $201,000.00 Doctoral Completion Award (DCA) has been allocated to 10 graduate units for 2018-19 academic year. The DCA is to support full-time PhD students who are beyond the funded cohort and within time-limit for the degree.

- $210,378 plus additional $648,484.00 (in lieu of the UTAPS program) was distributed to 5 graduate units with professional masters programs and 3 graduate units with course based masters in June 2018. Effective July 1, 2017, the Professional Master's programs (not including course based) in the Faculty of Medicine has phased out of the University Advanced Planning for Students (UTAPS) and transitioned to a divisionally managed program.

b) FoM GSEF Merit Scholarships for International Students

The Office of the Vice-Dean, GLSE, adjudicated the fourth year of merit-based scholarships valued at $5,000 each to international graduate students entering their second year of studies in 2018-19. Twenty scholarships were awarded.

c) External Studentships

Over 20 graduate studentships, including CIHR CGS D and other external doctoral research awards are paid through GLSE via ROSI to doctoral-stream students with Principal Investigators affiliated with the Faculty of Medicine.

d) Graduate Faculty Teaching Awards

The Graduate Faculty Teaching Award Competition deadline will be December 3, 2018. Six awards will be adjudicated by the FoM Graduate Awards Committee in three categories:

- Early Career Excellence in Graduate Teaching & Mentorship
- Mid-Career Excellence in Graduate Teaching & Mentorship
- Sustained Excellence in Graduate Teaching & Mentorship

Each awardee will receive a framed certificate and $1,000 cash prize.

e) Postdoctoral Fellowships

The FoM Postdoctoral Fellowships Review Committee adjudicated the 2018 Banting Postdoctoral Fellowships in early-August 2018 and forwarded nominations to the University for submission to the CIHR and NSERC agencies for nation-wide review. Each Fellowship is worth $70,000 per year for two years. The Vanier-Banting Secretariat will notify applicants of the results of their application in February 2019.

f) JJ Berry Smith Doctoral Supervision Award: Honorable Mentions

The JJ Berry Smith Doctoral Supervision Award recognizes outstanding performance in the multiple roles associated with doctoral (PhD) supervision in the University of Toronto. Two awards are offered annually, one in the Humanities and Social Sciences and one in the Physical and Life Sciences. The FoM Graduate Awards Committee reviewed 3 applications and forwarded 2 nominations, Dr. Dina Brooks (Rehabilitation Sciences Institute; Physical Therapy) and Dr. Ori Rotstein (Institute of Medical Science) to the Dean of Graduate Studies and Vice-Provost, Graduate Education. Dr. Rotstein was selected by the School of Graduate Studies this year and was acknowledged for his outstanding contribution to the doctoral supervision and graduate education in the Faculty of Medicine at the Governor General's Gold Medals and the JJ Berry Smith Doctoral Supervision Award Reception on May 29, 2018. Dr. Rotstein is Faculty of Medicine's third winner following Dr. Eleftherios Diamandis and Dr. Brenda Andrews (inaugural winner in 2012).

4. Curricular Changes 2017/2018

a) Follow-up: Expansion to UTM – Occupational Sciences and Occupational Therapy

As of September 4, 2018, 40 new graduate students in the Master of Science in Occupational Therapy (MScOT) have started their program at the Terrence Donnelly Health Sciences Complex at UTM.

b) New Professional Masters Program: MHSc in Medical Physiology

The external review for this new proposed professional graduate program was successfully completed in the Spring and has started the governance process this Fall. This one year, three term program is scheduled to start Fall 2019 with approximately 15 students with an anticipated growth in three years to 40 students.

c) Summary of Minor Modifications for 2017/18

Type of Curricular Change	Totals
New Courses	16
Changes in Existing Program Requirements	2
Change in Existing Courses	12
Other	30

5. Update on Graduate Initiatives 2017/2018

a) Online Course Evaluations

Graduate education in the Faculty of Medicine is designed to train our students to become thought leaders and critical thinkers to solve the biomedical challenges of the present and future. Across the 13 departments, this means the delivery of our curriculum goes beyond the traditional methods of didactic learning to utilize other means such as modular courses and blended course formats, to name a few. As a result, the depth and breadth of our programs remain the best in the province, country and around the world.

Unfortunately, this means that the majority of our graduate classes do not fit the framework used by the current Online Course Evaluations developed by the university, which was primarily built to evaluate large undergraduate courses. Our participation in a pilot study using this system last year revealed this reality. As a result, steps are being taking in consultation with the Vice Provost, Academic Program, and the Centre for Teaching, Innovation and Support to find a solution to fully implement a system to evaluate all graduate courses in the Faculty of Medicine

b) Graduate Supervisory Experience Taskforce (formally known as the Online Supervisor Evaluation Taskforce)

Over the summer, the Taskforce agreed to test the first iteration of the Graduate Supervisory Experience survey with the help of the students on the Taskforce. The Pre-Test survey was developed using the 2016 SGS Supervisory Guidelines and aligns well to the "General Characteristics of good supervisory practice" and "Role as Supervisor" as outlined in this document. The objective of this Pre-Test was to obtain student feedback, as the first step to wider consultation, on the quality of graduate supervision received in the 2017-2018 academic year. A small subset of currently registered research stream students were asked to complete the survey to test it for

clarity in questions, missing elements about supervision that the Taskforce should consider, review the data for potential misinterpretations/challenges in posing certain question (i.e. double barred questions, survey fatigue), as well as collecting feedback on its content and ease of completing. Currently the survey and the results of this pretest have been shared with Chairs for their feedback. Depending on these additional consultations, survey may be further revised.

Prior to collecting student and faculty feedback, the Taskforce consulted with Siobhan Nelson - Vice Provost, Academic Programs; Jean Robertson – Director of Human Resources, FOM; Sarah Gottlieb – Legal Counsel at FOM regarding quality assurance, faculty association/union issues and legal implications, respectively.

c) LOA Stipendiary Fund

This fund was established in Summer 2017 for research stream students who wish to take a Leave of Absence (LOA) due to health issues (i.e. physical and/or mental health challenges) which temporarily impairs a student's functioning in his/her graduate studies. Funding is available up to $5,000 per student for one term on a one-time only basis. To date, a total of 26 students have received this funding.

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6. Graduate Applications, Offers and Admissions

For the upcoming academic year, preliminary numbers indicate an 18% increase in the number of PhD applications in the Faculty of Medicine. This is likely due to at least 2 factors: the University's initiative to lower PhD International tuition fees to align with the PhD Domestic tuition fees (i.e. approximately $8,400) and the university's commitment to become a global leader in education. Similarly, MSc International applications were up by 15% compared to last year.

Domestic applications, admission and acceptance rates remain the same as last year.

7. Establishment of On-Location Counselors for Graduate Students at the Faculty of Medicine

With the generous funding by the Provost across the university for student mental health, effective Fall 2018, the Faculty of Medicine will have two embedded counselors to provide confidential wellness counselling to our graduate students across all 13 graduate units. This is in addition to the counselling services available at the School of Graduate Studies and the Health and Wellness Office at the Koffler Centre.

The on-site counsellors will provide confidential wellness counselling to students by taking a brief counselling approach that is focussed on strengths, resiliency, and skills-building (non-pathological and destigmatizing. The on-location counselling service is primarily for non-urgent issues but in the event more severe or complex issues arise, these students will be counselled to contact the central clinic at Koffler Centre. Furthermore, workshops, groups and drop-in services will be developed to meet specific needs of specific student population.

One of the counselors, Saretta Herman, will be located in the Medical Science Building and, Laurie Coleman, will have an office at 500 University. Students will be able to access services at both locations since many of our student are both on the St. George Campus and at one of the fully affiliated hospitals or research institutes on University Ave.

UNIVERSITY OF TORONTO
FACULTY OF MEDICINE

Academic Strategic Plan 2018-2023
Leadership in advancing new knowledge, better health and equity

Overview

The Faculty of Medicine at the University of Toronto has a deep history of global leadership in all aspects of its work – from discovery science and ground-breaking innovation to preparing expert physicians, rehabilitation professionals and researchers. The Faculty is known for: developing graduates who lead in their fields; attracting powerhouse scientists; fostering interdisciplinary research and learning; an unprecedented network of integrated academic and clinical sites; and access to one of the most diverse populations in the world.

With this unique breadth, depth and strength, developing a strategy for the next five years was about examining and articulating the impact that the Faculty of Medicine is having on the world, and identifying how it can fully live into its possibilities.

In early 2018, the Faculty held a series of engagement sessions to bring together diverse voices to explore high level strategic questions: How do we fully enable the "Toronto Advantage" – our unparalleled resources and strengths – to make a difference in the world? How do we anticipate what the world will need from our graduates and ensure they are poised to lead and create change in an increasingly complex world? And with our unique resources, where should we be focusing our provincial, national and global leadership?

These conversations included more than 400 faculty, learners, staff, academic and clinical partners, innovation leaders and patients and focused on the full scope of the Faculty of Medicine – Rehabilitation Sciences, Basic Sciences and Clinical sectors encompassing all aspects of teaching, research and administration.

Among the multiple strengths for the Faculty, the community continually pointed to an openness to collaboration, ranging from interdisciplinary research and interprofessional learning to the Faculty's ability to connect diverse clinical sites through the TAHSN network. This openness to collaboration was matched by a perceived valuing of equity and inclusion, and a deep desire to fully enable diversity in all aspects of our work. This means bring people together from across different disciplines and professions, but also ensuring we reflect the multitude of identities present at U of T and in the population of the Greater Toronto Area. Finally, the engagement sessions revealed a thirst to take the potential for innovation within the Faculty to a new level.

Throughout the planning process it became clear that the Faculty of Medicine is well established in all of its realms for ground-breaking research and innovation, leading approaches to teaching, meaningful relationships with clinical sites and economic sustainability. At the same time, there is a high desire to take on even greater leadership on some of the biggest health, science and equity issues, including Indigenous health, partnering to improve clinical care and ramping up the impact of its research and innovation, through meaningful translation to clinical practice and through commercialization.

Over the next few years, the primary strategic need is not to invent new elements for the Faculty, but to amplify the impact of what it is already achieving. This amplification should be focused on a fusion of what currently exists, to more fully share knowledge and resources across the Faculty, University and TAHSN network, and to expand international partnerships and impact. There is a need to actively incentivize and shape collaboration, cross-pollination and new ideas through process and support. Finally, a need was identified to bring the Faculty's focus on diversity and wellbeing to a new dimension, recognizing that excellence is not possible without equity, diversity and a thriving human environment. We cannot equip the next generation nor address the most difficult scientific and health questions without bringing the full force of multiple perspectives to bear.

Engagement Process

This strategy was developed through broad consultations, beginning with the engagement of a Strategic Planning Steering Committee made up of representatives from leaders in Clinical Medicine, Rehabilitation Sciences, Basic Sciences, students, and partners from the Toronto Academic Health Science Network. This group helped to identify topics of inquiry and key targets for our initial stakeholder consultation.

Between January and March of 2018, we hosted 14 focus groups with existing committees and teams from across the Faculty of Medicine, and members of the Steering Committee reached out to key partners from across our network and into the international community of academic health science institutions to gather input and perspectives about how the University of Toronto is perceived today and what we need to pay attention to as we plan for the next 10-15 years. In total, more than 400 people were consulted.

The initial consultation informed the creation of six big strategic topics that needed further exploration:

1. Preparing the Health Sciences Leaders of the Future
2. Strengthening Collaborative Research and Research Pathways
3. Healthy Organization/Belonging and Wellness
4. Our Focus as a Leader
5. Enabling Thriving Innovation
6. University/Health Sciences Centre Collaborations

These topics were each explored in half-day intensive strategy sessions that brought together leaders from across the Faculty and TASHN, faculty, staff, students and key partners to explore possible priority areas of focus in each of these domains. The results of these rich and meaningful conversations were consolidated to create a guiding vision for the Faculty of Medicine, three strategic domains of focus and two enabling elements.

*These aspirations came together in a **guiding vision** for the Faculty of Medicine:*

Our learners, graduates, faculty, staff and partners will be an unparalleled force for new knowledge, better health and equity.

We will cultivate and bring to life ideas that impact scholarship and society through unprecedented collaboration drawing in the diverse voices of our research, learning and clinical network.

This vision will be realized through action in five areas:

3 Strategic Domains of Focus:

***Ecosystem of Collaboration**: Promote, incentivize and support a new level of collaboration among our faculty, staff, learners, academic health science partners and our community that fuses the diverse strengths of our network and creates new possibilities for research, education and solutions for better health in our communities. Everything we do will set us up for exponential impact that draws on the diverse voices in our unparalleled research, learning and clinical network.*

***Groundbreaking Imagination**: Amplify our discoveries and academic excellence, escalate the real-world impact of our research and teaching and make space for novel collaborations that produce the extraordinary. We will cultivate and bring to life ideas that impact scholarship and society.*

***Excellence through Equity:** Make inclusion and equity essential components of how we define and foster excellence in scholarship, practice and health outcomes. Individuals across the Faculty of Medicine, regardless of how they identify, will be invited to have a voice and be empowered to effect change. Our environment will draw in and draw on our global outlook through diverse perspectives from a range of disciplines. Our graduates will be internationally recognized as a change force for equity.*

2 Enablers to support these domains:

***Support Health and Wellbeing in Everything We Do**: Foster a culture where health, wellbeing and resiliency are considered and integrated in all elements of our enterprise from the places we work, learn and conduct research to the opportunities people have to express their diverse needs.*

***Infrastructure, Policies and Technology that Compel Collaboration and Support Sustainability:** Create seamless flow of ideas and effective stewardship of resources within the Faculty of Medicine, across the University, across the TAHSN network and with other local, national and international partners to enhance our ability to collaborate and have collective sustainable impact.*

1. Ecosystem of Collaboration

Promote, incentivize and support a new level of collaboration among our faculty, staff, learners, academic health science partners and our community that fuses the diverse strengths of our network and creates new possibilities for research, education and solutions for better health in our communities. Everything we do will set us up for exponential impact that draws on the diverse voices in our unparalleled research, learning and clinical network.

Goals:

- Enable integration and collaboration opportunities across the Faculty of Medicine's sectors and educational portfolios
- Make robust collaboration rewarding and more seamless Faculty-wide, University-wide and city-wide
- Act as the catalyst and connector for addressing big questions in health and healthcare

Objectives:

- Create tools, resources and venues to enable easy sharing of existing research, innovation and scholarship across the Faculty and among our academic partners
- Investigate, design and implement incentives for meaningful collaboration across our academic health sciences network
- Elevate our teaching and student experience to embed expectations of collaboration in learning, clinical care and research
- Identify strategic topics where a city-wide effort provides obvious benefits and pilot a robust collaboration approach

Initial Priorities for Action:

- Build on successful models of large-scale data-driven projects (e.g. UTOPIAN, Gemini) to create new opportunities for collaboration with data sciences
- Engage in Master Planning process to identify gaps, avoid duplication and create transformational environments to meet the Faculty's future needs for collaborative learning and research across all sectors and programs
- Optimize our learning environments to deepen the integration of wellness, respect and resilience
- Develop and integrate programs to promote the highest standards of research integrity and other professional values that align with the University and TAHSN partners
- Enhance shared processes, agreements and contracts across TAHSN to catalyze collaborative research and learning (e.g. Indirect costs, major infrastructure, data management)
- Explore strategic joint-fundraising initiatives with hospital partners for aligned and shared priorities that maximize donor impact

2. Groundbreaking Imagination

Amplify our discoveries and academic excellence, escalate the real-world impact of our research and teaching and make space for novel collaborations that produce the extraordinary. We will cultivate and bring to life ideas that impact scholarship and society.

Goals:

- Actively promote an environment where world-leading fundamental research and novel ideas have the highest potential to thrive
- Build infrastructure and opportunities that drive learning across disciplines, fields and perspectives
- Link existing incubators and entrepreneurship programs to advance and translate knowledge into positive benefits for our communities
- Foster an environment and support system where innovation activities, entrepreneurship, commercialization and risk-taking are rewarded

Objectives:

- Leverage the University's position as a hub to remove barriers and stimulate interdisciplinary research and collaboration within and beyond the Faculty of Medicine
- Foster passion for research among students and trainees to strengthen future generations of clinician-scientists
- Give students the tools to create successful career pathways
- Create better links to existing supports for entrepreneurship and bridge identified gaps including education and certificate opportunities

Initial Priorities for Action:

- Build capacity to reflect the emerging role of artificial intelligence in health professions
- Develop a pipeline for research and innovation leadership in the Faculty through training and faculty development (e.g. creating a Research-Entrepreneur-in-Residence pilot program)
- Stimulate interdisciplinary research and collaboration across the Faculty and TAHSN (e.g. through novel seeding funding grants, expanding citywide Rounds and developing an annual summit on innovation and collaboration)
- Explore novel digital platforms to enhance educational and research opportunities
- Increase rehabilitation research and clinical capacity to address burgeoning demographic needs

3. Excellence through Equity

Make inclusion and equity essential components of how we define and foster excellence in scholarship, practice and health outcomes. Individuals across the Faculty of Medicine, regardless of how they identify, will be invited to have a voice and be empowered to effect change. Our environment will draw in and draw on our global outlook through diverse perspectives from a range of disciplines. Our graduates will be internationally recognized as a change force for equity.

Goals:

- Create a community of leaders across the Faculty of Medicine that is held accountable to advance equity, diversity and inclusion
- Empower students and graduates as leaders who will effect positive change and drive health equity
- Build world-leading scholarship around equity and inclusion
- Transform our Faculty to be fully inclusive of the communities that we serve
- Actively draw in diverse voices and perspectives to elevate our work in scholarship, practice and health equity

Objectives:

- Embed principles of equity and inclusion into curricula and teaching across the Faculty to create a safe and healthy learning environment for all
- Work with central University partners to ensure education, outreach and resources are provided to strengthen equity mechanisms, and to hold leaders accountable for supporting inclusion
- Maximize opportunities for qualified learners from diverse backgrounds to gain admission to all programs in the Faculty
- Partner with Indigenous communities, patients and across TAHSN to deliver on the recommendations of the Truth and Reconciliation Commission
- Create interdisciplinary structures that draw in and draw on diverse voices around key education and research questions

Initial Priorities for Action:

- Create and resource a comprehensive equity, diversity and inclusion plan, including a review of current resources across the Faculty, development of interdisciplinary programs, and expansion of the “We All Belong” campaign
- Review and clarify policies, procedures, reporting processes and best practices in communication with respect to intimidation, discrimination and harassment, and improve alignment across the Faculty.
- Expand the mandate of the Office of Indigenous Medical Education to support learners, faculty and staff across the Faculty, identifying appropriate resources and Indigenous leadership
- Expand our Diversity Mentorship Program beyond first- and second-year MD program learners
- Foster principles-based international partnerships that recognize and build on Faculty investments and strategic priorities

Enabler 1: <u>Support Health and Wellbeing in Everything We Do</u>

Foster a culture where health, wellbeing and resiliency are considered and integrated in all elements of our enterprise from the places we work, learn and conduct research to the opportunities people have to express their diverse needs.

Objectives:

- Develop a leadership role and comprehensive strategy to advance health, wellbeing and resiliency across the Faculty, including a robust mentorship approach
- Build on comprehensive Faculty survey data to create a set of metrics and programs that support a culture of wellness
- Create tangible opportunities to reward professionalism and health-supporting behaviours from Faculty leaders
- Create a joint Faculty of Medicine/TAHSN shared equity and wellness initiative to support faculty, staff and learner health and wellbeing within the University and across teaching and research sites

Enabler 2: <u>Infrastructure, Policies and Technology that Compel Collaboration and Support Sustainability</u>

Create seamless flow of ideas and effective stewardship of resources within the Faculty of Medicine, across the University, across the TAHSN network and with other local, national and international partners to enhance our ability to collaborate and have collective sustainable impact.

Objectives:

- Eliminate “red tape” across the Faculty and beyond, to foster easy transfer of data, knowledge, resources and people to strengthen research, collaboration and learning
- Work with TAHSN partners to create unified strategies for information management for clinical and research data sharing, liability, health and safety, agreements and contracts
- Work with our partners to create TAHSN-wide enabling roles to take action on integrated approaches to structures, policies and incentives
- Align investments in technology and other infrastructure to support our strategic goals and the ongoing sustainability of our work

UNIVERSITY OF TORONTO
FACULTY OF MEDICINE

FOR APPROVAL

TO: Faculty Council

SPONSOR: Allan Kaplan, Vice-Dean, Graduate and Academic Affairs

CONTACT INFO: Rachel Zulla, Graduate Affairs Officer; 416-946-0412; rachel.zulla@utoronto.ca

DATE: October 15, 2018

AGENDA ITEM: **5.1**

ITEM OF BUSINESS: New Program Proposal, Master in Health Science in Medical Physiology

JURISDICTIONAL INFORMATION:

The University of Toronto Quality Assurance Process dictates that establishing a new program requires the approval of divisional and university governance. The By-laws of the Faculty of Medicine Faculty Council dictate that new program proposals are to be approved by the Executive Committee, Education Committee and Faculty Council. It is at the discretion of the Executive Committee to determine if this proposal is seen by the Research Committee.

GOVERNANCE PATH:

1. Executive Committee [For review] – September 5, 2018
2. Education Committee [For recommendation] – September 20, 2018
3. Faculty Council [For approval] – October 15, 2018

CONSULTATIVE PATH:

The proposal has been seen and approved by the following committee(s) at the Faculty of Medicine

- GLSE Graduate Curriculum Committee, August 20, 2018

HIGHLIGHTS:

This is a new professional Masters program with the intent to start September 2019.

PROPOSED MOTION

"THAT the proposal to establish a new MHSc program in Medical Physiology be approved as submitted."

University of Toronto
New Graduate Program Proposal

This template is for all proposals for new graduate programs. It will help to ensure that all evaluation criteria established by the Quality Council are addressed in bringing forward a proposal for a new program. Separate templates have been developed for other types of proposals.

Full Name of Proposed Program:	Master of Health Science in Medical Physiology
Degree Name and Short Form:	MHSc (Medical Physiology)
Program Name:	Medical Physiology
Professional Program	Yes
Unit (if applicable) offering the program:	Department of Physiology
Faculty / Division:	Medicine/ Division 4
Dean's Office Contact:	Dr. Allan Kaplan, Vice-Dean, Graduate and Academic Affairs, Faculty of Medicine
Proponent:	Dr. Graham Collingridge, Chair, Dept. of Physiology Dr. Helen Miliotis, Dept. of Physiology Dr. Alison Buchan, Dept. of Physiology
Version Date*:*	September 21, 2018

New Graduate Program Proposal

MHSC in Medical Physiology
Department of Physiology
Division 4

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1 Summary

Please provide a brief overview of the proposed program summarizing many of the points found in more detail elsewhere in the proposal. (You may wish to complete this section last). This should include:

- *A short, clear description of what is being proposed (including the normal program length, the appropriateness of the degree designation and program name including whether the proposed program is a professional graduate program or not; expected numbers of students)*
- *The academic rationale for the program (i.e. why this program)*
- *The impetus for the program's development*
- *Any distinctive elements*

The discipline of Physiology is at the core of understanding the biological basis of health and the causes of disease. By integrating information on the behaviour of single cells, entire organs (e.g. heart, pancreas) and the integrated organ systems/intact body, physiologists are able to establish how changes at the microscopic level (e.g. products of individual and gene-cluster mutations) and at a macro level (i.e. activity and diet) affect the function of an individual. The proposed Masters in Health Science (MHSc) in Medical Physiology represents an innovative and relevant alternative to pursue graduate education in Physiology with an explicit focus on the physiology relevant to medicine and human health.

The intent of the new professional MHSc in Medical Physiology is to address the need for graduates who will take existing physiological knowledge concerning human health and put it into practice. The application of the knowledge can be in direct health care delivery or in an industry related to medical sciences. The courses are designed with an emphasis on combining a high-level understanding of how an individual's health is a consequence of societal and environmental factors (e.g. level of activity and diet), integrated with the daily interplay between their organ and cellular physiology. To manipulate the interaction between the macro and micro elements to promote human health and prevent disease, it requires the integration of multiple sets of physiological data on cellular, whole body and societal behaviours in healthy individuals and those with pre-existing diseases. Two of the new courses developed for this proposed program are designed specifically to address these requirements: Clinical Physiology and Big Data and Health. Both of these courses are unique to the Department of Physiology.

The proposed professional Masters Program has been developed to address a gap in the current graduate education offerings of the department. While we offer original research, bench science focused graduate MSc and PhD degrees, there is no professional course-based degree program for students interested in the implementation of newly discovered physiological knowledge relevant to human health.

The existing, highly competitive, MSc and PhD degrees focus on educating students to be experimentalists who design and complete original research projects. The focus of these

degrees is to prepare the students for careers as research scientists in either academic or industrial settings. These research-focused students will continue the innovation tradition established in the Department of Physiology over a 100 years ago. By expanding and implementing their scientific intuition and curiosity, they are following in the footsteps of Banting and Best, the discovers of insulin.

The program will be full-time for 3 terms with one point of entry each September, and an anticipated admission of 40 students (including 10 – 20% International students) at steady state. The curriculum is mainly course-based with 3.5 FCE required courses, 1.0 FCE Practicum and 1.5 FCE of electives to provide students with the flexibility to explore one of four areas: General Physiology; Endocrine and Reproductive Sciences; Cardiovascular, Respiratory and Renal Sciences (Integrative Sciences); and Brain and Behaviour (Neurosciences). The program will combine new and existing graduate level physiology courses, with a mentored literature review report, and a practicum in the final term to allow students to explore how human physiology is integrated and applied in different work environments. This practicum can be undertaken in basic and clinical research laboratories, entrepreneurial environments, biotechnology companies, and healthcare delivery organizations.

The degree represents an innovative and relevant alternative to pursue graduate education in Physiology with an explicit focus on human physiology. The rapid expansion in the bio-sciences workforce in Ontario (https://www.jobbank.gc.ca/content_pieces-eng.do?cid=9743) demonstrates the need to graduate additional students who can fill the positions in medical services and biotechnology industries without having to go outside of the province or country for training. Our program will be the first of its kind in Canada and will join several elite institutions in United States and United Kingdom.

2 Effective Date

Anticipated date students will start the program - September 2019

3 Program Rationale

- *Identify what is being proposed and provide an academic rationale for the proposed program (What is being created and why?)*
    - *Describe the mode of delivery of the program if distinctive (including blended or online; placement etc.) and explain why this is appropriate.*
    - *Include how the program addresses the current state of the discipline or area of study. (Identify pedagogical and other issues giving rise to the creation of this program. Where appropriate speak to changes in the area of study or student needs that may have given rise to this development)*

- *Include (you may wish to use titles as headings) :*
    - *Appropriateness of degree nomenclature and program name with reference to norms in the field and clarity.*
    - *Distinctiveness*
        - *Identify any innovative or distinguishing aspects of the proposed program*
        - *Briefly, place this program within the context of programs being offered by other universities in North America and Internationally. How is the proposed program similar to or different from existing programs at the U of T (as appropriate)?*
    - *Describe the consistency of the program with the University's mission and graduate unit/divisional academic plan and priorities*

Rationale for the Program

The Masters of Health Science designation was chosen to reflect the professional nature of the program. It will be a course-based program designed to provide both in-depth knowledge of physiology in one of four areas. It will also enable students to develop the skills required to understand and analyze complex physiological systems to derive an effective health intervention and a practical experience in a health-related field of the student's choice. The degree will focus on developing three specific skill sets:

1) the ability to critically review and assess the relevance of new physiological discoveries to human health and wellbeing,
2) the ability to accurately predict which of these new discoveries will have a direct impact on human health, and
3) the ability to successfully design interventions using new knowledge to address specific health needs.

The program is a blend of traditional graduate courses currently offered in the research focused M.Sc. and Ph.D. degree programs, and five new courses specifically designed with the professional masters degree in mind. The new courses are focused on developing the skills and knowledge required to integrate multi-level physiological data sets and define their relevance to human health and develop the interpersonal skills to work as part of large teams.

With the advent of "big-science" in human bio-sciences, there has been a significant increase in large, multi-investigator teams and with groups of 20 – 50 individuals working on related "wicked" problems in health. "Wicked" problems refer to those challenges that are caused by multi-factorial changes and have not been successfully addressed by individual investigator led teams. In order for "big-science" to be successful, the multi-investigator teams require individuals who can understand the high level (macro) context of the specific problem while also understanding the specific research areas of the individual team members (micro) and how the research from the individual team members can be integrated to address the health challenge. These individuals act as project managers. Our students will be able to undertake this role.

Positioning the Degree Program in the Environment

In the new era of data-driven health decision making, it is becoming increasingly common for health care professionals, pharmaceutical companies, patients and their families to rely on genomic data. The challenge with the shift to an emphasis on genomic traits to define specific treatments is that, in many instances, we have incomplete information on the underlying effects/risk of a given DNA mutation, let alone the effect of a combination of different mutations on the biology of an individual. The discipline of Physiology is ideally positioned to provide students with the required knowledge and skills to turn the genomic/cellular biology data into information that is relevant to clinical medicine and health care in general. In order to do this, our students will develop the critical skills and knowledge base required to understand and interpret complex physiological interactions and how changes in gene products affect human physiology and result in positive and negative health transitions.

Physiology at the University of Toronto is ranked #8 in the 2018 QS World Universities Ranking and ranked #7 in the 2017 Centre for World University Rankings. Furthermore, the proposed four streams available to the MHSc in Medical Physiology students were also ranked highly in the 2017 Centre for World University Rankings: #4 in Cardiac and Cardiovascular systems; # 3 in Peripheral Vascular Disease; #4 in Respiratory System; #3 in Gastroenterology & Hepatology; #5 in Developmental Biology; #4 in Endocrinology and Metabolism; #9 in Medical Informatics; #6 in Neurosciences. This data demonstrates that students will have access to world leaders in their areas of research interest to successfully complete their literature review project and practicum.

Health is not all about the genes. In a post-genomic era, new molecular, computational and micro-measurement techniques are revealing how our genomes and the environment interact to modify our biology and underpin health and contribute to disease development. Faculty in the Department of Physiology are utilizing this new wealth of complex biological information and integrating it with our existing understanding of bodily functions. For example, we can take data collected from heart monitors/wearables and show how changes in heart rate and electrical activity interplay with both cardiovascular health and obesity. One of the fastest growing job markets, according to the Government of Canada, is in the professional technical consulting industry (Professional, Technical, and Scientific Services: Ontario 2015-2017), with big data analytics as one of the main on-campus recruitment foci https://www.jobbank.gc.ca/content_pieces-eng.do?cid=9743 and http://www.businessbecause.com/news/mba-careers/3374/mba-jobs-market-is-booming-in-2015. Our graduates will be well-positioned to enter this growing employment sector.

Distinctiveness and Fit with the Faculty and University's Strategic Plans:

The proposed MHSc in Medical Physiology allows the department to renew and expand its graduate training offerings by providing an academic program designed to improve the career-readiness of graduates. This is also in-line with the increasing focus on translating new physiological findings into effective health interventions.

Faculty of Medicine's Taskforce on Innovation and Transformation in Graduate Education Report outlined an aspiration to develop graduate programs that reflect societal relevance and expand the future professional choices of the students. The MHSc in Medical Physiology is designed with this in mind and also aligns with the University's strategic focus of "Promoting healthy people, healthy communities and a healthy world."

The Faculty of Medicine's strategic plan outlines 3 areas of emphasis: Prepare, Discover and Partner. This degree delivers across all three areas:

- **Prepare:** the program will prepare students to succeed in the evidence-based, data rich environment of health professions and bio-sciences.
- **Discover:** the program will enable students to discriminate important new knowledge from the deluge of new information being published on a daily basis. It will also provide the student with an understanding of how to design interventions to address health challenges and apply new physiologically-based products in the market place.
- **Partner:** the program, with an emphasis on human health and team work, will enhance our students' ability to collaborate effectively and communicate with professionals and consumers alike.

The proposed program also aligns with President Gertler's emphasis of "Leveraging our Location." In an Autumn 2014 article written by Gertler, the University has collaborated

> *"with industrial, institutional and not-for-profit partners, including many local businesses and community-based organizations. As participants in these collaborations, our faculty and students are both the providers of new ideas and the beneficiaries. U of T faculty and students have created companies, jobs and entirely new industries. This has helped the city to reinvent itself continually over time. Indeed, producing well-educated graduates represents U of T's single biggest contribution to the Toronto region, to Ontario and to Canada."*

The MHSc in Medical Physiology encapsulates the essence of this strong relationship by merging the basic sciences with the advantage of local employers in health-related start-ups and innovation hubs (e.g. MaRS) to determine the best health intervention.

Programs that are most closely related to the MHSc in Medical Physiology are: the MHSc in Medical Genomics, Faculty of Medicine, which is focused on graduating individuals who will lead in the interpretation of genomic testing and the MHSc in Translational Research in the Health Sciences, Faculty of Medicine, which is focused on providing a general overview of translational practices in health sciences using a variety of approaches. These programs are focused on graduating students who can translate new information into action in a health care setting. However, these are two year programs as opposed to the proposed one year program length for the MHSc in Medical Physiology. The areas of emphasis of these programs are distinctly different from the focus of the MHSc in Medical Physiology (i.e. graduating students who have in-depth knowledge of physiology and understand how to implement new

physiological findings related to human health) and we do not expect competition between the programs for students.

In the **Canadian academic community**, the University of Windsor offers an MSc in Medical Biotechnology that can be completed in 16 months and involves the theory and practice in laboratory techniques, including business planning and entrepreneurship training. There is also a one year Masters in Biomedical Science run by the Ontario Veterinary College at the University of Guelph which is focused on veterinary medicine rather than human physiology.

Internationally there are only two comparable Applied/Clinical Physiology MSc degrees which are listed below:

Programs/University	**Program Length**	**Learning Objectives**
MSc in Molecular and Integrative Physiology, University of Michigan School of Medicine	1 year, Full-time	• Research and clinical careers • Includes a capstone project
MSc in Human and Applied Physiology, Kings College London	1 year, Full-time	• The original and foremost programme in human and applied physiology in the UK • Advanced theoretical and practical understanding of the functioning of the muscular, respiratory and cardiovascular systems, including the effects of extreme environmental conditions on whole-body physiology • Unique exposure to human physiology applied to aerospace and military medicine offered only by KCL • Training in a wide variety of relevant practical laboratory skills.

4 Fields/Concentrations [Optional]

- *Description of fields/concentrations, if any. (Please note: Graduate programs are not required to have fields/concentrations in order to highlight an area of strength or specialization within a program)*

N/A

5 Need and Demand

- *Provide a brief description of the need and demand for the proposed program focusing, as appropriate, on student interest, societal need, employment opportunities for prospective graduates, interest expressed by potential employers, professional associations, government agencies or policy bodies and how this has been determined.*
- *With specific reference to the impact on need and demand, describe how the proposed program relates to (is similar to or different from) existing programs offered by other universities in North America and Internationally (with specific reference to Canadian and Ontario examples). In doing this you may wish to append a table showing other programs.*

Student Demand

This degree program addresses an identified need from students who are looking for additional training in physiology relevant to human health. A survey of the career needs of undergraduate physiology students in 2015 identified the topic of 'Medical Physiology' as of the greatest interest. The MHSc in in Medical Physiology is designed with their comments and requests in mind.

The survey was circulated to the cohort of Physiology undergraduate specialists, majors and minors students (N = 1000) and 105 individuals responded. The majority of the students indicated that after completing their undergraduate degrees, approximately 80% intended to apply to a health professions program, 7% were interested in a business/other program, 2% in education and 12.5% were interested in a research/scientist career.

The respondents were specifically asked whether a one year graduate degree focused on expanding their knowledge of human health and how physiological knowledge is utilized in the health care environment would be of interest as a next step in their life-long learning. Please see Appendix C for a full report of this survey.

The following are a sample of quotations from students responding to the survey:

"I think this type of professional program in physiology will be popular with those who wish to gain practical applicable physiological knowledge before applying to medical professional schools. I wish this program had already been in place this year. I would have considered applying for it."

"I wish this program had been offered this year as I would have pursued this type of masters program that is course-based rather than research-based."

"This is an amazing idea, I wish you did this earlier."

Societal Need

The 2015 Life Sciences Ontario Sector report provided a detailed analysis of a vibrant community that generated in excess of $40 Billion in 2009. In Ontario, the Life Sciences sector is the third largest employer with 5,645 firms employing over 80,000 individuals. The sector is divided into 4 major segments: Agricultural, Drugs & Pharmaceuticals, Medical Device & Equipment, and Research, Testing & Medical Laboratories (www.lifesciencesontario.ca). A survey undertaken by BioTalent Canada identified management and leadership skills as the major talent gaps in the life sciences sector with 93.5% of companies identifying these skills as critical. The focus of the MHSc in Medical Physiology will provide graduates with the knowledge and skills set to immediately enter careers in three of the four segments: Drugs & Pharmaceuticals, Medical Device & Equipment and Research, Testing & Medical Laboratories.

The Department of Physiology surveyed of potential employers and recent alumni to explore the skills and knowledge gap that these graduates would fill, as well as identify future job opportunities. These findings will be summarized in a report that will be presented to the External Reviewers on March 29, 2018.

To be successful in a future health-related career, our students need critical thinking skills to be able to scan the literature of new knowledge in their area and understand how to extract those findings relevant to a given problem. Increasingly, the students will have to be able to deal with the results of "big data" whether the information is coming from genomic analysis, computer-assisted wearable devices or customers who are using advanced websearch engines. In order to address the remaining "Wicked" problems in medical sciences, multi-investigator teams are being created through programs such as the CIHR Strategy for Patient Oriented Research (SPOR). The members of these large teams can be located at a single institution or more commonly involve teams from multiple National and International institutions. The success of these large teams is largely dependent of the effectiveness of the leadership and presence of individuals who can act as project managers. These project managers need to be able to look after the logistics of large complex teams, while at the same time understanding the biological basis of the research. Our students will be able to undertake this role.

The proposed MHSc in Medical Physiology is designed to provide both the required professionalism training, an understanding of how to derive the evidence on which to base decisions on human health, while at the same time increasing the depth of knowledge of the student in their chosen physiological stream. By providing the students with this education we are preparing them for entry into the world of big-science projects in human health.

It is expected that students in this program will be interested in careers either as project managers in team science projects in biosciences laboratories/industrial settings, or establishing themselves as consultants to provide guidance to health professionals/public/patients on specific medical issues. There is an opportunity for individuals currently in the workforce to return to upgrade their skills and knowledge in health-related physiology. There is also the opportunity to attract international students,

especially those students currently in undergraduate science programs at the University of Toronto.

6 Enrolment

- *Please provide details regarding the anticipated in-take by year, reflecting the expected increases to reach steady-state. This table should reflect normal estimated program length. (Please adjust the table as necessary)*
- *Please provide an explanation of the numbers shown and their relation to the Faculty/Division's enrolment plan.*

At steady state, there will be a maximum of 40 students enrolled in a given year. This represents 25% of the total number of graduate students in the Department of Physiology and represents a key new area for the Department's educational mission.

Year of study	2019/20	2020/21	2021/22	2022/23	2023/24
Year 1	15	20	30	40	40
Total	**15**	**20**	**30**	**40**	**40**

7 Admission Requirements

- *Provide a formal statement of admissions requirements as they will appear in the calendar entry*
- *Indicate the undergraduate or master's programs from which students may be drawn*
- *Explain any admissions requirements that are above or in addition to the normal minimum requirements for a graduate program at this level (including higher GPA, specific knowledge or skills; additional language, portfolio, letters of intent, etc.)*
    - *How will they help to ensure students are successful?*
    - *How do they align with the learning outcomes established for the program?*

Minimum Admission Requirements

- Applicants are admitted under the General Regulations of the School of Graduate Studies. Applicants must also satisfy the Department of Physiology's additional admission requirements stated below.
- Admission is based on demonstrated exceptional scholarly achievement, using the following criteria:
    - a one page statement summarizing how this program will contribute to the advancement of the applicants' professional goals
    - curriculum vitae (CV)
    - 2 letters of reference.
- Applicants must have an appropriate bachelor degree (B.Sc. or B.A.) from a recognized university with an average of at least A- in the last two years of study. The students

must have completed at least third year level physiology or equivalent courses and a demonstrated interest in physiology.

- All potential students will be interviewed 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 Director to determine the fit with the program and student's goals. Furthermore, the interview will provide initial direction for the Program Director to identify appropriate practicum placements
- 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.

Other English proficiency tests are acceptable. Please consult the website for departmental standards.

8 Program Requirements

- *Please provide full Calendar entry including a formal program description as it will appear in the Calendar and program requirements including for any fields/concentrations.*
- *Describe in your own words how the program is structured and is intended to function with particular reference to how the requirements and structure of the program are appropriate to the learning outcomes. (Note that the specific Learning Outcomes and the elements that support them are outlined below.)*
- *As an Appendix, please provide a full list of all courses including course numbers, titles, and descriptions. Please indicate clearly whether they are new/existing. (Please note that new courses need to be proposed and approved separately.)*

Please refer to Appendix B

9 Program Description

- *(Section 6 focuses on academic requirements; this section focuses on the mechanics of the proposed program)*
- *Explain if the program will be offered on a full-time basis only or will also be offered part-time and if so why.*
- *What is the program length (for both full-time and part-time students)? Address how the program requirements can reasonably be completed within the proposed time period.*

- *Describe the mode of delivery of the program if distinctive (including blended or online; placement etc.) and how it is appropriate to support students in achieving the learning outcomes of the program.*
- *Describe how any distinctive elements of the curriculum (e.g., Internships, etc.) will be administered.*
- *For research-focused graduate programs, provide a clear indication of the nature and suitability of the major research requirements for degree completion*
- *Please include the standard text which has been inserted in the box*
- *Describe how the program structure and delivery methods reflect universal design principles and/or how the potential need to provide mental or physical health accommodations has been considered in the development of this program.*

The Department of Physiology Professional Masters Degree is a full-time 3 term program (1 year, 6.0 FCE) and will provide graduates with advanced knowledge in medical physiology relevant to human health. This program is intended for those individuals who would benefit from more advanced training in medical physiology for potential careers in industry, teaching and consultancies.

The Professional Masters program in Medical Physiology will consist of a total of 6.0 FCE courses at the graduate level. The course-based component (5.0 FCE) will occur in the Fall and Winter sessions (September – April) with the final 1.0 FCE comprising the Practicum. Students will enter the program as a unified cohort each year and will progress through each of the required courses together. In the event the student cannot complete courses within the program timeframe of 1 year due to physical/mental health issues, accommodations for program extensions will be made but done on a case by case basis.

The graduate courses are clustered into three sections. The first section comprises of courses that will develop and expand the students advanced knowledge of current areas of human physiology. These are Clinical Physiology course where the students will interact with specialists from a number of clinical disciplines (PSL 4030H, 0.5 FCE); a big data in health course where students will engage in a hands-on analysis of existing large data sets relevant to human physiology (Big Data and Health, PSL 4040H, 0.5 FCE); and a Collaboration and Commercialization in Physiology course where the students will acquire the skills to build collaborative teams, identify new discoveries that can be translated into products/interventions relevant to human health, and communicate their findings accurately and succinctly (PSL 4050H, 0.5 FCE).

The second section comprises of general courses focused on individual student development. As part of the Seminar and Professional Development course each student will create an Individual Development Plan (IDP) which will identify their career goals and how these are aligned with the program outcomes. The Seminar series will combine presentations from leaders in human physiology with team-based sessions where students will prepare and present presentations based on their Critical Literature review (Seminars and Professional

Development in Physiology, PSL 4000Y, 1.0 FCE). The mentored Critical Literature Review will develop the students' analytical skills to enable identification of valid new physiological knowledge that is relevant to advances in human health. The students will be required to develop a proposed intervention based on the new knowledge and communicate this in a written review and the short seminar in the PSL 4000Y course. The students will take 1.5 FCE in courses from the existing topic specific Physiology graduate offerings, the topics will be selected based on the individuals' area of interest.

The final component is a practicum (1.0 FCE, PSL 4020H) that will be completed during the Summer session (May – August), where the student will gain hands-on skills in a potential career area of interest in which physiology principles are applied to real life scenarios. From the start, the applicant's statement of intent and the information gathered at the admission interview will help determine what initial placements to discuss with the student. The successful student will be approached again about their placement interest during the first term when they take PSL4000H. This course will teach students how to network within professional circles, write effective cover letters/resumes and develop interview skills in order to help them recognize the best practicum match. By this time, the student will be exposed to enough foundational knowledge and professional skills to make a better informed decision on their practicum placement. A final measure to ensure a student is in the appropriate practicum is through regular check-ins with the Program Director before the end of the first term of the program.

Three of the new courses developed specifically for the MHSc in Medical Physiology program will address important areas in human physiological sciences. In the Clinical Physiology course (PSL 4030H) led by Dr. S-S Bolz (a professor of physiology who originally trained as a neurosurgeon) students will interact with clinical specialists in areas such as cardiovascular, paediatric, reproductive, neurosciences and respiratory health. The lectures in this course are designed with a 20 – 30 min overview of the relevant clinical physiology followed by a 20 min question and answer period where students can drill down into specific areas of interest. The second course will involve the students in a hands-on exploration of large, biological data sets. In PSL4040H - Big Data and Health, led by Dr Brian Cox, the students will use established methods (machine learning and prediction) to analyze large datasets and interpret the data in the context of human health. Students can tailor their learning experience to one of three data types: 1) Genomics: assessing the impact of gene sequencing variations on human health, 2) Gene expression: evaluating changes in gene expression for biomarkers of illness and disease progression and, 3) Physiological and clinical data sets: examining existing data sets for predictors of disease (e.g. cardiac monitor data, blood pressure, family histories).

The third of the new core course is PSL4050H - Collaboration and Commercialization in Physiology, led by Dr. Denise Belsham. This new course will focus on how to bring discoveries to the market. Specifically, the course will provide practical examples on how to expand from an individual working alone to setting up strategic collaborations and assembling teams to address specific problems. Potential collaborative partnerships include academics, biotech companies, and government agencies. Students will understand the importance of a respectful

work environment and how to nurture successful partnerships. The course will provide examples of how to recognize the key characteristics of new basic science findings that are relevant to human health and demonstrate how to engage the partners required for further development of these findings. It will take students through the basics of how to develop a business plan, utilizing the expertise of faculty who have been successful in taking their research to market. And it will require students to think "outside the box" and generate novel strategies to take their own ideas derived from new knowledge to design an intervention for a human health challenge that will also address a Canadian economic target.

Complementing the three core courses are four areas: General Physiology; Endocrine and Reproductive Sciences; Cardiovascular, Respiratory and Renal Sciences (Integrative Sciences) and Brain & Behaviour (Neurosciences). In these streams the students will learn how to apply knowledge derived from new physiological discoveries rather than engaging in individual discovery orientated research. The students will focus on developing the critical analysis skills to identify, from the mountains of new information, those discoveries that are valid and relevant to a specific health-related problem.

The second group of courses (Mentored Literature Review, Seminar Series and Practicum) are designed to provide the students with training in analytical, communication and knowledge synthesis skills. The mentored critical literature review will cover assessing the validity of newly reported physiological sciences, how to prepare an accurate and informative summary report and to design an evidence-based health intervention using the new knowledge. The Seminar Series will combine seminars from experts in human physiology with a team-based approach to preparing the students' own short presentations of their Literature Review project. These presentations will be given to the course instructor and fellow students at the end of the course. Finally, in Term 3 the students will have the opportunity to complete a practicum in a relevant sector. The placements will range from start-up companies (e.g. TECHNA), big-science research programs (e.g. with the Banting and Best Diabetes Centre), health professionals offices, and health care organizations.

10 Degree Level Expectations, Program Learning Outcomes and Program Structure

- *Identify the specific Learning Outcomes for the proposed program for each of the DLEs and describe the elements in the program's requirements that support these.*

Table 1: Master's DLEs

MASTER'S DEGREE LEVEL EXPECTATIONS (based on the Ontario Council of Academic Vice Presidents (OCAV) DLEs)	MASTER'S PROGRAM LEARNING OBJECTIVES AND OUTCOMES	HOW THE PROGRAM DESIGN AND REQUIREMENTS SUPPORT THE ATTAINMENT OF STUDENT LEARNING OUTCOMES
EXPECTATIONS: ***This MHSc (Medical Physiology) is awarded to students who have demonstrated:*** a systematic understanding of physiology and how it is relevant to human health and disease. The program is designed to provide the student with the theoretical and practical skills to undertake critical analyses of relevant research; to understand how to implement relevant new knowledge, and to function successfully in team environments. These are transferrable skills necessary for their next stage of employment and/or education. Lastly, the student have to demonstrate the ability to accurately summarize information relevant to a complex problem and communicate their analysis via a comprehensive report and oral presentation to their peers.		
1. Depth and Breadth of Knowledge A systematic understanding of knowledge, and a critical awareness of current problems and/or new insights, much of which is at, or informed by, the forefront of the academic discipline, field of study, or area of professional practice.	Depth and breadth of knowledge is defined in MHSc (Medical Physiology) as an understanding of advanced systems physiology and how to use new physiological knowledge to effectively promote human health. There are two Learning Outcomes (LO) associated with this DLE namely: LO 1 Analyze and evaluate the validity of new physiological knowledge and its relevance to human health. LO 2 Integrate physiological information to determine those factors contributing to current societal health problems e.g. obesity and diabetes.	The program design and requirements that ensure these student outcomes for depth and breadth of knowledge are: PSL 4000Y *Seminars in Physiology & Professionalism:* this course provides a combination of seminars from experts in the field to provide the context for advances in physiology and team-based work to enhance the students' analytical skills. PSL 4100H *Clinical Physiology:* active clinicians in a variety of disciplines will interact with the students. The experts will provide a detailed overview of the current advances in their field and then engage the students in an interactive discussion session.
2. Research and Scholarship A conceptual understanding and methodological competence that i) Enables a working comprehension of how established techniques of	Research and Scholarship is defined in MHSc (Medical Physiology) as the ability of students to critically analyse the merit of published experimental data. To achieve this the students	The program design and requirements that ensure these student outcomes for research and scholarship are:

MASTER'S DEGREE LEVEL EXPECTATIONS (based on the Ontario Council of Academic Vice Presidents (OCAV) DLEs)	MASTER'S PROGRAM LEARNING OBJECTIVES AND OUTCOMES	HOW THE PROGRAM DESIGN AND REQUIREMENTS SUPPORT THE ATTAINMENT OF STUDENT LEARNING OUTCOMES
research and inquiry are used to create and interpret knowledge in the discipline; ii) Enables a critical evaluation of current research and advanced research and scholarship in the discipline or area of professional competence; and iii) Enables a treatment of complex issues and judgments based on established principles and techniques; and, on the basis of that competence, has shown at least one of the following: i) The development and support of a sustained argument in written form; or ii) Originality in the application of knowledge.	will have to understand the theoretical concepts behind the experimental design of physiological studies. Although they will not undertake research projects, the students will develop critical analysis skills and be able to assess current advances in physiology. The students will work through complex questions and reach evidence-based decisions. The MHSc will provide students with an understanding of how to critically assess big biological data sets and whether appropriate tests have been employed to answer a given question related to human health. There are two LO associated with this DLE: LO 3 Adapt and analyze big data sets to determine their relevance to human health and construct interventions based on this new knowledge. LO 4 Analyze and validate current experimental approaches to research in their area of concentration e.g. General; Endocrine & Reproductive; Integrative; Neuroscience.	LO 3 PSL 4040 Big data and Health (new). Students will have a hands-on experience (with expert guidance) in analyzing existing publically available big data sets, focusing on genomic and physiological factors. They will be capable of evaluating how these big data sets are changing our understanding of human physiology. LO 4: Each student will be able to select from graduate level advanced courses in their field of interest. The existing topic specific graduate courses provide examples and interactive discussion of current advances in the experimental design and data analysis relevant to the different physiological systems. The topic courses include; for General Physiology: PSL1040 systems biology; for Integrated Physiology PSL 1080 cardiovascular physiology; and for Endocrine Physiology PSL 1067 developmental physiology. LO 4 PSL 4010Y Literature Review project (new). The mentored Literature Review project will develop the analytical skills of the student. The student and mentor will identify a specific topic related to the student's interest and the mentor's area of expertise. The student will combine information gained from the relevant in-depth courses to identify potentially important new research. Working with the mentor the student will critically review the new evidence and assess the relevance to the chosen topic.

MASTER'S DEGREE LEVEL EXPECTATIONS (based on the Ontario Council of Academic Vice Presidents (OCAV) DLEs)	MASTER'S PROGRAM LEARNING OBJECTIVES AND OUTCOMES	HOW THE PROGRAM DESIGN AND REQUIREMENTS SUPPORT THE ATTAINMENT OF STUDENT LEARNING OUTCOMES
3. Application of Knowledge Competence in the research process by applying an existing body of knowledge in the critical analysis of a new question or of a specific problem or issue in a new setting.	Application of knowledge is defined in MHSc (Medical Physiology) an understanding of how to apply physiological knowledge to promote human health in health-care and related industries. There are three LO associated with this DLE: LO 5 Combine valid and experimentally sound newly published research evidence to address a given health-related problem. LO 6 Construct and virtually test an evidence-based health intervention. LO 7 Construct a pathway for product commercialization including how to support team-based collaborations.	The program design and requirements that ensure these student outcomes for application of knowledge are: LO 5 & 6 PSL 4010Y Literature review project (new). The mentored Literature Review project will enable the students to evaluate the relevance of new knowledge and how it can be implemented in a health care setting. Once the relevant evidence has been identified (LO5) an appropriate health intervention will be designed based on the new knowledge. L0 6 PSL 4020H The Practicum experience will provide an opportunity for students to directly experience how physiological knowledge is applied in their area of concentration. LO 7 PSL 4040H Collaboration & Commercialization in Physiology (new). Students will have hands on experience in how to patent new discoveries. The students will identify the collaborations necessary for success and construct a business plan to take new physiological discoveries to market.
4. Professional Capacity/Autonomy a. The qualities and transferable skills necessary for employment requiring i) The exercise of initiative and of personal responsibility and accountability; and ii) a. Decision-making in complex situations; b.	Professional Capacity/Autonomy is defined in MHSc (Medical Physiology) as the acquisition of transferrable skills the students will work through the ethical decision-making process in research, and recognize how responsibility and	The program design and requirements that ensure these student outcomes for professional capacity/autonomy are: LO 7 & 8 PSL 4050 Commercialization & Collaboration will develop the students' transferable skill in reaching out

MASTER'S DEGREE LEVEL EXPECTATIONS (based on the Ontario Council of Academic Vice Presidents (OCAV) DLEs)	MASTER'S PROGRAM LEARNING OBJECTIVES AND OUTCOMES	HOW THE PROGRAM DESIGN AND REQUIREMENTS SUPPORT THE ATTAINMENT OF STUDENT LEARNING OUTCOMES
The intellectual independence required for continuing professional development; c. The ethical behavior consistent with academic integrity and the use of appropriate guidelines and procedures for responsible conduct of research; and d. The ability to appreciate the broader implications of applying knowledge to particular contexts.	respect are key components of a successful career. There are two LO associated with this DLE: LO 8 Competency in understanding team dynamics and ability to work and lead teams. LO 9 Compliance with professional standards including responsible conduct of research; ethical review requirements and implications of unforeseen consequences to research projects.	and developing collaborations and working in teams. Students will work together in small teams and develop an understanding of team vs individual dynamics. The students will be exposed to examples of ethical vs unethical research and the consequences of non-professional behaviour. LO8 Professionalism in Seminar series LO 7 & 8 PSL 4020Y Practicum. This will provide students with a hands-on experience of professional physiological settings. Students will be exposed to team work in a real world setting with requirements for critical decision making, ethical behaviour and the importance of responsibility and respect.
5. Communications Skills The ability to communicate ideas, issues and conclusions clearly.	Communications Skills is defined in MHSc (Medical Physiology) as the ability to summarize current medical physiological findings in an audience specific manner. In addition to be able to communicate effectively in a team environment. There are two LO associated with this DLE: LO 10 Students should be capable of providing scientific presentations (written and oral) that are comprehensible to experts in the field and the lay public. LO 11 Students should be able to work effectively with colleagues from different backgrounds in a team setting.	The program design and requirements that ensure these student outcomes for communication skills are: LO 10 PSL4010H Literature review; and PSL4000Y Seminar and Professional Development. During the mentored literature review the students will create written reports and an oral presentation for the PSL4000Y course. LO 11 In the Commercialization and Collaboration course students will work in teams to devise product-specific commercialization strategies. In the PSL4020Y Practicum; students will work with existing teams in a real-world environment.

11 Assessment of Learning

- *Please describe the methods of evaluation for the various program requirements*
- *Describe how the methods for assessing student achievement are appropriate and effective relative to established program learning outcomes and degree level expectations (in other words, how will faculty be able to determine whether students have learned and can do what we expect them to by the end of the program)*
- *Describe how the effectiveness of the proposed program be assessed.*
- *How will the program document and demonstrate the level of performance of students' consistent with the University's DLEs*

Assessment of Learning:

Mechanisms for student evaluation:
Program coursework will include a variety of assessment modalities in which students will be required to their mastery of conceptual frameworks and ability to design physiological interventions based on their knowledge. The program is designed such that the compulsory courses combine to provide the necessary repetition and depth to ensure the students are fully engaged and stimulated throughout the program.

The evaluation of student learning will be undertaken by two main mechanisms, written and oral reports. The number of written reports required reflects in part the request of future employers, who indicated the increased need for their employees to be capable of providing accurate, succinct reports in a timely manner.

Learning Outcome	Quizzes & Examinations	Written Projects	Oral Presentation
LO 1 Analyze and evaluate the validity of new physiological knowledge and its relevance to human health.		Students will prepare an in-depth, written evidence-based report, presented in clear, well-structured, precise and succinct prose, capable of publication in a scholarly journal in PSL 4010Y	Students will be evaluated on their preparation and presentation of a short talk in PSL 4000H
LO 2 Integrate physiological information to determine those factors contributing to current societal health problems e.g. obesity and diabetes.		The students will be assessed on the caliber of weekly short reports (2 pages) on the previous weeks presentation of PSL 4030H	The students will be evaluated on the level of their engagement during the weekly discussion sessions in PSL 4030H.
LO 3 Adapt and analyze big data sets to determine their relevance to human health and construct interventions based on this new knowledge.		The students will evaluated on a written report on the results of their big-data analysis in PSL 4040	

LO 4 Analyze and validate current experimental approaches to research in their area of concentration e.g. General; Endocrine & Reproductive; Integrative; Neuroscience.	Each topic-specific course will set examinations that will determine the extent of the students' knowledge.		Students will be evaluated on their level of engagement in discussion sessions in the topic specific courses. Students will be evaluated on their performance during their practicum placement.
LO 5 Combine valid and experimentally sound newly published research evidence to address a given health-related problem.		Students will prepare an in-depth, written report capable of publication in a scholarly journal in PSL 4010Y	Students will be evaluated on their preparation and presentation of a short talk in PSL 4000H
LO 6 Construct and virtually test an evidence-based health intervention.		Students will prepare an in-depth, written report capable of publication in a scholarly journal in PSL 4010Y	Students will be evaluated on their preparation and presentation of a short talk in PSL 4000H
LO 7 Construct a pathway for product commercialization including how to support team-based collaborations.		The students will be assessed on the caliber of an in-depth report concerning product development in PSL 4040H	Students will be assessed on their abilities to function effectively in a team environment during their practicum placement.
LO 8 Competency in understanding team dynamics and ability to work and lead teams.		The students will be assessed on the caliber of weekly short reports (2 pages) on the previous weeks presentation of PSL 4000Yand PSL 4040H	Students will be evaluated on their level of engagement in discussion sessions in PSL 4040H.
LO 9 Compliance with professional standards including responsible conduct of research; ethical review requirements and implications of unforeseen consequences to research projects.		The students will be assessed on the caliber of weekly short reports (2 pages) on the previous weeks presentation of PSL 4000Yand PSL 4040H	Students will be evaluated on their level of engagement in discussion sessions in PSL 4040H.
LO 10 Students should be capable of providing scientific presentations (written and oral) that are comprehensible to experts in the field and the lay public.		The students will be assessed on the caliber of weekly short reports (2 pages) on the previous weeks presentation of PSL 4030H and PSL 4040H	Students will be evaluated on their preparation and presentation of short talks in PSL 4000Hand PSL 4040H Students will be assessed on the quality of reports prepared as part of their practicum.
LO 11 Students should be able to work effectively with colleagues from different backgrounds in a team setting.			Students will be evaluated on their level of engagement in discussion sessions in PSL 4000Y and PSL 4040H.

Evaluating the effectiveness of the MHSc in meeting the desired Learning Objectives: To understand whether the program is successfully meeting the needs of the students two approaches will be followed: firstly, all students will be provided with a questionnaire to

provide feedback on the effectiveness of the individual courses to meet their needs; and secondly, we will monitor the subsequent work placements of the students.

How will the program document and demonstrate the level of performance of students' consistent with the University's DLEs?
The MHSc in Medical Physiology will establish a Program Oversight Committee which will consist of the Program Director, key faculty and two of the external practicum site leaders. Its purpose will be to review student grades and student evaluation of courses to assess whether the program is meeting its objectives. This committee will meet at least twice a year to discuss the curriculum, specifically how to identify and address gaps in the curriculum, review the assessments of practicum placements, and identify program strengths and areas for improvement.

The program has been designed to allow for flexibility in curriculum design to incorporate new knowledge in physiology, especially those concerning human health. This structured evaluation and course-planning approach will ensure that students are being provided with effective and relevant content.

The following metrics to measure the success of the program will be implemented:

1) Course Evaluations
All students will be provided with an anonymous course evaluation form to complete at the end of the course. Their responses to this will help guide subsequent revisions to the program.
2) Review of Grades and Quality of Assignments
This committee will meet two times a year to assess whether the learning outcomes of the courses delivered have been achieved by reviewing grades and the quality of assignments
3) Tracking Careers of Graduates
Once students have graduated from the program their subsequent job placements will be monitored.

12 Consultation

- *Describe the expected impact of what is being proposed on the nature and quality of other programs delivered by the unit/division*
- *Describe the expected impact of what is being proposed on programs being offered by other units/divisions*
- *Describe any consultation with the Deans of Faculties/Divisions that will be implicated or affected by the creation of the proposed program*

The initial concept of the MHSc was first raised in 2015 and involved exploratory discussions with the faculty and students across the distributed sites of the Department of Physiology with respect to the need for a professional MHSc. The response from both students and

faculty members was uniformly positive and the MHSc. in Medical Physiology is the result. The Department also interviewed individuals from local Life Sciences companies: Johnson & Johnson (Canada, R. Yu), Boehringer Ingelheim (Canada) Ltd (D. Qinn), and Merck Frosst Canada & Co (J-F. Richard). These individuals were supported of the proposed degree and help shaped the concepts behind the new degree courses, all three are potential sites for student practicums.

In the following two years additional discussions have taken place with Departments and Centres in the Faculty of Medicine and the Faculties of Arts & Science and Applied Science and Engineering.

We explored the potential need for individuals to co-ordinate and manage large, complex research projects in the health sciences with leaders of three major extra-Departmental units: the Banting and Best Diabetes Centre (Dr. G. Lewis) and the Lewar, Heart & Stroke Cardiovascular Centre (Dr. M. Farkouh) and the Institute for Biomaterials and Biomedical Engineering (Dr. C. Simmons). They are enthusiastic supporters of the proposal and their Centres would be ideal sites for student practicums. Discussions with the Institute of Medical Sciences (Dr. M-Y Liu) included the interaction between the proposed program and the existing MHSc in Translational Research in the Health Sciences that focuses on interdisciplinary collaborative research leading to innovations in bedside care. Dr. Liu was excited by the potential of the new degree and considered that the two MHSc programs will complement one another. We do not anticipate any competition for students as the target audiences are distinct. We also discussed the potential for the MHSc. in Medical Physiology to attract international students already studying at the UofT. Dr. Liu thinks that the degree will be highly attractive and increase the career prospects for these students.

The Department of Medicine is an enthusiastic supporter of the proposal and would be interested in hosting students for their practicums. Discussions with the Departments of Biochemistry, Immunology, Nutritional Sciences and Pharmacology & Toxicology were positive and in the future there may be an opportunity to share graduate courses (many of the Departments are specifically interested in the possibility of their students taking the Big Data & Health and Commercialization & Collaboration courses).

The Department has consulted with the Dean's offices in the following Faculties: Applied Science and Engineering, Arts and Sciences, Dalla Lana School of Public Health, Dentistry, Leslie Dan Faculty of Pharmacy and Rotman School of Management. In addition we have consulted with the Associate Vice-President International Partnerships (Dr. C. Yip) and the FoM Vice-Dean Graduate and Life Sciences Education (Dr. A. Kaplan). All parties are supportive of this proposal.

Units that may be affected - No other department has a Professional Masters Program with a medical physiology focus, thus it is the first of its kind at the university and would attract students with an interest in medical physiology and its applications.

Professional organizations relevant to this program area
In on-going consultations with hospital partners we have confirmed that the large Strategy for Patient-Oriented Research (SPOR) program grants awarded to FoM researchers would be sites for placements for students in the program, and that they are looking for individuals with project management and physiology backgrounds, and can accommodate the accepted number of placements.

13 Resources

- *Please be specific where this may impact significant enrolment agreements with the Faculty/Provost's Office.*
- *Indicate if the new program will affect any existing agreements with other institutions, or will require the creation of a new agreement to facilitate the major modification (e.g. Memorandum of Understanding, Memorandum of Agreement, etc.). Please consult with the Provost's Office (vp.academicprograms@utoronto.ca) regarding any implications to existing or new agreements.*

The Department of Physiology has an extensive number of faculty distributed across the St George campus and associated Toronto Academic Health Sciences Network. There are no implications for existing agreements.

The program will require a new 0.4 FTE Program Director (Dr H. Miliotis) starting July 2018 and a 0.5 FTE Program Manager starting Spring 2019 by the Department of Physiology.

The program will be housed in existing space on the 3rd floor of the Medical Sciences Building.

13.1 Faculty Complement

- *Complete Table 4 below*
- *Provide a brief commentary on:*
  - *the adequacy of the number and quality of Graduate faculty who will teach/supervise in the program*
  - *evidence that faculty have the recent research or professional/clinical expertise needed to sustain the program, promote innovation and foster an appropriate intellectual climate*
- *Provide the CVs of all faculty, as evidence substantiating the above. The Appendix should form a separate document with a table of contents and all CVs in alphabetical order. CVs should be submitted in a standardized format relevant to the proposed program field*

The Faculty
There are 5 faculty (Drs. Belsham, Bolz, Cox, Miliotis, and Wittnich) who will be responsible for delivering new courses specifically designed for the new degree. With the exception of Dr.

Miliotis, these are senior faculty with international recognition for their research excellence and extensive educational experience.

Senior physiology faculty who have had successful research careers, but are not able to support additional laboratory research focused graduate students, will participate by mentoring students in the Critical Literature review course PSL 4010Y. In addition, many of our cross-appointees with clinical and/or industry connections will contribute to the program in the Clinical Physiology course PSL4030H and provide sites for the Practicum PSL4020Y.

Challenges to complement
Our faculty are committed to the success of this new initiative as it serves to further develop outstanding curriculum and training and supports the Department financially.

Table 2: Faculty Complement (please list alphabetically)
This table covers only those faculty directly involved with the specific MHSc in Medical Physiology graduate courses and those teaching the topic-specific graduate courses. There are additional cross-appointed Clinical faculty who will be involved as needed in mentoring students in the Literature review course and providing practicums in laboratory management skills.

Name	**Home Department / Unit** *(who holds primary budgetary appointment)*	**University Rank**	**Graduate Faculty Status and graduate unit (PSL unless otherwise stated)**	**Commitment to other programs** *(please list other programs in which the person routinely teaches / supervises)*	**Nature of contribution to this program** *Course Instructor (CI), Mentor Critical Skill (MCS), Practicum Supervisor (PS).*
Tenured					
Belsham, D.	Physiology	Professor	Full	Primary supervision of PSL graduate students and teaching in PSL courses	**MHSc Advisory Committee** Mentor - Literature review PSL4010Y; Course director, PSL 4040H. **Topic specific courses**: PSL1034H course instructor; PSL1075H course instructor;

Name	**Home Department / Unit** *(who holds primary budgetary appointment)*	**University Rank**	**Graduate Faculty Status and graduate unit (PSL unless otherwise stated)**	**Commitment to other programs** *(please list other programs in which the person routinely teaches / supervises)*	**Nature of contribution to this program** *Course Instructor (CI), Mentor Critical Skill (MCS), Practicum Supervisor (PS).*
Bolz, S-S	Physiology	Professor	Full	Primary supervision of PSL graduate students and teaching in PSL courses	Mentor - Literature review PSL4010Y; Course Director PSL 4030H **Topic specific courses:** JCV3060H course director; JCV3064H course director;
Brubaker, P.L.	Physiology	Professor	Full	Primary supervision of PSL graduate students and teaching in PSL courses	**MHSc Advisory Committee**; Mentor - Literature review PSL4010Y **Topic specific course:** PSL1014H course director
Collingridge, G. *(Chair)*	Physiology	Professor	Full	Primary supervision of PSL graduate students and teaching in PSL courses	Mentor - Literature review PSL4010Y **Topic specific course:** PSL1050H course director; JYG1555H course instructor,
Cox, B.	Physiology	Assoc. Prof	Full	Primary supervision of PSL graduate students and teaching in PSL courses	**MHSc Advisory Committee;** PSL1080H course director; PSL1040H course instructor; PSL1067H course instructor; PSL 4010Y instructor; Course Director PSL 4040H, mentor Literature review PSL4010Y
Feng, Z.P	Physiology	Professor	Full	Primary supervision of PSL graduate students and teaching in PSL courses	Mentor - Literature review PSL4010Y **Topic Specific courses** PSL1026H course director;

Name	**Home Department / Unit** *(who holds primary budgetary appointment)*	**University Rank**	**Graduate Faculty Status and graduate unit (PSL unless otherwise stated)**	**Commitment to other programs** *(please list other programs in which the person routinely teaches / supervises)*	**Nature of contribution to this program** *Course Instructor (CI), Mentor Critical Skill (MCS), Practicum Supervisor (PS).*
					PSL1053H course director
Giacca, A.	Physiology	Professor	Full	Primary supervision of PSL graduate students and teaching in PSL courses	Mentor - Literature review PSL4010Y
Gramolini, A.	Physiology	Professor	Full	Primary supervision of PSL graduate students and teaching in PSL courses	**MHSc Advisory Committee**; PSL1040H course director; PSL1067H course instructor JCV3062 course instructor; Mentor - Literature review PSL4010Y
Heximer, S	Physiology	Assoc. Prof	Full	Primary supervision of PSL graduate students and teaching in PSL courses	JCV3063H course director; Mentor - Literature review PSL4010Y
Lambe, E.	Physiology	Assoc. Prof	Full	Primary supervision of PSL graduate students and teaching in PSL courses	PSL1026H course instructor; Mentor - Literature review PSL4010Y
Matthews S.G.	Physiology	Professor	Full	Primary supervision of PSL graduate students and teaching in PSL courses	Mentor - Literature review PSL4010Y

Name	**Home Department / Unit** *(who holds primary budgetary appointment)*	**University Rank**	**Graduate Faculty Status and graduate unit (PSL unless otherwise stated)**	**Commitment to other programs** *(please list other programs in which the person routinely teaches / supervises)*	**Nature of contribution to this program** *Course Instructor (CI), Mentor Critical Skill (MCS), Practicum Supervisor (PS).*
Miliotis, H	Physiology	Assist. Prof	Pending	Responsible for the operations and senior administrative duties for the MHSc in Medical Physiology	**Program Director, MHSc Advisory Committee**;
Tweed, D.	Physiology	Professor	Full	Primary supervision of PSL graduate students and teaching in PSL courses	PSL1071H course instructor
Watt, V.	Physiology	Assoc. Prof	Full	Primary supervision of PSL graduate students and teaching in PSL courses	Placement director Practicums PSL 4020Y
Wheeler, M.	Physiology	Professor	Full	Primary supervision of PSL graduate students and teaching in PSL courses	PSL1034H course director Mentor - Literature review PSL4010Y
Wittnich C.	Physiology	Professor	Full	Primary supervision of PSL graduate students and teaching in PSL courses	**MHSc Advisory Committee;** JCV1060H course director; JCV3061H course director; JCV3061H course instructor JCV3062H course director; PSL1086H course director & instructor; Course Director PSL4020Y; Mentor - Literature review PSL4010Y

Name	**Home Department / Unit** *(who holds primary budgetary appointment)*	**University Rank**	**Graduate Faculty Status and graduate unit (PSL unless otherwise stated)**	**Commitment to other programs** *(please list other programs in which the person routinely teaches / supervises)*	**Nature of contribution to this program** *Course Instructor (CI), Mentor Critical Skill (MCS), Practicum Supervisor (PS).*
Zhuo, M.	Physiology	Professor	Full	Primary supervision of PSL graduate students and teaching in PSL courses	PSL1068H course director
Others ***(please specify – i.e., Adjunct, status only, clinical faculty, visiting or other as per U of T definitions)***					
Bear, C. *(Primary Status-Only appointment)*	Physiology (primary status only)	Professor	Full	Supervises graduate students in PSL and IMS. Some teaching in PSL & primary department	PSL1048H course instructor; PSL1053H course instructor; Mentor - Literature review PSL4010Y
Belik, J. *(Primary Status-Only appointment)*	Paediatrics	Professor	Full	Supervises graduate students in PSL and IMS. Some teaching in PSL & primary department	PSL1067H course instructor, Mentor - Literature review PSL4010Y
Brown, T.J. *(Non-budgetary cross appointment)*	Ob/Gyn	Professor	Full	Supervises graduate students in PSL and IMS. Some teaching in PSL & primary department	**MHSc Advisory Committee**; PSL1020H course director; Mentor - Literature review PSL4010Y
Caniggia, I. *(Concurrent Status-Only appointment)*	Ob/Gyn	Professor	Full	Supervises graduate students in PSL and IMS. Some teaching in PSL & primary department	PSL1067H course director JCV1060H course instructor; Mentor - Literature review PSL4010Y

Name	**Home Department / Unit** *(who holds primary budgetary appointment)*	**University Rank**	**Graduate Faculty Status and graduate unit (PSL unless otherwise stated)**	**Commitment to other programs** *(please list other programs in which the person routinely teaches / supervises)*	**Nature of contribution to this program** *Course Instructor (CI), Mentor Critical Skill (MCS), Practicum Supervisor (PS).*
Carlen, P. *(*Main Status-Only appointment)*	Medicine	Professor	Full	Supervises graduate students in PSL and IMS. Some teaching in PSL & primary department	JNR144Y course instructor, Mentor - Literature review PSL4010Y
Hare, G. *(*Main Status-Only appointment)*	Anaesthesia	Professor	Full	Supervises graduate students in PSL and IMS. Some teaching in PSL & primary department	JCV3062H course instructor; Mentor - Literature review PSL4010Y
Horner, R. *(Non-budgetary cross appointment)*	Medicine	Professor	Full	Supervises graduate students in PSL and IMS. Some teaching in PSL & primary department	**MHSc Advisory Committee**; PSL1075H course director; Mentor - Literature review PSL4010Y
Jia, Z. *(Primary Status-Only appointment)*	HSC	Professor	Full	Supervises graduate students in PSL and IMS. Some teaching in PSL & primary department	JYG1555H course instructor; Mentor - Literature review PSL4010Y
Jin, T. *(Concurrent Status-Only appointment)*	Medicine	Professor	Full	Supervises graduate students in PSL and IMS. Some teaching in PSL & primary department	PSL1070H course director; Mentor - Literature review PSL4010Y
Jones, N. *(*Main Status-Only appointment)*	Paediatrics	Professor	Full	Supervises graduate students in PSL and IMS. Some teaching in PSL & primary department	PSL1014H course instructor; Mentor - Literature review PSL4010Y
Jurisicova, A. *(Concurrent Status-Only appointment)*	Ob/Gyn	Assoc. Prof	Full	Supervises graduate students in PSL and IMS. Some teaching in PSL & primary department	PSL1067H course director; PSL1040H course instructor; Mentor - Literature review PSL4010Y

Name	**Home Department / Unit** *(who holds primary budgetary appointment)*	**University Rank**	**Graduate Faculty Status and graduate unit (PSL unless otherwise stated)**	**Commitment to other programs** *(please list other programs in which the person routinely teaches / supervises)*	**Nature of contribution to this program** *Course Instructor (CI), Mentor Critical Skill (MCS), Practicum Supervisor (PS).*
Kavanagh, B. *(*Main Status-Only appointment)*	Anaesthesia	Professor	Full	Supervises graduate students in PSL and IMS. Some teaching in PSL & primary department	PSL1069H course director; Mentor - Literature review PSL4010Y
Liu, F. *(Concurrent Status-Only appointment)*	Psychiatry	Professor	Full	Supervises graduate students in PSL and IMS. Some teaching in PSL & primary department	PSL1068H course instructor; Mentor - Literature review PSL4010Y
Ng, Dominic *(*Main Status-Only appointment)*	Medicine	Assoc. Prof	Full	Supervises graduate students in PSL and IMS. Some teaching in PSL & primary department	PSL1070H course instructor; Mentor - Literature review PSL4010Y
Nostro, C. *(Primary Status-Only appointment)*	TGRI	Assist Prof	Associate	Supervises graduate students in PSL and IMS. Some teaching in PSL & primary department	PSL1048H course instructor; PSL1070H course instructor; Mentor - Literature review PSL4010Y
O'Brien, C. *(*Main Status-Only appointment)*	Surgery	Assist Prof	Associate	Supervises graduate students in PSL and IMS. Some teaching in PSL & primary department	PSL1014H course instructor; Mentor - Literature review PSL4010Y
Orser, B. *(*Main Status-Only appointment)*	Anaesthesia	Professor	Full	Supervises graduate students in PSL and IMS. Some teaching in PSL & primary department	**MHSc Advisory Committee**; PSL1075H course instructor; Mentor - Literature review PSL4010Y
Pausova, Z. *(Primary Status-Only appointment)*	HSC	Professor	Associate	Supervises graduate students in PSL and IMS. Some teaching in PSL & primary department	PSL1024H course director; Mentor - Literature review PSL4010Y

Name	**Home Department / Unit** *(who holds primary budgetary appointment)*	**University Rank**	**Graduate Faculty Status and graduate unit (PSL unless otherwise stated)**	**Commitment to other programs** *(please list other programs in which the person routinely teaches / supervises)*	**Nature of contribution to this program** *Course Instructor (CI), Mentor Critical Skill (MCS), Practicum Supervisor (PS).*
Post, M. *(Concurrent Status-Only appointment)*	Paediatrics	Professor	Full	Supervises graduate students in PSL and IMS. Some teaching in PSL & primary department	PSL1069H course director; PSL1067H course instructor; Mentor - Literature review PSL4010Y
Prescott, S. *(Primary Status-Only appointment)*	HSC	Assoc. Prof	Full	Supervises graduate students in PSL and IMS. Some teaching in PSL & primary department	PSL1053H course instructor; JYG1555H course instructor; PSL1047H course instructor; PSL1071H course instructor; Mentor - Literature review PSL4010Y
Rogers, I. *(Concurrent Status-Only appointment)*	Ob/Gyn	Assoc. Prof	Full	Supervises graduate students in PSL and IMS. Some teaching in PSL & primary department	PSL1067H course instructor; Mentor - Literature review PSL4010Y
Salter, M *(Primary Status-Only appointment)*	HSC	Professor	Full	Supervises graduate students in PSL and IMS. Some teaching in PSL & primary department	PSL1047H course director;
Skinner, F. *(Concurrent Status-Only appointment)*	Medicine	Professor	Full	Supervises graduate students in PSL and IMS. Some teaching in PSL & primary department	**MHSc Advisory Committee**; PSL1071H course director; Mentor - Literature review PSL4010Y

Name	**Home Department / Unit** *(who holds primary budgetary appointment)*	**University Rank**	**Graduate Faculty Status and graduate unit (PSL unless otherwise stated)**	**Commitment to other programs** *(please list other programs in which the person routinely teaches / supervises)*	**Nature of contribution to this program** *Course Instructor (CI), Mentor Critical Skill (MCS), Practicum Supervisor (PS).*
Sugita. S. *(Primary Status-Only appointment)*	TWHRI	Professor	Full	Supervises graduate students in PSL and IMS. Some teaching in PSL & primary department	PSL1026H course instructor; JYG1555H course instructor; Mentor - Literature review PSL4010Y
Sun, H. *(Non-budgetary cross appointment)*	Surgery	Assoc. Prof	Full	Supervises graduate students in PSL and IMS. Some teaching in PSL & primary department	PSL1026H course instructor; Mentor - Literature review PSL4010Y
Thomas, S. *(*Main Status-Only appointment)*	Phys Ed	Professor	Full	Supervises graduate students in PSL and IMS. Some teaching in PSL & primary department	JCV3062H course instructor; Mentor - Literature review PSL4010Y
Wang, L-Y *(Primary Status-Only appointment)*	HSC	Professor	Full	Supervises graduate students in PSL and IMS. Some teaching in PSL & primary department	**MHSc Advisory Committee**; JYG1555H course director; Mentor - Literature review PSL4010Y
Wen, X-Y *(Concurrent Status-Only appointment)*	Medicine	Assist. Prof	Associate	Supervises graduate students in PSL and IMS. Some teaching in PSL & primary department	PSL1040H course instructor; Mentor - Literature review PSL4010Y
Wheeler, A. *(Primary Status-Only appointment)*	HSC	Assist. Prof	Associate	Supervises graduate students in PSL and IMS. Some teaching in PSL & primary department	PSL1034 course director; PSL1070H course instructor; Mentor - Literature review PSL4010Y
Zhen, M. *(Concurrent Status-Only appointment)*	Molecular Genetics	Professor	Full	Supervises graduate students in PSL and IMS. Some teaching in PSL & primary department	JYG1555H course instructor; Mentor - Literature review PSL4010Y

**Main status means that the faculty member's primary status only appointment is with the Department of Physiology*

13.2 Learning Resources

Please see the following Appendices
Appendix D: Library statement confirming the adequacy of library holdings and support for student learning
Appendix E: Statement concerning student support services.

13.3 Financial Support for Graduate Students

- *Describe the financial assistance that will be available to students in the program, and discuss its adequacy relative to the number of students and nature of the program*

These students are not eligible for stipendary support. Students will be eligible for scholarships, loans and line of credit which is typically available to Professional Masters degree-based graduate students.

13.4 Space/Infrastructure

- *Address any unique space/infrastructure requirements including renovations to existing space, new space, information technology, laboratories, or equipment etc. and how these will be accommodated*

The Department of Physiology has space available to accommodate the programme through the recent renovations to the third floor in the Medical Sciences Building.
The space is fully accessible to all students. The students choosing to complete a practicum will matched with an appropriate placement by the Program Director and Program Manager, every effort will be made to ensure all students can be accommodated in their selected work experience.

14 Quality and Other Indicators

- *Please describe the appropriateness of the faculty's collective expertise and how it contributes substantively to the proposed program and refer to specific areas of faculty strengths, innovation, and scholarly record that will contribute to the quality of the program and student experience*
- *Please describe any elements that enhance the program's diversity*

The ability of our department to engage professors with basic science, as well as real-life clinical expertise in physiology is unique. Our faculty are world-renowned in their particular fields and will be ideal mentors for students in both the Literature review projects and supervising practicums in large research teams. We have identified several Extra-

Departmental units at the University of Toronto that will be ideal sites for the students training namely: Banting and Best Diabetes Centre, Lewar, Heart & Stroke Cardiovascular Research Centre and the new Strategy for Patient-Oriented Research in Diabetic complications. The mix of clinical sciences and commercialization will attract a diverse range of students both locally in Ontario and also Nationally and Internationally. More than 50 faculty involved in the program clearly demonstrate the Department is at the frontier of medical physiology and many are involved directly in implementing physiological knowledge in direct patient care and/or commercialization of new knowledge.

Diversity is represented in at least two levels of the proposed program. Firstly, the 50 faculty are drawn from a diverse group of human health specialties meaning that the students will be exposed to a wide and diverse range of topics. Secondly, the MHSc, course will employ a variety of educational methodologies including a traditional seminar series, case-based discussions in the Clinical Physiology course, and hands on practical experience in bio-informatics/data analysis.

15 Governance Process

	Levels of Approval Required
Consultation with Provost	
Decanal and Provostial Sign-Off	
	Faculty/Divisional Governance
Submission to Provost's Office	
	AP&P
	Academic Board
	Executive Committee of Governing Council
Program may begin advertising as long as any material includes the clear statement that "No offer of admissions will be made to the program pending final approval by the Quality Council and the Ministry of Colleges Training and University (where the latter is required)."	
	Ontario Quality Council
	Submitted to MAESD (in case of new graduate degrees and programs, new diplomas)

Appendix A: Courses

MHSc (Medical Physiology)

Program courses: (total 6.0 FCEs)

Required Courses
1.0 FCE – Literature review course (PSL4010Y);
1.0 FCE - Medical Physiology Practicum (PSL4020H)
1.0 FCE – Professional Master's Program Seminars & Professional Development (PSL4000Y);
0.5 FCE - Clinical Physiology (PSL4030H);
0.5 FCE – Big Data and Health (PSL 4040H)
0.5 FCE – Collaboration and Commercialization in Physiology (PSL 4050H)

Total: 4.5 credits

Elective Courses
1.5 FCE Selected Graduate only courses to develop topic expertise tailored to individual students' requirements, each course represents 0.5 FCE.

Courses Currently Available in the Department of Physiology

Applied Physiology:

Course #	*Course title*	*Director*	*Offered*
PSL 1086H	Diving comparative physiology	C Wittnich	Sept-Dec
PSL 1026H	Advanced topics- experimental cell physiology	ZP Feng	Sept-Dec
PSL 1040H	Systems biology in Physiology	T Gramolini	Jan-April
PSL 1075H	Biology in time	R Horner	Sept-Dec
PSL 1048H	Translational Physiology from molecules, model systems to the clinic.	L. Schlichter	Sept-Dec

Integrative Sciences:

Cardiovascular

Course #	*Course title*	*Director*	*Offered*
JCV 3060H	Advanced Topics Cardiovascular Sciences – Molecular Biololgy & Signal transduction	SS Bolz	Sept-Dec
JCV 3062H	Advanced Topics Cardiovascular Sciences - Heart Function (alternate year)	C Wittnich	Sept-Dec
JCV 3064H	Advanced Topics Cardiovascular Sciences - Microvascular Medicine	SS Bolz	Sept-Dec

JCV 1060H	Developmental Cardiovascular Translational Physiology	C. Wittnich	Jan-April
JCV 3061H	Advanced Topics Cardiovascular Sciences -hormones & CV system	C Wittnich	Jan- April
JCV 3063H	Advanced Topics Cardiovascular Sciences - Vascular (alternate year)	S Heximer	Jan-April)

Respiratory

Course #	***Course title***	***Director***	***Offered***
PSL1036H	Advanced Topics: Respiration (alternative year)	J. Duffin	Jan-April
PSL1069H	Advanced Topics: Respiratory Physiology (alternative year)	M. Post/ B. Kavanagh	Jan-April

Gastrointestinal (1 avail yearly)

Course #	***Course title***	***Director***	***Offered***
PSL1014H	Advanced Topics: The Gastrointestinal Epithelium	P Brubaker	Jan-April

Endocrine Sciences

Development/Reproduction (4 avail yearly)

Course #	***Course title***	***Director***	***Offered***
PSL 1067H	Advanced techniques in developmental physiology	I Caniggia/A Juriscova	Sept-Dec
PSL 1080H	Investigative developmental Physiology	B Cox	May-Aug
PSL 1020H	Reproductive physiology (new)	T Brown	Sept-Dec
JCV 1060H	Developmental Cardiovascular - bench to bedside	C Wittnich	Jan-April

Endocrine/Diabetes (2 avail yearly)

Course #	***Course title***	***Director***	***Offered***
PSL 1034H	Advanced topics- metabolic disorders	M Wheeler	Sept-Dec
PSL 1070H	Advanced Topics: Hormone Action (alternative year)	A Lam	Jan-April

Neuro Sciences (3 avail yearly)

Course #	***Course title***	***Director***	***Offered***
JYG1555H	Advanced Topics: Cellular and Molecular Neurobiology (alternative year)	L.Y. Wang	Jan-April
PSL1072H	Advanced Topics - Neural Basis for Sensation	S Prescott	Sept-Dec
PSL1047H	Advanced Topics: Somatosensory & Pain Neuroscience	M Salter	Jan-April
PSL1050H	Advanced Topics – The Hippocampus from Cell to Behaviour (alternative year)	M Wojtowicz	Sept-Dec
PSL1068H	Advanced Topics – Molecular Basis of Behaviour (alternative year)	M. Zhou	Sept-Dec

Sleep (1 avail yearly)

Course #	***Course title***	***Director***	***Offered***
PSL 1075H	Biology in time	R Horner	Sept-Dec

Course Descriptions

CORE - Mandatory Courses - 4.5 FCEs

Course #	***Course title & Description***
PSL4000Y **1.0 FCE**	Seminars in Physiology and Professional Development (new) *The course will dovetail with two other seminar courses: PSL1000 for MSc students and PSL2000 for PhD students. It consists of attending 12 seminars in Physiology during the academic year. For this course, 6 of these seminars will be specially created and targeted for the MHSc trainees. These will include professional development, career planning, biotechnology, statistics, and other career-related seminars. The other six seminars will be joint seminars with the PSL1000/2000 courses, given by either Physiology faculty or invited experts. Further, for this designated course, the graduate students will be required to present a seminar based on their Literature review project, which is a required part of the degree*
PSL4010Y **1.0 FCE**	Physiology Literature Review Project (new) *The core objective of this course is for the student to conduct an in-depth scholarly literature review (with individual mentorship from a Physiology faculty member) that will result in a publishable scholarly piece of written work. This written work will be on a current health challenge (e.g. obesity, stroke), supervised by a faculty member from the Department of Physiology. The student and mentor will establish deliverables and expected timelines that should be met to ensure scholarly excellence. The timing for this course would be throughout first two terms, with final report submission and an oral presentation in the Spring.*
PSL4020H **1.0 FCE**	Physiology Practicum (new) *During the summer term students will obtain a placement in a local or regional work environment. At the placement, students will apply knowledge gained from their course work and gain practical skills in a real work environment. Additionally, students will network with other employees and potential employers providing them with valuable contacts for career development. A wide range of work environments will be made accessible to these students spanning private and public sectors. The students will be evaluated on their integration and participation in the work environment and their ability to perform the required tasks. The placement supervisor will submit a written report on each student using a pre-agreed format that will be shared with the student at the start of the practicum.*
PSL4030H **0.5 FCE**	Clinical Physiology (new) *This course will demonstrate real world examples of medical physiology. Experts in different medical disciplines will utilize patient examples to illustrate: 1) integration of key physiological principals; 2) how physiological systems maintain homeostasis under differing conditions relevant to medicine; 3) how systems break down and the consequences of disease. The cases presented will be discussed in depth and be selected from the following four areas: 1) cardiovascular; 2) neurological; 3) reproduction; 4) endocrine. The course format will be weekly two hour sessions focused on a given case led by a clinical faculty member who is an expert in the area.*
PSL4040H **0.5 FCE**	Big Data and Health (new) *The students will use established methods (machine learning and prediction) to analyse large datasets and interpret the data in the context of human health. Students can tailor their learning experience to one of three data types: Genomics, assessing sequencing variation, Gene expression, evaluating changes in gene expression for biomarkers of illness and Physiological and clinical data sets (e.g. cardiac monitor, blood pressure, family histories) for prediction of disease. The students will be evaluated on their ability to complete data analyses and create prediction profiles based on their analyses.*
PSL4050H **0.5 FCE**	Collaboration and Commercialization in Physiology. (new) *This new course will focus on bringing discoveries to the market. Specifically, the course will provide practical examples on how to expand from an individual working alone to setting up strategic collaborations. Potential collaborative partnerships include academics, biotech companies, and government agencies. Students will understand the importance of a respectful work environment and how to nurture these partnerships. The course will provide examples of how to recognize the key characteristics of new basic science findings that are relevant to human health and demonstrate how to engage the partners required for further development of these findings. It will take students through the basics of how to develop a business plan, utilizing the expertise of faculty who have been successful in taking their research to market. The students will be assessed on their abilities to develop a business plan, understanding of respectful/supportive team dynamics and ability to derive a marketing strategy.*

Elective Courses

Breadth (6 avail yearly)

Course #	***Course title & Description***
PSL1048H **0.5 FCE**	Translational Physiology from Molecules to Model Systems to the Clinic: *In this course students will be exposed to published examples identifying molecules (e.g., genome-wide human screens, discovering mutated genes); designing/applying cell-based studies (e.g., selecting/creating appropriate cell-based assays, high-throughput screening); selecting/creating appropriate models at the organ or animal level; obtaining 'proof-in-principle' data; proceeding to clinical trials. Additional aims of the course are to augment oral and visual presentation skills, skills in both leading and participating in group discussions, critical and analytical thinking, and awareness of translational medicine resources, including journals, local seminars, centers and consortia. Each session will strive to include some controversy. For example, the presented papers might reflect differing views on the molecule underlying a disorder, the cellular or animal models used, or the interpretation of genomic studies.*
PSL1086H **0.5 FCE**	Comparative Systems Approach to Diving Physiology: *This specialized course will compare and contrast the physiologic and anatomical adaptations experienced by the different species of marine mammals in contrast to humans. In order to accomplish this the following areas will be explored in depth using key published scientific articles: physiologic and anatomic adaptations of the skeleton/musculature that facilitates swimming; overview of diving and its effects in humans; diving and marine mammals - what makes them so special; overview of human vs marine mammal cardiac and vascular physiology; their structural adaptations to facilitate diving; comparative lung physiology adapted to diving; blood and tissue oxygen carrying capacity; feeding & reproduction; renal homeostasis during diving, role of the neuro-endocrine system and comparative deep diving systemic effects. Where relevant the application of this knowledge to human health issues will also be discussed.*
PSL1026H **0.5 FCE**	Advanced Topics- Experimental Cell Physiology: *This course presents experimental approaches to cell physiology, with particular attention to electrical and optical recordings, and how these measurements can be employed to study the intrinsic membrane properties of various cell types, and the mechanisms of cell signaling and secretion. The main objective of the course is to provide students with the opportunity to understand physiological techniques commonly used in multiple fields, including neurobiology, endocrinology, cardiovascular, respiratory, developmental, and reproductive physiology. The course will focus on assisting the students with a contemporary understanding of not only the principles of the selected techniques, but also their applications and limitations. The course provides opportunities to participate in and/or to observe hands-on experiments with selected techniques, as well as related data analysis.*
PSL1040H **0.5 FCE**	Systems Biology in Physiology: *Systems biology is a recent area of science that links general medical scientific research approaches with 'large scale' analyses. The overall goal of systems biology science is to connect complex biological networks with biochemical and physiological outcomes. Systems biology platforms include many of the 'omic' disciplines such as: genomics, epigenetics, transcriptomics, network signaling, metabolomics, interactomics, lipidomics and proteomics. Links between cellular physiology and systems biology have profound significance to our understanding of general physiology. This course will teach students of these recent developments, and importantly, enable them to extract and utilize information at the systems biology level. The course will begin with a set of general lecture overviews of the approaches available, basic theory, and application. The remaining lectures will be student-driven, seminar-based discussions with faculty members as facilitators of this discussion. The course will cover the major systems biology literature and technical approaches. The general course detail will be relatively narrow given the topics covered, however the written essay will provide the student sufficient opportunity to explore one area in greater detail.*
PSL1053H **0.5 FCE**	Advanced Topics: Critical assessment of Ion Channel Function: *This course will provide graduate students with a broad exposure to a range of current research areas related to ion channels. Critical advances and papers dealing with ion channel structure and function will be covered. For example, activation gating of cation channels, inactivation mechanisms in cation channels, mechanisms of ion permeation and selectivity in cation channels, modulation of expression and function by accessory subunits in cation channels, permeation and regulation of water channels, allosteric*

	regulation of cation channels (by ions, lipids and phosphorylation), chloride channel regulation, and mathematical and computer modeling of ion channels.

Possible other breadth course options (4 avail yearly)

Course #	***Course title***
PSL1067H **0.5 FCE**	Advanced Topics: Advances and Techniques in Developmental Physiology: *This course is an interactive seminar course (student-oriented) designed to expose students to a wide range of current scientific advances/techniques in the general field of developmental physiology with the specific scope of understanding their application to examine developmental changes responsible for alteration of perinatal physiological function. The overall scope of this course is to teach/educate graduate students on current scientific advances and techniques in the field of developmental physiology.*
PSL1075H **0.5 FCE**	Biology in time: *Time is as much a niche in biology as physical space and behavior, and all of bacteria, fungi, plants and animals retain a sense of time and organize their physiological processes accordingly. The molecular machinery for a hard-wired and well-preserved temporal organization of physiological processes - especially circadian and rest-activity cycles - optimally suits every organism and the chemical machinery that drives them to the conditions of life. These rhythms of life are deeply rooted in ancient biology and have been conserved over time. Humans are the only organisms that now purposefully disrupt and coerce the natural rest-activity cycles and daily rhythms of our component cellular machinery to suit the demands of modern society. As examples, sleep and biological rhythm disturbances affect one in four Canadians, and have deleterious effects on cellular, organ, organismal and societal functions and health. Humans also now consume drugs in huge quantities to counter the problems associated with poor sleep, altered waking functions and disrupted rhythms, with enormous costs to the health care system. The goal of this course is for trainees to gain a broad perspective on the important role of time-dependent physiological processes to cellular and organismal functions, and how disruption of these cycles can have deleterious effects on cellular, organ and organismal health. Understanding the cellular and neuronal machinery underlying such time-dependent processes has led to major breakthroughs in topics of broad interest, including mechanisms of sleep, sedation and anesthesia, brain plasticity and learning, neurodegenerative and psychiatric disorders, endocrinology and metabolism, as well as diverse areas of clinical medicine and health care initiatives.*
PSL1080H **0.5 FCE**	Advanced Topics: Investigative Developmental Physiology: *This course represents an excellent opportunity to develop skills in presentation and critical analysis. Students need not have a strong background in many of the topics covered. In fact, a major goal of the course is to broaden the interdisciplinary background of the participants. Students will have the opportunities to hear lectures from and to meet international experts in multiple aspects of Developmental Physiology: Embryo Patterning and Organogenesis;* *Placentation and Birth; Neurodevelopment; Cardiovascular Development and Function; Developmental Origins of Health and Disease*

Focused Specialty Topic Course Options (Depth courses)

Cardiovascular (4 avail yearly)

Course #	***Course title***
JCV3060H **0.5 FCE**	Advanced Topics in Cardiovascular Sciences – Molecular Biology & Heart Signal Transduction: *This course is one of a set of five advanced seminar half-credit courses dealing with current areas in the cardiovascular system. Specifically, JCV3060H focuses on various aspects of the genetic, molecular and cellular properties of the heart and its' development and new techniques used to investigate these areas.*
JCV3062H **0.5 FCE**	Advanced Topics in Cardiovascular Sciences -Heart Function (alternate yr): *This course is one of a set of five advanced seminar half-credit courses dealing with current areas in the cardiovascular system. Specifically, JCV3062H covers all aspects of heart function from ultra-structure and gene regulation to whole organ and response to various environmental and disease states.*
JCV3064H **0.5 FCE**	Advanced Topics in Cardiovascular Sciences- Microvascular Medicine: *This course is one of a set of five advanced seminar half-credit courses dealing with current research areas in the cardiovascular system. Specifically, JCV3064H will provide a translational perspective on Microvascular medicine and progress from new molecular concepts of microvascular function to evaluating their clinical applicability and therapeutic value.*
JCV1060H **0.5 FCE**	Developmental Cardiovascular Physiology: *This course covers the development of the cardiovascular system from conception to adulthood with particular emphasis on the progressive maturational changes from fetus to adult, age related differences and developmental problems. Topics include: Embryology and fetal development; Post-natal changes at birth; Maturational changes in the cardiopulmonary system from infancy to adulthood.*
JCV3061H **0.5 FCE**	Advanced Topics in Cardiovascular Sciences -Hormones & Cardiovascular System: *This course is one of a set of five advanced seminar half-credit courses dealing with current research areas in the cardiovascular system. Specifically, JCV3061H focuses on hormonal influences and its role in the regulation of the cardiovascular system.*
JCV3063H **0.5 FCE**	Advanced Topics in Cardiovascular Sciences - Vascular (alternate year): *This course is one of a set of five advanced seminar half-credit courses dealing with current research areas in the cardiovascular system. Specifically, JCV3063H covers all aspects of the vascular system from genetic to molecular, including developmental biology, the diseased state and clinical treatments.*

Comparative Physiology

Course #	***Course title***
PSL1086H **0.5 FCE**	Comparative Systems Approach to Diving Physiology: *This specialized course will compare and contrast the physiologic and anatomical adaptations experienced by the different species of marine mammals in contrast to humans. In order to accomplish this the following areas will be explored in depth using key published scientific articles: physiologic and anatomic adaptations of the skeleton/musculature that facilitates swimming, overview of diving and its effects in humans; diving and marine mammals - what makes them so special; overview of human vs marine mammal cardiac and vascular physiology; their structural adaptations to facilitate diving; comparative lung physiology adapted to diving; blood and tissue oxygen carrying capacity; feeding & reproduction; renal homeostasis during diving, role of the neuro-endocrine system and comparative deep diving systemic effects. Where relevant the application of this knowledge to human health issues will also be discussed.*

Development/Reproduction (4 avail yearly)

Course #	***Course title***
PSL1067H **0.5 FCE**	Advanced Topics: Advances and Techniques in Developmental Physiology (alternative year): *This course is a half-term interactive seminar course (student-oriented) designed to expose students to a wide range of current scientific advances/techniques in the general field of developmental physiology with the specific scope of understanding their application to examine developmental changes responsible for*

	alteration of perinatal physiological function. The overall scope of this course is to teach/educate students on current scientific advances and techniques in the field of developmental physiology.
PSL 1020H **0.5 FCE**	Current Topics in Reproductive Endocrinology and Infertility: *This seminar style course will provide students with an in-depth knowledge of physiology related to major clinically relevant pathologies and topics in human reproduction. The course will consist of discussion of emerging topics in regulation of reproductive hormone activity and male and female reproductive physiology and will bring together clinical and research aspects of the topics. The majority of the course will focus on infertility. Topics in pregnancy and parturition will not be included (as these are the focus of PSL1421H). The course consists of 13 two-hour meetings, 12 of which will involve student presentations of recent and impactful research articles. Depending on enrollment, students will be divided into groups of three, with each group responsible for presentation of assigned core papers and papers of their choosing.*
JCV1060H **0.5 FCE**	Developmental Cardiovascular Physiology: *This course covers the development of the cardiovascular system from conception to adulthood with particular emphasis on the progressive maturational changes from fetus to adult, age related differences and developmental problems. Topics include: Embryology and fetal development; Post-natal changes at birth; Maturational changes in the cardiopulmonary system from infancy to adulthood.*
PSL1080H **0.5 FCE**	Advanced Topics: Investigative Developmental Physiology: *This course represents an excellent opportunity to develop skills in presentation and critical analysis. Students need not have a strong background in many of the topics covered. In fact, a major goal of the course is to broaden the interdisciplinary background of the participants. Students will have the opportunity to hear lectures from and to meet international experts in multiple aspects of Developmental Physiology: Embryo Patterning and Organogenesis; Placentation and Birth; Neurodevelopment; Cardiovascular Development and Function; Developmental Origins of Health and Disease.*

Endocrine/Diabetes (2 avail yearly)

Course #	***Course title***
PSL1034H **0.5 FCE**	Advanced Topics- Metabolic Disorders: *This is a seminar-based course that covers very recent papers and research topics in the areas of endocrinology and metabolism. The objective of this course is to improve analytical and critical thinking skills of students who have a keen interest and have a good background in at least one of the general topic areas (endocrinology or metabolism).*
PSL1024H **0.5 FCE**	Advanced Topics: Neuroendocrinology (alternative year): *This course is a seminar course and focuses on the multidisciplinary approach to the study of neuroendocrine systems in health and disease. There are six sections dealing with interrelated topics, all facilitated by professors with research expertise in the subject. Each topic will be assessed at multiple levels, ranging from populations and patients to experimental models and molecules. The overall objective of the course is to broaden the interdisciplinary background of the participants. Students will learn proper presentation techniques, expand their scientific writing abilities, and have the ability to critically judge scientific research in the field. The most up-to-date research and technologies will be presented, which will facilitate the student's own research design and encourage independent scientific judgement. Background knowledge of endocrinology is essential (PSL302Y is recommended). No textbook provides adequate coverage for the material presented due to the up-to-date format; therefore, pdfs of recent research articles on each subject will be available for each lecture.*
PSL1070H **0.5 FCE**	Advanced Topics: Hormone Action (alternative year): *The overall goal of this seminar style course is to teach students how to read and analyze scientific papers. To achieve this goal, students will be first assigned a specific paper to read, and will then present the latest physiology and molecular endocrinology findings within the paper on hormone action in the context of the study of metabolism, obesity, and diabetes. The faculty will foster an environment to guide, facilitate, and discuss major findings of the papers with the presenter and their classmates. The students will learn how to (a) make use of the latest, as well as the well-established, experimental approaches to study how various hormones exert their functional effects on metabolic organs in regulating energy homeostasis; (b) evaluate the paper with a critical assessment; and (c) suggest potential experiments to address the limitation of the current study. Students will also learn the classic, as well as the latest, discoveries in the study of metabolism, diabetes and obesity. Based on what they have learned during the presentations and discussions, the students will then individually write a literature review on their choice of a topic discussed in class.*

Gastrointestinal (1 avail yearly)

Course #	***Course title***
PSL1014H **0.5 FCE**	Advanced Topics: The Gastrointestinal Epithelium: *The gastrointestinal epithelium is a complex biological system that comprises the largest organ in the body. Originating from stem cells in the crypts, the epithelial cells differentiate and migrate to form the crypt-villus unit which carries out the unique digestive, absorptive, secretory, endocrine, barrier and immune functions of the gut, as well as interactions with the gut microbiota. Consistent with the large number of physiological roles of the gut, diseases of the gastrointestinal epithelium are commonly associated with morbidity. This seminar-style course will consider the various functions of the gastrointestinal epithelium through student presentations and class discussion of selected recent publications from the literature, as well as through manuscript and grant reviews.*

Neurosciences (3 avail yearly)

Course #	***Course title***
PSL1050H **0.5 FCE**	Advanced Topics: The Hippocampus from Cell to Behaviour (alternative year): *The link between cellular mechanisms, such as synaptic plasticity and animal behaviour, such as learning, is still elusive, but researchers are beginning to bridge the gap. One approach is to build computational or conceptual models made up of modules with each module corresponding to a cellular element. The functional contribution of each module to the system (the animal) can then be tested by experimental manipulation. Clarity of ideas is greatly enhanced when this experimentation is guided by predictions (right or wrong) from a computational approach. Ultimately, the convergence of experimental and computational approaches will lead to better understanding of how various parts of the brain contribute to behaviour.*
PSL1068H **0.5 FCE**	Advanced Topics: Molecular Basis of Behaviour (alternative year): *The goal of the course is for students to gain a broad perspective on the molecular basis of behavior. Students will discuss and evaluate advanced topics in the molecular determinants of behavior, from physiological to pathological mechanisms of plasticity. More specifically, the course will explore learning and memory, pain and drug abuse.*
JYG1555H **0.5 FCE**	Advanced Topics: Cellular and Molecular Neurobiology (alternative year): *This course is jointly sponsored by the departments of Physiology, Medical Genetics & Pharmacology. Medical Genetics students taking JYG1555 are required to participate for an appropriately shorter period as required by their department and are evaluated accordingly. This course will provide graduate students with a broad exposure to a range of research areas in molecular neurobiology. However, this course is not simply a general review. Students from various backgrounds in neurobiology will be exposed to a critical understanding of current research objectives in a number of major areas of study. For example, a student with expertise in ion channels will have the opportunity to explore areas of development and plasticity as well as be exposed to techniques in molecular biology and genetics within this context. Students need not have extensive background in all areas of neurobiology.*
PSL1071H **0.5 FCE**	Advanced Topics: Computational Neuroscience (alternative year): *Computational neuroscience seeks to understand how the brain and nervous system compute. This highly interdisciplinary field requires both experiment and theory and encompasses several disciplines including physiology and mathematics. This course will focus on selected computational neuroscience aspects such as types of neuron and network models, and techniques from dynamical systems theory that are used to analyze different models. The emphasis in this course will be on understanding the neurobiological basis and assumptions in models and insights and understanding that can be achieved from the models and analyses. The overall objective of this course is to foster an appreciation for combinations of modeling, experiment and theory in the field so that students can read and critically evaluate computational neuroscience papers. This course is expected to enhance collaborative research training by teaching students how to interact as well as expanding and enriching their view of theoretical and non-theoretical research interactions in the future. This course is also meant to help break down communication barriers between different disciplines and to encourage dialogue between theoretical and non-theoretical type individuals.*
PSL1047H **0.5 FCE**	Advanced Topics: Somatosensory & Pain Neuroscience:

	This course provides a wide coverage of all aspects of the somatosensory system and deals with psychophysical studies, general somatosensory theories, receptors and primary afferents, and anatomical and electrophysiological aspects of central structures. Recent topics of interest will be discussed. The course will consist of a preliminary series of lectures to provide background material and an overview of the field, which will then be followed by presentations and discussion of original classical and current state of the art papers assigned to individual students. These papers will be chosen so as to cover most of the major topics. During this first part of the course (4 weeks) the students are expected to learn the basics of the somatosensory system and pain from readings in textbooks, assigned papers, lectures and classroom discussions.

Respiratory

Course #	***Course title***
PSL1036H **0.5 FCE**	Advanced Topics- Respiration (alternative year): *This course is designed for students whose main research interest is in the field of respiratory physiology. It provides a view of the leading research in this field, as well as some of the experimental techniques in current use.*
PSL1069H **0.5 FCE**	Advanced Topics - Respiratory Physiology (alternative year): *This course aims to provide students with a broad foundation in respiratory physiology. Students will participate in presentations and discussions on all aspects of physiology as it pertains to the respiratory system, and will focus on basic as well as applied aspects. Specifically, lung structure, development and host defenses will be integrated with lung mechanics and theories of gas exchange and control of breathing; novel approaches in pulmonary medicine and investigation, as well as environmental aspects will also be covered. The course will consolidate approaches characteristic of classical physiology and integrate contemporary experimental methodology and clinical application. High caliber papers and essay topics will be selected to introduce the student to key concepts and novel contemporary research.*

Sleep (1 avail yearly)

Course #	***Course title***
PSL1075H **0.5 FCE**	Biology in time: *Time is as much a niche in biology as physical space and behavior, and all of bacteria, fungi, plants and animals retain a sense of time and organize their physiological processes accordingly. The molecular machinery for a hard-wired and well-preserved temporal organization of physiological processes - especially circadian and rest-activity cycles - optimally suits every organism and the chemical machinery that drives them to the conditions of life. These rhythms of life are deeply rooted in ancient biology and have been conserved over time. Humans are the only organisms that now purposefully disrupt and coerce the natural rest-activity cycles and daily rhythms of our component cellular machinery to suit the demands of modern society. As examples, sleep and biological rhythm disturbances affect one in four Canadians, and have deleterious effects on cellular, organ, organismal and societal functions and health. Humans also now consume drugs in huge quantities to counter the problems associated with poor sleep, altered waking functions and disrupted rhythms, with enormous costs to the health care system. The goal of this course is for trainees to gain a broad perspective on the important role of time-dependent physiological processes to cellular and organismal functions, and how disruption of these cycles can have deleterious effects on cellular, organ and organismal health. Understanding the cellular and neuronal machinery underlying such time-dependent processes has led to major breakthroughs in topics of broad interest, including mechanisms of sleep, sedation and anesthesia, brain plasticity and learning, neurodegenerative and psychiatric disorders, endocrinology and metabolism, as well as diverse areas of clinical medicine and health care initiatives.*

Appendix B: Graduate Calendar Copy

Physiology: Introduction
Faculty Affiliation: Medicine

Degree Programs: Physiology
MSc
PhD

Degree Programs: Medical Physiology
MHSc

Combined Degree Programs
MD / PhD

Collaborative Programs
The following collaborative programs are available to students in participating degree programs as listed below:

- Biomedical Engineering
- Physiology, MSc, PhD
- Cardiovascular Sciences
- Physiology, MSc, PhD
- Developmental Biology
- Physiology, MSc, PhD
- Human Development
- Physiology, PhD
- Neuroscience
- Physiology, MSc, PhD
- Resuscitation Sciences
- Physiology, MSc, PhD

Overview
In the Department of Physiology, research ranges from the gene level to the organism level in areas including endocrinology and diabetes; reproduction endocrinology; fetal physiology, pregnancy, and parturition; neuroendocrinology; cardiorespiratory regulation; gastrointestinal motility; sensory physiology; motor control; brain development and aging; ionic channels and synaptic transmission; excitability, ultrastructure, and plasticity of the brain.

Contact and Address
Web: www.physiology.utoronto.ca
Email: graduate.physiology@utoronto.ca
Telephone: (416) 978-2601

Fax: (416) 978-4940

Department of Physiology
University of Toronto
Room 3217, Medical Sciences Building
1 King's College Circle
Toronto, Ontario M5S 1A8
Canada

Physiology: Medical Physiology MHSc
Master of Health Science

Program Description
The Department of Physiology's Master of Health Sciences (MHSc) in Medical Physiology is a professional course-based Masters program. The program is designed to provide graduates with the analytical and professional skills to lead large team-science projects in the bio-sciences and develop their own consultancy company.

The MHSc in Medical Physiology blends advanced topic-specific physiology courses with a mentored current Literature Review (where graduates acquire the critical analysis skills to identify new knowledge relevant to specific problems in human health), Commercialization and Collaboration (where students will acquire skills to understand how to commercialize new discoveries and how to work in a team science environment) and a practicum opportunity (where students will experience how physiological knowledge is applied to real-life scenarios in their area of interest). Each graduate will develop the analytical and communication skills to design and implement new health interventions. The students will develop an individual program based on their area of interest.

Admission Requirements
Applicants are admitted under the General Regulations of the School of Graduate Studies and must also satisfy the Department of Physiology's additional admission requirements stated below:

- Admission is based on demonstrated exceptional scholarly achievement, using the following criteria:
    - a one page statement summarizing how this program will contribute to the advancement of the applicants' professional goals
    - curriculum vitae (CV)
    - 2 letters of reference.
- Applicants must have an appropriate bachelor degree (B.Sc. or B.A.) from a recognized university with an average of at least A- in the last two years of study. The students must have completed at least third year level physiology or equivalent courses and a demonstrated interest in physiology.

- All potential students will be interviewed 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 Director to determine the fit with the program and student's goals. Furthermore, the interview will provide initial direction for the Program Director to identify appropriate practicum placements
- 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. Other English proficiency tests are acceptable. Please consult the website for departmental standards.

Program Requirements
All students are required to take 6.0 FCEs full-course equivalents (FCEs) in physiology courses, with the following guidelines:

- 1.0 FCE in PSL 4000Y Seminars and Professional Development in Physiology, mandatory for all students
- 1.0 FCE in PSL 4010Y Mentored Literature Review Project in Physiology mandatory for all students
- 1.0 FCE in PSL 4020Y Practicum in Physiology
- 0.5 FCE in PSL 4030H Clinical Physiology mandatory for all students
- 0.5 FCE in PSL 4040H Big Data and Health mandatory for all students
- 0.5 FCE in PSL 4050H Collaboration and Commercialization in Physiology mandatory for all students
- 1.5 FCE selective in one of the four areas: General Physiology; Endocrine and Reproductive Sciences; Cardiovascular, Respiratory and Renal Sciences (Integrative Sciences); and Brain and Behaviour (Neurosciences).

Students will be matched with a mentor and practicum placement in consultation with the relevant Course Director and the Department of Physiology Professional Masters Program Director.

Program Length
3 terms full-time (typical registration sequence: F/W/S)

Time Limit
3 years full-time

Appendix C: Undergraduate Student Survey

In 2015, a survey was sent out to undergraduate physiology students to explore their career interests The survey was circulated to Physiology undergraduate specialists, majors and minors students (N ~1000 students) and 105 individuals responded. Below are the results.

Q1: What are your Career Goals?

	%	Number
Health Professional	**79.05%**	**83**
Scientist	12.38%	13
Business	1.90%	2
Education	1.90%	2
Other	4.76%	5
Total	**100%**	**105**

Q2: If you chose Professional Medical in Question 1, please indicate the preferred career field.
Answered: 85 Skipped: 20

	%	Number
MD	70.59%	60
DDS	5.88%	5
DVM	1.18%	1
Physiotherapist	14.12%	12
Other	8.24%	7
Total	**100%**	**85**

(Responses under the category Other include: Pharmacist, Optometry, Occupational Therapist, Physician's Associate, Phar.D., Nursing, MD/PhD, and Clinician Scientist)

Q3: If you chose Scientist in Question 1, please indicate the preferred career field.
Answered: 25 Skipped: 80

	%	Number
Academia	44.0%	11
Industry	44.0%	11
Other	12.0%	3
Total	**100%**	**25**

(Responses under the category Other include: Public Health)

Q4: Would you consider enrolling in a Professional MSc Program, if it would enhance your future career success? (choose one**)** **Answered: 104 Skipped: 1**

	%	Number
Yes	67.31%	70
No	2.88%	3
Not sure/Need to know more	29.81%	31
Total	**100%**	**104**

Q5: What length of time would you prefer for a Professional MSc Program? (Rank preferences 1 highest - 4 lowest). Your ranking will automatically be re-ordered**.** **Answered: 103 Skipped: 2**

	Ranking					
	1	**2**	**3**	**4**	**Total**	**Score**
1 year program, 3 terms (May - April)	43.69% (45)	36.89% (38)	13.59% (14)	5.83% (6)	103	3.18
1 year program, 3 terms (Sept - Aug)	34.95% (36)	45.63% (47)	9.71% (10)	9.71% (10)	103	3.06
1.5 year program, 4 terms (May - Aug)	12.62% (13)	9.71% (10)	69.90% (72)	7.77% (8)	103	2.27
2 year program, 6 terms	8.74% (9)	7.77% (8)	6.80% (7)	76.70% (79)	103	1.49

Numbers in brackets represent the number of responses

Appendix D: University of Toronto Libraries Report

University of Toronto Libraries Report for Professional Masters Degree in Medical Physiology, Faculty of Medicine, 2017

Context

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, behind Harvard, Yale and Columbia.[1] The research and special collections, together with the campus and college libraries comprise over 12 million print volumes, 5.6 million microform volumes, more than 17,000 journal subscriptions, in addition to a rich collection of manuscripts, films, and cartographic materials. The system provides access to more than 1.9 million electronic books, journals, and primary source materials and increasingly supports access via personal handheld devices.[2] There are numerous collection strengths in a wide range of disciplines reflecting the breadth of research and instructional programs at the University. The University of Toronto Library system has an annual acquisition budget of $31 million. The strong collections, facilities and staff expertise attract unique donations of books and manuscripts from around the world, which in turn draw scholars for research and graduate work.

Major North American Research Libraries[3]					
	2010-2011	**2011-2012**	**2012-2013**	**2013-2014**	**2014-2015**
ARL RANK	**UNIVERSITY**	**UNIVERSITY**	**UNIVERSITY**	**UNIVERSITY**	**UNIVERSITY**
1	Harvard	Harvard	Harvard	Harvard	Harvard
2	Yale	Yale	Yale	Yale	Yale
3	**Toronto (3rd)**	**Toronto (3rd)**	**Toronto (3rd)**	**Toronto (3rd)**	Columbia
4	Michigan	Columbia	Columbia	Columbia	**Toronto (4th)**
5	Columbia	Michigan	Michigan	Michigan	Michigan

[1] Chronicle of Higher Education, "Library Investment Index at University Research Libraries, 2014 – 2015." In the Almanac of Higher Education, 2015. http://www.chronicle.com/interactives/almanac-2016?cid=cp51#id=65_416

[2] Figures as of 2014 taken from UTL's 2015 Annual Report and 2013-2014 annual statistics. https://onesearch.library.utoronto.ca/sites/default/files/annual_reports/annualreport-2015.pdf and https://onesearch.library.utoronto.ca/annual-statistics/2013-2014

[3] Association of Research Libraries Statistics, 2014-15 http://www.arlstatistics.org/analytics

Top 5 Canadian Universities in the ARL Ranking of Major North American Research Libraries				
2010-2011	**2011-2012**	**2012-2013**	**2013-2014**	**2014-2015**
RANK/ UNIVERSITY	**RANK/ UNIVERSITY**	**RANK/ UNIVERSITY**	**RANK/ UNIVERSITY**	**RANK/ UNIVERSITY**
3/Toronto	**3/Toronto**	**3/Toronto**	**3/Toronto**	**4/Toronto**
11/Alberta	10/British Columbia	18/Alberta	22/British Columbia	27/Alberta
16/British Columbia	15/Alberta	24/British Columbia	26/Alberta	31/British Columbia
32/Montreal	18/McGill	30/McGill	35/McGill	43/McGill
38/McGill	32/Montreal	35/Montreal	36/Montreal	49/Calgary

Space and Access Services: The Library system provides a variety of individual and group study spaces for both undergraduates and graduates in the 10 central and 23 divisional libraries on the St. George, Mississauga, Scarborough and Downsview campuses. Study space and computer facilities are available twenty four hours, five days per week at one location, Robarts Library. Web-based services and electronic materials are accessible at all times from campus or remote locations, through the U of T based Scholars Portal and other leading edge digital services.

Instruction & Research Support: The Library plays 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 Faculty of Medicine degree level expectations in the ability to gather, evaluate and interpret information. These services are aligned with the Association of College and Research Libraries (ACRL) Framework for Information Literacy for Higher Education.[4]

Program Specific Instruction: Instruction occurs at a variety of levels for Department of Physiology students and is provided by the faculty liaison librarian for Physiology. The Gerstein Science Information Centre facilitates formal instruction integrated into the class schedule and hands-on tutorials related to course assignments. For example, the liaison librarian presents at the graduate orientation in the fall and teaches in the undergrad class PSL495, Communicate Biomedical Science (http://guides.library.utoronto.ca/c.php?g=251664&p=1674996). Librarians at Gerstein provide one-to-one consultations with undergraduate and graduate students who are conducting literature, scoping or systematic reviews. The Library, through its liaison librarians, customizes feeds of library resources. These appear prominently in Portal/Blackboard course pages. For example: Medicine at http://guides.library.utoronto.ca/medicine and Systematic Reviews at http://guides.library.utoronto.ca/systematicreviews.

Collections: Many college and campus libraries collect materials in support of Medical Physiology, 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

[4] Association of College & Research Libraries. Framework for Information Literacy for Higher Education. ACRL, 2016. http://www.ala.org/acrl/sites/ala.org.acrl/files/content/issues/infolit/Framework_ILHE.pdf

and styles of our current students and faculty. The University of Toronto Library is committed to collecting both print and electronic materials in support of Medical Physiology at the University of Toronto.

Journals: The Library subscribes to 24 of the top 25 journals listed in Journal Citation Reports (JCR)[5] in the subject area Physiology. Of these titles, 24 are available electronically to staff and students of the University.

Monographs: The University of Toronto Library maintains comprehensive book approval plans with 53 book dealers and vendors worldwide. These plans ensure that the Library receives academic monographs from publishers all over the world in an efficient manner. For Medical Physiology, monographs are purchased in electronic form where possible. The Library currently receives all current e-books directly from the following publishers: *Springer*, *Elsevier*, *Wiley* and *Books@Ovid.*

Preservation, Digitization, and Open Access: The University of Toronto Library supports open access to scholarly communication through its institutional research repository (known as T-Space), its open journal services, and subscriptions to open access publications. In addition to acquiring materials in support of Medical Physiology, the Library, in cooperation with the Internet Archive, has digitized its monograph holdings published before 1923. These books are available without charge to anyone with access to the Internet through the Scholar's Portal e-Book platform.

Key Databases: To support the research needs of students in Medical Physiology, the Library subscribes to the two major databases for clinical medicine, *Medline* and *Embase*; the *Cochrane Library*, a database of systematic reviews and register of clinical trials; and the multidisciplinary databases, *Scopus* and *Web of Science*.

Special Collection Highlights: To support program commitments in Medical Physiology, the Library has acquired *Henry Stewart Talks*, a collection of online lectures in the life and biomedical sciences http://simplelink.library.utoronto.ca/url.cfm/83832, with over 500 physiology-related talks on topics such as comparative physiology; modelling of physiological systems; and effect of physiological factors on drug metabolism. The Library also subscribes to the *Thieme E-Book Library*, which includes a collection of anatomy atlases and medical science texts, e.g. *Fundamentals of medical physiology* and *Color atlas of physiology*.

Prepared by:
Gail Nichol, Selector for Health and Life Sciences, August 19, 2016

Submitted by:
Larry Alford, Chief Librarian, University of Toronto Libraries, Date

[5] 2014 Journal Citation Reports® (Thomson Reuters, 2014)

Appendix E: University of Toronto Student Services Support

Student service information for Quality Assurance Framework

All University of Toronto undergraduate and graduate students have access to student services on all three campuses, Mississauga, St. George (downtown Toronto), and Scarborough, regardless of their 'home campus'. The services and co-curricular educational opportunities provide a complement to the formal curriculum by engaging and challenging students to reach their full potential as learners, leaders and citizens. At the University of Toronto (St. George Campus) these services are organized by Student Life Programs and Services, the academic division registrar offices, and the School of Graduate Studies. All these services combine to support the success of our students from the time they are admitted through degree completion and beyond.

Students have access to comprehensive **physical and mental health care** on campus, including a medical clinic, travel medicine services, immunization, contraception and sexual health education. Counselling and treatment options for psychological and emotional concerns include psychotherapy, group therapy and pharmacotherapy, as well as specialized assault counselling services provided both by the health and wellness centre and the Sexual Violence Prevention and Support Centre. In addition, a large number of wellness programs are provided, such as mindful meditation, workshops on coping skills and stress management.

Housing needs, including off-campus housing listings and resources for students living independently, are met through the Student Housing Service.

Coaching and education in the development of key **learning skills** – from time management to overcoming exam anxiety – is provided through the Academic Success Centre. The ASC also partners with faculty to integrate success strategies and support into the curriculum. Students' career exploration and employment services are provided through a **Career Centre** offering resume and interview coaching, workshops, career resources, on and off-campus employment and volunteer listings, job shadowing, and career counseling.

Specialized services are provided for **international students** (orientation, advising, cross-cultural counselling), students with **disabilities** (academic accommodations, advising), students with **children or other family responsibilities** (advising, resources, subsidized child care), **Indigenous students** (academic support, financial counselling) and **lesbian, gay, bisexual and transgender** students (counselling, referrals, equity outreach and engagement).

Participation in **campus life** and **experiential learning** are facilitated through Hart House (clubs, committees, events), the Centre for Community Partnerships (service learning and volunteer opportunities in community settings), the Multifaith Centre (interfaith dialogue, events), and

the Student and Campus Development (leadership development, orientation, recognition and support for student groups, activities.) **Sport and recreational facilities and programs** are provided to all students through both Hart House and the Faculty of Kinesiology and Physical Education.

In the Office of the Vice Dean, Graduate and Academic Affairs in the Faculty of Medicine, is the Director of Mentorship, Professor Nana Lee, who works with students (with particular focus on professional master students) to advise them on their professional and career development prior to graduation.

School of Graduate Studies, Student Services [all campuses]

In addition to the above services available to all students, graduate student have access to registrarial services and co-curricular programs at the School of Graduate Studies that assist students in meeting their academic goals.

Administrative staff at the School of Graduate Studies (SGS) provide **registrarial** services to graduate students including but not limited to recruitment, admission, orientation, registration, fees, program progress, awards/financial assistance and graduation. Fully equipped meeting rooms, which can be booked by student groups when not used for Final Oral Examinations, are distributed across two locations, the newly renovated 63 St. George Street (home of SGS Student Services) and 65 St. George Street. Financial advising and wellness counselling services are also available at 63 St. George.

The **Grad Room** is an accessible space on the St. George campus which provides University of Toronto graduate students with a lounge area and a multi-purpose space for academic, social and professional graduate student programming. An additional lounge area for graduate students is now available at 63 St. George.

Grad Room is home to the **Graduate Professional Skills Program** (GPS). GPS is a non-academic program presented by SGS consisting of a variety of offerings that provide doctoral stream students a range of opportunities for professional skills development. The program focuses on skills beyond those conventionally learned within a disciplinary program, skills that may be critical to success in the wide range of careers that graduates enter, both within and outside academe. GPS aims to help students communicate effectively, plan and manage their time, be entrepreneurial, understand and apply ethical practices, and work effectively in teams and as leaders.

The **Conflict Resolution Centre for Graduate Students** offers support to the University of Toronto graduate community in taking steps to prevent or resolve conflict.
It is a peer-led services that welcomes graduate students to connect confidentially with one of our trained G2G Peer Advisors to talk about options and strategies for addressing a concern and available university supports and resources.

The Office of **English Language and Writing Support** (ELWS) provides graduate students with advanced training in academic writing and speaking. By emphasizing professional development rather than remediation, ELWS helps students cultivate the ability to diagnose and address the weaknesses in their oral and written work. ELWS offers four types of instruction designed to target the needs of both native and non-native speakers of English: non-credit courses, single-session workshops, individual writing consultations, and website resources.

Faculty of Medicine

Starting September 2018, graduate students registered in any graduate program in the Faculty of Medicine will be able to access counselling services based in the Medical Sciences Building and at 500 University Ave.

Furthermore, any students wishing to explore career options are encouraged to make an appointment with the Director of Mentorship and Graduate Professional Development in Graduate Life & Science Education, Dr. Nana Lee.

Appendix G: Potential Employer Survey

The proposed MHSc in Medical Physiology is designed for graduates who wish to apply physiological knowledge regarding human health for the purpose of impacting the delivery of health and healthcare. The degree represents an innovative and relevant alternative to pursue graduate education in the Department of Physiology, with an explicit focus on human physiology. The rapid expansion in the bio-sciences workforce in Ontario demonstrates the need to graduate these types of students who can fill such positions in medical services and biotechnology industries.

To explore this, the Department of Physiology conducted an environmental scan of potential employers. These individuals were identified as either 1) associated with the University of Toronto and running large programs/centers, who could provide student placements and who could be employers in the future; or 2) external corporations who have interactions with UofT and/or Department of Physiology and could provide placements for students and future employment.

The survey was primarily administered via personal invitation through Survey Monkey. In some cases, individual phone calls were made to these potential employers if they were considered to be of high importance with respect to the ability to offer student placements in the future. A total of 18 potential employers responded – 13 via Survey Monkey and 5 by telephone interview.

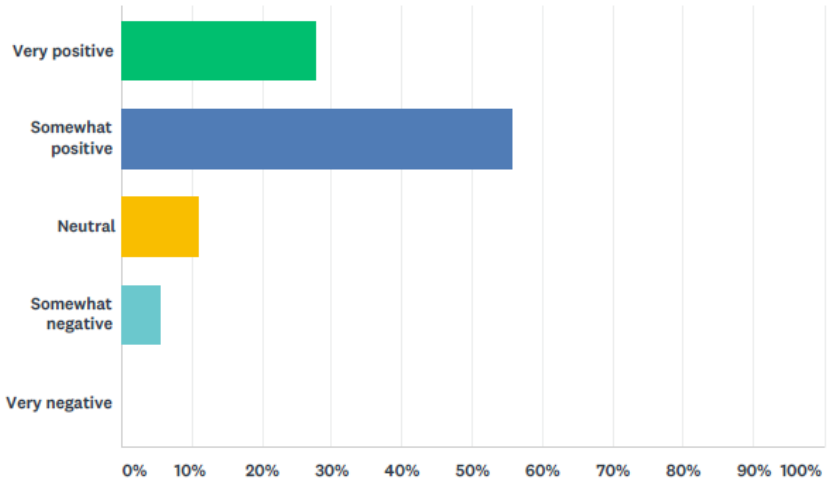
Below is a list of potential employers who were approached and surveyed to determine their interest in offering a practicum placement. Following this are the results from the survey.

Name	Title	Completed	Potential Placement Site
UofT			
Michael Farkouh	Director Lewar Centre; Vice Chair Research Department of Medicine	by phone	Yes
Gary Lewis	Director BBDC	by phone	Yes
Michael May	Director/CEO CCRM		Yes
Norman Rosenblum	CIHR Institute Director	partial	
Mansoor Hussain	Director Rogers Heart Centre		Yes
Art Slutsky	VP Research St Michaels		Yes
Simon Sharpe	Research and training director		Yes
Donald Mabbott	Program in Neurosciences & Mental health	Yes	Yes
Steven Miller	Director Centre for Brain & Mental Health	Yes	Yes
Derek Newton	AVP Innovations & Partnerships	yes email	Yes
Eva Grunfeld	Director KT Research Network OICR	Yes	

David Jaffrey	TECHNA director	Yes	Yes
Bruce Perkins	Director Clinical Research Unit	Yes	Yes
Brian Hodges	Universtiy Health Network		
External			
Susan Marlin	President/CEO Clinical Trials Ontario		Yes
Erica Nishimura	NovoNordisc Scientific Director Endocrine Division		
Shawn Penny	Lilly Endocrine Division	Yes	Yes
John Hepburn	VP Research CIFAR		
Janet Halliwell	Govt consultant Research Evaluation		
Ryan Wiley	Health Sciences Strategy		Yes
Anne Mullin	Engagment Health Sciences Strategy		Yes
Kathryn Deuchars	Director Ontario Personalized Medicine, OGI	Yes	Yes
Bettina Hamelin	President/CEO Ontario Genomics	Yes	Yes
Karl Tibelius	VP Genomics Programs	Yes	
Renee Lyons	Collaboration for Research & Innovation	Yes	Yes
Eric Bosco	MITACS Chief Business dev & partners officer	Yes	Yes
Bob Goldstein	CCTN Chief Scientific Officer	Yes	Yes
Bruce Seet, PhD, MBA,	Sanofi Pasteur, Director, Medical Affairs	Yes	Yes
Greg Francis,	HR Manager, Amgen Canada Inc.	Yes	Yes
Daniel Quinn	Manager, Medical Communications, Medical Affairs	Yes	Yes
Rebecca Yu	Manager, JLABS, Toronto	Yes	Yes
Arya Sharma	Scientific Director & CEO, Canadian Obesity Network	Yes	Yes
Antonio Ciaccia	Bayer Canada	Yes	Yes

Q1 What is your first reaction to the concept of the MHSc degree program?

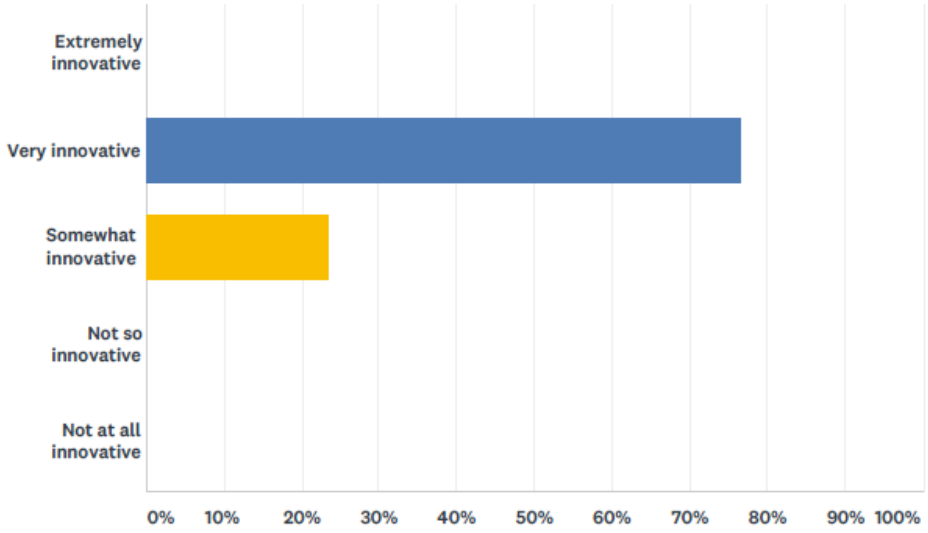
Answered: 18 Skipped: 0



ANSWER CHOICES	RESPONSES	
Very positive	27.78%	5
Somewhat positive	55.56%	10
Neutral	11.11%	2
Somewhat negative	5.56%	1
Very negative	0.00%	0
TOTAL		18

Q2 How innovative is the design of the degree program.?

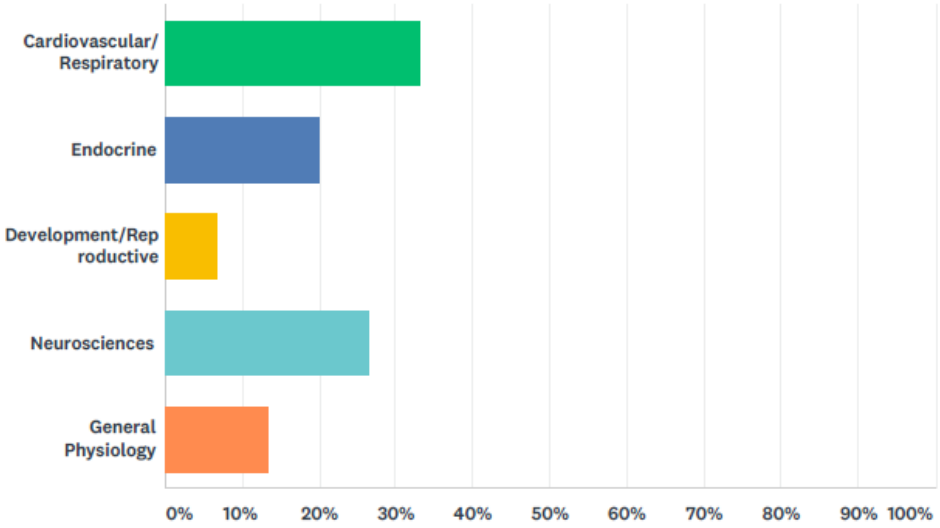
Answered: 17 Skipped: 1



ANSWER CHOICES	RESPONSES	
Extremely innovative	0.00%	0
Very innovative	76.47%	13
Somewhat innovative	23.53%	4
Not so innovative	0.00%	0
Not at all innovative	0.00%	0
TOTAL		17

Q3 Which areas of Systems Physiology would be of interest to your organization?

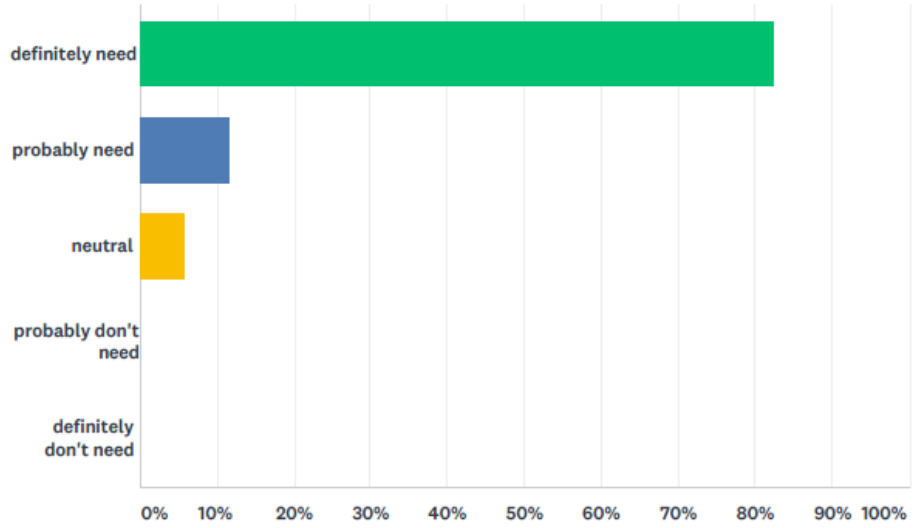
Answered: 15 Skipped: 3



ANSWER CHOICES	RESPONSES	
Cardiovascular/Respiratory	33.33%	5
Endocrine	20.00%	3
Development/Reproductive	6.67%	1
Neurosciences	26.67%	4
General Physiology	13.33%	2
TOTAL		15

Q4 Is the development of project management and team leading skills important to your organization?

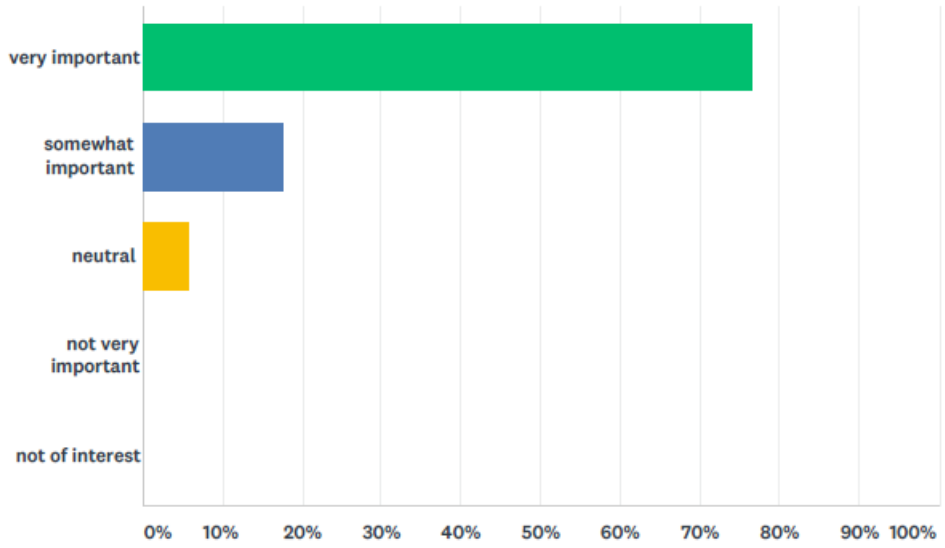
Answered: 17 Skipped: 1



ANSWER CHOICES	RESPONSES	
definitely need	82.35%	14
probably need	11.76%	2
neutral	5.88%	1
probably don't need	0.00%	0
definitely don't need	0.00%	0
TOTAL		17

Q5 How important is the ability to analyze and interpret health related big-data?

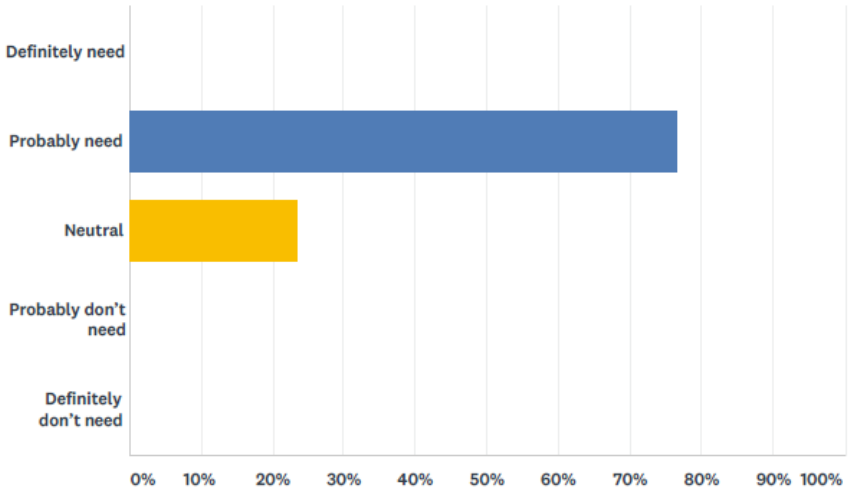
Answered: 17 Skipped: 1



ANSWER CHOICES	RESPONSES	
very important	76.47%	13
somewhat important	17.65%	3
neutral	5.88%	1
not very important	0.00%	0
not of interest	0.00%	0
TOTAL		17

Q6 When you think about the graduates from the degree would they be of interest to your organization?

Answered: 17 Skipped: 1



ANSWER CHOICES	RESPONSES	
Definitely need	0.00%	0
Probably need	76.47%	13
Neutral	23.53%	4
Probably don't need	0.00%	0
Definitely don't need	0.00%	0
TOTAL		17

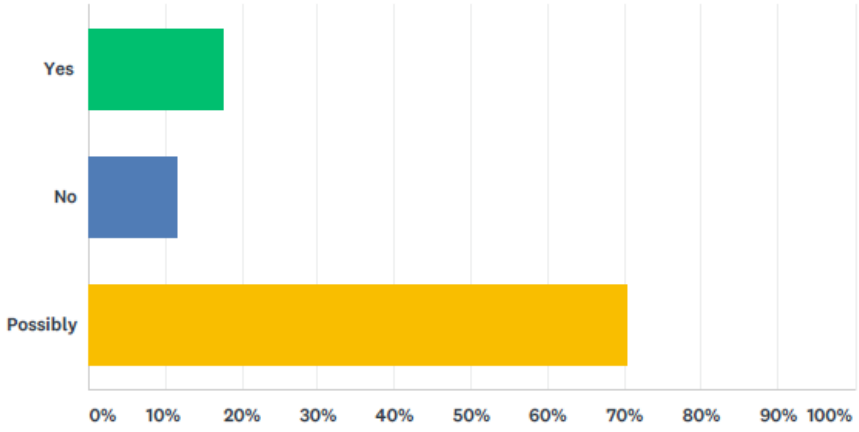
Q7 In your own words, what are the things that you like most about this new professional degree? Do you have any concerns with the proposal?

Answered: 15 Skipped: 3

#	RESPONSES	DATE
1	not at this time	3/20/2018 12:53 PM
2	none at this time	3/20/2018 12:26 PM
3	integrating big data with physiology	3/20/2018 12:22 PM
4	Need to ensure students can understand clinical importance of physiological systems.	3/20/2018 12:20 PM
5	The training in translational sciences linked to big data analytics	3/20/2018 12:18 PM
6	I like the idea of creating a group of graduates with the scientific background to tackle research problems of current relevance - in particular if they also gain research project management skills. There is a significant need for lab/clinical research project coordinators. Ideally, it would be great to train a subset of this group with clinical research skills (ethics/processes/etc) to facilitate their involvement in clinical and/or translational research. In pure lab research, managerial positions are increasingly occupied by PhD-holding Research Associates, while clinical groups require a different set of skills. WRT question 8 (hosting a student), this would require some further discussion, based around the parameters of the placement, compensation required for the student, and the precise skill sets acquired in the finalized program. However, given the size of the organization, I strongly feel we could place students from this program.	3/19/2018 11:52 AM
7	the hands on experience, professional development and the elite nature of the program	3/15/2018 2:16 PM
8	Most like: Teaching students to "be capable of managing projects requiring integration of data from multiple sources" so that the benefits of "big data" can be gleaned. Also like the inclusion of learning about the "interface between research and implementation" again to that research results better transition to implementation. My concern is that given the complexity of integration of big data and the need to use and understand bioinformatics and computational biology (or at least understand the capabilities of these tools and when to apply them) cannot be learned in just a one year course.	3/15/2018 2:06 PM
9	I am not familiar enough with big data to give you a good review. Are there companies in Canada taking advantage of this? Best to find and reach out to those companies to get their input. I imagine this would involve a good deal of statistics? Is a 1-year programme enough time to learn these skills adequately to become attractive to employers? Also, ensure that students work with influential physicians and physicians group. These relationships can be leverage when seeking employment.	3/7/2018 7:55 AM
10	The 4V's of the data that will be generated through this future will challenge our ability to interpret and use the data. We need to build skills and capacity. I would suggest you include a primer on measurement, noise, uncertainty.	2/15/2018 1:39 PM
11	The amalgamation of modern techniques in generating, organizing and managing large datasets and providing a practical experience that will aim to create value (ie: KT and commercialization) and provide trainees applied tools (project management skills etc). The only concern might being able to market the program to employers. The types of degree titles that would bring together these skills would be somewhere between epidemiological, bio-stats and a project management certification program. A degree called, and MHSc in Medical Physiology may not completely convey the breadth of training that your students will receive and the practical 'big/wicked' problems that they'll be able to solve. I'd have to think a bit more about what would be a compelling description to potential students and future employers (eg: MHSc in Applied Medical Health Systems)	2/12/2018 10:27 AM
12	There is a need for people trained to led large multidisciplinary team grants who understand the science but are also skills in project management. It is rare that those two things coexist!	2/4/2018 8:08 PM
13	focus on big data and knowledge transfer in science. The duration (12 months) may be a bit short	2/2/2018 10:05 AM
14	Big data orientation; leadership potential	1/31/2018 3:37 PM

Q8 Would your organization be able to host a student for a work experience project?

Answered: 17 Skipped: 1



ANSWER CHOICES	RESPONSES	
Yes	17.65%	3
No	11.76%	2
Possibly	70.59%	12

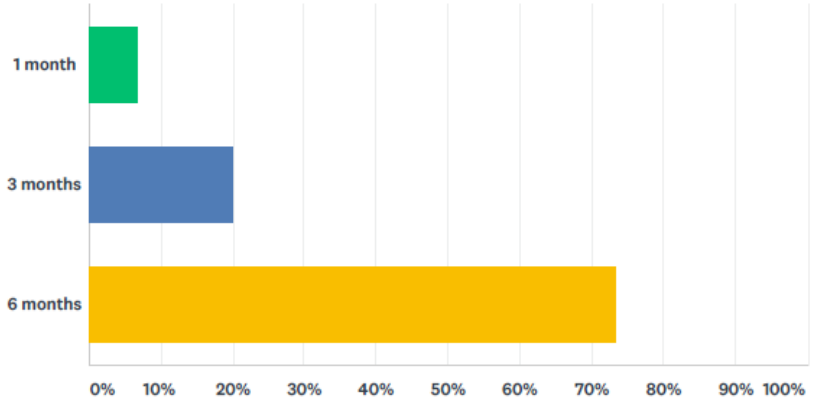
Q9 Are there any specific areas you would like to be included in the new program?

Answered: 14 Skipped: 4

#	RESPONSES	DATE
1	can't say	3/20/2018 12:53 PM
2	unable to say at this time depends on the graduates	3/20/2018 12:26 PM
3	Stem cell biology	3/20/2018 12:22 PM
4	Integrate endocrine & cardiovascular	3/20/2018 12:20 PM
5	not at this point	3/20/2018 12:18 PM
6	As outlined above, I think training in clinical research project setup and management would be a significant asset.	3/19/2018 11:52 AM
7	work integrated learning (internship)	3/15/2018 2:16 PM
8	Don't understand big data enough to be more helpful	3/7/2018 7:55 AM
9	Cardiac;	2/15/2018 1:39 PM
10	Innovation Processes and Design thinking Health Economics/Cost-Effectiveness Analysis	2/12/2018 10:27 AM
11	knowledge of REB requirements, knowledge of budget management and fundamental HR principles, knowledge of the principles of data management, scientific integrity, data storage, grant application processes	2/4/2018 8:08 PM
12	Application of basic science to human health	2/2/2018 10:05 AM
13	Brain Health; Development; Longitudinal data	1/31/2018 3:37 PM
14	(there wasn't an opportunity to raise potential concerns: To me this program seems to have elements of what a grad student could pursue in IMS, IHPME, or even the Dalla Lana school of public health.	1/31/2018 3:02 PM

Q10 If you answered yes to #8 what would be the preferred length of the practicum?

Answered: 15 Skipped: 3



ANSWER CHOICES	RESPONSES	
1 month	6.67%	1
3 months	20.00%	3
6 months	73.33%	11
TOTAL		15

Appendix H: External Appraisal Report

Proposed Program	Medical Physiology, MHSc
Commissioning Officer	Professor Trevor Young, Dean
External Reviewers	Prof. John White – Dept. of Physiology, McGill University Prof. Donald DeFranco – Dept. of Pharmacology and Chemical Biology,
Date of Visit	March 29, 2018

EXTERNAL APPRAISAL SUMMARY *(Please provide a summary of your findings.)*

1. **OBJECTIVES**
   - **consistency of the program with the University's mission, and Faculty's and Department's academic plans**
   - **clarity and appropriateness of the program's requirements and associated learning outcomes in addressing the academic division's graduate Degree Level Expectations**
   - **appropriateness of the degree or diploma nomenclature**

As outlined in the proposal, the program is consistent with the mission of the University as highlighted by the University President's directive regarding "Leveraging our Location". The consistent message that we heard from all parties involved in the site visit was the "need" for students with training in systems physiology and "big data" analysis. This program seeks to provide students with both. The program also enhances the major teaching mission of the Department as evidenced by the large number of undergraduates (including "specialists") and PhD students they instruct in physiology. Many of the students do not seek careers in laboratory science but wish to obtain a skill set that would give them opportunities in the many expanding areas that directly and indirectly affect health care delivery, management and scientific exploration.

Given the fact that the program seeks to admit students with some advanced knowledge in physiology, which is one of its most distinctive features, the rigorous course requirements appear appropriate. The practicum experience is an important component of the student learning experience, but as will be discussed below will require considerable attention and oversight to be successful given potential barriers in finding placements for an ultimately large number of students for a somewhat limited time scale. Finally, individual course structures and variety will insure that students will attain the learning outcomes of the proposal as outlined in the proposal. In that regard, the lack of "wet lab" exposure or a Masters thesis addressing a novel question in physiology is not considered a weakness given the critical analysis, writing and oral presentation requirements in many of the advanced courses.

The naming of the program as “Medical Physiology” is appropriate given its focus on human physiology and translation of physiology knowledge to clinically relevant scenarios.

2. ADMISSION REQUIREMENTS

- **appropriateness of the program’s admission requirements to the learning outcomes established for the completion of the program**
- **appropriateness of any alternative requirements for admission into the program such as minimum grade point average or additional languages or portfolios, along with how the program recognizes prior work or learning experience**

The program’s stated policy to admit students with significant exposure to physiology courses as undergrads is appropriate given the rapid immersion of the students in rigorous, advanced physiology courses. The expectations that students identify a practicum experience within one year (or sooner) will favor students with a clear vision of their career goal even before matriculating into the program. In that regard, it is hoped that the admissions committee pay particular attention to applicant one-page summaries describing how the program will “contribute to the advancement of (their) professional goals”. This can also be probed in interviews (Will all interviews be live or some by Skype?) where it is hoped that interviewers will alert applicants to the accelerated aspect of the program and need to have career goals reasonably well formulated particularly given practicum requirement. Finally, the role of the Vice Chair of Undergraduate Instruction of the Department of Physiology to direct qualified undergraduates to the program could be expanded as well as her role in management and execution of many of the program’s goals.

The program’s requirements for foreign students whose native language is not English, to pass an English proficiency exam (TOEFL) is appropriate.

3. STRUCTURE

- **appropriateness of the program's structure and regulations to meet specified program learning outcomes and Degree Level Expectations**
- **rationale for program length in order to ensure that the program requirements can be reasonably completed within the proposed time period**

- **appropriateness of the program's structure and regulations to meet specified program learning outcomes and Degree Level Expectations**

As a professional degree program, the MHSc should be designed to orient students towards specific careers rather than to serve as a feeder program for other areas of study (e.g. medical school). In discussions with students, we wound up defending the design of the program against suggestions it look like a prep year to strengthen application to medical school. In fact, as designed, the program would not compete well with other “feeder programs” that exist in the US and Canada to aid students seeking admission to medical school since there is no

"linkage" to any medical school that guarantee admissions of minimally an interview and no focus on improving medical school admission test (MCAT) scores. Nonetheless, the program appears to be appropriately set up, although we do provide specific recommendations for course requirements (see program content).

The strength and depth of the academic environment and the course options available are definitely a plus. That being said, given its goals, the most important and distinctive aspect of the program is the practicum, and it is concerning the administration and organization of the practicum that the most serious concerns arose, as follows:

1. Concerns were raised about the administrative burden that placement would represent, particularly when the program reaches its 40-student limit. Discussions with representatives from other professional programs were particularly revealing; it was suggested that placement was more difficult than anticipated both in terms of administrative burden and of finding partners. The Medical Genomics program, which is just getting underway, is finding placement of a limited number of students for practicums more challenging than anticipated.
2. Given administrative issues around placement (e.g. acquiring provincial funding), there appears to be a tight timeline for finding placements for students. There was also concern that if a student discovered a research/career area that she/he had not considered halfway through course work there would not be enough time to adjust and find a new more appropriate placement. While it is hoped that in the selection process, the admission committee would seek students with clear career goals and paths (see above), there will clearly be some students whose interests change while enrolled in the program.
3. After our discussions with several parties, we were convinced that proposed future enrollment numbers (leading to a maximum of 40 students in the program) were reasonable, and, even if there were some overlap between program requirements, competition would not be a major issue because with the current number of professional programs available, demand would out-weigh supply. This raised concerns about an apparent lack of communication and coordination between professional masters programs.

These considerations led to the following recommendations:

1. Coordination between programs should be enhanced substantially. This could lead, where appropriate, to sharing of courses between programs.
2. <u>We strongly recommend</u> that the faculty set up a central "Placement Office" with adequate staffing whose mandate would be to coordinate outreach to potential placement partners. This would reduce administrative burden on the individual programs and should be cost-effective. It would also ensure that the faculty communicates with potential partners with one voice and that the same potential

partner is not contacted independently by different professional programs. Such an office would be increasingly important as enrollment in current programs increases and in the event of establishment of other professional programs in the faculty.

3. As a follow-up to 2, every effort should be made to provide in the final document describing the program an in-depth quantitative and qualitative assessment of the number and types of potential placement partners available in the GTA. Ideally, the numbers of potential placement sites should be substantially greater than the number of potential applicants once all programs are running at full capacity.
4. Ideally, all of the above should be coordinated with the provincial government to assure that appropriate provincial policies are in place to induce potential placement partners to participate in the programs.

- **rationale for program length in order to ensure that the program requirements can be reasonably completed within the proposed time period**

If appropriately organized and administratively supported, the program length of one year appears ambitious but feasible. As detailed above, flexible and efficient placement of students in practicums is essential for the success of the program. However, it was not clear how the program would deal administratively with students who wished to extend their practicum experience. Would they still be considered matriculated students at the University of Toronto? That could be a requirement of their practicum site or organization. The program needs to provide some clarity regarding this issue.

4. PROGRAM CONTENT

- **ways in which the curriculum addresses the current state of the discipline or area of study**

Although specific recommendations were made (below), there were no major concerns raised with the global course content of the program. Numerous course options taught by outstanding researchers are available to the students.

- **identification of any unique curriculum or program innovations or creative components and their appropriateness**

Overall, the physiology and big data component of the program is a terrific idea. However, concerns were raised about the relationship between the 4040 and 1040 “big data” courses as presented in the documents provided. These were partially alleviated by discussions with Dr. Brian Cox. The two appear to be largely complementary, however, it might be a good idea to have 1040 as a prerequisite for 4040 if one of the goals of the program is to turn out at least a subset of students with the skills to analyze raw data. This might require setting up specific streams within the program and have 1040 taught in the fall and 4040 in the winter.

The collaboration and commercialization component of the program (PSL4050H) was also greeted with enthusiasm.

Considering potential job options for trainees, is it worth having as an option access to a course on clinical trials and their management?

Minor comment: In the documents provided, the Diving Physio course (PSL1086H) is listed both as an Elective (Breadth) course and Focused Specialty (Depth) course. It seems it should only be the latter.

5. MODE OF DELIVERY

- **appropriateness of the proposed mode(s) of delivery—mixed-mode or non-standard forms of delivery, flex-time options—to meet the intended program learning outcomes and Degree Level Expectations**

The courses contain a mixture of learning modalities that will provide students with an opportunity to interact closely with experts in the field, critically analyze the literature and raw data, work in collaborative teams on issues regarding commercialization of biomedical products and discoveries, etc. There is even flexibility in some courses for students to tailor their learning to attain specific skills in big data analysis. However, as mentioned above, there is a need for the program to have a policy regarding “flex-time” for the practicum, which could exceed the stated program length requirements.

6. ASSESSMENT OF TEACHING AND LEARNING

- **appropriateness of the proposed methods for the assessment of student achievement of the intended program learning outcomes and Degree Level Expectations**
- **completeness of plans for documenting and demonstrating the level of performance of students, consistent with the academic division’s statement of its Degree Level Expectations**

While the proposal outlines in detail mechanisms of assessment of student achievement for the 11 stated Learning Outcomes (LOs), the extent of written feedback provided to students, particularly in evaluations of their engagement in small group activities needs to be more explicitly stated.

The plan to have a “Program Oversight Committee” biannually evaluate individual student progress is appropriate and will be useful to maintain student goals and LOs.

7. RESOURCES

- **adequacy of the administrative unit's planned utilization of existing human, physical and financial resources, and any institutional commitment to supplement those resources to support the program**

On the academic side, several outstanding researchers are committed to teaching in the program. There are no issues with expertise or degree of academic commitment.

As detailed above, it appears that the administrative burden of managing practicum placement for a program running at full capacity (and those of other programs) has not been adequately anticipated. This will almost certainly require additional HR and financial resources, and, as detailed above, would be best run at the Faculty level.

- **participation of a sufficient number and quality of faculty who are competent to teach and/or supervise in the program**

  No issues.

- **adequacy of resources to sustain the quality of scholarship of graduate students, including library support, and information technology support**

  No issues.

- **recent research or professional/clinical expertise of faculty to sustain the program, promote innovation and foster an appropriate intellectual climate**

  Outstanding – no issues.

- **sufficiency of financial assistance for students to ensure adequate quality and numbers of students**

  Appears adequate.

- **supervisory load distribution and the qualifications and appointment status of supervisors**

  No issues.

8. QUALITY AND OTHER INDICATORS

- **quality of the faculty (e.g., qualifications, research, innovation and scholarly record; appropriateness of collective faculty expertise to contribute substantively to the proposed program)**

- **program structure and faculty research that will ensure the intellectual quality of the student experience**

The program draws on a diverse group of highly successful faculty from various disciplines to provide the students with excellent opportunities to experience many emerging areas of physiology and biomedical research. Since a “wet lab” or faculty-mentored research is not a component of the program (excluding the experience gained from the practicum of course), the ability of funded faculty to support additional students who will be enrolled in this program is not an issue. Nonetheless, having funded, research-active faculty as the predominant instructors in this program will ensure that students will be exposed to the most cutting edge research and most pressing basic research and clinical problems. Finally, as outlined in the proposal, many extra-departmental sites and research centers are available for students to receive hands-on training.

Appendix I: Dean's Response to Appraisers' Report

July 10, 2018

Dr. Susan McCahan
Vice Provost, Academic Programs
University of Toronto
McMurrich Building
12 Queen's Park Crescent West, Room 103
Toronto, Ontario
M5S 1S8

Administrative Response to the External Review of new Degree Program
MHSC in Medical Physiology Conducted March 29, 2018

The Faculty of Medicine is most grateful to the external reviewers, Professor John White, Department of Physiology, McGill University and Professor Donald DeFranco, Department of Pharmacology and Chemical Biology, University of Pittsburgh for their comprehensive review of, and subsequent report on, the proposal for a new professional Master in Health Science (MHSc) in Medical Physiology. I would also like to thank Professor Alison Buchan, and the other faculty in the Department of Physiology, for their leadership and creativity in developing this innovative proposal. Overall the reviewers were very positive in their assessment of this proposal, stating that "the physiology and big data component of the program is a terrific idea" and that "(t)he program draws on a diverse group of highly successful faculty from various disciplines to provide the students with excellent opportunities to experience many emerging areas of physiology and biomedical research."

This administrative response was developed in consultation with the following individuals in the Faculty of Medicine: Graham Collingridge, Chair, Department of Physiology; Professor Alison Buchan, Department of Physiology; Dr. Allan Kaplan, Vice Dean, Graduate and Academic Affairs.

I will address the specific issues raised by the reviewers:

1. Admission requirements

The appraisers had several recommendations on the admission process which we agree with and will implement. For example, the admissions committee will pay particular attention to the applicant's one-page summary to determine how the program aligns with their professional goals and also what they envision in terms of a typical practicum placement and subsequent career prospects. As suggested, these discussions will also carry through to the interview process. In response to the appraisers' question on using Skype for the interviews, this platform will be used if a face-to-face interview is not possible.

2. Program Structure

The appraisers had a number of comments and recommendations related to the administrative burden of managing the practicum placement when the program is running at full capacity. To meet this demand, the appraisers suggested additional human and financial resources, particularly at the Faculty level, to support this program and enhance coordination between similar programs. Specifically, a Central Placement Office was suggested which would coordinate placements for all the professional programs in the Faculty of Medicine.

We agree that coordination between programs should be strengthened and efforts in this area are already underway. Program Directors of other professional programs that have placements have met and discussed joint strategies including exploring options to share courses, enhancing communications regarding placement locations, and the potential to co-host a placement "fair" inviting industry and other health care professionals to meet students. They will continue to meet and provide recommendations to the departments for future collaborative ventures.

To ensure enough placements are available for all students, the program recently surveyed potential employers and the 15 out of 18 confirmed they would have a potential placement for students in this program (Appendix G). As well, the program anticipates that the 9 teaching hospitals and 14 research institutes affiliated with the University of Toronto will also provide placement sites as well as employers in the sectors of Drug and Pharmaceuticals, Medical Device and Equipment, Research Testing and Medical Laboratories. At this time, the Faculty believes that this approach to support placements is preferable to the establishment of a Central Placement Office.

The appraisers commented that the short length of the program may not provide enough time for a student to change the their focus and potentially arrange a different practicum placement. After reviewing the External Apprasial Report and some discussion , the following protocol will be implemented to ensure all efforts are made to align a student's interest and skills to the optimal practicum placement.

From the start, the applicant's statement of intent and information gathered at the admission interview will help determine what initial placements to discuss with the student. The second point of contact will be during the first term when the student is exposed to graduate professional development in PSL4000H. This course will teach students how to network within professional circles, write effective cover letters/resumes and develop interview skills in order to help them recognize the best practicum match. A final measure to ensure a student is in the right practicum is through regular check-ins with the program director before the end of the first term of the program.

The appraisers asked how the program would handle students who wished to extend their practicum experience. This program has been designed so that students will achieve the learning outcomes in three sessions, which includes the 4 month practicum placement. Students will not be able to extend the length of their program as it would delay graduation and result in additional tuition. This would not preclude placement sites from hiring graduates.

3. Program Content

The appraisers were enthusiastic about the big data component of the program. Although partially alleviated during the site visit, there was some concerns, regarding the proposed relevant courses and suggested making the optional course, PSL 1040H (Systems Biology in Physiology), a prerequisite for the required course, PSL 4040H (Big Data and Health). The Department feels that this would be neither necessary nor appropriate. The intent of this program as it relates to the topic of big-data, is to give the students grounding in the methodologies required to explore datasets, expand their skills in big-data analysis and understand the terminology used by big-data scientists. This goal will be more easily meet through the required course PSL 4040H.

PSL 1040H is a lecture course, complemented with student seminars, that focus on the link between medical scientific research approaches with 'large scale' analyses. The overall goal of systems biology science is to connect complex biological networks with biochemical and physiological outcomes. The link between cellular physiology and systems biology have profound significance to our understanding of general physiology and the goal of PSL 1040H is to teach students of recent developments, and importantly, enable them to extract and utilize information at the systems biology level. In contrast, PSL 4040H is designed to teach students how to apply large data methods to tackle hands-on analysis of large datasets related to human health (e.g. from a wearable device). There is some overlap in the content of PSL 1040H and PSL 4040H so both are not necessary.

In terms of the assessment of teaching and learning, the appraisers requested more information regarding the written feedback that students will receive when assessed on engaging in small group activities. The type of written feedback will vary depending on the course, discussion topics, and weight of the assessment, but it will also be tailored according to a student's interest in consultation with the program director. These will include peer feedback forms, or grading rubrics that will evaluate participation and valuable contribution to discussions.

Thank you again for the opportunity to address the very helpful comments of the reviewers as we move to have this Program added to the offerings for U of T students.

Sincerely,

L. Trevor Young, MD, PhD, FRCPC
Dean, Faculty of Medicine
Vice-Provost, Relations with Health Care Institutions

Appendix J: Vice Provostial Response to Dean's Response

19 July 2018

Trevor Young
Dean, Faculty of Medicine and
Vice-Provost, Relations with Health Care Institutions

Re: Appraisal Report, Proposed Master of Health Science in Medical Physiology

Dear Trevor,

I am very pleased to receive the appraisal of the proposed Master of Health Science in Medical Physiology. Your administrative response to the appraisal nicely summarizes the report and highlights the specific suggestions made by the appraisers.

The appraisers made a number of recommendations related to supporting practicum placements. These included enhancing coordination among existing programs with a practicum requirement, creating a list of placement sites and creating a central placement office within the Faculty of Medicine. You agree with the appraisers that coordination among programs with practicums be strengthened and you indicate that this is underway. Your response indicates a survey of potential employers was done and it confirms placement sites are available. Given this, you do not feel it is necessary to create a central placement office. The appraisers commented that one year might not be adequate time to complete the program if the student wished to switch their placement area. In response, the program has developed procedures at the time of admissions and during the program to ensure student interests are matched appropriately and supported toward a timely time-to-degree.

I will be very pleased to recommend this new professional master's degree program to governance for approval, following approval at the divisional level.

Sincerely,

Susan McCahan
Vice-Provost, Academic Programs
cc.

Amy Lee, Executive Secretary to the Vice-Provost, Relations with Healthcare Institutions and Dean, Faculty of Medicine
Allan Kaplan, Vice-Dean, Graduate and Academic Affairs, Faculty of Medicine
Rachel Zulla, Graduate Affairs Officer, Faculty of Medicine
Daniella Mallinick, Director, Academic Programs, Planning and Quality Assurance, Office of the Vice-Provost, Academic Programs
Jennifer Francisco, Coordinator, Academic Change, Office of the Vice-Provost, Academic Programs