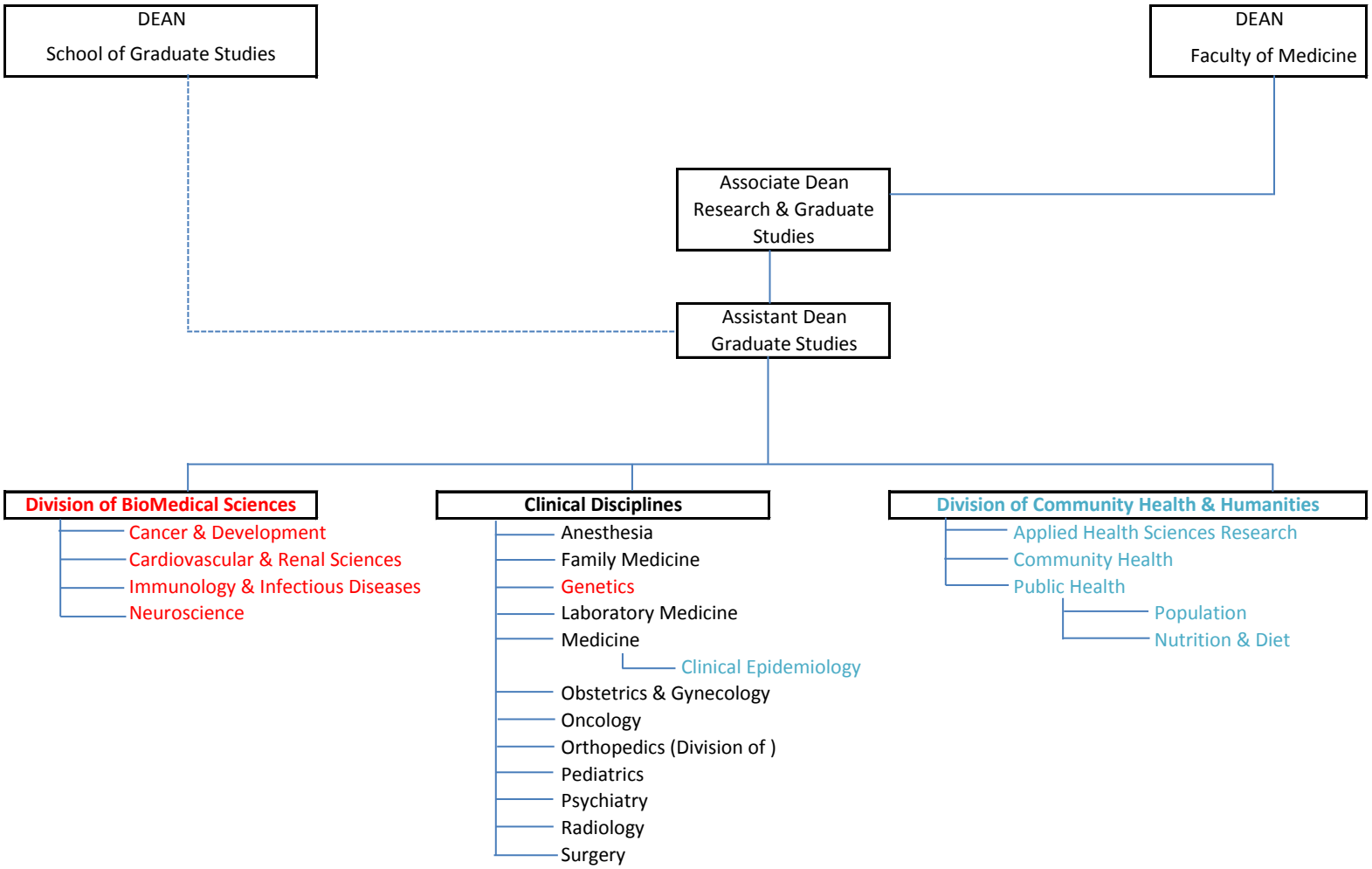
DEAN
School of Graduate Studies
DEAN
Faculty of Medicine
Associate Dean
Research & Graduate
Studies
Assistant Dean
Graduate Studies
Division of BioMedical Sciences
Cancer & Development
Cardiovascular & Renal Sciences
Immunology & Infectious Diseases
Neuroscience
Clinical Disciplines
Anesthesia
Family Medicine
Genetics
Laboratory Medicine
Medicine
Clinical Epidemiology
Obstetrics & Gynecology
Oncology
Orthopedics (Division of)
Pediatrics
Psychiatry
Radiology
Surgery
Division of Community Health & Humanities
Applied Health Sciences Research
Community Health
Public Health
Population
Nutrition & Diet
*Highlighted areas constitute 1 Academic Unit
*Highlighted areas constitute 1 Academic Unit

Academic Program Review
Report on Self-Study
Division of BioMedical Sciences and Division of Clinical Disciplines (Human Genetics)
October 2012

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October 2012

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Academic Program Review
Report on Self-Study
Division of BioMedical Sciences and Division of Clinical Disciplines (Human Genetics)
October 2012

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Cardiovascular and Renal Sciences Faculty Curricula Vitæ (cont'd)

Synopsis

Self-Study Background

An Academic Program Review (APR) is a formative process initiated by the Vice-President, Academic (VPA) under the authority of the Senate, and carried out by the academic unit for the purpose of evaluating academic programs.

For the purpose of this APR, Dr. Doreen Neville (VPA) identified two academic units within the Faculty of Medicine, each responsible for a conducting a self-study of their graduate programs. The documents that comprise this self-study constitute a review of the programs in the Division of BioMedical Sciences and the Discipline of Genetics. The Dean of Record for this APR is the Dean of the School of Graduate Studies (SGS), Dr. Noreen Golfman.

Dr. Neville and members of the Centre for Institutional Analysis and Planning (CIAP) introduced the review process to faculty, staff and students of the Division of Biomedical Sciences and the Discipline of Genetics at an information session held on March 22, 2012. A committee leading the self-study included Dr. Diana Gustafson, Acting Assistant Dean (Graduate Studies), Dr. Karen Mearow, Associate Dean (BioMedical Sciences), Dr. Bridget Fernandez, Acting Discipline Chair (Human Genetics), Dr. Ann Dorward, Program Coordinator (Cancer and Development), Dr. John McGuire, Program Coordinator (Cardiovascular and Renal Sciences), Dr. Roger Green, Program Coordinator (Human Genetics), Dr. Sheila Drover, Program Coordinator (Immunology and Infectious Diseases), Dr. Michiru Hirasawa (Neuroscience) and Heidi Moore, graduate student representative. The first meeting of the committee was held on April 5, 2012.

This synopsis provides an overview of the key elements identified in the reports submitted by the program coordinators and graduate students of the five graduate programs that comprise this academic unit. As an APR aims "to evaluate the quality, success, and role of academic units and programs in the fulfillment of their own and the University's mission and strategic goals" the synopsis is organized using the three strategic frameworks adopted by the Memorial University in 2012: Research, Teaching and Learning, and Engagement. Attention is given to the alignment of the self-study indicators with these University frameworks and the mission of the Faculty of Medicine.

Research

Research is the first of the three new strategic frameworks. One of the ten cross-cutting strategic themes is Well-being, Health and Biomedical Discovery. The University goal of growing key research areas in biomedical sciences and genetics is consistent with the aspirational goals and strategic objectives of the five programs.

Strategic Objectives: The four programs in biomedical sciences (Cardiovascular and Renal Sciences, Cancer and Development, Immunology and Infectious Diseases, and Neurosciences) have clearly stated strategic objectives that are in alignment with the mission and strategic plan of the Faculty of Medicine and the University. Currently, the genetics program does not have program-specific strategic objectives but these will be developed during a Discipline retreat planned for early 2013.

Infrastructure: The graduate programs have maximized their use of the available office, and laboratory space for faculty and students; however there is no effective space to meet and have a sense of community. Furthermore, the critical space shortage and inadequate animal care facility are regarded as key barriers to increasing graduate student enrolment and faculty complement and attracting post-doctoral fellows.

A state of the art genetics facility that is scheduled to open in 2014 will provide opportunities for growth and advancement in genetics research. This facility will provide space to expand the current full-time faculty complement from 8 to 12 by the years 2018- 2020. Some lab space in this facility may be available for non-genetics faculty.

Redevelopment of the space vacated by faculty from the Discipline of Genetics will address some of the existing space issues for faculty and students in the Division of Biomedical Sciences. Funds were recently allocated to undertake renovations in the animal care facility.

Faculty Complement and Outcomes: At the time of this report, there is a full-time faculty complement of 31 in the Division of BioMedical Sciences and 8 in the Discipline of Genetics, with a range of seniority (Assistant, Associate and Full Professors). The majority (25 of 31 in the Division of BioMedical Sciences and 7 of 8 in the Discipline of Genetics) are actively engaged in research with a strong record of publication and a good level of funding through multiple external grants. The remaining faculty members have varying levels of contributions to teaching and administration. For example, the eighth faculty member in the Discipline of Genetics makes major teaching contributions both at the undergraduate and graduate level.

The projected decline in research funding opportunities is a recognized challenge to fulfilling the strategic objectives.

The aging professoriate (as is common in most Canadian universities) offers opportunities to hire new and mid-career faculty to realign programmatic priorities while reinforcing existing strengths. There is currently one CRC Chair (Tier I) in Immunology and Infectious Diseases and one CRC chair (Tier II) in Cancer and Development. The search to recruit additional CRC Chairs (Tier II) in Neurosciences has identified two candidates who have tentatively accepted offers of employment. Since the last APR there have been five post-doctoral fellows (two in Immunology and Infectious Diseases) and three in Neurosciences.

Improvements in infrastructure (laboratory space, animal care services) will be necessary in order to make it possible to increase the faculty complement in the Division of BioMedical sciences to a critical mass of ten per program group by 2020 and add another five for a proposed new program area in biotechnology.

Administrative Support and Efficiency: The current complement of six full-time staff in the Office of Research and Graduate Studies is generally regarded as competent and helpful in administering programs and providing assistance to faculty and students across a range of activities.

Two additional administrative assistants (one serving the needs of the human genetics program and other clinical disciplines, and one serving the needs of programs in biomedical sciences) are needed to assist faculty, staff and potential and current students with individual program support.

Teaching

The Teaching and Learning Framework is the second of three strategic frameworks. The success of these programs has been measured using a variety of indicators (detailed below). Five key elements are highlighted here. All five programs (Cancer and Development; Cardiovascular and Renal Sciences; Immunology and Infectious Diseases, Genetics, and Neuroscience) have established specific programmatic requirements and learning outcomes that students are expected to meet. The laboratories are staffed by expert faculty, experienced research assistants and in some cases, postdoctoral fellows to support knowledge and skill development.

Graduate Student Outcomes: Faculty and current students regard the master's and doctoral programs offered in each of the five programs areas as rigorous and challenging.

Some measures of the effectiveness of the programs are completion times, Grade Point Average (GPA), faculty-student ratio, internal and external funding and student publication record. These and other indicators are recorded in individual student paper files and electronic databases internal and external to the Faculty of Medicine.

There is no single, comprehensive, readily searchable electronic database held by the Faculty of Medicine for tracking graduate student outcomes. This makes monitoring student outcomes and calculating future projections challenging. There are also gaps in the inventory of graduate training outcomes. A comprehensive and searchable electronic database would provide detailed and reliable historical data to track trends and calculate projections. Other indicators such as post-convocation placement are not tracked. Neither the Office of Research and Graduate Studies nor individual programs routinely interview or survey exiting students about program outcomes or reasons for leaving the program.

Doctoral students have at least two opportunities to defend their disciplinary knowledge and research (oral and written comprehensive examination and doctoral defense). Master's students are not required to defend their theses although a survey of faculty indicates that some are interested in considering this possibility as a way to build graduate student skill and enhance masters' program rigour.

The completion time for the two-year master's program ranges from 7 to 8.25 semesters. The completion time for the doctoral program ranges from 15 to 21 semesters.

Variation may be related to skill level of incoming students (e.g. exposure to hands-on laboratory instruction; academic background), student status (full-time versus part-time status), leaves of absence (illness, parental leave) or the extent of the research commitment.

MD-PhD Program: The goal of the integrated program is to provide exceptional students with the opportunity to be trained as both a physician and a health researcher. Only three applicants were accepted into the program in the twelve years since its introduction. One student completed the program after twelve years; the second has completed the doctoral portion and has returned to complete the remaining two years of her medical education. The third student withdrew. The uptake of the program has not been particularly successful when compared with comparable programs across Canada. The viability of the program is under discussion.

Graduate Student Enrolment: There has been significant and steady growth (20.1%) in total graduate enrolment in the Faculty of Medicine in the five years since the 2006 APR (199 in 2007-239 in 2011). This overall growth falls short of the 30% projection set forth in the Faculty of Medicine Strategic Plan 2008-2012. Growth in enrolment has reached a plateau for two main reasons: infrastructure and faculty complement.

International students make up a significant proportion of applicants to the graduate programs in genetics and the biomedical sciences. Faculty and students have identified some challenges to supporting success in this population. For example, some international students for whom English is a second language require significantly more time to assist with writing skills. Formalized mechanisms in the Faculty of Medicine that promote international students' success and build on wider university programs may address this and concerns as part of a larger plan to increase graduate student enrolment.

One example of a formalized mechanism for attracting students to graduate (and medical) programs is the Summer University Research Assistantship (SURA) program. The SURA program provides Memorial University undergraduate students (both science and MD) with an opportunity to gain hands-on research experience with faculty and graduate students. Funding comes from internal and external sources and has supported between ten and twenty students each summer since the last APR in 2006. The popularity (and competitiveness) of the program is increasing. Currently, there is no tracking or formal evaluation of the program to indicate if this is a successful recruitment strategy for graduate school.

Other summer research programs such as the NSERC USRA program are also intended to attract strong students to enrol in graduate programs. The majority of faculty across all five programs also supervise undergraduate science students for honours research projects. This is another mechanism for attracting graduate students.

Workload Balance: All faculty members are engaged in supervision, co-supervision, supervisory committee membership, comprehensive and thesis examinations committees while also carrying out their research programs. Because of the relatively small faculty complement, the teaching and supervisory work crosses program boundaries. The ratio of faculty to graduate students is regarded by most faculty and students as appropriate. Limited opportunity for

faculty and graduate students to engage in didactic teaching is a hindrance to promotion and tenure and the development of graduate student skills. A new Teaching Skills Enhancement Program (TSEP) for graduate students is being launched in fall 2012.

Administrative and Technical Support: The Office of Research and Graduate Studies (RGS) provides overall administrative support to graduate programs in the Faculty of Medicine including the five programs that are the focus of this APR. The Office coordinates and supervises admission processes, assessment and evaluation of programs, the development and approval of new courses and programs, and implementing and monitoring regulations and policies approved by SGS and MUN, and coordinating funding and scholarship activities.

This self-study reveals the need for an adjunct to the overall program administration provided by RGS. Specifically, an academic program assistant located the Division of BioMedical Sciences and another in the Discipline of Genetics may improve the timely disposition of admission files and support individual faculty and students by providing information about their graduate programs.

Student Funding: Full-time graduate students must be funded at a minimum of $12,000 funding per annum for two years for master's students and four years for doctoral students. RGS provides $6,000 per year for each eligible student on a first-come, first served basis, to a maximum of three students per supervisor. In many cases, supervisors top up the stipends to a total of $17,000 to $20,000/per annum. In the past, this system has worked in the interests of most students in these graduate programs. The significant growth in student enrollment in other Faculty of Medicine programs coupled with the all-semesters intake has the potential to disadvantage some students. A review of the funding allocation has been undertaken to ensure equitable distribution of funds and a more competitive student stipend.

Students are eligible for various internal and external scholarship and award opportunities. For example, last year, RGS put a financial plan in place that made possible dedicated funds for six Dean's Fellowship Awards (twice as many as in previous years). These Awards are a stepping stone for success in external award competitions such as CIHR and other Tri-Council agencies.

Engagement

The engagement framework is the third component of Memorial's strategic plan. There are some important elements in place to support faculty and students engagement with areas for growth identified.

Faculty and students agreed that there are several established venues for building intellectual community, enhancing presentation skills, and learning about cross-disciplinary research. These include the seminar/ journal club (a requirement in all programs), and conferences, forums or symposiums, retreats and speakers series. Although these tend to be program specific, they do attract students and faculty from across the Faculty of Medicine and the wider University community who are enthusiastic about learning and interested in enhancing their communication skills. More opportunities can be created to promote an appreciation of diverse interests in health research.

Position Specification

Dean of Medicine

Memorial University of Newfoundland

Introduction

Memorial University enjoys a strong and growing reputation in Canada and internationally for excellence in higher education and research.

The University aims to enable its students to acquire a fine, well-rounded education, to provide its employees with an excellent working environment and to serve the needs of the Province of Newfoundland and Labrador.

The Faculty of Medicine has an equally strong and clear Mission Statement: "Our purpose is to enhance the health of the people of Newfoundland and Labrador by educating physicians and health scientists; by conducting research in clinical and basic medical sciences and applied health sciences and by promoting the skills and attitudes of lifelong learning."

The Faculty succeeds in playing a key role in the University and in the Province. In addition to offering sound programs at the undergraduate and the graduate levels and pursuing a robust research agenda, the Faculty provides clinical support to the Province with particular emphasis on specialty services and community health issues. It continues to play a leading role in the development and deployment of telehealth.

The undergraduate curriculum is designed to foster integrated learning and permit contact with patients and with community agencies early in each student's training. Plans are currently being developed to expand opportunities for distributed learning. At the graduate level new program specializations are being developed and distance education is being expanded. There is also a substantial continuing education program. The more than 160 full-time and 280 part-time faculty members have major strengths in research as well.

The Faculty operates on a non-departmental system, with faculty members divided into three broad areas. The Division of Basic Medical Sciences has graduate programs in Cancer Biology, Cardiovascular Sciences, Immunology and Neurosciences and includes expertise in anatomy, biochemistry, endocrinology, immunology, molecular and cell biology, pharmacology and physiology. In the Division of Clinical Disciplines faculty members specialize in anesthesia, family medicine, genetics, medicine, obstetrics and gynaecology, oncology, pathology, pediatrics, psychiatry, radiology and surgery. The Division of Community Health covers behavioural sciences, community medicine, epidemiology and biostatistics, genetics, health care and delivery and occupational health. There is substantial collaboration across these three divisions in both teaching and research.

Role Description

The Dean is expected to develop and articulate an engaging, inspiring strategic vision for the future of the Faculty. The successful candidate must work effectively with the leadership of the University, Faculty and affiliated health care organizations to ensure the highest quality of medical, graduate and post-graduate education and research together with the delivery of health care in the Province. These objectives will be achieved by sustaining an aggressive agenda of research and education agenda, recruiting new faculty members and securing the resources necessary for these goals. The Dean will also lead the day-to-day administration of the Faculty and exercise prudent fiscal management. He or she will be responsible for strengthening partnerships with clinical affiliates, developing collaborative opportunities with other schools, colleges and universities and building effective relationships within the University, the Department of Health and Community Services, the Health Care Corporations and partners in industry and the broader community.

Because the Faculty of Medicine is funded directly by the Department of Health and Community Services, the management of this particular relationship will be critical to the Dean's success, as will his or her ability to develop other sources of funding for the Faculty.

The Dean of Medicine plays a crucial role in the Province as a key advocate of health care issues and as an interface between the University and the community.

Background Requirements

The new Dean of Medicine must offer Memorial a credible and sustained record of achievement as a clinician or in medical research or community health. The Dean will combine a strong educational background with experience in leading and successfully managing large complex organizations. The successful candidate should be sensitive to issues in community health, familiar with the Canadian health care system and able to demonstrate the ability to form and sustain strong professional relationships with people at different levels and with organizations of various cultures.

Faculty of Medicine
Memorial University of Newfoundland
Research and Graduate Studies (Medicine)

NAME:
POSITION: Associate Dean, Research & Graduate Studies (Medicine)
DISCIPLINE/DIVISION: Faculty of Medicine, Deans Office
Term: 3 years, renewable effective January 1, 2011
Stipend:

REPORT TO AND APPOINTED BY: Dean, Faculty of Medicine

PURPOSE:

Faculty of Medicine - Mission statement

"Our purpose is to enhance the health of the people of Newfoundland and Labrador by educating physicians and health scientists; by conducting research in clinical and basic medical sciences and applied health sciences and by promoting the skills and attitudes of lifelong learning"
This statement was reaffirmed at the November 2002 retreat. The Assistant Dean, Postgraduate Medical Studies, has a major responsibility for the education and preparation of Newfoundland physicians for medical practice and lifelong learning

DESCRIPTION

The Associate Dean of Research and Graduate Studies has a pivotal role in the day-to-day activities related to research within the Faculty of Medicine. S/he is a leader in developing educational programs for health scientists. S/he will, in consultation with the Associate Deans of Clinical Research, Biomedical Sciences and of Community Health and Humanities Divisions, identify the needs of research and graduate studies in the day to day administration of the Medical School. The Associate Dean, Research and Graduate Studies (Medicine), will lead the Faculty of Medicine in a strategic planning process for research, in consultation with the Associate Deans of Biomedical Sciences and of Community Health and Humanities divisions and the Associate Dean of Clinical Research and in collaboration with current and potential researchers and interested stakeholders.

ACTIVITIES AND RESPONSIBILITIES

The Associate Dean, Research and Graduate Studies (Medicine), reporting to the Dean of Medicine will:

- Develop, a strategic plan for research in the faculty of medicine and its implementation in consultation and collaboration of all stakeholders in Medicine and oversee the implementation of the strategic plan;
- Facilitate the development of research teams, including multi-disciplinary and intra-faculty teams to take advantage of funding opportunities to grow the research agenda of the Faculty of Medicine

- Communicate with granting agencies both at the Provincial and Federal levels on broad issues related to research in the Faculty of Medicine
- Maintain a register of all research equipment in the Faculty in conjunction with the Manager of MELS.
- provide information on matters such as:
    - sources of research funds, expenses involved in research activities submission of grant applications
    - equipment available to faculty within the Medical School and within the larger university community
- Provide guidance and advice to new faculty members, in terms of obtaining and maintaining research funds, in collaboration with the Associate Dean of Clinical Research and the relevant Division Associate Deans and Discipline Chairs.
- Ensure that the research proposals follow the procedures and guidelines of the university;
- Assess the results of grant competitions and maintain a comprehensive registry of grants for reporting to the Faculty yearly, to the University and to outside agencies;
- Represent the Faculty of Medicine on the AFMC Standing Committee on Research and Graduate Studies;
- Liaise with the University Office for Research and VP research on matters relating to research operations within the Faculty of Medicine
- Collaborate with the Communications Coordinator to publish appropriate brochures regarding research within the Faculty of Medicine
- Provide guidance and advice in addressing issues related to proper conduct of research in the Faculty of Medicine;
- Oversee the smooth and effective running of the office of Research and Graduate Studies;
- In the absence of the Assistant Dean of Graduate Studies (Medicine)or when there is a perceived conflict of interest, the Associate Dean will fulfill the role of the Assistant Dean under special circumstances;
- Represent the Faculty of Medicine on University Committees or most other external committees related to research;
- Meet at regular intervals with the Dean of Medicine to apprise him of new developments and issues of concern.

Committee participation includes:

- Senior Management Committee (member)
- Faculty Council (member)

In addition the Associate Dean will also undertake such other duties or special assignments as may from time to time, be requested by the Dean.

Faculty of Medicine
Memorial University of Newfoundland
Research and Graduate Studies

NAME:	
POSITION:	Assistant Dean, Graduate Studies
DISCIPLINE/DIVISION:	Faculty of Medicine, Office of the Dean
Term:	3 years, renewable
Stipend:	
REPORT TO:	Associate Dean, Research and Graduate Studies

PURPOSE:

Faculty of Medicine - Mission statement

"Our purpose is to enhance the health of the people of Newfoundland and Labrador by educating physicians and health scientists; by conducting research in clinical and basic medical sciences and applied health sciences and by promoting the skills and attitudes of lifelong learning"
This statement was reaffirmed at the November 2002 retreat. The Assistant Dean, Graduate Studies, has a major responsibility for the education and preparation of graduate students and post-doctoral scholars

ACTIVITIES AND RESPONSIBILITIES

The Assistant Dean, Graduate Studies is responsible for:

- Coordinating and supervising of the graduate programs and post doctoral fellows in the Faculty of Medicine to include (but not limited to)
    - Admissions
        - Oversight and coordination of the admissions,
    - Assessment and Evaluation
        - Oversight and coordination of evaluation processes
        - Organization of regular internal reviews of graduate programs
    - Meeting graduate students individually or in groups annually
    - Facilitating approval of new courses within existing programs
- Developing, implementing and monitoring procedures for graduate studies education within the faculty of medicine
- Lead the development of new graduate research programs and facilitate the approval process
- Implement and monitor Graduate Studies and University regulations and policies

Faculty of Medicine
Memorial University of Newfoundland
Research and Graduate Studies

- Coordinate activities related to graduate student stipends, awards, fellowships and other Graduate Student applications
- Promotion of graduate programs externally
- Liaison with Assistant Deans, Postgraduate Residency Directors, and the Director of Clinical Research Development where applicable

Committee participation includes:

- Committees related to Graduate Studies and Post-Doctoral Scholars (Faculty of Medicine representative)
- Faculty of Medicine Graduate Studies Committee (chair)
- Senior Management Committee (member)
- Faculty Council (member)
- Academic Council for the Medical Education Scholarship Centre (MESC)
- Association of Faculties of Medicine Canada (AFMC) Committee

In addition the Assistant Dean will also undertake such other duties or special assignments as may from time to time, be requested by the Dean or Associate Dean, Research and Graduate Studies.

Faculty of Medicine
Memorial University of Newfoundland
Faculty Administrative Appointment
BIOMEDICAL SCIENCES

POSITION:	Associate Dean, BioMedical Sciences
DISCIPLINE/DIVISION:	Faculty of Medicine, Dean's Office
TERM:	3 years, renewable
REPORTS TO:	Dean, Faculty of Medicine

Goals and Objectives of the Division of BioMedical Sciences

To conduct and promote excellence in research and associated scholarly activities in the area of BioMedical Sciences.

To promote and deliver a high quality, science-based medical education to undergraduate and post-graduate medical students and to foster programs of excellence for the training of graduate students in BioMedical Sciences.

To serve as a primary resource for BioMedical Sciences for the Faculty of Medicine, other Faculties and schools, national and international scientific and educational organizations and for the Community at large.

Roles/Responsibilities:

- Promotes the Division by providing strong leadership and guidance in a manner that the goals and objectives of the Division of BioMedical Sciences are achieved within the Faculty of Medicine. Encourages faculty members to apply for external research funding, and fosters interactions and collaborations within the Division and communicates the contributions of the Division.
- Participates in developing the general policies that emphasize and enhance the contributions of the Division to the Faculty of Medicine and ensures that these policies are reflected in the recruitment of faculty and in other activities.
- Ensures that adequate resources are available for all teaching and research programs within the Division and ensures that resources are deployed equitably and for maximal benefit to the Division.
- Schedules annual discussions with each faculty member on the allocation of their time and resources. Identifies divisional /faculty resources that would assist faculty members in their activities. Counsels and advises faculty members regarding their professional development. Decisions agreed upon will be recorded in a jointly approved document.

- Provides new faculty with guidance and infrastructure required to establish their research program and teaching activities.

- Encourages and advises faculty members in the development of their scholarly activity, including the identification and recommendations of the most appropriate sources of both internal and external support.
- Encourages participation of faculty members in decision making and policy formulation for the Division and ensures timely communication of all matters which affect them, including monthly Division meetings (September to May) and the circulation of minutes for approval and acceptance at subsequent meetings.
- Represents the Division, in association with other Associate and Assistant Deans, in the development of general administrative policies which promote cooperative and effective interdisciplinary relationships within the Faculty of Medicine, the University and Eastern Health.
- Works in collaboration with the Associate Dean of Research and Graduate Studies (Medicine) and where appropriate, the Research Marketing Coordinator for the Faculty of Medicine, to develop and implement policies that serve to increase external research support, highlight the research profile of the Division, and enriches the educational experience for graduate students.
- Serves on committees referred to in the Constitution and Bylaws of the Faculty of Medicine.
- Ensures that appropriate searches for new faculty are conducted in order to achieve the goals and objectives of the Division of BioMedical Sciences.
- Submits an annual report to the Faculty of BioMedical Sciences which includes an overview of Divisional goals and objectives for the upcoming year (e.g. faculty recruitment, development etc.).

Faculty of Medicine
Office of the Dean
Memorial University of Newfoundland

POSITION:	Chair, Discipline of Genetics
DISCIPLINE/DIVISION:	Faculty of Medicine, Deans Office
REPORT TO:	Dean, Faculty of Medicine
APPOINTED BY:	Provost and Vice-President (Academic), MUN

PURPOSE:

Faculty of Medicine - Mission statement

> **"**Our mission is to enhance the health of the people of Newfoundland and Labrador by educating physicians and health researchers; promoting lifelong learning; conducting research in biomedical, clinical, and applied health sciences, and in community health and humanities; engaging communities and decision makers; and collaborating to apply the best available evidence in the formulation of policy and the organization and delivery of care." (2012)

ACTIVITIES

Teaching

- Participate in the current Undergraduate and Postgraduate teaching in Genetics
- Liaise with the Undergraduate Medical Studies Committee and Associate Dean, Undergraduate, to enhance the Genetics experience over the four years of the medical school curriculum
- Assess the feasibility of a Royal College training program in Genetics in concert with the Assistant Dean, Postgraduate
- Participate in the provision of professional development for the physicians of Newfoundland and Labrador through the Office of Professional Development and the Assistant Dean, CME

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Date: June 1, 2012
Author: Paula Corbett
File name: PC/Job Ads/Chair Genetics

Faculty of Medicine
Office of the Dean
Memorial University of Newfoundland

Administration

- Work with the Dean to recruit full time faculty for the Discipline and develop a 5 year human resource plan
- Direct and evaluate the academic and professional contribution of Discipline members to the Discipline, the Faculty of Medicine and the University
- Recommend (R) to the Dean or notify (N) the Dean's Office:
    - Part time appointments and the appropriate stipend according to the Part time appointment guide (R)
    - Resignations and retirements (N)
    - Full time faculty salary levels (R)
    - Sabbatical leaves (R)
    - Committee memberships when requested (R)
    - Appointment of support staff (R)
    - Equipment (R)
- Foster the academic professional development of the Discipline members through
    - Meeting annually with each Discipline member
    - Establishing with the individual faculty member her/his goals and objectives
    - Negotiating resources needed to achieve goals and objectives
    - Advising on and supporting promotion and tenure
- Prepare an annual report of discipline activities highlighting major accomplishments
- Liaise with, in a leadership capacity, Eastern Health in the provision of Genetics services regionally and provincially
- Prepare certain budget allocations and/or requests for the discipline to be submitted to the Dean for approval
- Be responsible for the use of travel and discipline funds allocated to the Discipline to include the development of priorities with the discipline for the use of discipline and travel funds
- Hold regular meetings with full time faculty within the Discipline and with full time and part time faculty **at least** annually

Version: one
Date: June 1, 2012
Author: Paula Corbett
File name: PC/Job Ads/Chair Genetics

Faculty of Medicine
Office of the Dean
Memorial University of Newfoundland

Scholarly Activity

- Foster increased research collaboration between the Discipline of Genetics and other divisions within the faculty of Medicine
- Increase the research activities of the Discipline
- Provide excellence in clinical care in her/his area of expertise equivalent to a minimum of 0.2 – 0.4 FTE

The Chair of Genetics committee membership includes, but is not limited to:

- Senior Management Committee
- Faculty Council
- Discipline Committee

Version: one
Date: June 1, 2012
Author: Paula Corbett
File name: PC/Job Ads/Chair Genetics

Academic Program Review – Students from the Division of BioMedical Sciences and Division of Genetics

The students of BioMedical Sciences and Genetics met in individual groups based on program and below is a summary of the meetings. Students were asked the following questions,

1) What were your expectations of the program before you entered?
2) Now that you are in the program, do you feel it has met your expectations (with regards to courses, laboratory work, conferences, student-professor interactions, administration etc.)?
3) What are your suggestions for improvement to the program and what do you feel should stay the same?

<u>Highlights of the program</u>

Journal Club

All programs mentioned the importance of journal club and how they felt it brought the group together on a scientific level. One program (Cardio) stated journal club has stopped in the last few years and said they would like to see it back into a regular weekly schedule. The majority of students felt journal club helped in presentation skills as well as another opportunity to highlight their research to the program.

Student to professor ratio

Across all programs students felt the student to professor ratio was appropriate in regards to accessibility of the supervisor. Most students felt their supervisor is available for help in laboratory work, presentations, poster preparations etc. However there are also a few students who feel their supervisor is involved in too much outside of their own research which negatively affects their progress in the program.

Division of BioMedical Sciences Seminar Series

Students within the BioMedical Sciences commented on the importance of maintaining the seminar series started this year. They feel it is an opportunity to learn about the research that is taking place within the division in a relaxed atmosphere.

Course Work (Cardio, Neuroscience, Cancer)

Students within these programs felt the required courses were well structured, and that the amount of background material as well as application of the material was well done. The students of Genetics would like to see all courses offered every year rather than every two years to ensure they can graduate on schedule. Students in Immunology felt the course load was very heavy and did not leave opportunity for lab work in their first year of the program.

Conferences

Students at both the Master's and PhD level felt there were opportunities for them to present their research on a national and international level outside of Memorial. This gives experience presenting scientific data as well as establishing important connections for a future within science.

Student forums / retreats

Again students felt this was an excellent opportunity to showcase their research as well as learn what other students were doing within their program. One suggestion that came up was potentially having a divisional forum or retreat for students from all programs.

Stipend

Students want to stress the importance of the minimum stipend currently in place for all students. The graduate program is essentially their job and this money is necessary. Some students wished for an increase in the minimum stipend, stating it can be difficult to make ends meet with current salaries, however they still recognized the importance of what they currently receive.

<u>Suggested areas of improvement</u>

Consistency between programs

Students felt there was little consistency between the different programs. For example, a student from cancer has a much lighter course load than a student from immunology. All students graduate with a Master's of Science in Medicine and it is felt that no matter which program they decide to choose, they should receive the same level of training (course and lab wise).

Implementation of a graduate officer

There were many small issues that arose between all programs but the general consensus was that these issues could be resolved with a graduate officer whose position is dedicated to the graduate students. Issues that came up with students frequently were, details about the different programs (what is the difference between them), specific guidelines for writing a thesis and/or scientific paper, details of deadlines in order to graduate and convocate within the two years specification for a Master's, future career opportunities, as well as a more specific list of scholarship availability that are applicable to the students, not just mass emails about every possible scholarship that may not even be applicable to medical graduate students.

Administration

Some students had problems with administration issues such as travel claims. There are inconsistencies with some administration.

Clear expectations for students from the start of the program

Some students feel there are no clear expectations set when they begin their program and sometimes expectations change from one year to the next because there are no written regulations. For

example, the number of required journal club presentations can vary from one year to the next. At one point a student may have to present every semester, but the year before they were only required to present once a year. The issue is not the extra presentation, but rather that there is a lack of consistency and no written outline of what is required by the student. Another issue is in regards to vacation time. Many professors make their own rules regarding vacation time, but this should be something that is standardized for all graduate students.

More regularly occurring committee meetings

Many students feel it would be beneficial to have committee meetings every six months as opposed to once a year. Closer monitoring of the students progress would help ensure they could finish their degree on time.

Recruitment

Active recruitment is necessary in order to get highly qualified students into the program. This is in regards to all levels of graduate study. For example there could be more active recruitment to the undergraduate students at Memorial in the Faculty of Science to complete their Master's at Memorial. In addition, many students felt their program could be enriched if more post-docs were present. While it is noted that it can be difficult to obtain post-docs, students felt more senior individuals working directly in the lab would be beneficial for when they first start their program. This also ties in more potential for extended collaboration both within the programs and with other universities. Many students felt their program could be enhanced with more collaboration.

Academic Program Review of the Cancer and Development Graduate Program
Division of BioMedical Sciences, Faculty of Medicine, Memorial University

Overview of the Program:

The Cancer and Development (CD) graduate program is one of the original biomedical programs for students undertaking graduate work in the Faculty of Medicine. Participating faculty who are, or have been, primary CD graduate program supervisors are members of the Division of BioMedical Sciences, the Discipline of Medicine and the Discipline of Radiology: Drs. Jon Church, Jules Doré, Ann Dorward, Robert Gendron, Laura Gillespie, Kensuke Hirasawa*, Kenneth Kao, Edward Kendall*, Christopher Kovacs, Daniel MacPhee, Hélène Paradis, Gary Paterno and Guang Sun.

With this complement of faculty, there is substantial breadth in the graduate research programs of study that relate to cancer, development and endocrine physiology in the context of health and disease. A sample of the research areas includes: radiological imaging, general and reproductive endocrinology, skeletal biology, endothelial cell regulation and angiogenesis, growth factor signaling, transcriptional regulation, epigenetic regulation, model systems genetics, metabolic regulation, adipogenesis, breast, cervical, ovarian and prostate cancer research, uterine function and placental development. Faculty are engaged in graduate supervision, co-supervision, supervisory committee membership, comprehensive or thesis examinations and graduate course teaching while maintaining independent research programs (Appx A – Curriculum Vitae documentation). Furthermore, supervisory duties cross graduate program boundaries (Appx C, Q2). The group is collegial and supportive of the overall graduate program goals, as indicated by full participation in the 2011 group meeting, full participation in the annual (2007-2012) graduate student research symposia, regular attendance at the weekly student seminar program and cooperative graduate teaching roles for the active CD core courses (MED6580, MED6591) with cross-program graduate teaching contributions.

The self-study component of the CD graduate training activities (2006-present) will be supplemented by appendices that summarize program and course enrollments (Appx B), anonymous responses of a cohort of the faculty (8 respondents) to a recent survey of questions relevant to program review (Appx C), convocation rates, program duration estimates and information about the career choices of graduates (Appx D). Of 9 graduates contacted who have completed the program (Masters or Doctoral), 1 response was available from a PhD graduate. Currently enrolled students have submitted their comments to the APR committee's student representative.

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* The CV for Dr. Hirasawa is with the IID graduate program self-study materials; Dr. Kendall's CV was not available at the time of submission.

Philosophy of the Group and Program Outcomes:
There is no single mission statement for the group, but a collection of shared values that translate to a list of goals for a quality graduate training experience at the Masters or Doctoral level. Ideally, the students will achieve:

- Expertise in their chosen field of study through course work and personal study
- Increased potential for original and independent thought
- Acquisition of technical laboratory skills
- Execution of an original research project that contributes to peer-reviewed publications (Doctoral requirement; Masters ideal)
- Development of communication skills culminating in the written thesis (Masters and Doctoral) and oral defense (Doctoral)

Through their accumulated experience as graduate supervisors, the faculty knows that each trainee in the program will achieve these goals to different degrees depending on their incoming talents, their academic career goals and their accumulated experience during the program of study. This appreciation is represented in the survey, such that undergraduates from Memorial University, other Canadian universities or International students each show the same degree of variation in their incoming skill sets, as measured by their varied potential to complete the Masters program in the proposed 2 year timeframe (Appx C, Q3). It is recognized that International students for whom English is a second language require significantly extra time and assistance with their writing skills in English.

Empirical evidence of CD graduate achievements comes from the evidence of successful program completion at the Masters and Doctoral level (Appx D, Fig 3). Masters students undergo examination of a written thesis that clearly presents original research with appropriate background. To pass the examination, the document must be satisfactory according to the discipline's standards. Faculty responded on the survey whether an oral defense was considered necessary for the Masters degree. The majority responded in the negative (57%) although there were written suggestions that an informal seminar, and not necessarily an oral examination, might serve the same purpose (Appx C, Q5). Doctoral requirements include the comprehensive exam, the production of significant publishable research, an in-depth written thesis and the oral defense with expert examination.

The annual CD Graduate Research Symposium has served the program for the past 5 years (and beyond) as an end-of-spring term event with formal, short oral presentations for both Masters and Doctoral students, as a finale to their oral practice presentations given during the Seminar courses (MED6400-6403 for MSc or MED6410-6413 for PhD). Anecdotally, faculty and visiting speakers have positively commented on the polished, mature quality of the student oral presentations each year, suggesting the formula of the seminar course followed by the annual symposium is succeeding to raise the standard of their oral presentation skills. Students are encouraged to do their best with the awarding of the CD program prizes based on their symposium presentations. The CD group have identified additional funding mechanisms to implement a dramatic increase in the CD program prize numbers and amounts, to reward graduate research excellence (AppD, Fig 2). Over the years, this funding has been provided by the Office of Research and Graduate studies (Mary Pater Award) and topped up with funding from external agencies (Cancer Research Society), individual endowments (Mary O'Neill award),

vendor exhibition fees and more recently, a collaborative venture with the Discipline of Oncology to support symposium activities. The Faculty of Medicine sponsors a Visiting Speaker Program Fund for each graduate program and this core funding supports the CD Graduate Research Symposium costs that incorporate visiting speakers. The Visiting Speaker Program is highly valued by the faculty and students (Appx C, Q14).

In the development of the self-study, it was clear that outcomes of graduate training in the Faculty of Medicine have not been rigorously inventoried by the Office of Research and Graduate Studies, such that information gathering about program-specific outcomes was somewhat challenging. For example, exit interviews are not standard practice and the faculty survey was relied upon to get an incomplete snapshot of where the CD graduates go and the next career steps they take (Appx D, Fig 4). This is an area for immediate improvement, such that up-to-date databases to gather valuable information about graduate contributions to published work, program prize award histories, internal and external fellowship winners, supervisory activities, supervisory committee and examiner contributions, career moves post-graduation and the annual distribution of matching funds should be made available, and perhaps annually reported, at the Graduate Studies Committee Meetings.

CD Program Duration and Stipend Support:
On average, the time to completion for CD graduates who convocated prior to 2011 was 2.75 years for the Masters program (8.25 semesters) and 7.5 years for the Doctoral program (22.7 semesters), incorporating all students in the average regardless of F/T or P/T status (Fig 1, Appx D). Of note, the SGS data provided for these calculations did not factor in leaves of absence, thus the average number of registered semesters per student might be less than the numbers reported above. Particularly for the Doctoral programs, the historical data requires more rigorous analysis than the summary file provided by SGS. It would be valuable to know how male and female students are progressing through the doctoral program, whether they shift from F/T or P/T status over their program and to what degree they require leaves of absence, particularly for maternity or other family reasons. A structured return-to-program initiative might be relevant and beneficial for these students. In general, the faculty felt the Masters students were much more likely to submit their thesis within the 2 year timeframe than the Doctoral students within the 4 year timeframe. This might have to due with the more extensive research commitment, or the fact that doctoral students traverse that age in life when outside concerns (marriage, family, health matters) can interrupt the academic process (Appx C, Q6, Q7).

The faculty survey reports 2 -3 F/T years as a reasonable timeframe for a Masters degree and anywhere from 5 to 6 F/T years as a reasonable timeframe for the Doctoral degree (Appx C, Q4). It is noted by faculty members that basic laboratory skills of students entering the Masters program are generally lacking and some catch up time is required to raise their technical ability before they can progress with their research projects. It was suggested that erosion and/or eradication of hands-on laboratory instruction in the undergraduate science curriculum is leaving the students poorly prepared for graduate training.

The funding support policy in the Faculty of Medicine covers only 2 years of the Masters program and 4 years for the Doctoral program, should the student be eligible for (academic threshold), and given access to (first-come, first-served), the matched funding pool from RGS that is currently set to $6,000 of support per year for both F/T MSc and F/T PhD program students.

Funding is allocated each budget year on a first-come, first-serve basis, with a three F/T student per supervisor rule. Although this was an effective strategy that supported the majority of students in the past, the allocation formula and amounts need review to address graduate program growth and fairness, including an annual report of the allocations per program.

Given the current research funding climate at the national level (tight paylines), the imminent loss of CIHR-regional partnership funding in the province of NL, the absence of a provincial health funding body that is open to competitive biomedical research applications and the absence of a provincial scholarship program for competitive applicants, the sustainability of the current graduate student quota through biomedical graduate programs at Memorial University are in question (Appx C, Q19). In general, there is a lack of strategy in the Faculty of Medicine to leverage internal funding mechanisms for external funding sources (fellowship mentorship, for example) and no mechanism for eligible students to seek advice or mentorship in the preparation of competitive fellowship applications beyond the primary supervisor's input.

The Faculty of Medicine is unique on Memorial's campus with a policy to provide a minimum stipend to all F/T graduate program students at the Masters or Doctoral level for their program duration. The minimum stipend policy is well supported by the CD faculty (85% in agreement); in fact, the $12,000 is considered too low to attract quality candidates to the program (Appx C, Q15, Q16). Respondents suggested stipend averages of $15,700 for M.Sc. and $17,800 for PhD students. The Office of Research and Graduate Studies does not report on average stipend amounts paid out to Masters and Doctoral students in the CD program, but this type of information would be useful input for the database and future policy development to standardize supervisory requirements and/or make the stipend expectations clear and attractive to incoming students.

In terms of program outcomes, faculty members who were aware of their former graduate's career moves submitted categorical, anonymous information on the faculty survey (Appx D, Fig 4). Overall, one fifth of the pool of graduates continued in academia (21 %) while others attended professional schools (medicine plus other, 27 %), took research staff positions (15 %), became professional educators (12 %) or joined industry (6 %). Nine percent of students did not complete their program and another 9 % were in unknown occupations. Formal exit interviews at the end of graduate programs would greatly improve the quality of this information. Graduate placement statistics would allow all the graduate programs in Medicine to reflect on their successes (top placements, professional training) and address potential weaknesses (incompletion rates, for example).

Early withdrawal from graduate programs to enter Memorial's medical school is an ongoing issue in the Faculty of Medicine (Appx C Q20). Supervisors lose training time and spend hard-won resources on students who leave unfinished projects that must be abandoned or completed by professional staff. Knowing there is no formal deferral policy at MUN medical school to protect graduate supervisors, the CD faculty have altered their interview practices with incoming applicants to try to avoid this problem, or have come up with individual student solutions to ensure graduate program completion in the medical school off-terms (personal communications). Graduate program completion in the off-terms might not be feasible in the future, since the undergraduate medical curriculum and schedule will change in 2013. Generally, the CD faculty would appreciate that a more formal policy is put in place to create a number of

dedicated medical school placements for graduate students already engaged in their research projects beyond year 1 (AppX C, Q21,22). This seems more feasible with the upcoming class expansion from 60 medical school slots per year to 80 in 2013. Such a policy would ensure their graduate program is complete to the point of thesis submission before they transition to medical school, places due respect on the activities of graduate supervisors, and encourages the recurring theme of the revised medical curriculum to incorporate and appreciate research process.

Only one doctoral student responded to an email request for feedback about their experience (Framework questions listed in Appx E). The main points of reply:

Value:

- *I learned a lot through this program, albeit the learning curve was very steep!*
- *I do feel I have a knowledge base that allows me to appreciate (as well as promote and support) bench side science and how it can be translated to benefit population health.*
- *The instructors for the courses were…very knowledgeable and very patient with the diverse needs of the students in the class.*

Obstacles:

- *Course work could have been a better match to the work that I was doing; the courses that I had to do… were the 'best fit' with what was available to me.*
- *Communication with students and other faculty was at times a challenge.*
- *Most importantly, faculty need to understand the position of power they are in and not abuse it.*

Suggestions for improvements:

- *Thesis writing workshops.*
- *Support around mental health in graduate school; stress management specific to graduate school, people management.*
- *These questions would be more meaningful directly after the completion of grad school, I would suggest… if doing this again, to get students 'fresh out' of school. A lot of the constructive feedback has now been suppressed!*

Curriculum and Teaching:

The CD Masters program requires one core course plus four semesters of participation in the seminar program (MED6400-6403). Four semesters of seminar participation are also required for Doctoral students (MED6410-6413) but no specific core coursework. An individual's program of study at the Masters or Doctoral level may specify additional coursework to fill gaps in knowledge, according to the recommendations of the student's supervisor and supervisory committee. Appendix B lists course enrollments and syllabi for the core courses that have been offered most consistently over the past 5 years: MED6591 (Modern Methods in Molecular and Cellular Biology) and MED6580 (Molecular Biology of Cancer). A highlight of MED6591 is the development of a research proposal, to give students the opportunity to write in a concise and convincing style, as they would for future fellowship applications or academic research proposals. Despite this opportunity, weak writing skills are a recognized and significant limitation for incoming Masters and Doctoral students, regardless of their English proficiency or where they completed their undergraduate education. Memorial offers a student-led Writing Centre for assistance with basic writing skills and CD students have made use of these services, particularly if supervisors or supervisory committees make a direct request.

Thesis writing and thesis planning workshops are one suggestion that would benefit all the graduate programs, which may incorporate software training (reference management, illustration tools, word processing software proficiency) and basic writing skills for scientists. Ideally, this type of extra-curricular offering is supported by the Research and Graduate Studies Office, to spare a faculty member's time for scientific advising of students, rather than acting as tutors for scientific writing proficiency. If significant writing workshops are run as a pilot offering for several years, the RGS Office could analyze the program durations and overall thesis rankings by external examiners, in addition to student feedback on the workshops.

In terms of curriculum relevance, former graduates and current students have made requests for the CD program to offer a graduate level course on the general topic of endocrine physiology, to better reflect the diversity of research programs. One suggestion might be to modify the content of one of the calendar listings that are not in common use (MED6590 or MED6342). This change requires significant faculty consultation, input and curriculum planning, but seems timely given CD graduate program growth (sufficient enrollment to support a third core course) and the research diversity of the faculty complement.

An MD-PhD program is offered by the Faculty of Medicine, although no CD faculty have had students go through the program (Appx C, Q8-9). Anecdotally, administrative hurdles to the program and funding challenges have discouraged capable and interested CD students. The program is structured according to the current medical curriculum, with two years of undergraduate medical education completed prior to the Doctoral degree phase, followed by the completion of two years of Clerkship. As the undergraduate medical curriculum itself is undergoing renewal with a launch in 2013, the MD-PhD program structure will require review. With only a few MD-PhD graduates in its history, the CD faculty strongly felt the MD-PhD program should either be dropped or undergo a formal review to renew the goals and needs of the program relative to its original conception (Appx C, Q11).

Faculty Contributions and Workload Balance:

The CD group represents a range of seniority (Asst, Assoc. and Full Professors) with active engagement in health research (Appx A, CV listing). Graduate supervision is the predominant teaching role for the faculty members in Medicine, although undergraduate course instruction (medicine, biochemistry, biology), undergraduate research supervision (summer research awards, honours theses supervision for biology and biochemistry majors) and graduate course instruction are part of the teaching portfolio. Primary or co-supervisory duties are well-distributed across the group's membership, ranging from one to four students per supervisor and generally two to three-fold more supervisory committee member roles. Graduate supervisory load is intimately tied to research funding success, since biomedical research aims have tangible wet-lab or animal costs involved. External grant funding is also a necessary source of student stipends that are not fully covered by the Faculty of Medicine, even if matched funding comes available to a proportion of eligible students. Considering the absence of provincial scholarship opportunities and only a small number of teaching assistantship opportunities for students to top up their stipend, external research funding is essential to support CD graduate opportunities.

It is important that research priorities for Biomedical and Genetics faculty members who incorporate graduate trainees in their program are very well-supported by the Faculty and

university administration; however, an increasing administrative load has been transferred to faculty members without consultative planning or a concurrent increase in assistance, including: all financial reconciliations, increasingly complex and detailed animal care protocols, biosafety protocols, chemical and safety inventories, the tightening of reasonably flexible graduate procedures into locked-down policies and internal grant deadlines imposed without additional grant writing support. Although the spirit is well-meaning (improved animal care; safety for all; ease of self-service purchasing; consistent policies for graduate students; reasonable allowances for institutional sign off on grants) it is challenging to be an academic (a thoughtful, creative, innovative, motivated mentor) when buried by the administrative paper trail and a long list of triple-exclamation marked, high-priority emails with yet another imminent two-day, must-do deadline. The frequency and urgency of the long list of requests is wearing on the collegial spirit of both the clinical and biomedical faculty, as mentioned at the Faculty of Medicine strategic planning retreat in November 2011. Some suggestions for shifts in administrative duties and improved efficiencies with reference to graduate programs are discussed below.

Administrative Support and Efficiency:

In general, the CD faculty felt that library services were very satisfactory in the Faculty of Medicine but the faculty response for IT services was mixed (Appx C, Q14). The degree of graduate student use of library services is generally unknown. RGS or program-specific planning for future thesis writing workshops needs to be coordinated with library services to take full advantage of the expertise and capability of the library staff, at the very least to implement common software package proficiency of the graduate trainees.

With regards to IT service satisfaction, the geographic location of labs and offices might explain the mixed response; for example, some areas of the Health Sciences Complex have wireless internet service but other areas don't due to technical challenges in the building. Room bookings, AV support, photography and digital publishing services have been very helpful and responsive for course organization and the annual CD symposium planning. A dedicated survey for overall IT service needs across the Faculty would be helpful to pinpoint specific inadequacies and address solutions.

Office space for graduate students was considered insufficient overall (Appx C, Q14). Previous discussions with BMS faculty and the Associate Dean of BMS led to the consensus that the lack of a proper, non-laboratory office location to work and convene as a student body down plays the importance of their position. Without sufficient office space, the graduate students in BMS and Genetics programs are missing out on a "sense of place," which is quite important for long-term motivation.

Administrative and support staff duties were not considered adequate or efficient overall in the context of the CD graduate program (Appx C, Q14). This response is likely a mixed overview of administrative assistance with the general operations of a lab which has an impact on graduate studies, and the operations of the RGS graduate program office overall. Management of student funding, thesis and course administration and graduate application processing are quite functional in the RGS office with capable staff. Furthermore, the activities of the administrative program assistant for BMS have been very helpful to organize the CD symposia. Beyond these positives, there are several levels of administrative inefficiency to be addressed: 1) graduate applications submitted online to SGS are returned into a paper-trail that requires applicant

information to be distributed to potentially interested faculty by the program coordinator (a faculty member); this absolutely needs to move to an online system with the dissemination and private information responsibility coordinated by the RGS Office; 2) RGS web site improvements are required to direct new students interested in the programs to general information pages first (SGS or RGS) and faculty phone numbers last; 3) website improvements to incorporate graduate program policies online; 4) a requirement to continuously train administrative staff to meet the specific needs of faculty. The problem is not necessarily that we don't have enough staff, but that the staff aren't encouraged or trained to anticipate the right contributions or keep in step with the needs of the faculty. This is a major source of faculty frustration.

A dedicated BSM/Genetics graduate officer to facilitate writing workshops, fellowship applications and program symposia has been suggested as an aide to guide students, improve their sense of place and to conserve faculty time for research momentum and scientific advisory duties with graduate trainees (Appx C, Q24).

Summary:
Many points that surfaced in this self-study are repetitive with the faculty comments and external recommendations made in the 2006 APR for graduate programs in medicine. It is our sincere hope and expectation that the administrative leadership in RGS, the Faculty of Medicine and Memorial University will strive to address, and hopefully fulfill, forthcoming 2012 recommendations to improve the BMS and Genetics graduate program process and outcomes.

To summarize, I will provide the comments of the CD faculty for what is held good, what needs improvement and their immediate priorities for the graduate programs:

What are the strengths of the graduate programs as they exist now?

- *Small and focused. Commitment of faculty to the program.*
- *Matching funds program supports more training capacity, visiting speaker programs expose trainees to outstanding external research.*
- *BMS and Genetics offer excellent supervisory conditions (ratio and quality); quality research participation leading to original publications; minimum stipend policy for F/T students; office of Research & Graduate studies to facilitate aspects of graduate process (award submissions; theses submissions; funding coordination); dedicated position of the Assistant Dean for Graduate Studies to address student issues; visiting speaker program; internal awards (Dean's fellowships, for example); internal travel funding for students.*
- *Allows much flexibility; some of my grad students who have continued in research careers published more internationally peer-reviewed papers while at Memorial than they have since leaving. It speaks to a graduate program that has been working well.*

What are the limitations of the graduate programs as they exist now?

- *More course [selection to account for] the diversity of research projects of their supervisors.*
- *Faculty critical mass too small. Training of entering students varied and inadequate.*
- *Limitations on supervisors and their research programs (funding, specialized research resources) are probably the most significant factors affecting graduate training here right now. Office of Research Services policies impede rather than assist the supervisor. This*

diverts valuable time and energy that could instead be directed at research and graduate training.

- *Due to overall growth and graduate program diversity, it is time to revisit the matched funding allocation policy per program; insufficient data management strategy for FofM graduate programs (functional databases required to capture all current information about incoming, in-program, and outgoing students); electronic graduate admission file system required; continuous review to improve the efficiency and service range offered by RGS at our current program capacity (in order to consider growth and funding opportunities for the future); administrative requirements of graduate supervision should be organized in such a way as to reduce administrative barriers and maximally conserve faculty time for research and teaching (accessible and current policies, website functionality, efficient communication strategies), as some examples.*
- *[RGS should strive to reduce] obstacles for graduate student progress [and facilitate] research and education of graduate students.*

What are your highest priorities for lab-based Faculty of Medicine graduate programs in the future? (eg. growth, diversity, space, stipends, fellowships, faculty contribution)

- *Faculty contribution and stipends.*
- *All examples listed are priorities.*
- *Stipends, research grants success, critical mass of supervisors.*
- *Address the limitations on supervisors and their research programs (funding, specialized research resources). Retain or bolster matching funding for graduate students. Changes need to be made at Office of Research Services to eliminate policies that impede rather than assist the supervisor. This would free valuable time and energy that could instead be directed at research and graduate training.*
- *In the short term: funding and fellowship leverage for current students; initiatives to facilitate program completion that are supported by staff and not faculty members (eg. graduate officer for BMS/Genetics); doctoral student office space and support; Year 5 program support In the long term: program diversity and growth, including space needs for increased faculty complement in BMS/Genetics to increase the graduate program enrollment.*
- *Space, stipends, infrastructure and better undergraduate science education.*
- *Stipends; Assistance for finishing.*

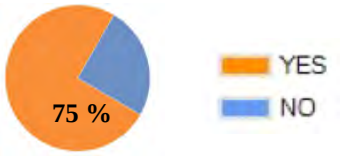
Dr. Ann Dorward
Coordinator for the Cancer and Development Group, 2012

Appendix B - Cancer and Development Program - Core and Seminar Course Enrollments (2006 - 2010)

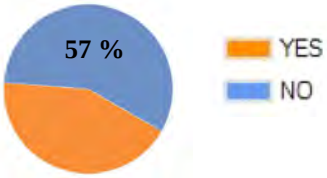
Course #	2006 Fall	2007 Winter	2007 Fall	2008 Winter	2008 Fall	2009 Winter	2009 Fall	2010 Winter	2010 Fall
6190									
6340									
6341									
6342									
6580		5		6					
6590									
6591	9		6		5				8
MSc Seminar Course #									
6400	6	3	3		3		2		7
6401		4	1	2		3	1	2	
6402	2		4		3		2		3
6403		2			1	2		2	
MSc enrollment/term	**8**	**9**	**8**	**2**	**7**	**5**	**5**	**4**	**10**
PhD Seminar Course #									
6410			1	1			1		1
6411			1		1			1	
6412		2							
6413					1	1			
PhD enrollment/term		**2**	**2**	**1**	**2**	**1**	**1**	**1**	**1**

Appendix C:
Cancer and Development Graduate Program
Faculty Survey Results (8 respondents)

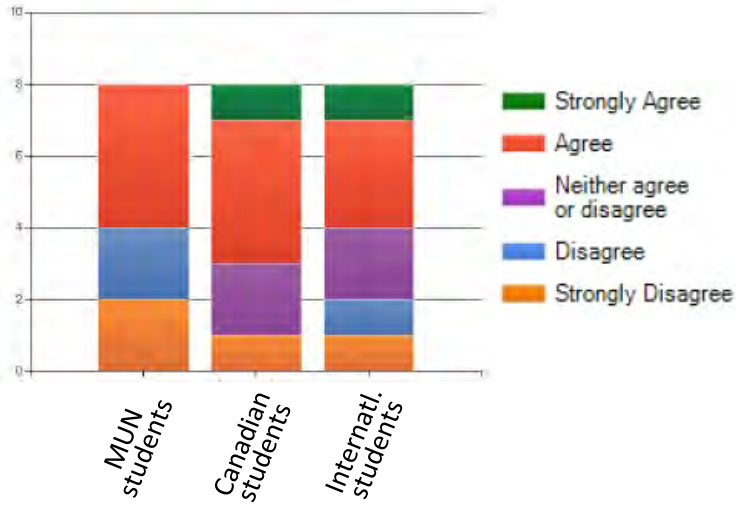
2. Have you supervised or co-supervised graduate students in other graduate programs?



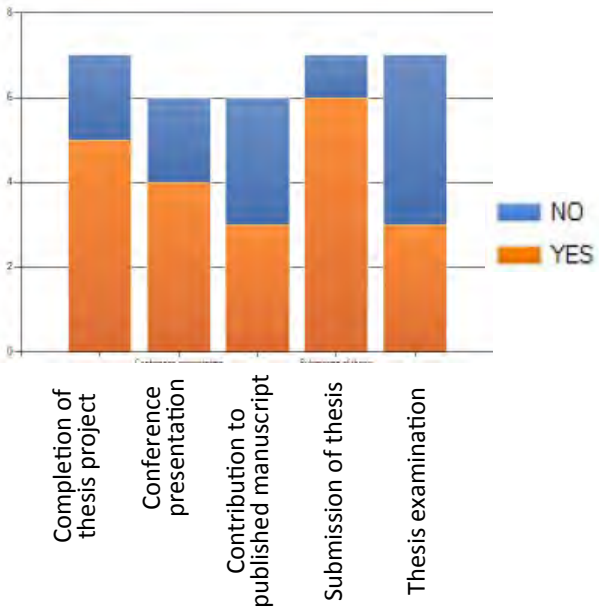
5. Should MSc students have to defend their thesis orally as part of the examination process?



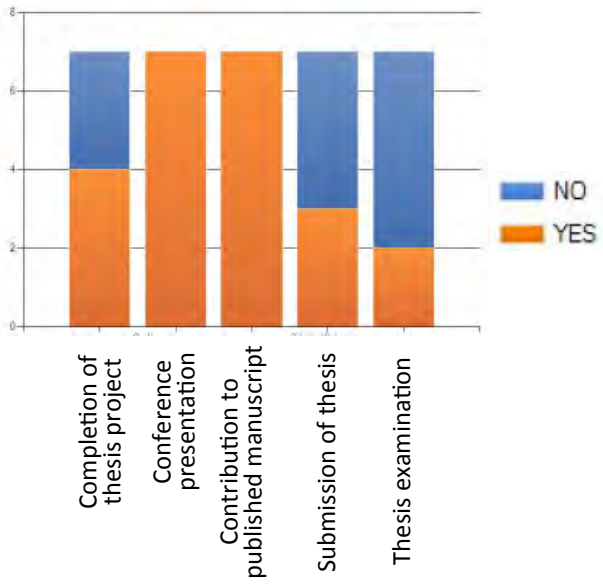
3. Students have adequate skills to allow them to complete an MSc in 2 years.



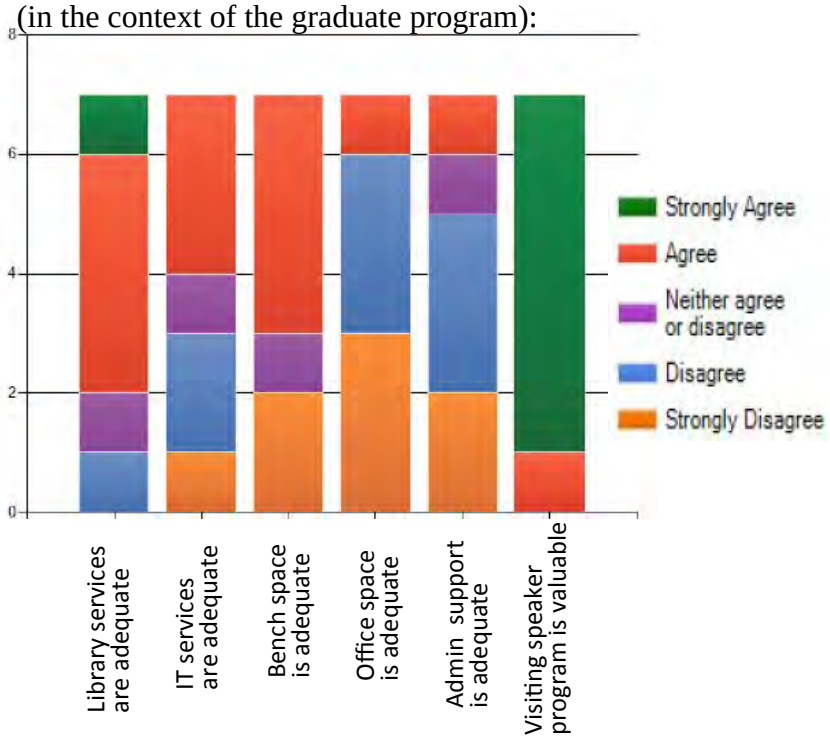
6. What are your expectations of the amount and quality of work that can be accomplished by MSc students in a 2-yr program?



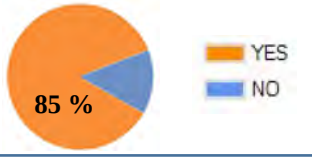
7. What are your expectations of the amount and quality of work that can be accomplished in the current 4-yr program that is available for full time PhD students?



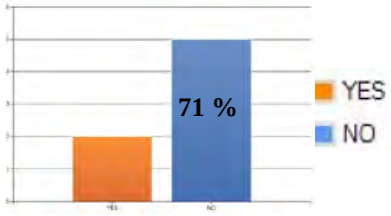
14. Please indicate your level of agreement with the following (in the context of the graduate program):



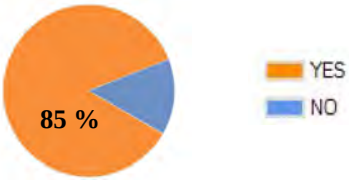
19. Will the demise of the RPP affect your ability to support graduate trainees?



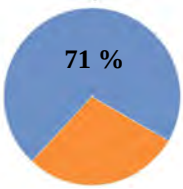
20. Have you had any student withdraw to enter the MD program?



15. Do you agree with the policy that ensures a min stipend for grad students?



16. Is the current min of $12,000 enough?



What should be the minimum stipend for an MSc student?

1	$16,000
2	15,000
3	14,000
4	17500
5	16,000

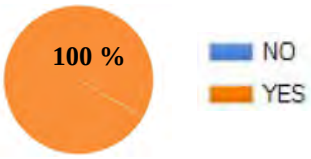
Average: $15,700

What should be the minimum stipend for a PhD student?

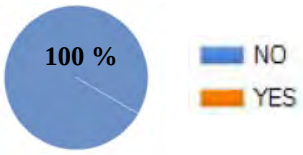
1	$18,000
2	17,000
3	16,000
4	20000
5	18,000

Average: $17,800

8. Are you aware that an MD-PhD program is available?

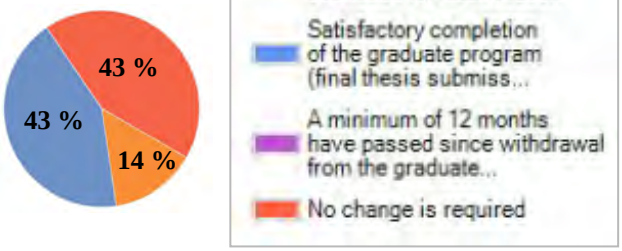


9. Have you supervised an MD-PhD student?

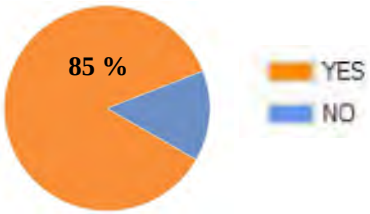


11. What is your opinion of the MD/PhD program?

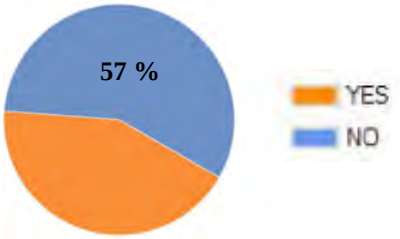
21. For students in our graduate program, entry into the MD program should be deferred until:



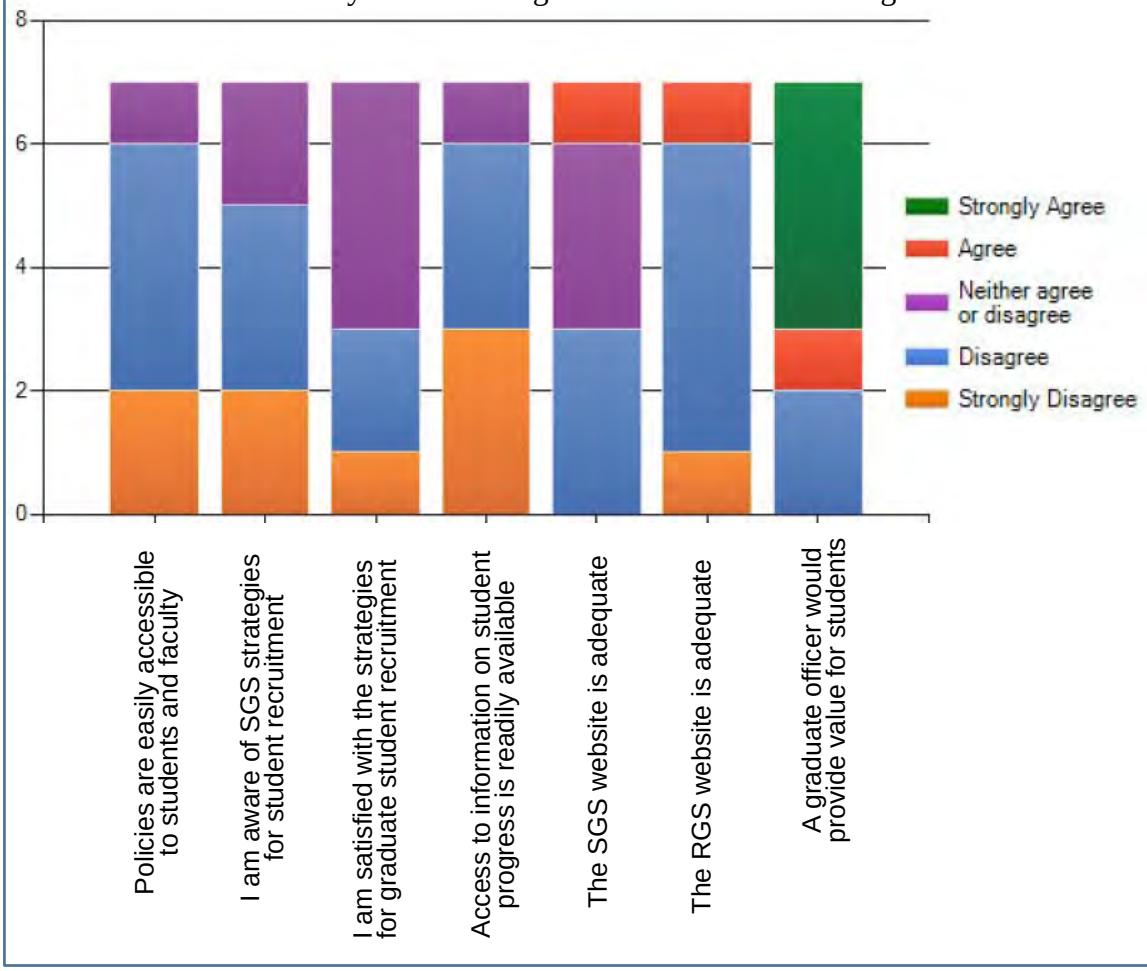
22. For graduate students applying to Med School, should there be a policy to allow them to defer their admission for one or more years?



23. For PhD students, should any overlap in membership of supervisory and comprehensive exam committees be permitted (excluding supervisors)?

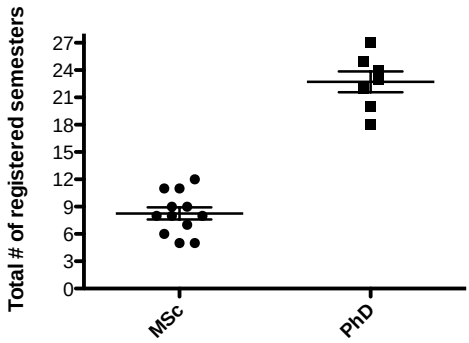


24. Please indicate your level of agreement with the following statements.



Appendix D - Cancer and Development Program - APR 2012

Fig 1. Cancer and Development Graduate Program Duration: Total Time-to-Degree*



(* Total time-to-degree may include F/T or P/T students who have completed their program, although it does not exclude formal leaves of absence. Data spans the years 2001-2012)

Fig 2. Cancer and Development Graduate Program Prize Totals

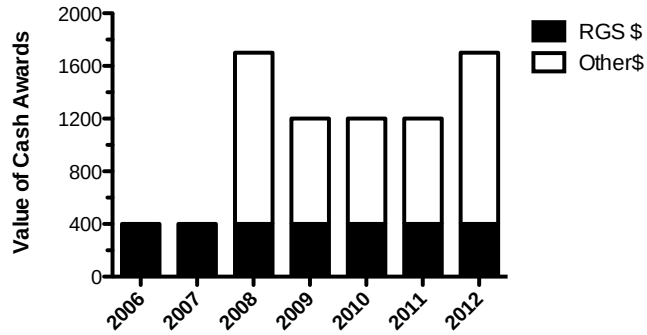


Fig 3. Cancer and Development Graduate Program Convocations: 2006-2011

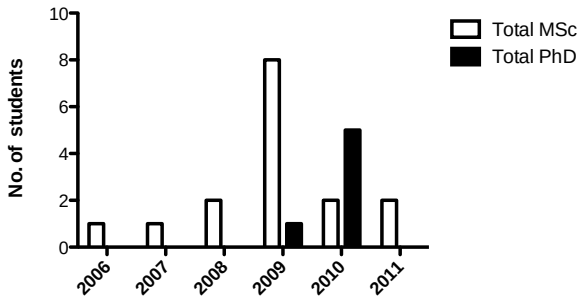
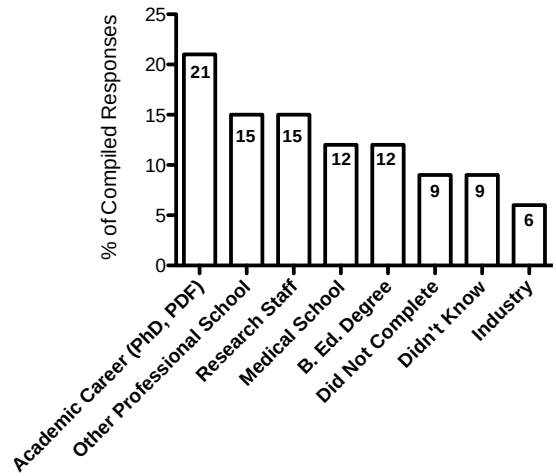


Fig 4. Career choices of Cancer and Development graduates based on faculty survey responses (n = 33 graduates; n = 6 supervisors)



Appendix E – Email Survey sent to CD Program Graduates (9 sent; 1 reply)

Q1) What is your overall opinion of the C&D graduate program? You might wish to address your satisfaction with the program, whether or not it met your expectations, whether or not it benefitted your next career steps or helped you personally.

Q2) Did you experience significant hurdles/obstacles to the completion of your program? These might be administrative, educational (course work), funding issues, research challenges, supervisor/supervisory committee restrictions or personal issues. If the obstacles appeared, was there a system in place to help you address them?

Q3) What educational or policy suggestions do you have to improve the C&D program for incoming students? These may be program-specific or applicable to all programs supported through RGS. Some examples could be thesis writing workshops early in the program; career workshops throughout the program, funding policies made more consistent or clear, fellowship assistance, mentorship program, etc.

Q4) Any other comments you might have that would help us reflect on our current situation and bring about positive change?

Medicine 6580 – Molecular Biology of Cancer

CHAIR: Jon Church
Terry Fox Labs, HSC 3307
X7907 (voice)
X7010 (facsimile)
jchurch@mun.ca (email)

This course is designed to give graduate students in the Cancer Research Group, and those interested in the study of cancer, a broad, molecular and cell biological survey of all current issues in oncology – from the causes, through biology, to treatment.

The course will meet Tuesday of each week, for three (3) hours (2 – 5 pm), in the rooms as indicated below, beginning January 17, 2012. Generally, the first two (2) hours of each class session will be devoted to student presentations and class discussion of papers assigned based upon the previous week's lecture subject. Following a short break, a lecturer will present new material on a different topic in preparation for the next week's discussion.

Evaluation: Performance in the course will be assessed on the basis of [**1**[see below]] oral presentations (40%), [**2**[see below]] a written component (40%), and [3] class participation (20%).

[1] Every week, each student should be prepared to present any of the assigned papers; every student will be expected to present at least three (3) times over the course of the semester, but selection of student presenters will be at random.

[2] Every week, each student will submit a two (2) page (max!), double-spaced, typed critical evaluation of one of the papers assigned. This paper will consist of the hypothesis stated in context, an evaluation of whether the data support the hypothesis, and strengths and weaknesses of the paper.

This is a graduate course and so active and meaningful participation by students is expected.

Lecture Schedule:

DATE	TOPIC	LECTURER	ROOM
Jan. 17	Introduction	JChurch	H2860
Jan. 24	Presentations/Discussion Growth Factors & Cancer	JChurch JDore	H2860

Jan. 31	Presentations/Discussion Genetics & Cancer	JDore SSavas	H2868
Feb. 7	Presentations/Discussion Cancer Cyto/Histopathology	SSavas BCarter	H2868
Feb. 14	Presentations/Discussion Environment & Cancer	BCarter GPaterno	H2868
Feb. 21	Presentations/Discussion Cell Cycle & Tumor Suppressors	GPaterno HParadis	H2868
Feb. 28	Presentations/Discussion Viruses & Cancer	HParadis KHirasawa	H2860
Mar. 6	Presentations/Discussion Immunology & Cancer	KHirasawa SDrover	H2866
Mar. 13	Presentations/Discussion Hormones & Cancer	SDrover KKao	H2868
Mar. 20	Presentations/Discussion Cancer Angiogenesis	KKao RGendron	H2868
Mar. 27	Presentations/Discussion Cancer Epidemiology	RGendron PWang	H2868
Apr. 3	Presentations/Discussion Chemotherapy	PWang CPopadiuk	H2868
Apr. 10	Presentations/Discussion Radiotherapy	CPopadiuk JThoms	H2868
Apr. 17	Presentations/Discussion	JThoms	H2868

MED6591 – Modern Methods in Molecular and Cellular Biology

The purpose of this course is to review current methods in molecular and cell biology that are relevant to cancer research. Students will be given written assignments that are due, the following week, at the beginning of each session. Additional material for study may be assigned for discussion at the session. The sessions will be in the form of tutorials, based on the assigned material. Instructors may also choose to deliver a lecture, followed by tutorial/discussion.

At the end of the course, students will be required to submit a written "Letter of Intent" or "Request for Proposal". These submissions are summaries of full-length research proposals that outline the hypothesis, experimental strategy, objectives and significance to cancer research. A formal tutorial on how to write these letters will be held before the last session. Deadline for submission of the letters will be one week after this last tutorial. Letters will be assessed a week later following a peer-review process adjudicated by one or more faculty member(s). Late letters will be assigned a mark of zero (0).

Evaluation

75% Tutorial Assignments (7.5% x 10)
25% Letters of Intent (Written submission and critical analyses)

DATE (2-5pm)	INSTRUCTOR	TOPIC	LOCATION
6-Sep	kao	Intro	H2868
27-Sep	young	genomics	IJ409
4-Oct	hirasawa	gene expression	H2868
11-Oct	Gillespie	proteins	H2868
18-Oct	Paradis	cell cycle	H2868
25-Oct	Paradis	signalling	H2868
1-Nov	Paterno	proteomics	H2868
8-Nov	Kao	chromatin	H2868
15-Nov	Church	RFP's	H2868
22-Nov	Macphee	Imaging	H2868
29-Nov	Gendron	Expt'l.Models	H2868
6-Dec	Kovacs	Transgenics	H2868
13-Dec	Kao/Church	Evaluation of RFPs	H2868

MED 6591 Guidelines for preparation of RFPs

Maximum Length: 5 pages, single spaced, font size no smaller than 12 pt.

Presentation

Your RFP's will be judged primarily on originality and clarity of presentation. They will be evaluated on the basis of the following points

1) Concise background information relevant to the proposal.
2) Clear statement of research question
3) *Original* hypothesis that addresses the question
4) Specific Objectives: State these as clearly as possible, with one or two sentences per objective. The objectives, if carried out, would provide evidence in support of your hypothesis.
5) Research plan: Brief description of what methodologies you will use and discuss their limitations for your study. What are the expected results? What are the pitfalls of the procedures?
   6) Relevance: How will the results of your proposed research impact on relieving the burden of cancer? (Alternatively: how will they impact on the purpose for which your research is being carried out?)
7) Include all references formatted in the style of a major international journal
8) Overlap with current thesis work. Your RFP should not overlap with your thesis topic. Please include an abstract of your thesis. This will be used to judge if there is significant overlap between your RFP and work already submitted or in progress, and if so may negatively impact on the evaluation of your RFP.

Evaluation

Your RFP will be rated according to "Peer Review Practices and Policies" as described by the CIHR, by Faculty and your colleagues

Range	**Descriptors**
Fundable:	4.5 - 4.9 outstanding
	4.0 - 4.4 excellent
	3.5 - 3.9 very good
Seldom funded:	3.0 - 3.4 acceptable, but low priority
Not fundable:	2.5 - 2.9 needs revision
	2.0 - 2.4 needs major revision
	1.0 - 1.9 seriously flawed
	0 rejected

example, the number of required journal club presentations can vary from one year to the next. At one point a student may have to present every semester, but the year before they were only required to present once a year. The issue is not the extra presentation, but rather that there is a lack of consistency and no written outline of what is required by the student. Another issue is in regards to vacation time. Many professors make their own rules regarding vacation time, but this should be something that is standardized for all graduate students.

More regularly occurring committee meetings

Many students feel it would be beneficial to have committee meetings every six months as opposed to once a year. Closer monitoring of the students progress would help ensure they could finish their degree on time.

Recruitment

Active recruitment is necessary in order to get highly qualified students into the program. This is in regards to all levels of graduate study. For example there could be more active recruitment to the undergraduate students at Memorial in the Faculty of Science to complete their Master's at Memorial. In addition, many students felt their program could be enriched if more post-docs were present. While it is noted that it can be difficult to obtain post-docs, students felt more senior individuals working directly in the lab would be beneficial for when they first start their program. This also ties in more potential for extended collaboration both within the programs and with other universities. Many students felt their program could be enhanced with more collaboration.

Cardiovascular and Renal Sciences Graduate Studies Program Self-Study

A. Strategic objectives

1. Research aligned with Memorial's Strategic Research Plan

Wellbeing, Health and Biomedical Discovery is a strategic research theme of Memorial University's Research Plan, and the best headline for the strategic objectives of the biomedical science graduate programs of the Faculty of Medicine. Under this banner, the Cardiovascular and renal sciences graduate studies (CVRG) program specifically supports the key area of research identified in Memorial's Strategic Research Plan as

- *biomedical sciences ranging from cellular and molecular processes to animal and cell modeling that respond to the province's high incidence of diseases such as obesity, diabetes, and cardiovascular disease*.

2. Experiential learning aligned with Memorial's Teaching and Learning Framework

The learning and teaching community of the CVRG program is outcomes-orientated

- to produce highly qualified graduates who have academic grounding and technical skills in cardiovascular sciences, which allow them to pursue such careers as medical and allied-health professionals, and research scientists.

The CVRG program engages and supports graduate students to conduct laboratory research and commit to discovery in the key areas mentioned above. In particular, individual MSc and PhD students conduct thesis research that relates to cardiovascular diseases, obesity and diabetes, while under the supervision and support of academic staff members who have expertise in the following specialized areas :

- Vascular endothelium
- Subcellular controls of cardiac function
- Sodium effects on blood pressure
- Cerebrovascular physiology
- Pharmacology of the venous system

3. An environment supporting excellence in cardiovascular science research, learning and teaching

- **The excellence of a graduate program is dependent on its faculty members.** Graduate students in the CVRG program are supervised by a core of full-time academic staff members (ASM) who have achieved research excellence at the national level as demonstrated by their records of competing successfully for awards of operating and infrastructure grant funding from federal and provincial government agencies [CIHR, CFI, NSERC, Research & Development Corp. NL]; publishing original research in peer-reviewed journals; and presenting at national and international conferences.
- **Graduate students are provided access to modern research resources that are appropriate to their field of study.** The laboratories of participating ASM are considered a graduate student's home base, where they are typically provided full-access to research infrastructure, laboratory consumables, support from highly qualified research assistants, and a place for academic study. In most circumstances, students will access services and infrastructure provided by the Division of BioMedical Sciences, the Faculty of Medicine's Support Services and Animal Care Services in the Health Sciences Centre, and CREAT.

4. Challenges to fulfilling the strategic objectives

- The small number of graduate students enrolled in the program.
- The small number of faculty within the cardiovascular graduate program.
- Laboratory spaces, animal care services, and research operating funds.

5. Identified needs for fulfilling the strategic objectives

For this self-study, the members of the CVRG program have indicated the highest priority needs are

- Increasing graduate student enrollment, especially PhD students, and
- Increasing the number of active faculty in the CVRG.

6. On-going activities to address priority program needs

- The current activities of the CVRG program with regards to enrollment are discussed separately under section B.
- A search committee to hire a tenure-track Assistant Professor in Cardiovascular Sciences to the Division of BioMedical Sciences is progressing and importantly, this new recruit is expected to participate in the future of the CVRG program. The success of this recruitment process is considered critical to this program's future as it is needed to bolster the current number of faculty members, especially as even small fluctuations in faculty member participation due to events such as retirements, interruptions in funding cycles, sabbatical leaves, and promotions to senior administrative positions can have significant effects on the ability to support graduate student enrollment and program activities. Many well-qualified candidates have applied to this hiring opportunity, which is promising news because there are similar hiring competitions going on elsewhere in Canada, so it demonstrates the competitiveness of the CVRG program environment to attract to Memorial the best candidates.
- The classroom experience for graduate studies in CVRG is mainly based in the small laboratories of its ASM, which are located in the over 35 year old Health Sciences Centre. With the expansion of the Faculty of Medicine planned for in the next few years, there have been preliminary assessments for renovating existing laboratory spaces to modern standards. This would occur when other Faculty of Medicine researchers transfer to a new building from the Health Sciences Centre; however, there is no commitment to set aside space for new ASM in the CVRG program.
- Memorial has approved plans to renovate the existing Animal Care Services Facilities in the Health Sciences Centre. Though these plans are not specific to the CVRG program, the planned renovations will be critical for many of the CVRG program graduate student work that must be compliant with national policies and guidelines for conducting research in animals.

7. Opportunities to consider

While faculty member recruitment can improve the critical mass of faculty participating in the CVRG, it can also be viewed as an opportunity to update the strengths and priorities of the CVRG program. As opined by a faculty member in his written submission for the APR regarding future challenges : *the CVRG will face* a

" shift in research specialties associated with Faculty turnover. Most of our older faculty (including me, if not especially me) rely on traditional approaches and subjects that are not taught in the undergraduate programs available on campus i.e. We are not connected to an undergraduate program. With Faculty turnover, there will be a shift (presumably) towards more contemporary methods (e.g. biochemistry/molecular biology/genetics) in which our local pool of applicants tend to be well trained (i.e. Our grad program will become better aligned with existing undergraduate programs)."

B. Student Enrollment and Program Outcomes

1. Student enrollment by participating faculty members 2007 - 2012

Because of the relatively strong cohesiveness of their research interests, the small core of faculty within the CVRG program has been able to bridge resources and academic expertise to sustain an active, small sized graduate program (**Table 1**).

Current rank	Degree program	Fall 2007	Fall 2008	Fall 2009	Fall 2010	Fall 2011	Fall 2012
Associate [a]	MSc	**1**	**2**(1)	**1**	**1**	**2**(1)	**2**
Associate [a]	MSc	**1**	**2**	**2**(1)	**3**(1)	**3**(1)	**1**
	PhD			**1**	**1**	**1**	**1**
Professor [a]	MSc	**1**	**1**	**1**	**1**	**1**(1)	**2**(1)
Professor [a]	MSc	**2**			**1**	**1**	
	PhD		**1**	**1**	**1**	**1**	
Professor [a]	MSc	*1*	*1*	*1*	*1*		
Professor [b]	PhD	**1**	**1**	**1**			
Professor [b]	MSc	**1**	**1**	**1**			
	PhD				**1**	**1**	

Table 1. Enrollment of graduate students in the CVRG program from 2007 - 2012 listed according to supervisor's academic rank. These data indicate the total number (in bold) of registrations of different individuals in the Fall Semesters of each year so reflect the net number of program admissions, terminations, and graduations for the listed periods; numbers in parentheses represent the number of students having part-time status; italics indicates a program leave of absence. Data for Fall 2012 are estimates based on interviews with faculty members regarding new offers of admissions pending and progress of students towards graduation.

[a] full-time appointment in Division of BioMedical Sciences [core faculty].

[b] formal co-supervision of student provided by professors without full-time appointment in the Division of BioMedical Sciences.

Since 2007, five ASM have held full-time appointments in the Division of BioMedical Sciences and have contributed to the CVRG program. Historically, the number of full-time ASM that aligned their duties to the CVRG program has never been higher than five; the last two recruits were appointed in January 2004 and November 2006. In efforts to increase enrollment and enable interdisciplinary research, from 2007 to 2012, four additional ASM who hold primary appointments outside the Division of BioMedical Science were granted permission to supervise students in the CVRG program; however, these students have been the least successful to have entered the program, and their supervisors are no longer participants in the program.

2. Memorial-wide graduate student interaction with CVRG program

Cardiovascular research is an area of interest for graduate students in many other programs of study at Memorial; the CVRG program has been a source of interdisciplinary exchange for some of these students and ASM. As an example of the scope of interest and demand for graduate cardiovascular science training at Memorial, three faculty members from the Department of Biochemistry hold cross-appointments to the Division of BioMedical Sciences, and have supervised graduate students who as part of their own graduate studies program of study also received technical and academic training from ASM of the CVRG program.

3. Where do our successful students come from?

From 2007 - 2012, one third to one half of the graduate student number was supervised previously as an undergraduate research student [Honours dissertations] by members of the CVRG program; the remaining students are international students, and one was a non-NL resident Canadian.

4. Challenges to increasing graduate student enrollment

Even after accounting for cyclical patterns in the number of students enrolled in the CVRG program, the level of recruitment of graduate students into the program is small. In fact, few students have been accepted by the program despite a continuous stream of applicants every semester [5 - 20]. Interviews for the self-study with faculty indicate that interest in supervising graduate students is still high.

The following views on new enrollment have been offered by faculty members:

- Many of the applicants are international students and medical graduates with only clinical expertise so they tend to match poorly with the research strengths of academic staff members and the career training expectations.
- The pool of applicants is poorly qualified in the academic backgrounds necessary for research study.
- For local applicants, the lack of an undergraduate program at Memorial in Life Sciences, which is often a pipeline for recruitment at other universities, limits the number of eligible applicants and exposure of undergraduate non-medical student classes to ASM in the CVRG program.
- The instability of external tri-council or other grant funding in terms of the amounts of funding and durations of awards, affects the reliability for ASM to make new offers of admissions.
- Lack of infrastructure support [space] for new students caps the enrollment within programs.
- Increasing the number of active faculty within the CVRG would likely lead to an increase in the number of graduate students taken on by each participating faculty member. Running the CVRG program with a small number of faculty increases the load [e.g. with respect to graduate course work, seminar programs, supervisory committees, thesis review] on faculty who are already heavily engaged in undergraduate teaching and committee work. Expansion of the number of faculty engaged in this research area would be expected to provide more opportunities for collaboration, leading to increased efficiencies and funding of CVRG research programs.
- Recruiting faculty with research programs in new areas could take advantage of existing local programs and students in mathematics, engineering, computer science, and bioinformatics.

5. On-going activities for addressing graduate student enrollment

Summer research employment opportunities have been advertised extensively to undergraduate students at Memorial, but there are limits on the number of opportunities each ASM can accommodate because the cost of salary is only one of the expenses for such training. Retaining these undergraduate students as future graduate students has been a challenge as it is also clear that these local students having the most appropriate undergraduate training for basic cardiovascular research, as result of participating in such summer research hires, and often having the highest academic records, are very successful at entering the undergraduate medicine program at Memorial.

A recent program shift in research funding policies by non-profit organizations, particularly the Heart and Stroke Foundation of Canada, is expected to change the research funding landscape for the better of all Memorial's cardiovascular researchers; it is also welcomed as an opportunity to apply for grant funding at a time when operating grants are becoming increasingly more difficult to obtain and programs are changing quickly at CIHR and NSERC.

6. Graduate student completion of CVRG programs 2007 - 2012

Programs of study for both MSc and PhD degrees are supervised by ASM in the CVRG. With one exception, all students have registered first in the MSc program (**Table 2**).

Current rank	Degree program	Fall 2007 - 2011	2012	2007- 2012 Total
Associate [a]	MSc	2		2
Associate [a]	MSc		(2)	2
	PhD		(1)	1
Professor [a]	MSc		(1)	1
Professor [a]	MSc		(1)	1
	PhD		1	1

Table 2. Number of MSc and PhD degrees awarded in the CVRG program from 2007 - 2012, listed according to supervisor's academic rank. These data represent the number of students that have completed, and are expected (in parentheses) to complete and pass all requirements for their degree program between September 2007 and December 2012. The values reported for the year 2012 are

estimated for the calendar year January - December rather than for the academic year.
[a] full-time appointment in Division of BioMedical Sciences [core faculty].

Success of students after completion of CVRG programs

After graduation, former Masters graduate students (2007-2012) in the CVRG program have entered medical, pharmacy, and allied health professions; these employments are in-line with the strategic objectives of the Faculty of Medicine to train clinical scientists and educate health professionals in research. All doctoral program graduates who chose not to reenter a health profession in Canada have found opportunities as research scientists and post-doctoral fellows in research after graduation.

Challenges to satisfactory retention rates in the CVRG programs

ASM have expressed concern over the retention of full-time status students after two years into a Masters program of study. The key concern has been that students departed the program to enter undergraduate medical school and other allied health training programs; these observations have been noted in prior APR and corrective policies brought forward at graduate studies meetings, but RGS has dismissed them, much to the dissatisfaction of the ASM in the CVRG program.

Challenges for completion of CVRG programs

Sustaining stable financial support for graduate students for two years in Masters and four years in PhD programs has been an ongoing concern. As with all of the biomedical graduate studies programs, research expenditures for a graduate student's program of study are covered by any available grant funds that have been awarded to ASM by national and provincial funding agencies; annual operating costs for a student's project in cardiovascular research will vary, however, an amount equal to the student stipend is reasonable assumption for an average minimum estimate. The minimum stipend required by RGS has been set at $12000 per annum (p.a.); however, full-time students in CVRG program typically receive at least $16000 p.a. by means of stipends from supervisor, scholarships from external and internal awards, and graduate teaching assistantships. The indirect costs of research, and the administrative running of the Office of Research and Graduate Studies in Medicine (RGS) are the main expenses for the graduate programs to the Faculty of Medicine.

7. CVRG program's admissions

Current admissions criteria

The admissions criteria outlined in the Calendars of the School of Graduate Studies (SGS) have served as the baseline for assessment of all applications, with additional information having been requested as needed. Normally, individual faculty members do their own individual assessment of applications on a per case basis and their recommendation to agree to supervise a student is then subject to the approval of the Associate Dean of BioMedical Sciences, Assistant Dean of Graduate Studies, and Associate Dean of RGS. The role of the coordinator of the CVRG has been to inform the RGS and the ASM about the status of opened and closed applications.

Challenges to CVRG program admissions

Until 2012, the primary limiting factor for admission to the CVRG program had been that a student must secure a commitment from an ASM to provide a stipend and thesis supervision. In light of the intention of RGS to change the admissions policy so that funding is not required for full-time students, it is the view of some ASM that the policies for admissions to graduate study and the oversight of graduate student supervision should be scrutinized more at the program level so that the competitiveness of the CVRG program is maintained; currently there is an internal sign-off by the coordinator that to date has been considered as advisory only.

Unfortunately, the competitiveness of the CVRG program has been reduced by ineffective graduate

student supervisory arrangements. Some of the challenges to correcting these problems are governance issues at the level of the Faculty of Medicine and SGS. For example, in the CVRG program as with the other biomedical programs there has been no restriction on which ASM are allowed to make offers of supervisory commitments and no mechanisms to prevent any ASM at Memorial from making such commitments. To address these issues, there is a view amongst ASM in the CVRG that only the full-time appointments in the Division of BioMedical Science should be allowed to be primary supervisors of graduate students in the CVRG program; other ASM at Memorial would need to seek approval of the core participants in the program, and be limited to co-supervision of students.

There are also significant inefficiencies and administrative barriers to the admissions process. The CVRG coordinator has reviewed the SGS online application system and concludes that a review of it should be undertaken to make improvements that would help with reviewing applications, and requesting appropriate materials from applicants that are specific to the programs of study. ASM have also raised issues about application procedures, such as requirements to submit a thesis supervisory committee meeting report prior to an applicant actually being granted admission to the CVRG program.

Finally, the Intellectual Property policies of the SGS do not adequately address the issues of data ownership, and use of data for ASM who participate in supervising students in the CVRG program; as example, the existing guidelines do not provide the same protection to ASM as the policies at the University of Toronto, a first tier research-intensive medical Canadian university.

C. Curriculum and Teaching

1. Current program of study requirements

The minimum requirements of the MSc (Medicine - Cardiovascular) degree have been passing grades in: one required course [MED 6140]; one elective course; written examination of a MSc thesis. The minimum requirements for a PhD add the following to the program of study: a second elective course; a comprehensive exam; oral examination of a PhD thesis. The Masters, and PhD thesis research topics for students have been expected to fall within an area of research expertise of the ASM who supervise students. Students may have completed additional internal certifications for conducting research on animals and research studies on humans and or health data.

Periodically since 2007, the CVRG program has engaged in activities for additional education of graduate students through internal Journal club and research seminars as well as an invited visiting speaker program; other graduate programs host similar activities, and the Faculty of Medicine hosts continuing medical education programs such as Grand Rounds, which are open to graduate students. RGS has intermittently provided funding to support the visiting speaker activities.

2. The need for curriculum change - the student view

Based on interviews in the CVRG program, current graduate students general opinion is that the core course *6140* needs to be replaced by a stronger basic science foundation course as the current content has too much clinical focus . They suggest that the clinical focus may be undermining the interest of students in pursuing higher level studies. Doctoral students are most affected by the current curriculum. Summarized by a quote from student interviews, "*It is not that the course is bad per se, but that it is not the right time and place for the course.*" No strong opinions were voiced by students regarding the elective course choices or offerings although they liked the flexibility in coursework which allowed them to focus on wet-lab experience and experiments. However, students who had spent longer time than their peers in the CVRG program asked for more regularly scheduled engagement activities [Journal clubs, Visiting Speakers] as they expressed a very strong likening for these programs. Some CVRG students would like to see more formalized interactions between the core ASM of the CVRG program with ASM of other units at Memorial as it pertains to collaborative projects and research.

3. Agreement on curriculum change - the faculty view

The current required core course MED 6140 is a hold over legacy from the initiation of the CVRG program over twenty years ago. This course has been designed to deliver a high paced introduction and grounding in basic cardiovascular physiology and pharmacology as well as appreciation for clinical pathology. Agreeing with the opinions of students, the majority view of ASM in the CVRG program on MED 6140 is that its delivery and method of instruction should be redesigned for the needs of the present generation of graduate students and supervisors.

As MED 6140 has been co-taught by clinical faculty members in Medicine as part of MED 5650 to first year undergraduate medical students, it has been integrated with the teaching responsibilities of CVRG members; and thus, increases the continuity of their research at other times of year. The rigor and quality of instruction of MED 6140 have not been questioned [always highly rated course in undergraduate medicine] although ASM in the CVRG program have questioned the assessment methods for graduate students in the course. Alternatives to the existing course list of program of study have been suggested that include replacing MED 6140 with a new required course, and offering MED6140 as an elective.

4. Elective course lists for CVRG program

The elective courses [6142, 6190, 6194], offered specifically by ASM in the CVRG program are orientated to the individual academic needs and career goals of graduate students. Both MED 6190 and MED 6194 are taught by ASM of the CVRG program and of other units, and involved either the whole or parts of other courses that are delivered to undergraduate pharmacy and medicine students. Typically, these two courses have been intended to provide academic grounding in fundamental pharmacology principles (MED 6190) and clinical respiratory physiology (MED 6194). MED 6142 (Special Topics) has been offered as by ASM to students as a directed independent study, as well as, recently, a combination of lectures and seminars (Spring 2012).

5. Assessment standards for Masters thesis examinations, and transfers and direct entries into PhD program

Currently, there is no requirement for an oral defense of the Masters thesis research in the CVRG program. The majority of the ASM in the CVRG program believe that that the Masters thesis examination, whether it is part of the final examination or a transfer to the PhD program, should follow a similar process to the current PhD thesis examinations that require an oral public defense, which would raise the current assessment standard to the same level as most other first-tier Canadian universities. For those students who have been offered direct entry into the PhD program of study, it has been suggested that a thesis proposal examination be held by the end of the first two semesters.

6. Comprehensive examinations for the PhD program

It is a common view of ASM in the CVRG that policies and procedures for establishing the composition of the PhD comprehensive exams require changes to ensure that the competencies of the doctoral candidates are assessed by ASM specifically affiliated with, and knowledgeable of the objectives of the CVRG program and the specific areas of cardiovascular research. The small number of ASM in the CVRG produces practical barriers such that ASM that serve as student thesis supervisory committee members are excluded from the same student's comprehensive examination committees, except for the student's primary supervisor.

7. Current curriculum responsive to the needs of students and employers

After graduation, a clear majority, if not all, of the MSc and PhD students from the CVRG program have entered health and allied health professional schools, for which the educational benefits of the curriculum (especially MED 6140) have been a considerable asset. Even the small number of PhD graduates that continued to pursue research have been successful obtaining Fellowships at other

universities. From the perspective of providing an experiential learning that enables students to be gainfully employed, the CVRG program has been successful.

Directions on program changes to curriculum

To guide the curriculum changes as one ASM of the CVRG program stated "Our first concern should be preparing our (undergrad and grad) students for a future career that may be in NL but most likely outside of NL, nationally and internationally. It is critical to make sure that curriculum, objectives and outcomes of the program are consistent with national and international standards and expectations and make sure that students leaving the program are well prepared for competition with people from other universities in Canada or elsewhere."

C. Faculty Contributions

1. Research and scholarship productivity of the trainees and ASM of the CVRG

All the ASM of the CVRG program have received and or renewed operating grants from either CIHR or NSERC; one ASM was also awarded a CFI infrastructure grant, which was used to establish his research laboratory; another ASM received additional operating funding as a New Investigator from CIHR. Both ASM and their students have received awards and distinctions in national competitions (see appendices for details).

A generally accepted standard for illustrating research and scholarship productivity of a graduate program is the number of abstracts, presentations and peer-reviewed publications by its ASM and trainees (**Table 3**). ASM and graduate students in the CVRG program do not work in isolation of each other or other trainees such as post-doctoral fellows, so Table 3 is really a snapshot of research activities from the CVRG program environment as a whole rather than by individual ASM supervision.

Current rank	Abstracts and posters	Peer reviewed publications	Oral presentations
Associate [a]	**12**(12)	**9**(8)	**4**(3)
Associate [a]	**4**(4)	**7**(5)	**7(**1)
Professor [a]		**18**(7)	**13**
Professor [a]	**6**(4)	**10**(7)	
Professor [a]	**5**(5)	**7**(5)	
Professor [b]	**24**(1)	**17(**3)	**1**
Associate [b]	**13**(3)	**23**(4)	**9**

Table 3. Research and scholarship productivity of ASM and graduate students in the CVRG program from 2007 to 2012. These data indicate the total number (in bold) of abstracts, publications and oral presentations; numbers in parentheses represent trainee contributions to the total number, which are only counted once when there were multiple trainee authorship. Data are obtained from curriculum vitae provided by ASM for the self-study as of May 2012; book chapters, and internal presentations were excluded.

[a] full-time appointment in Division of BioMedical Sciences [core faculty].

[b] formal co-supervision of student provided by professors without full-time appointment in the Division of BioMedical Sciences.

2. Responsibilities to other academic programs, professional organizations, and research agencies

ASM in the CVRG program have been

- responsible for teaching physiology, pharmacology and biochemistry in courses to undergraduate science, medicine, and pharmacy students.
- mentors and supervisors for trainees who held post-doctoral fellowship awards, and laboratory hosts for Visiting Professors who were on sabbatical leaves.
- active members in several professional societies including the Canadian Physiological Society,

Canadian Society of Pharmacology and Experimental Therapeutics, American Physiological Society, British Pharmacological Society, Hypertension Canada; also ASM have been part of the Canadian Salt Task Force.

- invited to serve as committee members of grant review panels for CIHR, NSERC, and the Heart and Stroke Foundation of Canada (HSFC); and as committee members, and Chairs of panels reviewing graduate student scholarship awards for CIHR and HSFC.
- active participants in administration and committee work for the Faculty of Medicine and in broader service to the University, including Medical Research Foundation; undergraduate medicine pre-clerkship; medical school admission; academic Search Committees; Promotion and Tenure; Human Investigation Committee; Senate Committee on Research.

3. Challenges to Faculty productivity and creativity

The full potential of the research and scholarship productivity in the CVRG program is being limited by circumstances that include

- A faculty compliment that is well below "critical mass".
- An expectation that the number of ASM participating in the CVRG program will decrease from its already small size due to circumstances that include retirements, administrative appointments, interruptions in grant funding, and sabbatical leaves.
- Small laboratory spaces that limit the number of students enrolled.
- Few doctoral students in the CVRG program. It is generally accepted that students pursuing a PhD will make novel contributions to their field of study as a result of spending longer time doing research and more detailed investigations, and will produce more than MSc candidates.
- A lack of consistency regarding the amounts, and the policies and procedures for financial support awarded through RGS for leveraged funding of graduate student stipends by ASM.

4. Directions for Faculty improvement

- Within the next five years, more participating core ASM will be needed in the CVRG program; a good estimate is five new core ASM hires. The CVRG program is the one of the few graduate studies programs in Medicine that does not have a core ASM who holds a Canada Research Chair, so this type of appointment could be seen as an opportunity to rejuvenate this graduate program by introducing new expertise and leadership. Financial support for post-doctoral fellowships, and visiting scientists e.g. sabbaticals, that are specifically linked to instruction in the experiential learning associated with the CVRG program can also be considered as mechanisms to supplement the program staffing needs.
- Recent changes to the grant funding programs of the Heart and Stroke Foundation of Canada provides a good opportunity to leverage recruitment of new faculty and to update the faculty expertise in the CVRG program.
- Incentives to have more non-core ASM effectively participate in the CVRG program need to be considered. For example, to encourage interdisciplinary experiential learning in graduate studies programs, the SGS, RGS, the Faculty of Medicine, and other units at Memorial should consider targeted financial support for students that will conduct doctoral thesis research that cuts across Memorials' units [e.g. biochemistry, engineering, mathematics, stroke, obesity, diabetes]. Such strategies can improve the competitiveness of grant applications submitted by Memorial's researchers to collaborative interdisciplinary research funding opportunities, such as those offered by NSERC and CIHR.

C. Administrative Support/Efficiency

1. Office of Research and Graduate Studies

Issues raised by the ASM of the CVRG program concerning the support and efficiency of administrative services have been included where it applies to the self-study sections above.

2. Laboratory space, equipment and services

Laboratory space available to the CVRG program is seen to be a limiting factor to increasing enrollment of graduate students, hiring new ASM, and maximizing the participation by ASM; it is a shared concern amongst the biomedical science graduate programs. The impact of infrastructure concerns specifically for the CVRG program have been outlined in the self-study sections above. Because of the ageing infrastructure in the Health Sciences Centre, ASM increasingly are challenged to maintain the laboratory certifications that are required by the Canadian Tri-Council Research Agencies, Canadian Animal Care Council, and others (Occupational Health and Safety, Biosafety). In addition, the scope of research opportunities that can be offered as experiential learning to graduate students is limited by the spaces that cannot support the installation and operations of some types of modern equipment. Graduate students in the CVRG program have offered the opinion that the laboratory space is adequate for their studies; however, they may not have realized that ASM would like to increase the numbers of graduate students by up to three-fold more than the current numbers.

3. Directions for improving facilities

Clearly, the laboratory space concerns cut across the graduate programs in Medicine, and impact both research and teaching mandates at Memorial, so addressing these problems should be a Faculty of Medicine priority and be supported by Memorial's leadership in research and academics.

Appendix Self-Study

Cardiovascular and renal sciences graduate studies program

6/19/2012

Appended materials are collated into three sections as :

Cardiovascular and renal sciences graduate studies program Fall 2007 - Spring 2012

Semester Year	Course	Students
Spring 2012	MED 6142	2
Spring 2011	**MED 6140**	3
	MED 6194 (Format A)	2
Spring 2010	**MED 6140**	1
Fall 2009	MED 6142	1
Spring 2009	**MED 6140**	1
Winter 2009	MED 6105	1
Spring 2008	**MED 6140**	3
	MED 6194 (Format A)	2
Fall 2007	MED 6194 (Format B)	1

Appendix Table 1. Student enrollment Fall 2007 - Spring 2012 listed according to semester and course number. Requisite course number is bolded and the other courses are electives.

MED 6140 Basic Cardiovascular and Renal Physiology
MED 6194 Special Topics in Physiology
Format A Respiratory Physiology and Pathology
Format B Medical Biochemistry
MED 6142 Special Topics in Renal and Cardiovascular Physiology
Format A prior to Spring 2012
Format B Spring 2012
MED 6105 Medical Physics
MED 6190 General Pharmacology

Course descriptions

MED 6140 – Basic Cardiovascular and Renal Physiology

Required course. This course is coordinated with the cardiology and renal sections of MED 5650 [Integrated Study of Disease 1] that is taught to the 1st year undergraduate medicine program. The graduate course consists of all the lectures, demonstrations, lab exercises and tutorials presented by the Faculty of Medicine to the undergraduate MD students. Graduate students attend the sections of MED 5650 covering the cardiovascular and renal systems with respect to normal and abnormal human physiology. The course consists of 105 lectures or demonstrations (50 min each), 6 hours of labs, and 8 hours of tutorials. The students are evaluated by 3 midterm exams; and potentially, a final exam if they score an average grade < 75 % on the midterms. They are required to write one 10 page essay that is graded on a pass or fail basis. The passing grade for the course is 65 %.

MED 6194 – Special Topics in Physiology

Elective course. This course has been given in two formats.

Format A. Advanced Respiratory Physiology. This format consists of the respiratory section of MED 5650 that is taught to 1st year undergraduate medicine and involves of the study of normal and abnormal respiratory physiology. The course has a format of 33 lectures or demonstrations (50 min each) and one 3 hour tutorial. The students are evaluated by one midterm exam and a final exam. They are also required to write a 10 page essay that is judged on a pass or fail basis.

Format B. Medical Biochemistry. This format is run in conjunction with the Biochemistry section of MED 5600 [Basic Medical Sciences 1] to 1st year undergraduate medical students. The course covers both the normal and abnormal biochemistry associated with human physiology during health and disease. It consists of 30 lectures or demonstrations (50 min each), and three 1 hour tutorials. The students are evaluated with 1 midterm and 1 final exam. In addition, the students are asked to present a 10 page essay that is judged on a pass or fail basis.

The passing grade for both formats is 65 %.

MED 6142 – Special Topics in Renal and Cardiovascular Physiology

Elective course. Prior to Spring 2012, this course was designed to allow graduate students to pursue directed study of a specialized subject, according to individual background or interests, that was not directly related to the subject of their thesis. The typical course of directed study consisted of a comprehensive review of the literature on a specific topic of interest. The student was assigned a supervisor to meet on a bi-weekly basis to discuss their progress. By the end of the course, the student was expected to provide a detailed review of the subject area, typically 50 double spaced typed pages, and a presentation in the form of a one hour seminar to the faculty. A grade was assigned by the faculty of the CVRG program based on the quality of the review (75 %) and seminar presentations (25 %) By special arrangement with the faculty, the scope or depth of the review may be reduced in lieu of other forms of directed study (e.g. laboratory benchwork, theoretical modeling). Passing grade is 65 %

For Spring 2012, this course has been offered in a format consisting of lectures and seminar sessions on a specific topic of cardiovascular research (Vascular Endothelium in Health and Disease). A detailed syllabus is attached, separately. Passing grade is 70 %

MED 6105 – Medical Physics

Elective course. This course was a specialty course designed by Drs. Carl Weslowski and Ed Kendall for their graduate student that has been registered in the CVRG program. The course covered various radiology techniques, and calculations using tracers to image human organs and to calculate renal function, bone density and the presence of various diseases. The course dealt with the use of tracers, their metabolism, clearance as well as the imaging of the traces during radiological techniques. This course will not be offered again as part of the CVRG program.

MED 6190 – General Pharmacology

Elective course. Graduate students attend the lectures and laboratories of MED 4300, a course co-taught to pharmacy students by ASM of the CVRG and other programs of the Faculty of Medicine. The course deals with the general principles of pharmacology (dose-response relationship, drug-receptor interaction, absorption, distribution, metabolism, excretion of drugs), and drugs that affect neuromuscular and autonomic neurotransmission, the cardiovascular, gastrointestinal, and central nervous systems, and autacoids/prostanoids. In addition to written examinations, graduate students participate in three laboratory sessions, write three lab reports, and complete a dissertation/library project. The duration of this course is 12 weeks.

Cardiovascular Sciences Graduate Studies

MED 6142 Special Topics in Cardiovascular Physiology

Vascular Endothelium in Health and Disease

Spring semester 2012

Course: MED 6142 Special Topics in Cardiovascular Physiology

Theme: **Vascular endothelium in health and disease**

Instructor: John J. McGuire PhD, Associate Professor

Format – 1 semester; 12 weeks; 1 h lecture per week plus 2 h seminar sessions per week

Lecture Topics

1. Normal Endothelium
   Functional and Ultrastructural Properties and Changes in Pathologies
   Calcium Signalling in the Endothelium
2. Eicosanoids and the Vascular Endothelium
   Nitric Oxide and the Vascular Endothelium
3. NO therapeutics
   Haemostasis
   Vascular Endothelium and Blood Flow
4. EDHF
5. Introduction to Endothelial Cell Dysfunction
6. Vascular Endothelium in Hypertension
7. Vascular Endothelium and Atherosclerosis
8. Vascular Endothelium and Diabetes

Non-core sub-topics may include: endothelial cells and vasoconstrictors, endothelial cell development; endothelium permeability; endothelial cells in angiogenesis, vasculogenesis, and cancer; endothelial cells in gene therapy, myocardial protection, and cardiovascular therapeutics; such topics would be covered through assignments, seminars, and optional reading lists.

Reading list

The assigned readings for this course are intended to provide fundamental background and references for students. The students may choose to review the materials aligned with the lectures on their own time table. Because the sources are not traditional text books, students will realize that often the same material may be presented again in another section of assigned reading.

All literature is accessible via Memorial University Libraries subscriptions to Springer E-books, which may require students to access via Memorial's computer network its Libraries.

Assigned readings will be selected Chapters from the following sources :

The vascular endothelium I eds. Moncada and Higgs in The Handbook of Experimental Pharmacology. New York: Springer, vol. 176 I, 2006. ISBN 0171-2004 http://www.springerlink.com/content/978-3-540-32966-4/

The vascular endothelium II eds. Moncada and Higgs in The Handbook of Experimental Pharmacology. New York: Springer, vol. 176 II, 2006. ISBN 0171-2004 http://www.springerlink.com/content/978-3-540-36027-8/

cGMP Generators, Effectors, and Therapeutic Implications. Eds. Harald H. H. W. Schmidt, Franz Hofmann and Johannes-Peter Stasch. The Handbook of Experimental Pharmacology, Vol. 191, 2009, DOI: 10.1007/978-3-540-68964-5 http://www.springerlink.com/content/978-3-540-68960-7/

Nitric oxide. Ed. Bernd Mayer. Handbook of experimental pharmacology, Volume 143, 2000, DOI: 10.1007/978-3-642-57077-3 http://www.springerlink.com/content/978-3-540-66122-1/

Phosphodiesterases as Drug Targets. Eds. Sharron H. Francis, Marco Conti and Miles D. Houslay Handbook of experimental pharmacology, Volume 204, 2011, DOI: 10.1007/978-3-642-17969-3 http://www.springerlink.com/content/978-3-642-17968-6/

Additional reading assignments will be made in advance of lectures during the second half of the course.

Timetable

Class times will be Tuesdays 09:00 am - 10 :00 am, and Fridays 09 :00 am - 11:00 am; the room assignment is different on Tuesdays and Fridays, and changes from week to week. Refer to Room booking schedule [latest update May 14, 2012] attached.

Week	Date	Event	Date	Event
week 1	8-May	Assigned reading	11-May	Assigned reading
week 2	15-May	Assigned reading	18-May	critique 0
week 3	22-May	lecture 1	25-May	critique 1
week 4	29-May	lecture 2	1-Jun	critique 2; outline due
week 5	5-Jun	lecture 3	8-Jun	tutorial; outline assessment
week 6	12-Jun	No classes; Self-study	15-Jun	critique 3
week 7	19-Jun	lecture 4	22-Jun	test 1 (written and oral)
week 8	26-Jun	lecture 5	29-Jun	critique 4
week 9	3-Jul	lecture 6; draft due	6-Jul	critique 5
week 10	10-Jul	lecture 7	13-Jul	critique 6
week 11	17-Jul	lecture 8	20-Jul	tutorial; draft assessment
week 12	24-Jul	lecture 9	27-Jul	test 2 - written
week 13	31-Jul	test 2 - oral	3-Aug	no classes; final paper due
week 14	7-Aug	no classes	10-Aug	oral presentation

Assessment:

Weekly Assessments: Each week, students will be assigned a peer-reviewed article to critically appraise. The following week, students will be graded on their presentation of their critique based on: the quality of oral presentation; appropriate integration of supplemental material e.g. slides, visual material, handouts; their participation in peer assessment of other students; and their own responses to instructor's questions e.g. Questions and Answers : 5% of total grade per critique. 30% of total grade.

Peer Assessment of writing assignment: Students will provide an assessment of another student's progress in writing their Final Papers at two stages: the outline, and first draft. The mark for each student will be based on the quality and clarity of their written peer assessment and the grade proposed by their peer. 5% of total grade.

Test 1: This examination will cover the lectures up until the examination week. The test will be 45 minute written exam, and 15 minute oral exam. 10% of final grade.

Test 2 : This examination will cover all lecture topics from the course; however, the focus will be on the second half of the topics covered. Examination will be a 2 hour exam comprised of 1 ½ hour written (10 % of final) and 30 min oral exam (5% of final) components.

Final Paper: A 20- 25 page review [double spaced text, minimum 12 point font; maximum 33 lines per page; 2 cm margins; page total includes figures, excludes a properly formatted bibliography] of an assigned subject of cardiovascular pathophysiology research. The paper will be marked on the quality of presentation, the clarity of the thesis, and the completeness and scientific rigor of critical appraisal. The special topic review should be intended to be read by an audience that includes non-specialist scientists in cardiovascular physiology and pharmacology, and research scientists specializing on endothelium and vascular biology. Students should check the contents of recent reviews in the *Canadian Journal of Physiology and Pharmacology* for examples.

Final Oral Presentation: 1 hour period. The presentation by student will be marked on quality of oral presentation, slides (visual material) and handout materials. The primary instructor will conduct the examination and assign a final grade. Additional academic staff members that have appropriate expertise for the subject of the review may be invited to participate in evaluation.

Evaluation Tool	Assessment
critique 1	5.0%
critique 2	5.0%
outline peer assessment	2.5%
Test 1 (written and oral)	10.0%
critique 3	5.0%
critique 4	5.0%
critique 5	5.0%
critique 6	5.0%
draft peer assessment	2.5%
Test 2 (written and oral)	15.0%
final paper due	20.0%
oral presentation	20.0%
Total Mark	100.0%

Academic Integrity

Students are expected to conduct themselves in all aspects of the course at the highest level of academic integrity. Any work for which the student is claiming credit should be original work and the source of any submitted material which is not original must be given proper credit. Any student found to commit academic misconduct will be dealt with according to the School of Graduate Studies, Faculty of Medicine, and University practices.

Submitting copied work is considered academic misconduct and will be dealt with according to Faculty policies and regulation 11 of the General Academic Regulations (Graduate) of the University Calendar.

The Memorial University of Newfoundland Code shall be respected :

“All members of the Memorial University of Newfoundland Community, which includes students, faculty, and staff, shall treat others with respect and fairness, be responsible and honest, and uphold the highest standards of academic integrity."

[found in the University Calendar, Section 2 of General Information]

Students shall familiarize themselves with and abide by the principles of the "Code of Student Conduct”. Revised July 8, 2010, Board of Regents. http://www.mun.ca/student/home/conduct.php

Students suspected of academic dishonesty will automatically be assigned a zero as grade by the instructor.

Normally, students will receive a zero as the grade for any component of evaluation that has not been completed by the scheduled time. By reading the University Calendar, students are expected to familiarize themselves with Memorial’s policies on appealing grades and missing scheduled tests.

Week 1.

This week the students will engage in self-directed learning. Throughout this quick-paced course, students will have to actively take ownership for their time management, writing, and organization skills. Knowing what services are available and how to access those of the Libraries and Writing Centre early on in this course will be an asset for students.

Assignment

Students should read the Writing Centre's "*How to* " materials, and familiarize themselves with the services provided by the Writing Centre to graduate students. Students should also familiarize themselves with the services and workshops offered to graduate students by Memorial's University Libraries, especially those concerning conducting literature searches, using bibliography software and document delivery services.

Week 2.

Assigned readings May 15th, 2012

To prepare for **Lecture 1** ***An Introduction to the endothelium***, students should read the following:

Vascular Endothelium Vol. 1. Chapter 1 *Normal Endothelium.*

Vascular Endothelium Vol. 1 Chapter 2 *Functional and Ultrastructural properties and changes in* pathologies.

Vascular Endothelium Vol. 1. Chapter 5 Calcium *Signalling in the Endothelium*

Optional readings:

Vascular Endothelium Vol. 1. Chapter 3 *Development of the Endothelium.*

Vascular Endothelium Vol 1. Chapter 4 *Transport Across the Endothelium: Regulation of Endothelial Permeability.*

Critique 0: May 18th, 2012

The Sixth Sense Method to Critical Appraisal

The objective of this tutorial is for the instructor to lead the students through a structured review of a peer-reviewed original research article as is commonly presented in a "*journal club"*. By the end of this class, the students should have actively participated in learning how to prepare to review research articles by approaching their reading of literature in a planned manner and developing their own customized review template. In addition, the students should gain an appreciation for the learning objectives and expectations of *journal club* presentation. It is expected that each student will continue to customize, and develop their review templates, and develop their own presentation style appropriate to the audience by participation in more journal article reviews.

The article for review for Critique 0 will be assigned by the instructor. Students are expected to read the article and be prepared to discuss its general contents.

Students will be assigned their papers for Week 3 critique 1 at the end of class.

Optional assignment: Watch the movie(s) *The Sixth Sense* or *The Usual Suspects* three times: first, watch for the experience; second, make notes on how the story line; finally, determine how the story pieces come together. Ask yourself, what are the consistencies or

inconsistencies ?; What assumptions or cheats are necessary to make the story work ? Are any of the assumptions critical ?

Week 3.

Lecture 1. An Introduction to the endothelium

In addition to a basic overview of the course, this lecture will consist of a review of some fundamental basics of endothelial cell physiology. Some specific areas of interest about the normal endothelium will be highlighted. The assigned readings will provide a good preparation for students and allow active discussion during the class. At the end of the lecture, the instructor will assign the subjects of the term papers for the individual students.

Critique 1. Journal club for the laboratory

Each student will present a journal club presentation of a research paper. This presentation should be as formal as would be appropriate for an *internal laboratory meeting*. 15 minutes length. The weight of evaluation of this session will be the rigor and the structure of the critiques that are presented. Participation of students in the journal club will be expected and evaluated for quality.

Week 4.

Lecture 2. The World of NO (nitric oxide).

Assigned readings:

Vascular Endothelium Vol. 1. *Eicosanoids and the Vascular Endothelium*

Vascular Endothelium Vol. 1. *Nitric Oxide and the Vascular Endothelium*

Nitric Oxide. Chapter 1 *The Chemical Biology of Nitric Oxide. Balancing Nitric Oxide with Oxidative and Nitrosative Stress. pp. 7-29.*

Nitric Oxide. Chapter 2 *Enzymology of Nitric Oxide Synthases*

Nitric Oxide. Chapter 3 *Regulation of Nitric Oxide Synthase Expression and Activity*

Nitric Oxide. Chapter 8 *Nitric Oxide and Regulation of Vascular Tone*

Nitric Oxide. Chapter 24 *Therapeutic Potential of Nitric Oxide Synthase Gene Manipulation*

Optional readings

Vascular Endothelium Vol. 1. *Angiotensin, Bradykinin and the Endothelium*

Vascular Endothelium Vol. 1. *Endothelin*

Nitric oxide. Chapter 5 -7

Nitric oxide. Chapter 9

Nitric oxide. Chapter 11 - 14

Critique 2. Journal club for the non-specialist scientist.

This week the journal club presentation should be prepared for the non-specialist scientist as an audience (for example, a neuroscientist). The weighting on evaluation will be the

clarity of the presentation and the usefulness of the critical appraisal for the intended audience.

Week 5.

Lecture 3. NO therapeutics

This lecture is intended to familiarize the students with the links between endothelial cells and nitric oxide-based therapeutics from historical and modern perspectives.

Assigned readings

Endothelium vol. 2. *Haemostasis*

Endothelium vol. 2. *Vascular Endothelium and Blood Flow*

Nitric oxide. Chapter 10 *Regulation of Platelet Function*

Nitric oxide. Chapter 4 *Enzymology of Soluble Guanylyl Cyclase*

Nitric oxide. Chapter 15. *Therapeutic Importance of Nitrovasodilators*

Nitric oxide. Chapter 16. Therapeutic *potential of NOS inhibitors in septic shock*

Nitric oxide. Chapter 17. *Inhalation therapy with NO gas*

Tutorial. Outline assessment. Self-directed.

Students will meet together during the usual scheduled class time to discuss each other's review outlines. Each student is expected to submit a summary of the review of the others outline and a summary of responses to address the critique of their own. The formats provided for review and critique are open to the students discretion; however, the critiques and responses to review should be submitted by 12:01 am June 9th, 2012.

Week 6.

Critique 3. Journal club for deadlines.

Peer review is a fundamental process in publishing academic research. Providing timely reviews of submitted manuscripts to Journal editors shows them that you respect your colleagues and the principle of fairness in peer-review, amongst other things. This week the journal club will be a presentation of a critique of a paper to the instructor, who will play the role of Editor. A written 2 page critique will be submitted and the recommendation regarding its publication will be defended. Two students will be assigned the same paper. It is expected that the students will not work together so that independent recommendations will be submitted. Evaluation will be based on the rigor, structure and strength of the recommendations.

Week 7.

Lecture 4. EDHF : Endothelial-derived *hypothetical* factor ?

This lecture will provide a review of selected literature on endothelium-derived relaxing factors(s).

Assigned reading

McGuire JJ, Ding H, Triggle CR. Endothelium-derived relaxing factors: A focus on endothelium-derived hyperpolarizing factors(s). Can. J. Phys. Pharmacol. 79: 443-470, 2001.

Test 1.

This examination will cover all the lectures up until week 7 i.e., not lecture 4. The test will be 45 minute written exam, and 15 minute oral exam. 10% of final grade.

Academic Program Review
Self-Study
Immunology & Infectious Diseases (IID) Graduate Student Research Program

Prepared by: Sheila Drover
June 25, 2012

Table of Contents for Report

Appendices

Abbreviations:
BHCRI/CRTP - Beatrice Hunter Cancer Research Institute/Cancer Research Training Program; **CASL** - Canadian Association for Study of the Liver; **CBCF –** Canadian Breast Cancer Foundation; **CIHR** - Canadian Institute of Health Research; IID – Immunology & Infectious Diseases; **MUCEP** - Memorial Undergraduate Career Experience Program**RGS**/**FoM** - Research & Graduate Studies/ Faculty of Medicine; **SGS** - School of Graduate Studies School of Graduate Studies; **SWASP** - Student Work and Service Program, **SURA** - Science Undergraduate Research Awards, **NCTRF** - National Canadian Research Training Program, and **NSERC-USRA** - National Science & Engineering Research Council Undergraduate Summer Research Awards

Overview and Program Objectives

This APR self-study report was prepared after consultation with faculty members in the IID group via e-mails, meetings and a questionnaire (survey monkey). There was a general sense of **Déjà vu** since previous concerns relating to student stipends, bench and office space that were documented in the last APR Review (2006), were not adequately addressed. Statistics on student enrollment and program outcomes (**Section A)** were extracted from data provided by Research and Graduate Studies (RGS) in the Faculty of Medicine (FoM) via the School of Graduate Studies (SGS), and from information obtained from faculty members. However, to move forward, a survey **(Appendix 1)** was designed and conducted with help from Ms. Jacinta Reddigan (Medical Education Scholarship Centre, FoM) and the coordinators of the Cancer & Development (Ann Dorward) and Genetics (Roger Green) programs to collect statistics and input from individual faculty members on: graduate enrollment, programming and student needs **(Section B**); graduate program administration and polices (**Section C**). Other questions related to strengths and limitations of the existing program and priorities for the future (**Section D**). The compliance rate for the IID group was excellent with seven of the eight faculty members participating. The final section (**Section E)** addresses curriculum/teaching & scholarly activities

Objectives: To train highly qualified personnel and to foster excellence, at both MSc and PhD levels for future careers in academic, research and biotechnology institutes. To instill in graduates whose chosen career path is medicine an appreciation for the importance and contribution of fundamental research to understanding and treating diseases and to partner with researchers in translating their discoveries to the patient's bedside.

A. Enrollment and Program Outcomes

Recruitment: Recruitment of local students from the undergraduate student (UGS) pool at Memorial University is done mainly by participating in an "Open House" session hosted by RGS and/or the Biochemistry Department as well as through recruiting students in MUCEP, SWASP, SURA, CBCF, NCTRF, CASL and NSERC-USRA summer research programs. Information for Canadian and International students is also available on the RGS/FoM and SGS websites as well as individual faculty member's websites.

Demographics: Data on MSc applicants to the IID program were extracted from files provided by RGS/SGS for the years **2009-2012** (**Figures 1A-1C**). Most applicants to the MSc program are international and male, whereas most enrolled students are Canadians and female. The files did not identify the PhD applicants by specialty; however, based on the coordinator's review of applications for the past three years and enquiries by e-mail, the same demographic applies for PhD applicants. A review of the demographics of current students (**Figure 2**) identified 13 and 5 in the MSc and PhD programs, respectively. While most MSc students are Canadian and female, all PhD students are international with slightly more males. It is noteworthy that none of the current PhD students transferred from an MSc program, although one completed an MSc (IID) before starting a PhD program.

Figure 1A

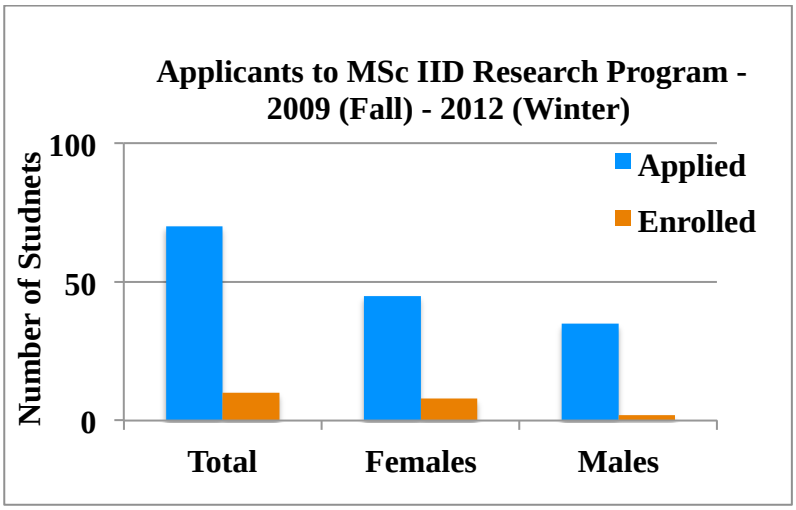


Figure 1B

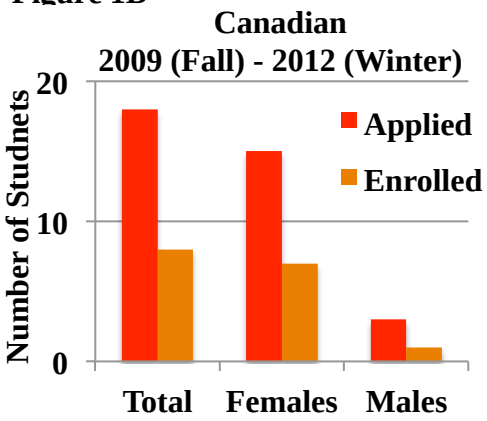


Figure 1C

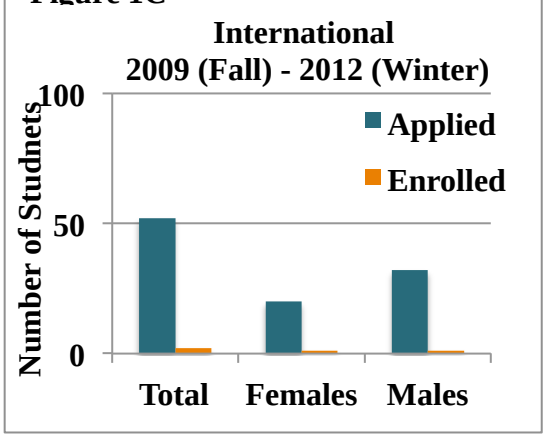
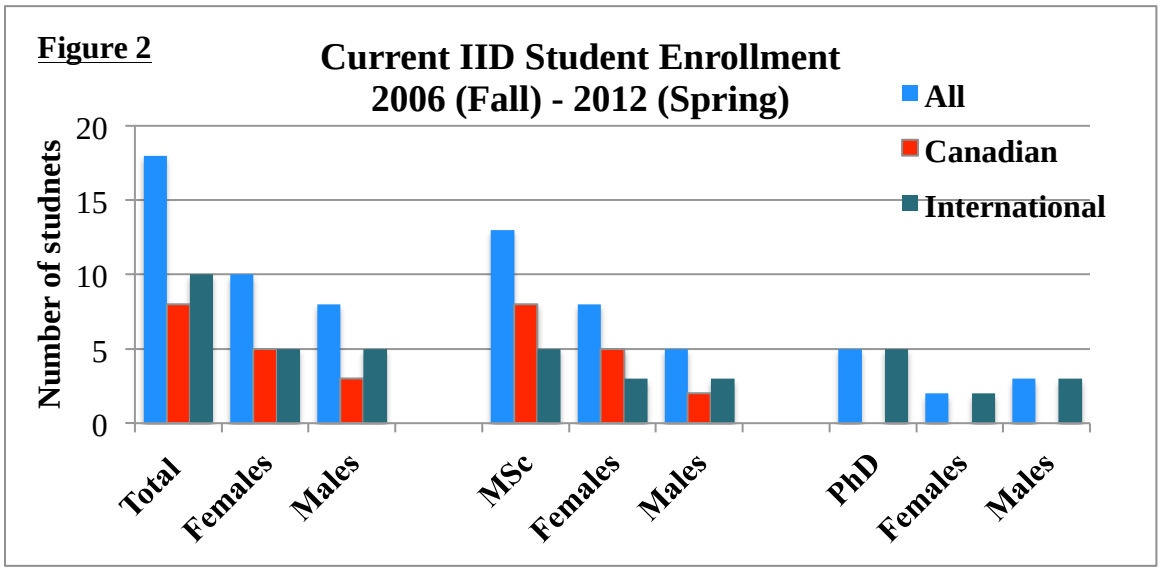


Figure 2



External awards and publications: As illustrated in the following table, graduate students enrolled in the IID program between 2006-2012 received **16** (10 MSc & 6 PhD scholarships (3 students received more than one) from several different funding sources. In addition four PDF's received 7 fellowships for a total of **23 externally funded salary awards**. Trainees are encouraged to present their work at national and/or international meetings. These are funded in part or wholly by either the supervisor's grant, RGS/FoM; however, several received competitive travel awards -17 for graduate students and 9 for PDF's, for a total of **26 travel awards** from several different sources. A PubMed search (2006-2012) identified **20** graduate students who contributed as first or co-author on **37** publications by IID faculty members.

Table 1. List of external awards received by IID graduate students and PDF's (2006-2012)

Name of Award	Salary support				Travel awards			
	MSc	PhD	PDF	**Total**	MSc	PhD	PDF	**Total**
CIHR Frederick Banting & Charles Best CGS	*5*			**5**				
CIHR/RPP Applied Health Professional Fellowships		*2*		**2**				
CIHR PDF			*2*	**2**				
NSERC – Alexander Graham Bell CGS	*2*			**2**				
Hoffman-La Roche			*1*	**1**				
Beatrice Hunter Cancer Research Institute/Can. Research Training Program		*1*	*1*	**2**		*2*	*1*	**3**
Canadian Association for the Study of Liver (CASL)		*1*	*1*	**2**		*3*		**3**
National Canadian Research Training Program– Hep C	*3*	*2*	*2*	**7**	*2*	*4*	*1*	**7**
American Society for Microbiology Viral Polymerase Meeting					*1*			**1**
American Association for the Study of Liver Disease						*1*		**1**
Canadian Society for Immunology – De Nova Travel Award						*2*		**2**
CIHR Poster Travel Award						*2*		**2**
European Association for the Study of Liver Disease							*5*	**5**
International Meeting on Hepatitis							*2*	**2**
Total	*10*	*6*	*7*	**23**	*3*	*14*	*9*	**26**

Time to completion and career choices: Analysis of data on 30 enrolled students, provided from RGS/SGS **for 2007 (Fall) – 2012 (Spring),** revealed that 3 (10%) withdrew or were terminated (2 MSc, 1 PhD); 18 (60%) are current; 9 (30%) completed their programs. The average time for completion (enrollment to convocation) for MSc (n = 4) was about 3 years; for PhD (n=5), about 6 1/4 years.

The enrollment times for current MSc students are variable - one enrolled in 2007 (P/T since 2010); 5, in 2009 (3 P/T since 2011); 2, in 2010; 2 in 2011; 2 in 2012. Four of these (2007 and 2009) are expected to submit their theses by the end of the Spring Semester. Current PhD students include 1 enrolled in each of the years 2007- 2009 and 2 in 2010, with the 2007 student expected to finish during the fall semester. Thus, the average time expected from start to finish is similar to the statistics **(slightly more than 3 and 6 years for MSc and PhD students, respectively)** for those who have competed their programs.

Data from convocation records **(1996-2012),** provided by RGS/SGS are presented in **Figure 3** and show a slight increase in the number of MSc and PhD graduates in the interval **2006-2012**. The career choices of 41 graduates, ascertained from survey responses, are shown in **Figure 4**. Twenty four (58.5%) chose academia, industry, research jobs or teaching; while 8 switched

career paths to Medicine or Pharmacy; six (14%) did not complete their program and three were unaccounted for.

Figure 3

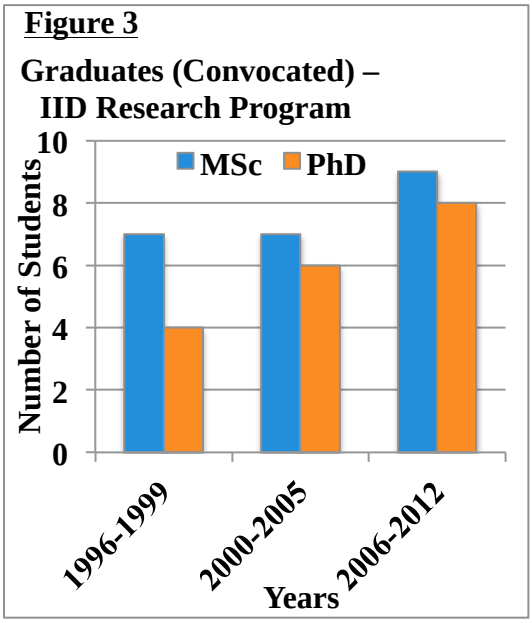
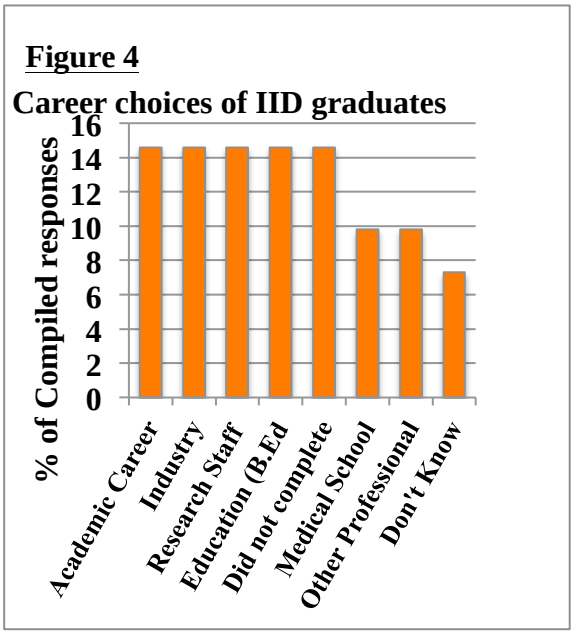


Figure 4



B. Summary of Responses to Survey on Graduate Enrollment, Program and Student Needs:

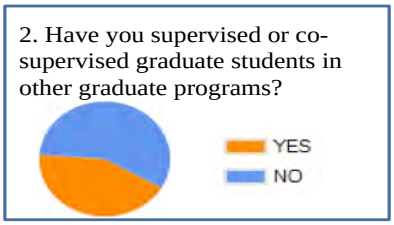
Responses to **Questions 2-7 and 14** are displayed graphically on the following two pages; responses to **Question 13** are displayed in Figure 4 above. Other responses and comments are briefly summarized.

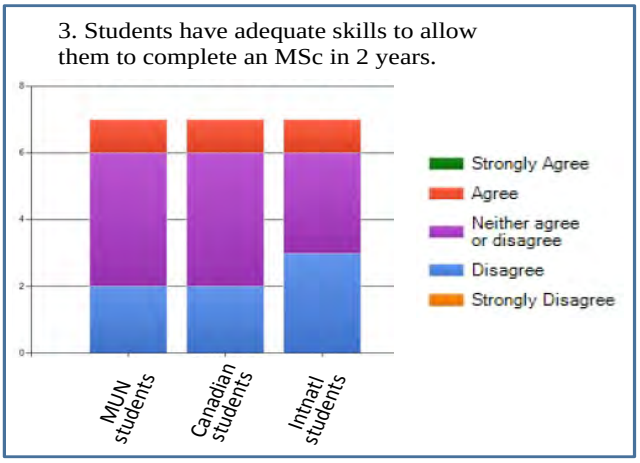
- **Q3** - Most faculty members were non-committal regarding the skill levels of entrance students to the IID graduate program, rightly commenting that this is student dependent; an undergraduate course in Immunology and a course in scientific writing were suggested.

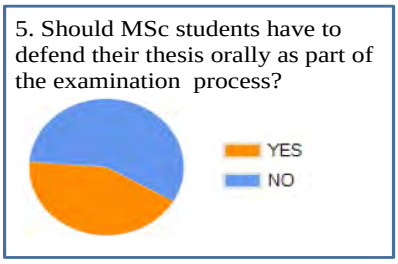
- **Q4** – A reasonable time period for students to complete their degrees is similar to the actual length of time described in Section B above:
  - MSc P/T average 4 years; range 3-5 years (5 responses)
  - MSc F/T average 2.5 years; range 2-3 years (7 responses)
  - PhD P/T average 7.5 years; range 6-10 years (5 responses)
  - PhD F/T average 5.5 years; range 4.5-7 years (7 responses

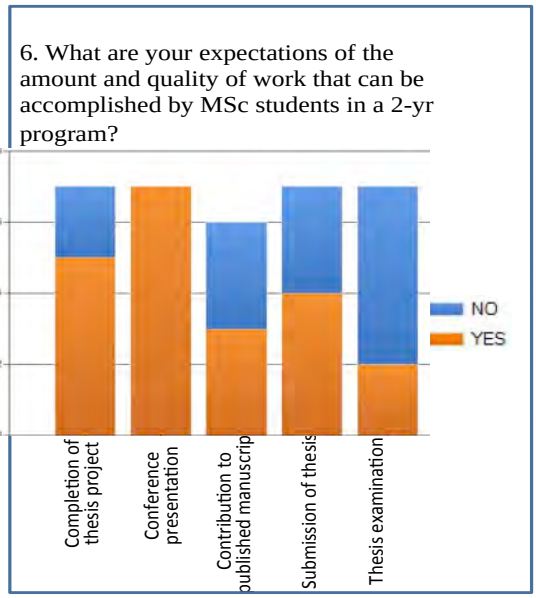
- **Q5** - The majority disagreed with MSc students defending their theses.

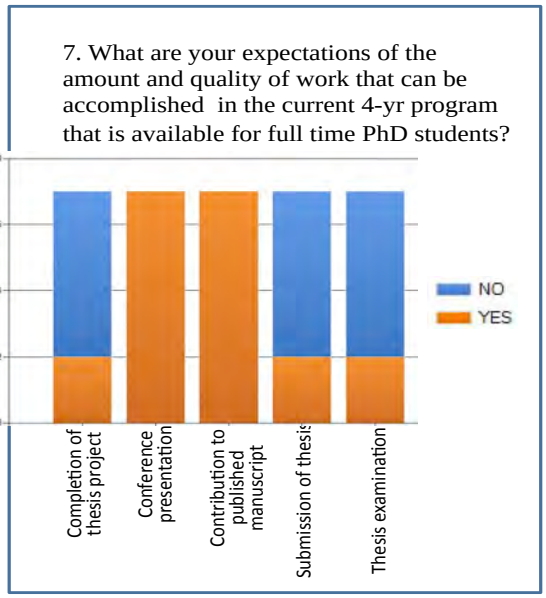
IID GRADUATE PROGRAM SURVEY RESPONSES – PART A







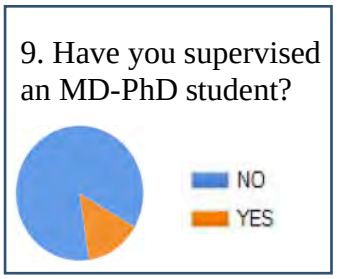


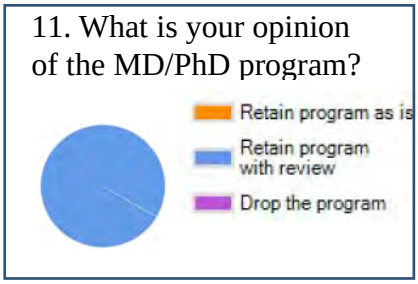


- **Q6** – While the majority expected MSc students to complete their lab-based projects in two years, most did not expect full completion (thesis examination) within that time frame. All expected their students to present at a conference, which does occur; about half expected them to contribute to a manuscript and based on the aforementioned PubMed search, several MSc student's work resulted in one or more publications. The amount of course work expected varied from 1 to 4 courses, average 2.5 (6 responses.).

- **Q7** – A minority expected PhD students to complete their programs in four years. All expected students to present at a conference and to contribute to manuscripts, which does occur - the PubMed search showed that all PhD graduates have contributed to publications. The amount of course work expected varied from 2 to 6 courses, average 4 (6 responses.)

- **Q8 – Q12** related to the MD-PhD program; responses indicated that while all were familiar with the program, only one had supervised a student. All were in favor of retaining the program in some format, but there were few suggestions (e/g more match money and fewer courses) on reconfiguring or recruitment into this program.

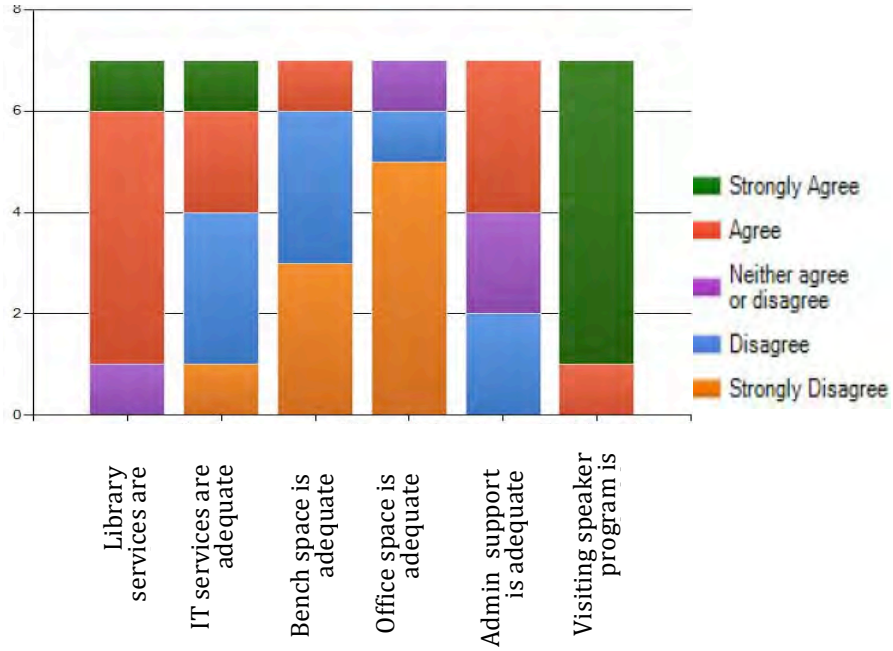




- **Q13** – Responses regarding follow-up of former graduate trainees are shown in Figure 4 above together with Figure 3, showing the number of students who have graduated since 1996. These numbers are mainly representative of more established faculty and not of two new junior faculty members.

- **Q14** – Responses displayed below, indicate that most are satisfied with library and IT services and very satisfied with the visiting speaker program. By contrast, most are dissatisfied or very dissatisfied the available bench and office space for trainees. These were previously identified as major concerns in the 2006 APR review.

14. Please indicate your level of agreement with the following



C. Summary of Responses to Survey on Graduate Program Administration and Policies:

Responses to **Questions 15-24** are displayed below; other responses and comments are briefly summarized.

- **Q15 - Q17** responses indicate that the majority agrees with ensuring a minimum stipend for graduate students and all think the minimum of $12,000 is too little – again the same sentiment was expressed in 2006. The suggested minimum stipends for MSc and PhD trainees are shown in the tables and range from increasing the current stipend by $2000 to $6000 for MSc students and $3000 – S10,000 for PhD students.

- **Q18** responses generally agreed with the 3-student rule for matched funding, but vehemently disagreed with funds being allocated on a first-come-first served basis, regardless of program rule. Five of seven faculty indicated that the 2-year and 4-year duration of matched funding was too short. This is not surprising, given the time to completion for graduate students in the IID program.

- **Q19** - a slight majority, likely those who have been recipients RPP, felt that the demise of RPP would affect their ability to support graduate students.

15. Do you agree with the policy that ensures a min stipend for grad students?

16. Is the current min of $12,000 enough?

17A. What should be the minimum stipend for an MSc student?

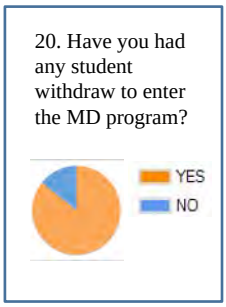
1	18,000
2	16,000
3	14,000
4	15,000
5	14,000
6	CIHR
7	17,000

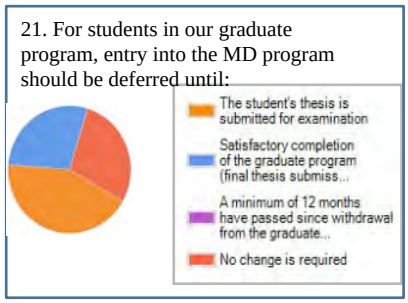
17B. What should be the minimum stipend for a PhD student?

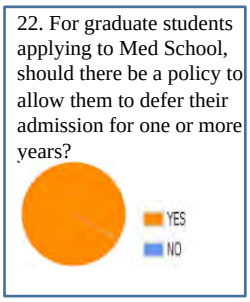
1	20,000
2	19,000
3	17,000
4	15,000
5	18,000
6	CIHR
7	22,000

19. Will the demise of the RPP affect your ability to support graduate trainees?

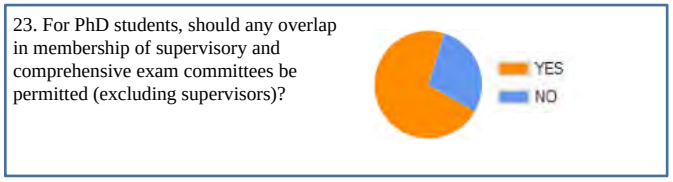
Q20 – Q22 relate to loss of enrolled graduate students to Medical School, which has been a frequent occurrence, based on the response to **Q20**. Most indicated that acceptance to Medical School should be contingent on students completing their program or at least have submitted their thesis. It was also noted that many of the potential graduate students from the UGS pool - trained as part of the BSc Honor's program or through summer research projects - frequently choose Medical School. Therefore it is not surprising that all six responses were in favor of a policy to defer admission. The number of deferral spots suggested (**Q22**) ranged from 5 to as many as are needed!



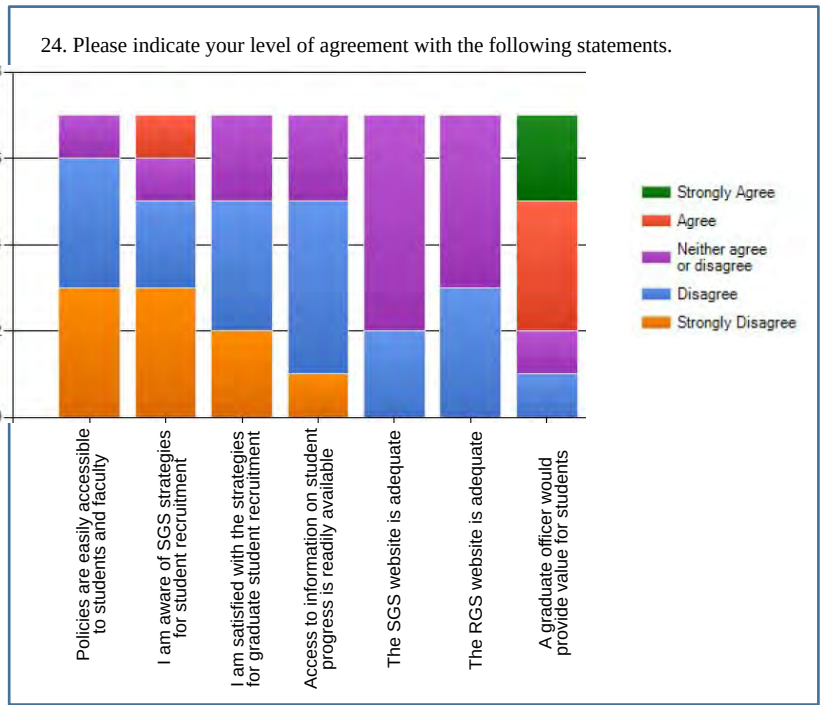




- **Q23** responses indicate that most faculty support the idea of some overlap in the membership of the supervisory and comprehensive exam committees because of the small numbers in the group; however, it was also suggested to use members from other groups, which indeed is often the case.



- **Q24** responses, shown in the following graph, indicate a high level of dissatisfaction with accessibility of policies relating to graduate students information and recruitment, and some neutrality about websites. Not surprisingly, the majority felt that having a graduate officer dedicated to students in BMS and Genetics would provide value for both students and faculty.



D. Summary of Responses to Additional Questions

Q25 – Strengths of the program - Five of six responses were positive. Strengths included a strong focus on research, cohesiveness and small numbers helpful to students, continued focus on disciplines, dedicated faculty and teachers and good uptake of external awards, very good students and relatively good cooperation within the groups.

Q26 – Limitations of the existing graduate programs - Seven made comments relating to: too much focus on courses; not enough overlap among the groups with a suggestion for a common core course and participation in other groups' journal clubs; administrative handling of certain intra-or inter programme problems that in other places would have been taken care of by department heads; narrow focus in some cases; limited infrastructure; insufficient administrative support for faculty; inadequate space for labs and office; students taking too long to complete; no critical mass in some areas; insufficient numbers of outstanding/excellent graduate student candidates.

Q27 – Highest Priorities for lab-based FoM in the future - Seven responses, overwhelmingly identified funding/stipends/fellowships, space/infrastructure; recruitment of highly motivated and qualified students. Again these priorities have been previously identified (APR 2006)

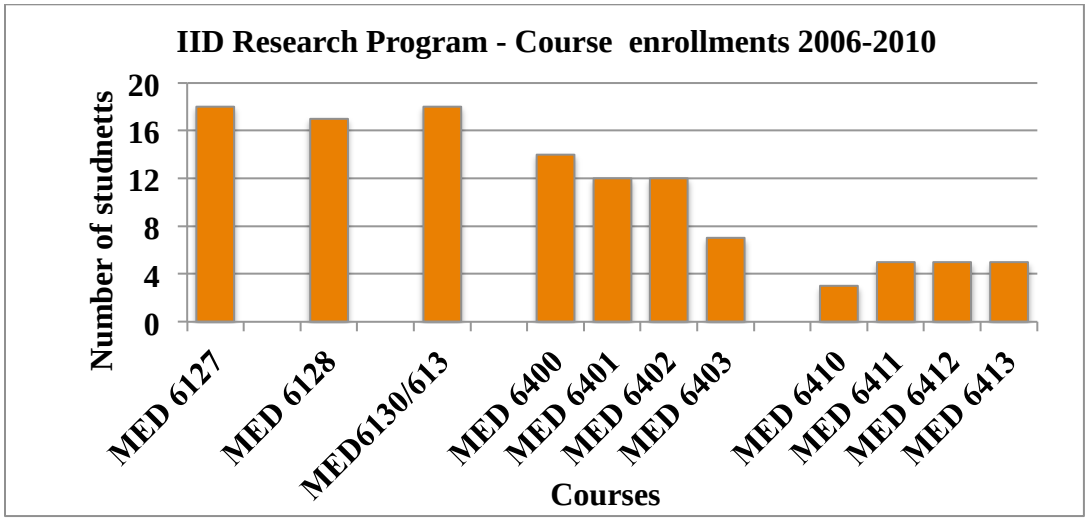
Q28 - Two comments: one expressing hope that this APR report will help bring improvements to the program and one with a concern regarding not enough PDF plus a perception of lack of local support and clinical faculty interested in research.

E. Curriculum/Teaching & Scholarly Activities

The IID graduate student research program has evolved from one with a focus primarily on classical immunology (cellular and antibody-mediated immunity/immunoregulation in normal and diseased individuals) to one that encompasses innate immunity, tumor immunity and virology: specifically HIV, Hepatitis B and Hepatitis C. The research programs for the eight faculty whose research interests are briefly described on the FoM website http://www.med.mun.ca/getdoc/ba834d62-9864-4c60-8abc-c5273727b752/Immunology.aspx and/or individual websites. Faculty participation in the program includes directly funding and supervising graduate students, serving as members of supervisory, comprehensive and thesis examination committees; serving as chairs and/or instructor for courses and course development (see below), and coordinating the IID program. IID faculty members also actively participate in other graduate student programs in Medicine and Science, undergraduate teaching in the Faculty of Medicine, Pharmacy and Science. These activities are detailed in the appended CVs (**Appendix B**).

Courses: All students enrolled in the IID program must take for credit the core course MED 6127 (Basic Immunology). Depending on the student's project and supervisory committee, the student will then choose either MED 6128 (Advanced Immunology) or MED 6114 (Topics in Virology) or any other graduate course in Medicine that is deemed suitable and/or necessary for the student's program. Previously, MED 613A/613B (Advanced Immunological Methods) was a core course, but is now in the process of being designated optional. The course syllabi for these courses are contained in **Appendix C**. All MSc students are required to attend, for credit, and participate in the Immunology and Infectious Diseases Seminar Series (MED 6400-6403) by

giving an oral presentation for a minimum of three of the four semesters. Students who are enrolled as full-time for more than two years are expected to attend and participate in the seminar series and to present once during each academic year. Similarly, all PhD students are required to attend, for credit, and participate in the Immunology and Infectious Diseases Seminar Series (MED 6410-6413) by giving an oral presentation for a minimum of three of the four semesters. Students who are enrolled as full-time for more than four years are expected to attend and participate in the seminar series and to present once during each academic year. The following figure shows the number of students enrolled in each course for years 2006-2010. The data for MED 6114 are not included as this course commenced in 2011 with eight enrolled students, including one from Biology.



Visiting speaker program: As indicated by the responses to **Q14** in the survey, the visiting speaker program which is funded by the FoM, is highly valued and an important component of graduate student training. Approximately 6-8 national and/or international speakers per year, present seminars, meet with faculty and students – for the students this is an opportunity to discuss and compare graduate student training and activities at other universities. A small portion of the fund is also used to host the annual IID Graduate Student Research Forum.

Annual IID graduate student research forum and program prizes: This has been an ongoing activity for almost 25 years and is usually held in November. All enrolled students are expected to compete by presenting their research work, or if new to the program, their research proposal. A visiting speaker is also invited to present a seminar and to participate in ranking the student's presentations. At least two awards, funded by the program are given to the top PhD and the top MSc presentations. For ten years (1999 – 2008) the Zetta Tsaltas award (valued at $500), which was made possible mainly through fundraising efforts by the Greek Community of NL, was given for the Best Overall Presentation. All members of the IID program gratefully acknowledge this generous gift.

IID retreats and meetings: For the past six years the IID group has held a summer retreat, alternating between a major event at an "out-of-town" location and a smaller event at an "off-campus" location. The former is organized by one or more faculty members and sponsored by

various companies that sell laboratory equipment and supplies. This retreat combines research presentations from faculty and graduate students, separate focus meetings by faculty and students on such topics as collaborations, infrastructure & space, student recruitment and program review. The smaller retreat, funded by FoM is co-organized by faculty and graduate students and is used as a venue for summer undergraduate students to present their work. Both events include recreational and team-building exercises.

This year the IID group organized and hosted the 25th Annual Canadian Society for Immunology Meeting, which marked the first time this meeting was held in St. John's http://www.csi-sci.ca/scientificmeeting/meetingwelcome12.aspx.
We used this opportunity to highlight IID research and graduate students at Memorial University. Faculty members chaired and organized symposia and workshops; graduate and undergraduate students actively participated as volunteers and presenters – three students were selected for oral presentations and nine students presented posters, with one winning the Top Poster Award.

Appendix A – Survey Questionnaire

PART A - Questions relevant to BMS and Genetics graduate enrollment, programming and student needs

1. To which program do you primarily affiliate as a graduate student supervisor?

- ○ Cancer and Development
- ○ Cardiovascular & Physiology
- ○ Immunology & Infectious Diseases
- ○ Neurosciences
- ○ Human Genetics

2. Have you supervised or co-supervised graduate students in other graduate programs?

- ○ YES
- ○ NO

If YES, please provide details (number of students; list of other programs)

3. Please rate your level of agreement with the following statements:

	Strongly Disagree	Disagree	Neither agree or disagree	Agree	Strongly Agree
In your experience, Memorial University entry-level graduate students have adequate skills to allow them to complete a MSc in 2 years	○	○	○	○	○
In your experience, entry-level students from other Canadian Universities have adequate skills to allow them to complete a MSc in 2 years?	○	○	○	○	○
In your experience, international students have adequate skills to allow them to complete a MSc in 2 years?	○	○	○	○	○

Please comment on the inadequacies and potential remedies.

Next

PART A - Questions relevant to BMS and Genetics graduate enrollment, programming and student needs

4. Under normal circumstances, what is a reasonable time period for students to complete the following degrees?

Part-time MSc	
Full-time MSc	
Part-time PhD	
Full-time PhD	

5. Should MSc students have to defend their thesis orally as part of the examination process?

- YES
- NO

If YES, would this be accomplished by an internal committee (Memorial University Faculty) or a committee that incorporates external membership? Please use the comment box to elaborate on your position.

6. What are your expectations of the amount and quality of work that can be accomplished by MSc students in a two year F/T program.

	YES	NO
Completion of project		
Conference presentation		
Contribution to published manuscript(s)		
Submission of thesis		
Thesis examination		

Number of courses

7. What are your expectations of the amount and quality of work that can be accomplished in the current 4-year program that is available for full time PhD students?

	YES	NO
Completion of thesis project		
Conference presentation		
Contribution to published manuscript (s)		
Submittal Submission of thesis		
Thesis examination		

Number of courses

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PART A - Questions relevant to BMS and Genetics graduate enrollment, programming and student needs

MD-PhD program

8. Are you aware that a MD-PhD program is available at Memorial University?

- ○ YES
- ○ NO

9. Have you previously supervised students enrolled in the MD-PhD Program?

- ○ YES
- ○ NO

If YES, how long did it take for the student to complete the program?

10. Did the student require formal leaves of absence during this period for health, maternity or other reasons? Please explain.

11. What is your opinion of the MD/PhD program?

- ☑ Retain program as is
- ○ Retain program with review
- ○ Drop the program

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MD-PhD Program

12. Do you have any suggestions about recruitment, program configuration or Faculty of Medicine support for this program? Please comment.

13. What has happened to your graduate trainees?

	Number of Students
Continued in Academia (includes PDF)	
Went to Medical School	
Went to other health related professional schools	
Education (ie teaching)	
Biomedical Industry	
Staff position	
Did not complete graduate program	

Other (please specify)

14. Please indicate your level of agreement with the following statements

	Strongly Disagree	Disagree	Neither agree or disagree	Agree	Strongly Agree
Library services are adequate and effective					
IT services are adequate and effective					
Bench space is adequate					
Office space is adequate for graduate students					
Administrative support is adequate and effective for graduate students					
The visiting speaker program is a valuable component of graduate student education					

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PART B - Questions relevant to graduate program administration and policies

15. The Faculty of Medicine has a policy that ensures a minimum graduate stipend for F/T students enrolled in MSc or PhD programs. Do you agree with this policy?

- YES
- NO

16. Do you feel the current minimum stipend of $12,000 for full-time students is enough?

- YES
- NO

17. If you do not feel the minimum stipend is enough,

What should the minimum stipend be for a MSc student?

What should the minimum stipend be for a PhD student?

Funding is assigned on a first-come, first-served basis for a period of two years (MSc) or four years (PhD), with a three-student per supervisor rule. For each F/T, eligible student, SGS provides the Faculty of Medicine $3,000 per MSc and $5,000 per PhD, per program year (topped up by FOM to $6,000 for every graduate trainee). Based on this algorithm, RGS funding is not always available to every student.

18. Comment on the match funding allocation process:

The amount of matched funding available per year per F/T student:

The amount of matched funding available per supervisor (three-student rule):

The allocation process (first come, first-served, regardless of program):

The maximum duration of matched funding for (two -years MSc, four-years PhD):

19. Will the demise of the RPP program likely to affect your ability to support graduate trainees?

- YES
- NO

Please comment

Prev Next

PART B - Questions relevant to graduate program administration and policies

20. Have you had any graduate students who withdrew or altered their program of study in order to enter the MD program?

- [ ] YES
- [ ] NO

IF YES, please provide details (number of students, withdrawal without degree completion, leave of absence with subsequent completion).

21. For students enrolled in a graduate program in the Faculty of Medicine, entry into the MD program at MUN should be deferred until:

- ( ) The student's thesis is submitted for examination?
- ( ) Satisfactory completion of the graduate program (final thesis submission) is evident?
- ( ) A minimum of 12 months have passed since withdrawal from the graduate program?

22. For those students who wish to complete their graduate program before Medical School admission, should there be a formal policy that would allow an applicant to defer their admission for one or more years?

- ( ) YES
- ( ) NO

If Yes, what suggestions do you have for such a policy? For example, how many deferral slots would you like to see allocated in the new, expanded undergraduate class size of 80 students?

23. The university guidelines state that there should be minimal overlap between the supervisory and comprehensive exam committees for PhD students. Should any overlap in committee members be permitted (excluding supervisors)?

- ( ) YES
- ( ) NO

Comments

Prev Next

PART B - Questions relevant to graduate program administration and policies

24. Please indicate your level of agreement with the following statements

	Strongly Disagree	Disagree	Neither agree or disagree	Agree	Strongly Agree
Graduate program policies are easily accessible to students and faculty					
I am aware of SGS strategies for student recruitment					
I am satisfied with the strategies for graduate student recruitment (FOM)					
Access to information on student progress in the graduate programs is readily available					
The SGS website is adequate (www.mun.ca/sgs/)					
The RGS website is adequate (www.med.mun.ca/graduate/home.aspx)					
A graduate officer for BMS/Genetics would provide value for student progress (fellowships, writing or career workshops)					

25. What are the strengths of the graduate programs as they exist now?"

26. What are the limitations of the graduate programs as they exist now?"

27. What are your highest expectations for lab-based Faculty of Medicine graduate programs in the future?(eg. growth, diversity, space, stipends, fellowships, faculty contribution)

28. Additional comments on any of the above

Thank you for your time and valuable input.

Medicine 6114-Virology 2011

Course co-ordinators: Dr. Rodney Russell, Dr. Michael Grant
Other instructors: Dr. Ken Hirasawa, Dr. M. Larijani, Dr. T. Michalak and Dr. S. Drover

Topics to be covered in this course include:

1. General characteristics of viruses-composition/structure/classification
2. General viral replication strategies
3. Influenza
4. Reovirus/Respiratory syncytial virus
5. Retroviruses
6. Human Papilloma Virus/Hepadnaviruses
7. Hepatitis C Virus
8. Herpesviruses
9. Human Immunodeficiency Virus
10. Antiviral Immunity/Immune Evasion
11. Viral Gene Therapy/Oncolytic Viruses
12. Viruses and Cancer

This course will consist of lectures, student presentations from recent scientific papers and class discussion. There will be no assigned textbook, but "Fields Virology" would be a useful general reference. Readings will be assigned from scientific papers relevant to the topic. All students will be expected to read the assigned papers with 1 student selected in advance to prepare a 20 minute presentation for each assigned paper. Class discussion of the presentation and related material will follow. Student marks will be derived from their participation in class discussions (20%), presentation of assigned papers (40%) and a term project involving a five page single spaced research proposal with a one year budget included on an approved topic.

Prerequisite: registration in graduate program, appropriate background and approval of course chair(s)

Immunology & Infectious Diseases Special Topics in Virology – MED6114 – Spring 2011

Date/Time	Instructor	Topic	Room
May 10			
1:00	Russell	Introduction to Virology	H2868
2:00	Russell	Filoviruses (Lecture)	
May 17			
1:00	Russell (Jones)	Filoviruses (Papers: **Heidi/Ali**)	H2862
3:00	Russell	Flaviviruses (Lecture)	
May 24			
1:00	Russell (Jones)	Flaviviruses (Papers: **Jessica/Kayla**)	H2767
3:00	Hirasawa	Picornaviruses (Lecture)	
May 31			
1:00	Hirasawa (Lang)	Picornaviruses (Papers: **Ali/Kate**)	H2868
3:00	Hirasawa	Reoviruses (Lecture)	
June 7			
1:00	Hirasawa (Grant)	Reoviruses (Papers: **Jessica/Yanyan**)	H2868
3:00	Grant	Retroviruses (Lecture)	
June 14			
1:00	Grant (Larijani)	Retroviruses (Papers: **Ali/Mahdis**)	H2868
3:00	Drover	Herpesviruses (EBV) (Lecture)	
June 21 – No class – Students will attend the Virology Symposium at the CSM Meeting.			
June 28			
1:00	Drover (Grant)	Herpesviruses (EBV) (Papers: **Alex/Krista**)	H2767
3:00	Mulrooney-Cousins	Hepadnaviruses (Lecture)	
July 5			
1:00	Mulrooney-Cousins (Russell)	Hepadnaviruses (Papers: **Krista/Heidi**)	H2767
3:00	Larijani	Viral Subversion (Lecture)	
July 12			
1:00	Larijani (Russell)	Viral Subversion (Papers: **Yanyan/Mahdis**)	H2767
3:00	Grant	Herpesviruses (HSV) (Lecture)	
July 19			
1:00	Grant (Russell)	Herpesviruses (HSV) (Papers: **Alex/Katrin**)	H2862
3:00	Lang	Mimiviruses (Lecture)	
July 26			
1:00	Lang (Russell)	Mimiviruses (Papers: **Kayla**)	H2767
3:00	Russell	Concluding Remarks/Feedback	
August 2			
1:00	Russell (Grant)	Grant Review Panel	H2767

Med 6127 Course Description and Syllabus (Revised 2010 & 2012):

Rationale and purpose:

Med 6127 is the core required course for all graduate students enrolled in the M.Sc. or Ph.D. degrees in Immunology and Infectious Disease Graduate program in the Faculty of Medicine. It is the intention of the Immunology and Infectious Diseases graduate program that this will be the core course from which graduate students can go on to participate in more advanced courses specializing in Immunology or Virology. The purpose of this course is to acquaint graduate students with the fundamentals of basic Immunology as well as to begin to provide them with an up to date understanding of general as well as specialized concepts within Immunology and general concepts of Virology.

Description:

This course will be offered in the fall semester, if there are more than 2 graduate students enrolled in the program who have not yet completed this course. It will cover major concepts of Immunology and Virology from a historical perspective, focusing on key experiments and discoveries, molecular and cellular mechanisms in health and disease states, and evolution of our up to date understanding of discussed topics. The course will be taught at the minimum level of the Kuby Immunology textbook, but may go beyond this text on various topics to the levels of more detailed texts such as Janeway or Paul Immunology, and may include materials not directly limited to a textbook, at the discretion of the lecturer and course chair.

Med 6127 Syllabus:

Offered in the Fall semester

Lectures: Tuesdays, Thursdays, 9-10:30 am

Lectures and hours: 25 lectures for a total of 37.5 hours, given over 12.5 weeks

Room: See schedule on next page

Text: Kuby Immunology

Evaluation scheme:

-Mid-term Exam: 40%

-Final exam: 60% (covering all chapters with preferential emphasis on the chapters taught after the Midterm such that equal weight is given to all chapters considering after both the midterm and final exams)

Examinations format:

Exams will consist of any combination of multiple choice, "fill-in-the blanks" or written answer-type questions, with required answer lengths ranging from a few sentences to a short paragraph.

Instructors and contact information:

GC: Dr. George Carayonniotis, gcarayan@mun.ca
KH: Dr. Kensuke Hirasawa, kensuke@mun.ca
MG: Dr. Michael Grant, mgrant@mun.ca
ML: Dr. Mani Larijani, mlarijani@mun.ca*
RR: Dr. Rodney Russell, Rodney.russell@med.mun.ca
SD: Dr. Sheila Drover, sdrover@mun.ca
TM: Dr. Thomas Michalak, timich@mun.ca
VR: Dr. Vernon Richardson, vrichard@mun.ca*

* Course chair

Chapter	Topic	Date	Room	Lecturer
1	Overview of the Immune system			GC
2	Cells and organs of the Immune system			GC
3 + select material from 7 and 13	Innate Immunity			KH
4	Antigens and Antibodies			ML
5	Organization and Expression of Immunoglobulin genes			ML
6	Antigen-Antibody Interactions			ML
Midterm exam				
8	Major compatibility complex			SD
9	T cell receptor			MG
10	T cell maturation, differentiation and activation			MG
11	B cell maturation, differentiation and activation			ML
14	Cell mediated cytotoxic response			TM
15	Hypersensitivity reactions			VR
na	Basic virology			RR
na	General virology (more specific topic tbd by RR)			RR
Final exam				

Medicine 6128 - Advanced Topics in Immunology Revised April 2012

Course Description:

This course is designed primarily for graduate students in the Immunology & Infectious Diseases (IID) Graduate Student Program who have successfully completed the prerequisite course, MED 6127. Graduate students from outside the IID program who are interested may also register or audit the course providing they have the permission of both the Chair and the Coordinator for the IID Graduate Program. The course will cover a broad range of topics, which will incorporate cellular, molecular and biochemical mechanisms in immune responses in health and disease including vaccines and immunotherapy. A list of topics is provided at the end of this document.

The course will be given during the winter semester on Wednesday of each week, beginning the middle of January of each year, providing there are more than two students who are registered for the course. Each class will focus on one topic that will be introduced by a lecturer with expertise in that topic. Depending on the number of students two to three papers, selected from current literature and highlighting recent advances in the field will be assigned. The first class will consist of an overview provided by the course chair, followed by a lecture on the first topic. In subsequent classes, the first 1 3/4 will be devoted to student presentations and class discussions of previously assigned papers. After a 15-minute break, a lecturer will present new material on the topic for the next week and assign papers for following week.

Evaluation:

Performance in the course will be assessed on the basis of 1) oral presentations (40%); 2) a written component (40%); class participation (20%). It is expected that the students will attend all classes and engage in an active and meaningful way in the discussion. Students who miss class without an acceptable reason will lose 1.5 marks off their participation marks for each missed class.

1) Every week, each student should be prepared to present any of the assigned papers. Each student will be expected to present a minimum of three (3) times over the course of the semester, but the selection of the students will be at random.
2) Every week, each student will submit a two (2)-page summary, double-spaced typed critical review of one of the assigned papers. The review should provide the hypothesis, an evaluation of whether the data support the hypothesis, and the strengths and weaknesses of the paper.

Textbook:

None is required but a suggested list as learning aids will be provided at the beginning of the semester. Each lecturer will provide links to reference material and papers.

MED 6128 Topics:

Session/ Time		Topic	Lecturer
1	1-2:30 3:00-400	Overview – How to critically review a paper & prepare a presentation Mucosal Immunity (L)	SD TM
2	1:00-2:45 3:00-4:00	Mucosal Immunity (P) (? Host Pathogen interactions) (L)	TM/MG MG
3	1:00-2:45 3:00-4:00	(? Host Pathogen Interactions) (P) Vaccines (L)	MG/RR/TM RR
4	1:00-2:45 3:00-4:00	Vaccines (P) Autoimmunity (L)	RR/GC/TM GC
5	1:00-2:45 3:00-4:00	Autoimmunity (P) Transplantation (L)	GC/SD SD
6	1:00-2:45 3:00-4:00	Transplantation (P) Signaling through immune receptors (L)	SD/GC KH
7	1:00-2:45 3:00-4:00	Signaling through immune receptors (P) Cancer Immunity (L)	KH/SC SD
8	1:00-2:45 3:00-4:00	Cancer Immunity (P) Immunodeficiency Diseases (L)	SD/ML ML/MG
9	1:00-2:45 3:00-4:00	Immunodeficiency Diseases (P) Malignancies of the Lymphoid System (L	ML/MG ML
10	1:00-2:45 3:00-4:00	Malignancies of the Lymphoid System (P) Structure determination – NMR/X-Ray crystallography (L)	ML/SD ML
11	1:00-2:45 3:00-4:00	Structure determination – NMR/X-Ray crystallography (P) Immunotherapies (L)	ML/VR VR/SD
12	1:00-2:45 3:00-4:00	Immunotherapies (P) Epigenetics (L)	VR/SD SC/GP
13	1:00-2:45 3:00-4:00	Epigenetics (P) Bioinfomatics (L)	SC/GP SC/
14	1:00-3:00	Bioinfomatics (P)	SC

Instructors and contact information:

GC: Dr. George Carayonniotis, gcarayan@mun.ca

KH: Dr. Kensuke Hirasawa, kensuke@mun.ca

MG: Dr. Michael Grant, mgrant@mun.ca

ML: Dr. Mani Larijani, mlarijani@mun.ca

RR: Dr. Rodney Russell, Rodney.russell@med.mun.ca

SD: Dr. Sheila Drover*, sdrover@mun.ca

TM: Dr. Thomas Michalak, timich@mun.ca

VR: Dr. Vernon Richardson, vrichard@mun.ca

Others to be added once confirmed

***** Course chair

Revised I&ID Graduate Course Med 6130

Revisions: Dec 20, 2006; April 16, 2008; Aug 25, 2009

Course: Advanced Immunological Methods - Med 6130

Description:
This laboratory course will be run through both the fall and winter semesters. It will include eight separate labs coordinated with material covered in the Immunology lecture courses (Med 6127 and Med 6128). All students in the Immunology and Infectious Diseases graduate programme will take the lab course. They will do background reading for preparation, perform the laboratory work, analyze results and prepare written reports describing methods and results, and answering questions posed by the laboratory instructor. The lab reports will be marked and the course mark will be an aggregate of the individual lab marks. The course will be coordinated by a responsible faculty member, but different faculty members with specialized expertise will direct individual labs and be responsible for marking that particular lab.

Laboratories:

1. Serological Assays - Agglutination and Immunoprecipitation (V.R. – previously S.D. & K.H.**)**

The main objective is to introduce students to serological immunoassays, illustrating the interaction between antigens and their corresponding antibodies, and the use of the antibodies as tools in basic science or clinical labs.

A. Agglutination: (a) ABO Typing; (b) To compare the antibody titer in serum from an animal that has made a primary immune response to that of an animal, which has made a secondary immune response. This will also illustrate the concepts of avidity versus affinity.
B. Precipitation: (a) Double immunodiffusion (Ouchertlony); (b) Demonstration of single radial immunodiffusion which can be used to measure the concentrations of immunoglobulins and demonstration of principles of immunoelectrophoresesis and immunofixation.

2. Enzyme-Linked Immunoadsorbent Assay (ELISA) – (G.C.)

Students will coat plates with antigens for direct detection of antibodies and coat plates with antibodies for a sandwich ELISA. They will perform all steps in the assays, analyze the results and submit a lab report.

Illustrates the principles of antigen coating of polystyrene plates, specific binding of antibodies or capture of antigens from biological fluids, secondary detection reagents and enzymatic conversion of a colorless to a colored substrate quantitated by optical density.

3. Sodium Dodecyl-Sulfate Polyacrylamide Gel Electrophoresis (SDS-PAGE), Western Blot and Immunoprecipatation – (K.H.)

Students will prepare protein samples from cultured cells and isolate a target protein by immunoprecipitation. They will cast their own polyacrylamide gels, carry out SDS-PAGE and transfer proteins on a nitrocellulose membrane. Western blot analysis will be performed using several different antibodies.

Illustrates principles of immunoprecipitation, electrophoretic separation of proteins, electrophoretic transfer of proteins from a polyacrylamide gel to nitrocellulose membrane, and specific binding of antibodies.

4. Immunofluorescence and Flow Cytometry – (S.D.)

Students will prepare cells for analysis on the flow cytometer and analyze the data collected by a technician. Extracellular and intracellular staining will be carried out. Students will interpret results and submit a lab report.

Illustrates principles of specific binding of antibodies to cell surface molecules or intracellular molecules, tagging of antibodies with flurochromes, laser-mediated excitation of molecules, detection of fluorescence emission, gating of cell populations based on light scatter characteristics and three color fluorescence.

5. Cell-Mediated Cytotoxicity and Apoptosis - (M.G.)

Students will test the natural killer (NK) cell activity of their own PBMC by chromium release assay with labeled K562 cells. The ultrastructural features of apoptosis will be observed by treating LS102.9 cells with anti-Fas antibodies. Students will submit reports on the NK cell assay, including comparison of different mechanisms of cytotoxicity, a description of how different inhibitors work, and an explanation for individual variability in NK cell activity. Students will also describe the pathway for Fas-mediated induction of apoptosis and describe cellular changes that occur during apoptosis.

Illustrates the chromium release assay for cytotoxicity, the principles of cell-mediated cytotoxicity, measurement of NK activity, Fas-mediated induction of apotosis and cellular changes associated with apoptosis.

6. Antigen-Specific Activation T Cell-Proliferation Assays – (G.C.)

Students will inject and boost mice with antigens, harvest lymph node cells, prepare single-cell suspension, culture cells in the presence of antigen and measure antigen-specific T cell proliferation by ^{3}H-thymidine uptake. Students will submit reports describing the procedure and interpreting the results of the assays.

Illustrates the principles of immunization, anatomical location of lymph nodes, *in vitro* stimulation of antigen-specific T cells and measurement of cellular proliferation.

7. Polymerase Chain Reaction (PCR) and Southern Blot Hybridization – (T.I.M.)

Students will isolate DNA from tissue sources, perform PCR assays for woodchuck hepatitis virus (WHV) DNA and run agarose gel electrophoresis to identify PCR products by their predicted molecular size. Students will transfer DNA fragments amplified by PCR onto a nylon membrane and will observe Southern blot hybridization procedure. Students will submit reports describing procedures of PCR and Southern blot analysis, controls required to ascertain the validity of amplifications, and describe principles of selecting oligonucleotide primers for sequence-specific PCR amplifications.

Illustrates principles of DNA extraction, targeting of gene sequences with specific oligonucleotide primers, designing of oligonucleotide primers, thermal cycling, thermostable DNA polymerase, size-based separation of DNA fragments on agarose gels, visualization of DNA with ethidium bromide and ultraviolet light, and by DNA hybridization with recombinant DNA as a probe.

8. Human Histocompatibility Antigen Class I and II Typing – (S.D.)

Students will isolate DNA from their own peripheral blood and carry out PCR with a commercial test kit incorporating allele-specific primers in separate test wells. Products are run on an agarose gel and HLA class II DR and DQ alleles carried by the individuals are inferred from the band pattern produced.

Illustrates principle of allele identification with specific primers and HLA class II polymorphism.

Instructors:

G.C. - Dr. George Carayanniotis
S.D. - Dr. Sheila Drover
M.G. - Dr. Michael Grant
K.H. - Dr. Kensuke Hirasawa
T.I.M. - Dr. Thomas I. Michalak

BUDGET:

The budget is based on up to 4 students enrolled and it may increase by up to 25% if more students are enrolled.
We cannot accept more than 7 students at the same time.
GSA: taxes not included, if applicable.

S&R = Supplies and Reagents
GSA = Graduate Student Assistant ($16.43/h)

Lab. 1 Agglutination and Precipitation (**S&R: none; GSA: $98.58**)
Lab. 2 Enzyme-Linked Immunoadsorbent Assay (ELISA) (**S&R: $120; GSA: none**)
Lab. 3 SDS-PAGE, Western Blot and Immunoprecipatation (**S&R: $80; GSA: $82.15**)
Lab. 4 Immunofluorescence and Flow Cytometry (**S&R: $400; GSA: $98.58**)
Lab. 5 Cell-Mediated Cytotoxicity and Apoptosis (**S&R: $150; GSA: $115.01**)
Lab. 6 Antigen-Specific T Cell-Proliferation Assays (**S&R: $300; GSA: $65.72**)
Lab. 7 PCR and Southern Blot Hybridization (**S&R: $270; GSA: $115.01**)
Lab. 8. HLA Class I and II Typing (**S&R: $260; GSA: $131.44**)

Subtotal: **Supplies and reagents: $1,580.00**
Graduate student assistants: $706.49
Grand Total: **$2,286.49**

A. Strategic Objectives

The objectives of the Neuroscience Graduate Program are in alignment with the mission and strategic objectives of the University and the Faculty of Medicine.

- To conduct and promote research and associated scholarly activities in the area of biomedical sciences and to foster programs of excellence for the training of graduate students in the area of Neuroscience.

- To instill within students the wish and the capacity to further the neuroscience research through the creation of new knowledge for the improvement of the health of the world's peoples

B. Program structure/requirements

❖ Program description

- The Neuroscience program at Memorial University offers graduate students the opportunity to pursue research within an interdisciplinary setting. Entering students obtain training in neuroscience through
    - Thesis based hands-on training in biomedical research labs
    - Graduate Courses
    - journal clubs, research forum and visiting speaker program

- The majority of neuroscience graduate students (>90%) are supervised by faculty members from the Neuroscience Group, Division of BioMedical Sciences (BMS), Faculty of Medicine.
    - Students with thesis project strongly related to neurosciences are occasionally enrolled in the program, regardless of the membership of the supervisor in the BMS Neuroscience Group. Normally in these cases, at least one advisory committee member is a neuroscience faculty.

- Neuroscience research facilities are housed mainly within the Health Sciences Centre

❖ MSc program

- A minimum of two graduate courses is required; normally including Systems Neuroscience (MED 6196) and one other graduate level course that is selected to fit the student's needs and interests. Courses are generally organized in lecture and/or seminar fashion with some courses having significant laboratory components.

- MSc students are expected to participate in weekly neuroscience journal club and to give a seminar at least once a year

- The Masters program is thesis based and generally takes approximately 2 years to complete.

Amount and quality of work that represent a reasonable standard for MSc (summarized comments from faculty survey):

- A stand-alone project with a defined, specific research question that can be performed within the 2-year time frame
- Equivalent of a small research paper or a component of a larger publication
- In order to complete the program in expected time frame (2 yr) full-time commitment and willingness to work beyond 9 to 5 would be necessary

❖ **Transfer from the M.Sc. to the Ph.D.**

- If a student shows aptitude for research and excellent progress in the M.Sc. program then he/she may apply to transfer into a Ph.D. program. The transfer follows the general regulations of the School of Graduate Studies (section 1.2.1.3):
    - The student must be registered for a minimum of 12 months in the M.Sc. program and the transfer should take place no later than the 5th semester of the program.
    - Following an approved transfer the Ph.D. is retroactive to the admission date of the program of study.
    - Graduate students in the Faculty of Medicine wishing to transfer to the Ph.D. program should discuss this with both the supervisor and program coordinator and must have the approval of the supervisory committee.
    - Recommendation for transfer is based on a satisfactory written report and oral presentation to the supervisory committee.
    - In addition, the student must give a research seminar to the neuroscience group based on their thesis research topic.

❖ **PhD program**

- Normally, to be considered for admission for the Ph.D. program, the minimum requirements will be a Master's degree from a university of recognized standing, in an appropriate area of study (Regulation 1.2.1.3 University calendar).

- Normally, students in the Ph.D. program are required to complete two graduate level courses (both of which would be in Neuroscience and include Systems Neuroscience Med 6196). Course selection is made on the recommendation and advice of the supervisory committee.

- Ph.D. students are required to take the comprehensive examination following general regulation 1.2.8.2 of the University Calendar. In the Faculty of Medicine the comprehensive examination is both written and oral and must be completed before the end of the 7th semester. The specific areas to be examined are decided upon by the examination committee in consultation with the student's supervisor.

- Ph.D. students are expected to take an active role in formulating a research project.

- PhD students are expected to participate in weekly neuroscience journal club and to give a seminar at least once a year

- The Ph.D. program is thesis-based and generally takes 4-5 years to complete.

Amount and quality of work that represent a reasonable standard for PhD (summarized comments from faculty survey):

- A project with a broader scope, with a number of possible directions to be pursued
- The student should play an active role in developing/directing the research project
- Work equivalent to 2-3 full articles
- In order to complete the program in expected time frame (4-5 yr) full-time commitment and willingness to work beyond 9 to 5 would be necessary

❖ **M.D. - Ph.D. program**

- There has been one student who enrolled as MD-PhD student in the neuroscience program. The sample size is not large enough to provide statistical analysis
- Faculty survey results:
    - In its current state, it is a challenging program that does not necessarily shorten the time to complete MD and PhD degree separately
    - PhD portion (research) tends to be more superficial than that of PhD only program
    - Potential benefit of providing MD students with expertise in research is outweighed by its limitations raised above

❖ **Graduate courses**

Med 6196 Systems Neuroscience:
- Core neuroscience course (mandatory)
- Physiological functions of the nervous system
- Neuroanatomy
- Neurological Diseases
- Skill Development (oral presentation, SMART board technology)
-

Med 6197 Cellular and Molecular Neuroscience:
- Advanced neuroscience course
- Cellular/molecular mechanisms
- Techniques in Cellular and Molecular Neuroscience
- Skill development (scientific writing, critical thinking, information analysis etc)

Med 6195 Cellular and Molecular Biology of Nervous System Diseases
- Diseases of the nervous system have been integrated into Med 6196; currently this course is not offered on a regular basis.

Med 6198 Neuroanatomy for Graduate Students
- Neuroanatomy has been integrated into Med 6196; currently this course is not offered on a regular basis.

Course Enrolment (number of students)

Course Number	2006 Fall	2007 Winter	2007 Fall	2008 Winter	2008 Fall	2009 Winter	2009 Fall	2010 Winter	2010 Fall
6195						4		5	
6196	5		3		6		8		6
6197		4		5					
6198							2		

- Most students take graduate courses in the 1st year MSc program
- Number of enrolment tends to be higher than the number of 1st year students in the neuroscience program, as graduate students in other programs also take the courses (mainly psychology students).
  - Pros: better discussion during class
  - Cons: Students in other programs often do not have the same background preparation and thus fall behind

❖ **Skill development**

Teaching opportunities

- Limited teaching assistantships are available, funded by the Division of Biomedical Sciences
  - Human physiology (lab instruction)
  - Neuroanatomy (lab instruction)
  - Ad-hoc lectures for senior PhD students
- Currently no TA opportunity available through the RGS
- Mentoring experience in research labs (undergraduate students and junior graduate students)

Other skills

- Animal care training
- WHIMIS
- Ethics course (GRIP)
- Library offers training sessions on various softwares
- Writing course

❖ **Advisory committee, examination committee (comprehensive exam, thesis defense) membership requirements**

- Many of us feel that partial overlap (one member) in committee membership should be allowed, in particular between advisory and comprehensive exam committees.
- Reasons;
  - advisory committee members generally have a stronger background in the specific subject area
  - neuroscience group is very small and thus it is difficult to find different members with appropriate expertise for 3 committees

C. Student Enrolment/ Program outcomes

- Student admission 2009 - 2011

	Canadian			International			total		
	applied	admitted	%	applied	admitted	%	applied	admitted	%
Male	11	4	36.4	8	2	25	19	6	31.6
Female	10	6	60.0	4	1	25	14	7	50.0
total	21	10	47.6	12	3	25	33	13	39.4

- Convocation 1997 – 2011

	PhD	MSc
1997-2001	3	6
2002-2006	6	12
2007-2011	8	13

- Program completion rate
  - PhD: 72.7% completion (sample size: 11, completed or no longer in program)
    - 1 student withdrew from PhD program in the past 6 years
    - 2 students transferred from PhD to MSc (both due to health issues)
  - MSc: 100% completion (sample size:15)

- Program duration
  - MSc 7.58 ± 0.42 (range 6-10, n=12)
  - PhD 19.4 ± 1.29 (range 15-22, n=5)

- Transfer from MSc to PhD
  - Out of 11 PhD students who have completed or are currently enrolled, 7 students transferred from MSc program (64%)

- Research dissemination (data from completed students only)

	MSc	PhD
Publication total	1.33 ± 0.47	4.00 ± 0.63
Publication 1st authorship	0.78 ± 0.32	3.25 ± 0.41
abstract	2.25 ± 0.37	5.33 ± 2.40

- Awards
  - Fellowship holders MSc: 33.3% (4/12) PhD: 70% (7/10)

- Postgraduate career (students graduated in past 6 years)
  - PhD sample size: 7
    - Postdoctoral fellow (research) 4
    - Medical school 1

        - Other (environmental and health policy law 1, Research Liaison Officer 1)
    - MSc sample size: 11
        - Medical school 4
        - PhD student in other programs 3
        - Research assistant 2
        - Other (law school 1, research officer 1)
    - Majority of students (both MSc and PhD) are pursuing science/medicine related careers

- Suggestions for improving student recruitment
    - More advertising
    - Better website
    - Social media
    - Physically bring undergraduate students for visits/interviews ("Free trip to St. John's") – this strategy is taken by Dalhousie U

D. Resources

- Funding
    - Stipend: Given the time commitment necessary for completion of the neuroscience graduate program, students should be adequately funded.
    - Minimum stipend of $12,000 is too low even with the low tuition rate. $17,000 – 18,000 would be appropriate with an option for top up. If for some reason the supervisor cannot afford this level, then the student should be allowed to work part time elsewhere with the blessing of the supervisor.
    - Travel: Given the geological constraints, more support for travel to conferences would be very helpful

- Space
    - Students need space outside the labs, meeting areas etc. for example a grad room on each floor
    - Space limitation has restricted the group's ability to grow or maintain its number of researchers (retired/resigned faculties have not been fully replaced)

- Administrative support
    - There is a need for student support within the Division of Biomedical Sciences for the graduate/research programs centered within the Division
    - RGS:
        1. Large turnover of personnel seems to have resulted in inconsistent support at times
        2. Often new students have to wait for weeks before receiving the first stipend payment. This is unacceptable.
        3. There needs to be a better understanding of what the responsibilities of everyone in the office are.
        4. Alternative system/protocol for each person's responsibilities should be in place in case of absence from office. This is particularly important for late

summer – early September when the majority of graduate students come in while office members tend to go on holidays.

5. Information from RGS seems more readily available than in the past

- Library
  - Current services are adequate for the most part.
  - It would be nice to be able to access more full text articles.
  - Older (historical) texts should be more available.

E. Faculty Contributions

❖ Current Faculty Composition

Full professor: 3
Associate professor (<10 yr since appointment): 1
Assistant professor (<5 yr since appointment): 2

❖ Research Productivity

- Publications (per faculty, past 5 years)
  - Peer reviewed articles: 6.5 ± 0.8
  - Reviews/book chapters: 0.5 ± 0.3
  - Abstracts: 11.3 ± 1.0

- Invited talks (past 5 years): 2.3 ± 1.0

- Operating grants (average over past 3 years): $134,333.00

❖ Teaching

- Research Trainee Supervision (past 6 years)
  - MSc: 2.7 ± 0.5 students/faculty
  - PhD: 1.6 ± 0.6 students/faculty
  - Honours (BSc): 3.7 ± 1.1 students/faculty

    Given that 1/3 of our faculty members are within 5 years of their appointment, it is anticipated that the number of graduate students will increase.

- Course teaching
  - Graduate courses: All neuroscience graduate courses are team taught
  - Undergraduate medical courses
    - Human Anatomy, Neuroanatomy, Histology
    - Integrated Study of Disease - Neuroscience/Neurology
    - Basic Science of Medicine – Physiology
  - Other ad-hoc teaching (undergraduate and graduate courses)

- With the decrease in the number of neuroscience faculty members, fulfilling teaching and administrative duties has become more challenging. Possible solutions include:
  - New faculty recruitment (contingent on space availability)
  - More effective administrative assistance (academic program assistant, secretary)

F. Other issues

❖ Critical Mass

- The current neuroscience group is too small. This needs to be improved in order to strengthen the neuroscience graduate program.
  - the number of graduate students is limited by the number of faculty
  - research forum and journal club are not as lively and enlightening as they could/should be
  - more PIs = enhanced expertise
  - teaching and administrative load each faculty has to carry has increased as number of faculty decreased
  - ideal critical mass would be 10 – 12 PIs

❖ Funding

- Obtaining consistent research funding is always a challenge.
  - Lack of provincial health research fund or equivalent
  - Loss of CIHR Regional Partnership Program
- More graduate student fellowships may encourage undergraduate students to pursue graduate degrees in health research and increase the competitiveness of our graduate program against other schools
  - With the expansion of medical school class size, there may be a decline in the interest in MSc program
- Largely due to the limitation in funding, there have been only a few postdoctoral fellows in the neuroscience labs in the past 6 years.
  - Postdocs should be an integral part of the research environment for graduate students
  - More opportunities for postdoctoral fellowships would be helpful

❖ Mentoring junior faculty

- Available resources are not always obvious to junior faculty
- More semi-formal/unofficial mentoring may be useful
  - Within the Division of Biomedical Sciences, the Associate Dean provides guidance to junior faculties to help with establishing labs, balancing research/teaching/administration, promotion and tenure process etc.
  - Teaching: It seems that teaching resources are underutilized by junior faculty; better orientation and/or mentoring would be useful
  - Research : Currently no formal mentoring system in place
- Increase in group size (critical mass) would improve mentoring (for example internal grant reviews)

November 18, 2009

MED 6195
Cellular and Molecular Biology of Nervous System Diseases, 2010
TENTATIVE OUTLINE AND SCHEDULE

TIME: Tuesday and Thursday
January – February: 2:00 pm- 3:30 pm (No class on Feb. 23)
March: 2:00 pm – 5:00 pm
Place: see the table below. Most classes will be in Rm2869 except for those highlighted.

Coordinator:
Dr. Michiru Hirasawa, H4338/4313, phone 777-6727, email: michiru@mun.ca

Course Objective

To build the understanding of:

- Cellular and molecular mechanisms of the nervous system; physiology and diseases
- Experimental approaches for cell and molecular biology in neuroscience

Skill development:

- Critical assessment of information
- Presentation
- Concise writing

Jan 5 – Feb 25: Cellular and molecular neuroscience and techniques

➢ Lectures

Various topics relevant to cellular and molecular neuroscience will be presented by faculty members.

➢ Article discussions

The faculty member giving a lecture that precedes an article session will assign 1 paper to be discussed. **If you have not received a paper in advance, please contact the faculty member in question.**

1. 1-page written critique to be submitted before the session (**25% total**, each critique will be assessed by the faculty member in charge of the session).
2. In the class, each student takes a turn to present a part of the assigned paper i.e. everyone participates in presenting a single article (intro, Fig1, Fig2…). Methods, results and discussion should be blended into the discussion of each figure. The order of presentation will be determined at the session (students will not know in advance which part they will get).

Tips for article critique and discussions

1. Background:
    a. What issue is being addressed?
    b. What has previously been done?
    c. What new hypothesis/approach are the authors using to address the problem/issue?
2. Clearly state the objectives of the paper.
3. Results:
   For each figure:

    a. What is the question it is addressing?
    b. How was the experiment performed – understand and be able to explain the technique.
    c. What is the main conclusion from the result of the experiment?
    d. Critique –
        i. Does the experiment address the question?
        ii. What are the limitations of the experiment used?
        iii. Other possible interpretations of the result?
4. Discussion – Briefly summarize how the authors' results fit with the current data on the topic. What is new?

March 2 – Mar 30: Cellular mechanisms of neurological disease

- Session 1: Overview
    1. A list of diseases will be provided at the preceding session. Each student will pick a disease from the list. In the first session, everyone will give a 10-15 min presentation on general information of the disease (symptoms, epidemiology, etc), followed by 5 min Q & A. One-page handout is to be distributed to the class as well as submitted to the instructor. **Evaluation: 5% on the handout, 5% on presentation**
    2. Following all the presentations, students will choose one disease from the group of diseases discussed during the session on which they will do further research.

- Session 2: Choose topics

  Each student will come up with several cellular and molecular aspects that are critical for the understanding of the disease. In the class, they will decide on which topics will need more in-depth investigation, and each student will get a topic to investigate. Depending on the topic, more than one student can be assigned to one topic.

- Session 3: Discussions on mechanisms

  Each student will give a 10-15 min presentation on topics chosen in Session 2, followed by 5 min Q & A. **Evaluation: 15% on the presentation**

Date	Topic	Contents	Instructor	Room
Jan 5	Receptors and cell signalling	Overview of various types of receptors and cell signalling pathways	J Weber	2869
Jan 7		Examples of receptors/signalling pathways	K Mearow	2869
Jan 12	Receptor pharmacology		J Weber	2869
Jan 14	Gene expression		J Vanderluit	**2862**
Jan 19	Article 1		J Vanderluit	2869
Jan 21	Protein analyses		J Vanderluit	**5349**
Jan 26	Article 2		J Vanderluit	2869
Jan 28	Transgenic		A Dorward	2869
Feb 2	Imaging 1	General introduction to imaging, confocal microscopy, fluorescence imaging	K Mearow	2869
Feb 4	Imaging 2	EM, image analysis, stereology, golgi staining, cell tracing etc.	J McLean	**2862**
Feb 9	Imaging 3	fMRI, PET	D Corbett	2869
Feb 11	Ion channels		X Chen	**2860**
Feb 16	Synaptic transmission		M Hirasawa	**2868**
Feb 18	Patch clamp & Ca imaging		Q Yuan	**5349**
Feb 25	Article 3		Q Yuan	2869
Mar 2	Diseases: Group 1	Overview	M Hirasawa	2869
Mar 4		Choose topics	K Hirasawa	2869
Mar 9		Discussions on cellular mechanisms		2869
Mar 11	Diseases: Group 2	Overview	D Corbett	2869
Mar 16		Choose topics	K Mearow	2869
Mar 18		Discussions on cellular mechanisms		2869
Mar 23	Diseases Group 3	Overview	J McLean	2869
Mar 25		Choose topics	X Chen	2869
Mar 30		Discussions on cellular mechanisms	J Weber	2869

November 18, 2009

Disease Group 1
Multiple sclerosis
Guillain-Barre syndrome
Myasthenia gravis
Prion
Polio
Rabies
Tetanus
HIV-associated dementia and neuropathy

Disease Group 2
Alzheimer's
Amyotrophic lateral sclerosis
Parkinson's
Huntington's
Vascular cognitive impairment
Down's syndrome
Narcolepsy
Diabetic neuropathy

Disease Group 3
Schizophrenia
Depression/Anxiety
Addiction
Autism
ADHD
Epilepsy
Fetal alcohol syndrome
Spina bifida
Add Fragile X mental retardation next year

Medicine 6196: Systems Neuroscience **Fall Semester 2011**

Course Coordinator: Dr. Jacqueline Vanderluit

The aim of the Systems Neuroscience course is to ensure that students have a fundamental knowledge of Neuroscience concepts: organization of the nervous system, sensory and motor systems and higher integrative function and a range of neurological diseases and disorders.

Timeline and Room:

Lectures

Tues and Thurs 2:00 – 5:00, schedule given below
Room 4347

Labs

Lab#3 Tuesday October 11, 2011, 9:00 – 12:00, MELSS Room 2810
Lab #5 Tuesday October 18, 2011, 9:00 – 12:00, MELSS Room 2810
Lab Exam Tuesday November 8, 2011 9:00 – 12:00, MELSS Room 2812

Topics and Timeframe:

Part 1

General organization and Motor Systems Cortex, spinal cord, basal ganglia, cerebellum, voluntary movement, motor planning, postural control and locomotion.

Part 2

Sensory Systems using somatosensory (2 hr) and vision (2 hr) as model systems but also including session on olfaction/taste (2 hr) and vestibular/audition (2hr).

Part 3

Neuroregulation and Higher Function: Feeding, drinking, stress (2hr), Memory and Learning (2 hr)**,** Circadian Rhythms, Sleep, Attention (2 hr)

Part 4

Neurological Disorders and Diseases

Part 5

Neuroanatomy Labs

Evaluation:

Student Presentations (40%)

Students will be required to give a 20-25 min presentation on specific neurological diseases.

Quizzes (40%)

There will be a quiz after each section of the course, weighted based on hours per topic

Part 1: Sept. 28, 2:00 – 4:00
Part 2: Oct. 19, 2:00 – 4:00
Part 3: Nov. 2, 2:00 – 4:00
Part 4: Dec. 14, 2:00 – 4:00

Neuroanatomy: (20%)

Lab Exam: Nov. 8, 9:00-12:00 Room 2812 MELSS

Proposed Readings: The following textbooks have been used in preparing lectures (specific chapters, for each section, are given in the table below):

Squire et al (2nd or 3rd edition), Fundamental Neuroscience,
Kandel et al (4th or 5th edition), Principles of Neural Sciences
Alberts et al (4th or 5th edition) Molecular Biology of the Cell

Lecturers:

XC: Xihua Chen
RG: Robert Gendron
MH: Michiru Hirasawa
JM: John McLean
KM: Karen Mearow
JV: Jackie Vanderluit
JW: John Weber
QY: Qi Yuan
CC: Chris Cordova

DATE	Lecture Topic	Quizzes	Reading	Lecturer
Sept. 8	Introduction and Organization of the Course Overview of Neurons and Glial Cells, neurotransmitters, receptors, action potential		Kandel et al. (4th ed) Ch. 2, 4, 15	JV
Sept. 13	***Neuroanatomy Overview*** Nervous system organization, hierarchical and topographic representation, meninges, csf, blood supply	Lab #1 Introduction (1h)	Kandel et al. (4th ed) Ch. 17, 18, Appendix C	JV
Sept. 15	***Motor Systems*** Cortex, spinal cord, motor pathways.	Lab #2 Spinal cord – motor pathways (1h)	Kandel et al (4th ed) Ch 33, 36, 42 and 43	JV
Sept. 20	Basal ganglia and cerebellum	Lab #4 Cerebellum component (1h)		JW
Sept. 22	Voluntary movement, motor planning, postural control and locomotion		Kandel et al (4th ed) Ch 33, 36, 42 and 43	JV
Sept. 27		Quiz #1 Motor Systems		JV, JW
Sept. 29	***Sensory Systems*** Somatosensory Part 1: touch, pain and temperature. Somatosensory Part 2: proprioception (muscle spindles and stretch receptors), stretch reflex,	Lab #2 Spinal cord – Sensory pathways (1h)	Kandel et al (4th ed) Ch 22 and 24	XC KM
Oct. 4	Brainstem & Cranial Nerves			JM
Oct. 6	Vision System and Vision	Lab #4 Visual System component (1h)	Kandel et al (4th ed) Ch.25-28	RG
Oct. 11	Olfaction/taste	Lab #3 Brainstem & Cranial Nerves (3h) MELSS Room 2828 (9:00 – 12:00)	Kandel et al (4th ed) Ch. 32	JM, XC, JV
Oct. 13	Auditory and vestibular systems/audition and balance		Squire et al (3rd ed) Chapter 26, 30 Kandel et al (4th ed) Ch. 30, 31, 40	QY
Oct. 18	***Neuroregulation and Higher Function:***	Lab #5 Higher Cerebral Function (3h) MELSS		XC, QY

Oct. 20	Room 2810 MELSS	Room 2810 (9:00 - 12:00) Quiz #2 Sensory Systems		XC, KM RG, JM QY
Oct. 25 Oct. 27	Learning & Memory Sleep/Attention/ Circadian rhythms		Kandel et al. (4th ed.) Ch. 62 and 63 Kandel et al (4th ed.) Ch 50 Squire et al (3rd ed) Ch. 41, 42, 48, 51	QY CC
Nov. 1 Nov. 3	Hypothalamus and regulatory systems (neuroendocrine and autonomic nervous system	 Quiz #3 Neuroregulation and Higher Functions	Squire et al (2nd ed) Ch 34, 35, 38 – 40	MH QY, CC, MH
Nov. 8 Nov. 10	 Introduction to Neurological Disease & Disorders Section: Group 1 Diseases - Choose Topics	Neuroanatomy Lab Exam MELSS Room 2812 (9:00 – 12:00)		 MH, QY, JV
Nov. 15 Nov. 17	*No class* Addiction & Schizophrenia	*Society for Neuroscience (Nov 12-16)*	 Kandel et al. (4th ed) Ch. 51, 60	 XC
Nov. 22 Nov. 24	Student Presentations Alzheimer's Disease & Dementia		 Kandel et al. (4th ed) Ch. 58	MH, QY JV KM
Nov. 29 Dec. 1	Group 2 Diseases - Choose Topics Stroke & Vascular disease or Multiple Sclerosis or Retinal Degeneration			XC, JW, JV Mark S or RG
Dec. 6	Autism Spectrum Disorders		Review article	JM

Dec. 8	Student Presentations			XC, JW, JV
Dec. 13		Quiz#4 Neurological Disease & Disorders		XC, KM, JM

MED 6197
Cellular and Molecular Neuroscience, 2012
TENTATIVE OUTLINE AND SCHEDULE

TIME: Tuesdays 2:00 – 5:00 pm, 4th floor conference room
Winter semester break: February 21

Coordinator:
Dr. Michiru Hirasawa, H4338/4313, phone 777-6727, email: michiru@mun.ca

Course Objective

This is an advanced graduate course, designed to promote the following:

To build the basic knowledge on:
- Cellular and molecular mechanisms of the nervous system
- Experimental approaches for cell and molecular biology in neuroscience

Skill development:
- Critical assessment of information
- Concise writing

Contents

- Review sessions on writing, literature review and ethics including plagiarism (1 hr sessions)
- Lectures: Various topics relevant to cellular and molecular neuroscience will be presented by faculty members. (2 hr lectures unless noted otherwise)
- Article discussions (1 hr sessions)

Evaluation

- **Article discussions**: 60% of the final mark
  1. A scientific article will be assigned by an instructor prior to the session
  2. **1-page** written critique to be submitted BEFORE the session (a word file to be sent to the instructor as email attachment: email addresses can be found at the end of this document)
     a. Each critique will be assessed by the faculty member in charge of the session
     b. Use single space, times new roman 12 pt, arial 11 pt or equivalent font size. Page margin: no less than ¾ inch. Condensed type or spacing is not

acceptable (-25% for not following the guidelines). Title page is not necessary.

c. late submissions without reasonable explanations will be penalized by point deduction

3. In the class, each student takes a turn to present a part of the assigned paper i.e. everyone participates in presenting a single article (background & aim or hypothesis, Fig1, Fig2…).
    a. Methods, results and discussion should be blended into the discussion of each figure.
    b. The order of presentation will be determined at the session (students will not know in advance which part they will get).
4. evaluation: Critique (5/10), presentation during class (3/10) and participation during class (2/10)

Tips for written critique and discussions

- Synopsis (approx. 50% of the page): Summarize the paper in your own words
    1. Background:
        - What issue is being addressed?
        - What has previously been done?
    2. What is the objective/hypothesis of the paper?
    3. Results:
        - The key findings of the study
        - How was the experiment performed? Concisely explain the experimental technique and method of analysis used.
    4. What is the main conclusion suggested by the authors?
- Critique (approx. 50% of the page)
    1. Do the data support the conclusions drawn by the authors?
       Other possible interpretations of the result?
    2. How does it fit with the current literature on the topic?
       What is novel about the study?
    3. Was the experimental approach appropriate for testing the hypothesis?
       What are the limitations of the experiment used?
       Can you think of alternative strategies to address the hypothesis?

- **Writing assignment**

We will follow the Journal of Neuroscience Journal club article format. Guidance and evaluation will be performed by two reviewers (instructors) for each student.

Students can contact the reviewers to seek for guidance at any time, once the original articles are chosen. Please do not discuss with your supervisor regarding

this written assignment. General inquiries should be directed to the course coordinator.

- Content and Format
  - Critical reviews, but comments must be accurate, well-reasoned, and diplomatic.
  - Inappropriately harsh or glowing reviews will not be accepted.
- In general, Journal Club articles should have three components:
  - a short overview of the background of the reviewed paper,
  - a critical data-based review of the key findings,
  - a brief summary of the significance of the paper.
- The Journal Club must offer more than a summary of what was stated in the original article. For example:
  - important caveats or interpretations that the author did not mention
  - A distinct interpretation of the results in the context of work that the author did not discuss (e.g., important findings published in the last couple of months).
  - A more in-depth explanation of a new technique used in the paper
- The Journal Club should focus on the most important results — there is rarely reason to discuss every figure.
- Length limit: about 1500 words. References: limited to approximately 7-10. Indicate the word and reference numbers on the title page.
- Avoid using jargon and unnecessary abbreviations.
- Titles should be informative.
- Addition of a single, original schematic or explanatory figure is encouraged.

Flow of tasks and deadlines

All submissions should be directed to the course coordinator (michiru@mun.ca)

* Late submissions without reasonable explanations will be penalized by point deduction

1. **Choose an article**

   Deadline: Jan. 31

   - Choose a paper that mainly deals with cellular/molecular neuroscience
   - Choose from one of the following journals: Nature, Science, Nature Neuroscience, Neuron, Journal of Neuroscience
   - Submit by email (as PDF attachments) your first and second choice along with a brief statement of why you chose these papers

2. **Outline submission**

   Deadline: Feb 10

   - In relation to the original paper chosen, give a list of ideas (minimum of 3) that can be discussed. For each idea, describe what/why it is important or interesting

- Pick one or two ideas you will focus on in your review paper and explain the reason of your choice
- Choose a title and write an outline of the review paper you will write
- If the reviewers feel a major revision is necessary, this procedure will be repeated (may also involve a face-face meeting). In this case the timeline will be determined in consultation with the reviewers

3. **Draft submission** (10% of final mark: 5 points on logic, 5 points on overall impression)
   Deadline: March 15

4. **Final submission with rebuttal** (30% of final mark)
   Deadline: April 13
   - Rebuttal should contain a point-by-point response to the reviewer's comments to the draft. Please be sure to respond to all the issues/suggestions raised.
   - If revisions were made in the paper in response to the reviewer's comments, the location of changes made (page and line number) should be provided.
   - Don't get personal – constructive criticisms should be received with professionalism and courteousness.
   - You are not obliged to concur to every comment from the reviewer. If you disagree with a comment, rebut with a logical explanation (and with scientific evidence where applicable).

   The evaluation of written assignment will be based on the following criteria:
   - logic (10 pts)
   - creativity (5 pts)
   - critical assessment of the original article (5 pts)
   - rebuttal (5 pts)
   - overall impression (5 pts)

   total: 30 points

Date			Topic	Instructor
Wk1	Jan	10	Course overview	Hirasawa
			Electrical properties of excitable membrane	Chen
Wk2		17	**Review on literature browsing**	Hirasawa
			Synaptic transmission/ plasticity	Yuan
Wk3		24	**Review on scientific writing**	Hirasawa
			Electrophysiology	Hirasawa
Wk4		31	**Review on written assignment (journal club articles/critique)**	Hirasawa
			Overview of various types of receptors, details of GPCR; Receptor pharmacology	Weber
Wk5	Feb	7	**Ethics in Science**	Weber
			Receptors/signalling pathways (excluding GPCRs)	Mearow
Wk6		14	**Article #1**	Chen
			Gene expression	Vanderluit
Wk7		21	**Winter semester break**	
Wk8		28	**Article #2**	Weber
			Protein analyses	Vanderluit
Wk9	Mar	6	Transgenic technology (1.5hr)	Dorward
			Epigenetics (1.5hr)	Paterno
Wk10		13	**Article #3**	Yuan
			Molecular imaging in metabolic disease (MRS, PET and SPECT)	Kendall
Wk11		20	**Article #4**	Vanderluit
			Stem cells	Vanderluit
Wk12		27	**Article #5**	Mearow
			Imaging: EM, image analysis, stereology, golgi staining, cell tracing etc.	McLean
Wk13	Apr	3	**Article #6**	McLean
			Glia functions	Hirasawa

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Med 6198

Title: Neuroanatomy for Graduate Students

Instructor: Dr. John McLean

Description:

This course is principally offered to

1. Enhance graduate students' knowledge of brain structure and function and
2. Train graduate students in the teaching of neuroanatomy labs to medical students

Students will attend the neuroanatomy laboratory sessions of the 2nd year Medicine class (ISD II Neuroscience and Neurology), as well as a selection of lectures. The course consists of 11 contact hours of laboratory material, 14 contact hours of lectures and specimen/question preparation.

A component of the course will occur after the lab exam so the students will have already observed many of the methods used in the laboratory teaching. Following guidance from the instructor, the students will be expected to show teaching acumen by preparing one of the following:

1. Capture digital images of either four gross or four microscopic specimens and label the images in a self-test type manner so medical students could self-test their neuroanatomy knowledge on Desire2Learn.
2. Prepare brain models by painting and labeling neuroanatomy specimens (four specimens that have been pre-caste).

This component of the course will be due to be completed within one month following the lab exam.

The section includes a laboratory manual and demonstration material.

Evaluation:

The evaluation is based on

1. One hour laboratory 'spot' exam: 80%
2. Teaching preparation: 20%

Students will receive constructive feedback for each of the evaluated components.

DATE	Time	Lectures	Labs	Lecturer
Sept. 22 (Tues)	9:00-9:50	General Structure and Development of the Nervous System		J. Vanderluit
	10:00-10:50	Spinal Cord		J. Vanderluit
	11:00-11:50	Functional Anatomy of the Cerebral Cortex		A. Goodridge
Sept. 23 (Wed)	9:00-9:50	CSF and Hydrocephalus		A. Goodridge
	11:00-11:50	Blood Supply and Imaging		B. Heale
	12:00-12:50	Clinical Correlates: Spinal Cord		W. Pryse-Phillips
Sept. 24 (Thurs)	9:00-9:50	Brain Stem I		X. Chen
	10:00-10:50	Brain Stem II		X. Chen
	12:00-12:50	Cerebellum		J. Weber
Sept. 25 (Fri)	10:40-12:30		Lab I Cortex and Blood Supply	J. McLean
Sept. 28 (Mon)	9:00-9:50	Basal Ganglia: Anatomy & Physiology		J Weber
	11:00-12:50		Lab II Spinal Cord	J. McLean
Sept. 29 (Tues)	9:00-9:50	Brain Stem Clinical Correlates		A. Ogunyemi
	10:00-10:50	Language		A. Ogunyemi
Sept. 30 (Wed)	9:00-12:00		Lab III Brain Stem	
Oct. 1 (Thurs)	9:00-10:30	Neuroanatomy and Physiology of Vision and Ocular Movement		A Goodridge
Oct. 2 (Fri)	9:00-10:50		**Lab IV** Vision and Cerebellum	J. McLean
Oct. 5 (Mon)	11:00-12:30		**Lab V** Higher Cerebral Function	J. McLean
Oct. 7 (Wed)	11:00-12:50		Neuroanatomy Review Session	J. McLean
Oct. 9 (Fri)	1:30-2:30		LAB EXAM	J. McLean
Nov. 9 (Mon)			Final assignment Due	J. McLean

GRADUATE PROGRAM IN HUMAN GENETICS: SELF-STUDYREPORT

June 25, 2012

Contents

GRADUATE PROGRAM IN HUMAN GENETICS

Background

In terms of research, one of the most active of the clinical disciplines is that of Genetics, which offers MSc and PhD programs in Human Genetics. The Discipline of Genetics was created in 1999 and combines both laboratory-based scientists and clinical researchers. Dr. Bridget Fernandez has recently been appointed as Chair of the Discipline.

Currently, there are eight full-time faculty members: three of these have an MD or equivalent, of which two have ongoing clinical workloads. There has been no change in the number of full-time faculty in Genetics since the last program review in 2006. There are also five faculty members, cross-appointed from other units, who contribute to graduate training in the Genetics program.

Full-time Faculty

Discipline Chair
Bridget Fernandez, MD, FRCPC, FCCMG

Professors
Jane Green, BSc, MSc, PhD, CFMG.
Roger Green, B.Sc, PhD.

Associate Professors
Terry-Lynn Young, BSc, MSc, PhD.
Michael Woods, BSc, MSc, PhD.
Guangju Zhai , MB-BS, MSc, PhD.

Assistant Professors
Sevtap Savas, B.Sc., M.Sc., PhD.
Lesley Turner, MD, FRCPC.

Cross-Appointed Faculty

Proton Rahman - MD, FRCPC, Professor of Medicine (Rheumatology) and Associate Dean for Clinical Research.

Yagang Xie, - MD, FCCMG, DMed, Professor in Laboratory Medicine.

Han, Fei-yu - MD FCCMG, Associate Professor in Laboratory Medicine.

Ann Dorward, BSc, MSc, PhD, Assistant Professor Biomedical Sciences, and Canada Research Chair.

Kathleen Hodgkinson, BSc, MSc, PhD, Assistant Professor of Medicine (Clinical Epidemiology).

This is a small group of researchers who collaborate extensively within the Faculty of Medicine, nationally and internationally. The faculty are well supported by research grants from multiple sources. Almost all of the research performed in this discipline is applied or translational in nature and focuses on utilizing the unique population of Newfoundland and Labrador. Research on Mendelian diseases still forms an important part of our program, but an increasing proportion of research is focussed on complex diseases such as cancer, autism and arthritis. For gene discovery projects, next-generation exome and whole-genome sequencing are replacing linkage analysis and candidate-gene approaches.

The Discipline of Genetics has a single administrative staff member—financed by the Faculty of Medicine—and ten research staff who are all supported from research grants. The latter are research assistants who either work in one of the laboratories, as clinical research assistants or as

a project manager. Further information about faculty, research, graduate programs and graduate students is available on the Web site for Genetics (http://www.med.mun.ca/genetics).

Graduate Programs

During the last academic year, we had 13 graduate students registered: three in PhD programs, one in the MD/PhD program and nine MSc students.

Students in the MSc program are required to take a minimum of two graduate-level courses. The Human Genetics program offers four courses, but students may also take courses offered by other programs if approved by their supervisory committee. There are no mandatory courses. Students in the Masters program may elect to "roll over" their research into a PhD program without completing their MSc.

Graduate students must make presentations at the weekly journal club which is attended by laboratory scientists, clinicians, students and genetic counselors. As part of the Visiting Speaker program, a small number of national and international researchers are invited each year. They meet collectively with all the students during a working lunch session.

In 2010 we held our first Graduate Student Research Forum to enable our graduate students to experience making platform presentations in a formal setting. Ten students—six Masters and four Doctoral—made presentations. Students in the PhD program were asked to chair the sessions and keep the presentations on time. The winner in each category received a monetary prize at the Graduate Studies awards luncheon. In 2012, as part of an effort to reinforce the importance of scientific output, prizes were awarded to the PhD and MSc student with the best publication record.

TOPICS COVERED IN MUN'S GUIDELINES FOR SELF-STUDIES (APPENDIX A)

These topics were discussed at a meeting of Genetics faculty on June 21, 2012. Six of the eight fulltime faculty members were able to attend this meeting. The following section takes into account the consensus of this meeting together with the results from an on-line survey which are appended hereto.

Strategic Objectives

The Graduate Program in Human Genetics currently has no strategic objectives other than those established by Memorial University and by the Faculty of Medicine. However, it was decided to raise this item at the Discipline Retreat planned for the late fall of 2012. Suggested objectives included mentoring those planning a career in genetics research, and training the next generation of geneticists for academic appointments in Newfoundland or elsewhere.

Student Enrolment and Program Outcomes

Concern was expressed at the continuing loss of graduate students to the MD program. Two students withdrew from MSc programs to enter medical school at MUN. However, an additional four students who are still 'officially' enrolled in MSc programs are now in the MD program. It seems likely that few, if any, of these will actually complete their MSc. However, there are also several examples of Genetics students successfully completing an MSc *before* joining the MD program.

1. **We recommend that the MD Admissions Committee require that students in graduate programs in Medicine submit a completed thesis, approved by their supervisory committee, before commencing MD studies.**
2. **We recommend that this same committee review and enhance their policy of allowing suitable applicants to defer entrance into the MD program for one year in order to permit students to successfully complete their graduate studies.**

Funding

We find it difficult to attract high-quality PhD students and post-doctoral fellows. Although we have established a good international reputation during our short existence to date, the low level of funding for graduate trainees makes it difficult to attract good students. We should be paying on a scale *above* the national average, instead of which we are paying below it. The system of first-come, first-served as a way of allocating RGS-administered graduate scholarships appears intrinsically unfair, given the vagaries of the admissions timetable.

3. **We recommend that the minimum amount of individual student bursaries be increased substantially.**
4. **We recommend that the overall funding provided by RGS be increased.**
5. **We recommend that the allocation of funding by RGS be reorganized on a more equitable basis.**

In general it appears that the large majority of our graduates over the past several years have been successful in fining a position commensurate with their qualifications. Our PhD graduates have been successful in finding post-doctoral fellowships in high-quality academic centres of their choice. A significant portion of our MSc students end up in MD programs, at MUN or elsewhere. We hope that this will result in the production of more physician-scientists who will be interested in promoting medical genetics research.

MD/PhD program

Although only a single genetics student has enrolled in the MD/PhD program, there was general support for this program, although it was thought that students' progress in the PhD component needed enhanced monitoring to ensure that completion could be assured within the time available.

Curriculum and Teaching

The graduate courses are rigorous and challenging, and it is apparent that several students entering the program have an inadequate background in human genetics. We will consider requiring prerequisites for taking graduate-level genetics courses. This may involve offering a remedial course similar to the current genetics course in the MD program.

Currently, there are no yardsticks to properly measure the effectiveness of our graduate training programs.

6. **We recommend that every student leaving a graduate program—whether graduating or not— have an exit interview, or at least complete an exit questionnaire administered by the office of Graduate Studies in the Faculty of Medicine.**

Faculty Contributions

Overall, the Faculty members are successful as researchers and scholars: we have an excellent record of publication and have attracted a good level of funding though external grants. Details can be found in the individual Curricula Vitae. Our success may be judged by the high frequency with which we are invited to join national and international collaborative projects.

One hindrance to the professional development and promotion prospects of our faculty is the limited opportunity to become involved in didactic teaching, whether undergraduate, graduate or postgraduate.

Administrative Support/Efficiency

The Discipline of Genetics is badly in need of an additional administrative assistant. Currently we have only a single administrative position funded by the Faculty of Medicine. This person is supposed to support the administrative requirements of the Chair of Genetics, provide general office and secretarial support for all faculty, students and staff in the discipline, help maintain the discipline Web site, provide support for financial management of external grants, assist in preparation of grant applications, administer travel claims and arrange accommodations and itineraries for invited visitors. This cannot possibly be accomplished by a single individual, no matter how hard-working. The discipline has requested an additional administrative position, but as yet has received no word on the outcome of this request.

The staff of the Office of Research and Graduate Studies (Faculty of Medicine) is very helpful, but they do not have the capacity to provide sufficient assistance to the individual program coordinators to maintain the different programs. Additional support is required at the individual program level.

The revisions to the Graduate Student Handbook currently underway in RGS will enhance the usefulness of this document. Consideration should be given to providing a hard copy of the handbook to all students and faculty.

The capacity of RGS to support program administration is *severely* curtailed by the absence of a complete, well organized relational database system which can supply information on all aspects of graduate programs and the progress of individual students.

7. **We recommend that priority be given to establishing a multi-user database system that can properly support all aspects of the graduate programs in an integrated manner.**

Space

At the present time the availability of space is very inadequate. There is insufficient laboratory space even for the current number of graduate students. To make matters worse, since there is also a lack of office/desk space for students, they have to use laboratory benches as a desks. This does not provide an appropriate atmosphere for study or writing.

The space problems should be resolved when the Discipline of Genetics moves into a new building in 2014. Until then, however, we will continue to face a critical space shortage that will prevent any increase in student numbers in the short-term.

Cost Effectiveness

The Genetics graduate program does not have an individual budget.

ADDITIONAL THEMES EMERGING FROM THE ONLINE SURVEY

The survey was anonymous. Seven faculty members who identified that their primary affiliation was in Genetics completed the survey. Four of these also reported supervising students in other graduate programs, which is indicative of the multi-disciplinary collaborations in which our faculty members are involved.

The consensus was that, with some exceptions, incoming students had adequate skills to enable them to complete an MSC within two years. The expectations of the faculty were that an MSC thesis could be submitted within two years of starting the program and that PhD students should be able to submit a thesis after an additional four years.

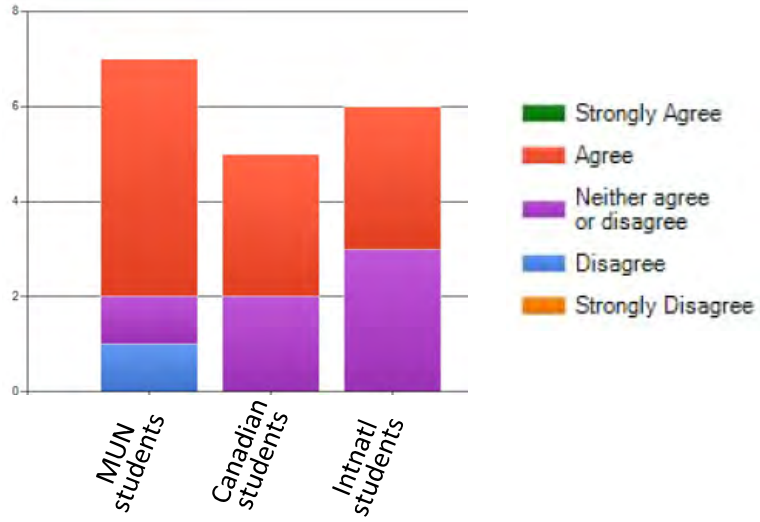
With regards membership on the supervisory and comprehensive examination committees of PhD candidates, the majority felt that there should be no overlap, with the exception of the supervisor. It was recognized that there are difficulties in finding sufficient committee members from within a department of small size.

There was support for the creation of a Graduate Student Officer who would provide support and counselling to individual graduate students, along the lines of the Office of Student Affairs which provides support for students in the MD program. It may be noted that the Office of Student Affairs has multiple staff and faculty members, whereas there is no graduate student equivalent, even though the number of students is about the same.

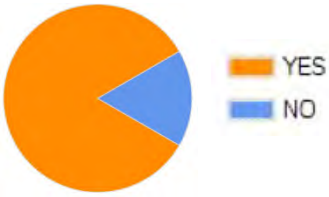
GENETICS GRADUATE PROGRAM SURVEY RESULTS

2. Have you supervised or co-supervised graduate students in other graduate programs?

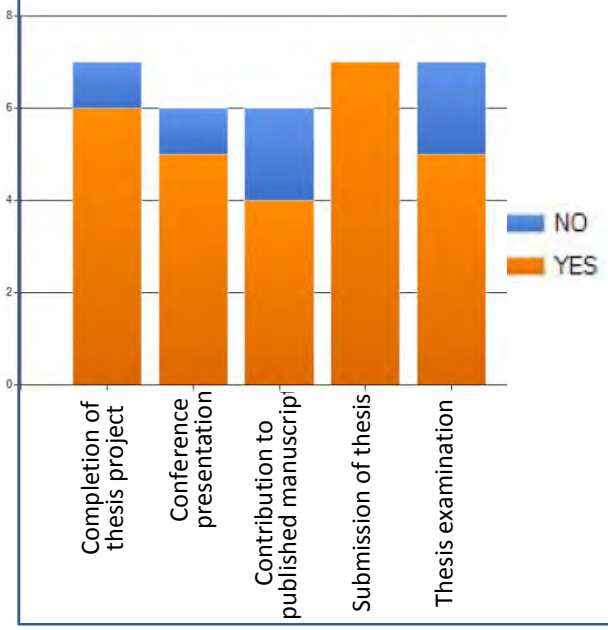
3. Students have adequate skills to allow them to complete an MSc in 2 years.



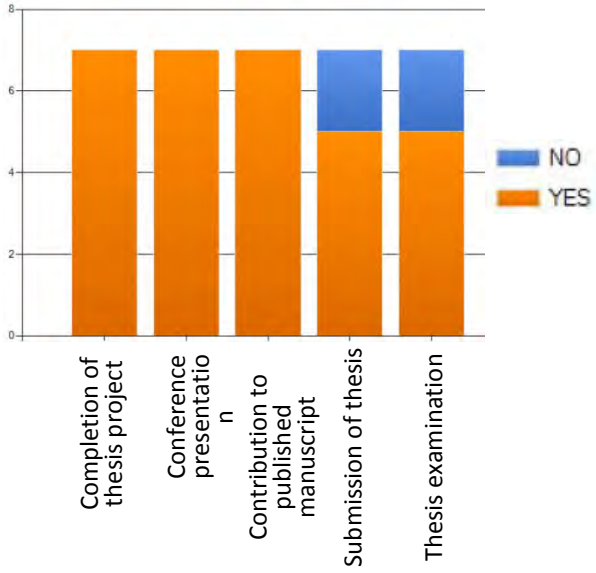
5. Should MSc students have to defend their thesis orally as part of the examination process?



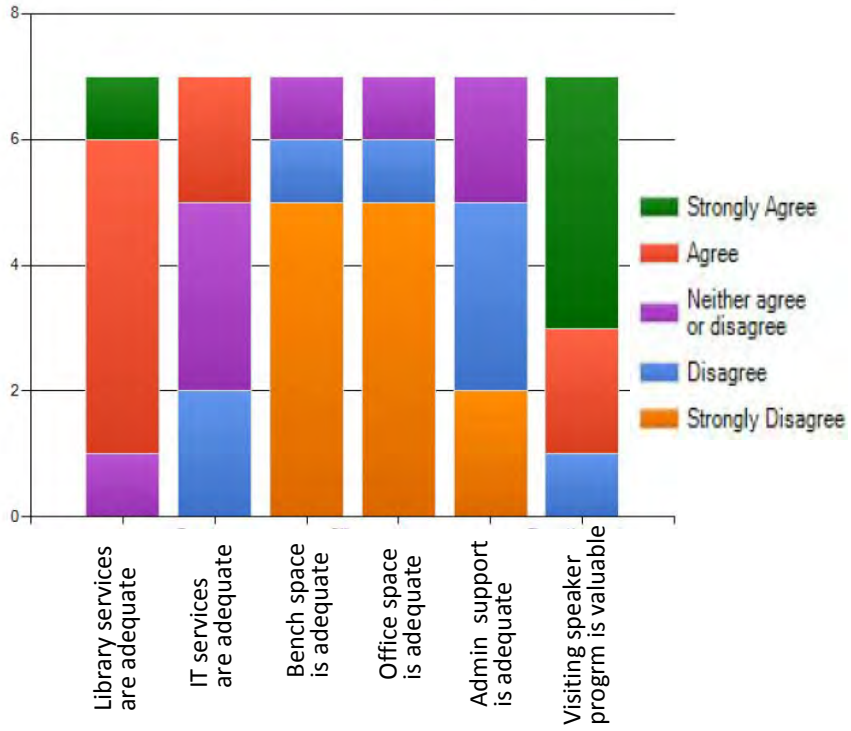
6. What are your expectations of the amount and quality of work that can be accomplished by MSc students in a 2-yr program?



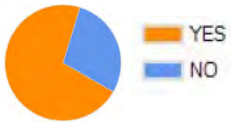
7. What are your expectations of the amount and quality of work that can be accomplished in the current 4-yr program that is available for full time PhD students?



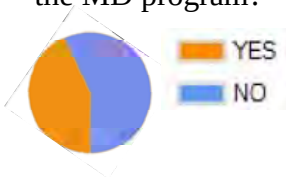
14. Please indicate your level of agreement with the following



19. Will the demise of the RPP affect your ability to support graduate trainees?



20. Have you had any student withdraw to enter the MD program?



15. Do you agree with the policy that ensures a min stipend for grad students?

16. Is the current min of $12,000 enough?

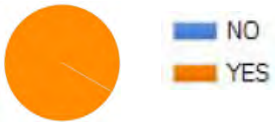
What should be the minimum stipend for an MSc student?

1	$15000
2	14,000
3	20k
4	12 000
5	16,000

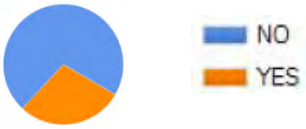
What should be the minimum stipend for a PhD student?

1	$18-20000
2	17,000
3	30k
4	20 000
5	20,000

8. Are you aware that an MD-PhD program is available?

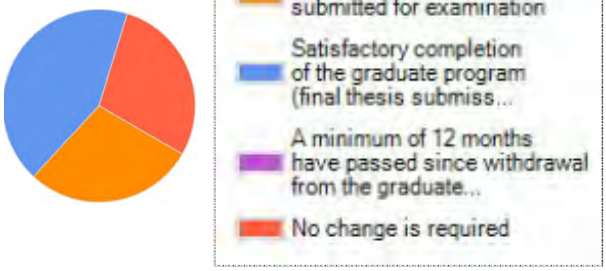


9. Have you supervised an MD-PhD student?

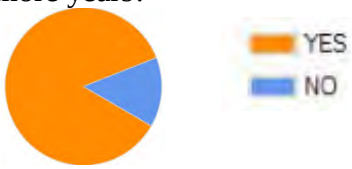


11. What is your opinion of the MD/PhD program?

21. For students in our graduate program, entry into the MD program should be deferred until:

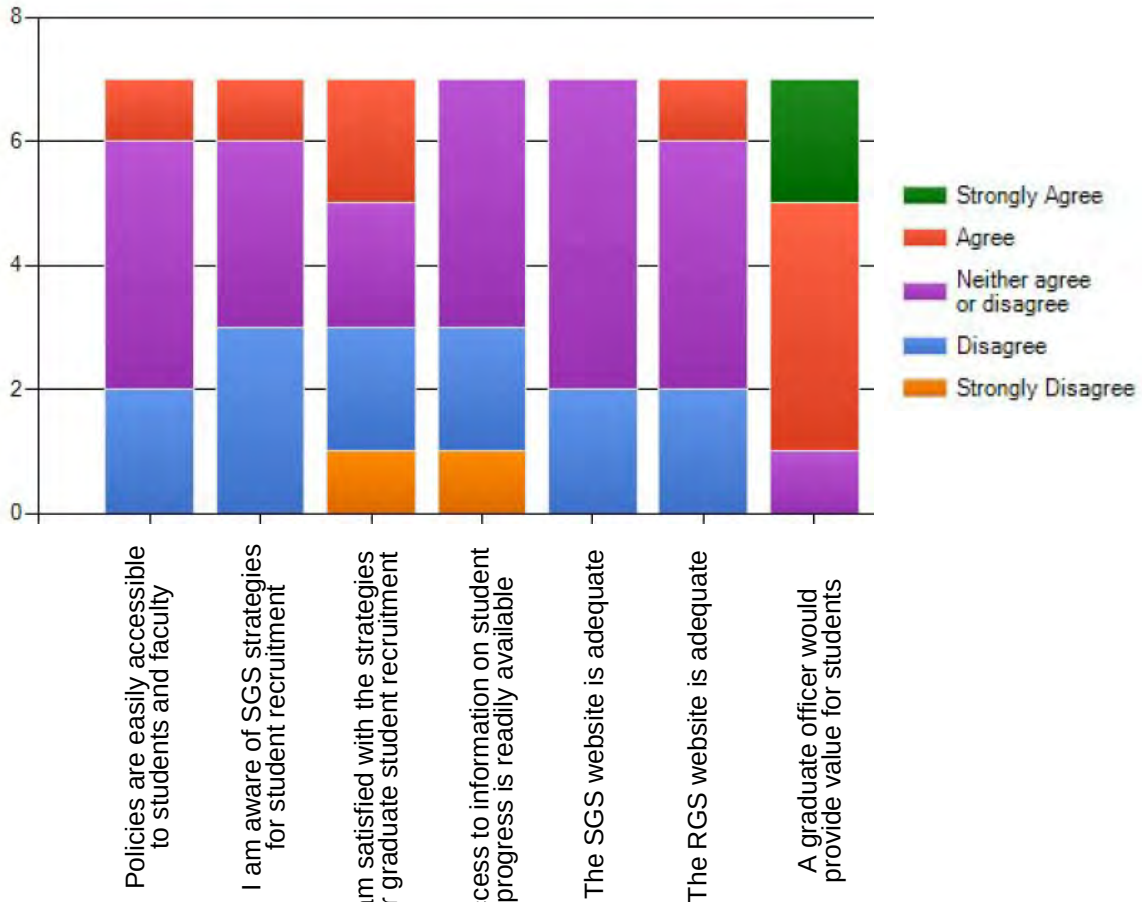


22. For graduate students applying to Med School, should there be a policy to allow them to defer their admission for one or more years?



23. For PhD students, should any overlap in membership of supervisory and comprehensive exam committees be permitted (excluding supervisors)?

24. Please indicate your level of agreement with the following statements.



GENETICS SURVEY RESULTS

APR Review

SurveyMonkey

1. To which program do you primarily affiliate as a graduate student supervisor?

	Response Percent	Response Count
Cancer and Development	0.0%	0
Cardiovascular & Renal Sciences	0.0%	0
Immunology & Infectious Diseases	0.0%	0
Neurosciences	0.0%	0
Genetics	**100.0%**	**7**
	answered question	**7**
	skipped question	**0**

2. Have you supervised or co-supervised graduate students in other graduate programs?

	Response Percent	Response Count
YES	**57.1%**	**4**
NO	42.9%	3
If YES, please provide details (number of students; list of other programs)		4
	answered question	**7**
	skipped question	**0**

3. Please rate your level of agreement with the following statements:

	Strongly Disagree	Disagree	Neither agree or disagree	Agree	Strongly Agree	Response Count
In your experience, Memorial University entry-level graduate students have adequate skills to allow them to complete a MSc in 2 years	0.0% (0)	14.3% (1)	14.3% (1)	**71.4% (5)**	0.0% (0)	7
In your experience, entry-level students from other Canadian Universities have adequate skills to allow them to complete a MSc in 2 years?	0.0% (0)	0.0% (0)	40.0% (2)	**60.0% (3)**	0.0% (0)	5
In your experience, international students have adequate skills to allow them to complete a MSc in 2 years?	0.0% (0)	0.0% (0)	**50.0% (3)**	**50.0% (3)**	0.0% (0)	6
			Please comment on the inadequacies and potential remedies.			3

answered question	**7**
skipped question	**0**

4. Under normal circumstances, what is a reasonable time period for students to complete the following degrees?

	Response Percent	Response Count
Part-time MSc	85.7%	6
Full-time MSc	**100.0%**	**7**
Part-time PhD	85.7%	6
Full-time PhD	85.7%	6
answered question		**7**
skipped question		**0**

5. Should MSc students have to defend their thesis orally as part of the examination process?

	Response Percent	Response Count
YES	**83.3%**	**5**
NO	16.7%	1
If YES, would this be accomplished by an internal committee (Memorial University Faculty) or a committee that incorporates external membership? Please use the comment box to elaborate on your position.		5
answered question		**6**
skipped question		**1**

6. What are your expectations of the amount and quality of work that can be accomplished by MSc students in a two year F/T program.

	YES	NO	Response Count
Completion of project	**85.7% (6)**	14.3% (1)	7
Conference presentation	**83.3% (5)**	16.7% (1)	6
Contribution to published manuscript(s)	**66.7% (4)**	33.3% (2)	6
Submission of thesis	**100.0% (7)**	0.0% (0)	7
Thesis examination	**71.4% (5)**	28.6% (2)	7
		Number of courses	6

answered question	**7**
skipped question	**0**

7. What are your expectations of the amount and quality of work that can be accomplished in the current 4-year program that is available for full time PhD students?

	YES	NO	Response Count
Completion of thesis project	**100.0% (7)**	0.0% (0)	7
Conference presentation	**100.0% (7)**	0.0% (0)	7
Contribution to published manuscript (s)	**100.0% (7)**	0.0% (0)	7
Submittal Submission of thesis	**71.4% (5)**	28.6% (2)	7
Thesis examination	**71.4% (5)**	28.6% (2)	7
		Number of courses	6

answered question	**7**
skipped question	**0**

8. Are you aware that a MD-PhD program is available at Memorial University?

	Response Percent	Response Count
YES	**100.0%**	**7**
NO	0.0%	0
	answered question	**7**
	skipped question	**0**

9. Have you previously supervised students enrolled in the MD-PhD Program?

	Response Percent	Response Count
YES	28.6%	2
NO	**71.4%**	**5**
If YES, how long did it take for the student to complete the program?		2
	answered question	**7**
	skipped question	**0**

10. Did the student require formal leaves of absence during this period for health, maternity or other reasons? Please explain.

	Response Count
	3
answered question	**3**
skipped question	**4**

11. What is your opinion of the MD/PhD program?

	Response Percent	Response Count
Retain program as is	33.3%	2
Retain program with review	**50.0%**	**3**
Drop the program	16.7%	1
answered question		**6**
skipped question		**1**

12. Do you have any suggestions about recruitment, program configuration or Faculty of Medicine support for this program? Please comment.

	Response Count
	3
answered question	**3**
skipped question	**4**

13. What has happened to your graduate trainees?

Number of Students

	unknown	0	1	2	3	4	5	6
Continued in Academia (includes PDF)	0.0% (0)	0.0% (0)	**50.0% (2)**	**50.0% (2)**	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)
Went to Medical School	0.0% (0)	**25.0% (1)**	0.0% (0)	**25.0% (1)**	0.0% (0)	**25.0% (1)**	0.0% (0)	**25.0% (1)**
Went to other health related professional schools	0.0% (0)	**50.0% (2)**	25.0% (1)	0.0% (0)	25.0% (1)	0.0% (0)	0.0% (0)	0.0% (0)
Education (ie teaching)	0.0% (0)	**100.0% (3)**	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)
Biomedical Industry	0.0% (0)	**100.0% (3)**	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)
Staff position	0.0% (0)	**66.7% (2)**	33.3% (1)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)
Did not complete graduate program	0.0% (0)	25.0% (1)	**75.0% (3)**	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)
Don't know	0.0% (0)	**66.7% (2)**	0.0% (0)	33.3% (1)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)

14. Please indicate your level of agreement with the following statements

	Strongly Disagree	Disagree	Neither agree or disagree	Agree	Strongly Agree	Response Count
Library services are adequate and effective	0.0% (0)	0.0% (0)	14.3% (1)	**71.4% (5)**	14.3% (1)	7
IT services are adequate and effective	0.0% (0)	28.6% (2)	**42.9% (3)**	28.6% (2)	0.0% (0)	7
Bench space is adequate	**71.4% (5)**	14.3% (1)	14.3% (1)	0.0% (0)	0.0% (0)	7
Office space is adequate for graduate students	**71.4% (5)**	14.3% (1)	14.3% (1)	0.0% (0)	0.0% (0)	7
Administrative support is adequate and effective for graduate students	28.6% (2)	**42.9% (3)**	28.6% (2)	0.0% (0)	0.0% (0)	7
The visiting speaker program is a valuable component of graduate student education	0.0% (0)	14.3% (1)	0.0% (0)	28.6% (2)	**57.1% (4)**	7
					answered question	**7**
					skipped question	**0**

15. The Faculty of Medicine has a policy that ensures a minimum graduate stipend for F/T students enrolled in MSc or PhD programs. Do you agree with this policy?

		Response Percent	Response Count
YES		**85.7%**	**6**
NO		14.3%	1
		answered question	**7**
		skipped question	**0**

16. Do you feel the current minimum stipend of $12,000 for full-time students is enough?

	Response Percent	Response Count
YES	14.3%	1
NO	**85.7%**	**6**
	answered question	**7**
	skipped question	**0**

17. If you do not feel the minimum stipend is enough,

	Response Percent	Response Count
What should the minimum stipend be for a MSc student?	**100.0%**	**5**
What should the minimum stipend be for a PhD student?	**100.0%**	**5**
	answered question	**5**
	skipped question	**2**

18. Comment on the match funding allocation process:

		Response Percent	Response Count
The amount of matched funding available per year per F/T student:		83.3%	5
The amount of matched funding available per supervisor (three-student rule):		**100.0%**	**6**
The allocation process (first come, first-served, regardless of program):		**100.0%**	**6**
The maximum duration of matched funding for (two -years MSc, four-years PhD):		**100.0%**	**6**
		answered question	**6**
		skipped question	**1**

19. Will the demise of the RPP program likely to affect your ability to support graduate trainees?

		Response Percent	Response Count
YES		**71.4%**	**5**
NO		28.6%	2
		Please comment	1
		answered question	**7**
		skipped question	**0**

20. Have you had any graduate students who withdrew or altered their program of study in order to enter the MD program?

	Response Percent	Response Count
YES	42.9%	3
NO	**57.1%**	**4**
IF YES, please provide details (number of students, withdrawal without degree completion, leave of absence with subsequent completion).		4
answered question		**7**
skipped question		**0**

21. For students enrolled in a graduate program in the Faculty of Medicine, entry into the MD program at MUN should be deferred until:

	Response Percent	Response Count
The student's thesis is submitted for examination	28.6%	2
Satisfactory completion of the graduate program (final thesis submission) is evident	**42.9%**	**3**
A minimum of 12 months have passed since withdrawal from the graduate program	0.0%	0
No change is required	28.6%	2
answered question		**7**
skipped question		**0**

22. For those students who wish to complete their graduate program before Medical School admission, should there be a formal policy that would allow an applicant to defer their admission for one or more years?

	Response Percent	Response Count
YES	**85.7%**	**6**
NO	14.3%	1
If Yes, what suggestions do you have for such a policy? For example, how many deferral slots would you like to see allocated in the new, expanded undergraduate class size of 80 students?		4
answered question		**7**
skipped question		**0**

23. The university guidelines state that there should be minimal overlap between the supervisory and comprehensive exam committees for PhD students. Should any overlap in committee members be permitted (excluding supervisors)?

	Response Percent	Response Count
YES	33.3%	2
NO	**66.7%**	**4**
Comments		3
answered question		**6**
skipped question		**1**

24. Please indicate your level of agreement with the following statements

	Strongly Disagree	Disagree	Neither agree or disagree	Agree	Strongly Agree	Response Count
Graduate program policies are easily accessible to students and faculty	0.0% (0)	28.6% (2)	**57.1% (4)**	14.3% (1)	0.0% (0)	7
I am aware of SGS strategies for student recruitment	0.0% (0)	**42.9% (3)**	**42.9% (3)**	14.3% (1)	0.0% (0)	7
I am satisfied with the strategies for graduate student recruitment (FOM)	14.3% (1)	**28.6% (2)**	**28.6% (2)**	**28.6% (2)**	0.0% (0)	7
Access to information on student progress in the graduate programs is readily available	14.3% (1)	28.6% (2)	**57.1% (4)**	0.0% (0)	0.0% (0)	7
The SGS website is adequate (www.mun.ca/sgs/)	0.0% (0)	28.6% (2)	**71.4% (5)**	0.0% (0)	0.0% (0)	7
The RGS website is adequate (www.med.mun.ca/graduate/home.aspx)	0.0% (0)	28.6% (2)	**57.1% (4)**	14.3% (1)	0.0% (0)	7
A graduate officer for BMS/Genetics would provide value for students (fellowships, writing or career workshops, program information and support)	0.0% (0)	0.0% (0)	14.3% (1)	**57.1% (4)**	28.6% (2)	7
				answered question		**7**
				skipped question		**0**

25. What are the strengths of the graduate programs as they exist now?"

	Response Count
	4
answered question	**4**
skipped question	**3**

26. What are the limitations of the graduate programs as they exist now?"

	Response Count
	4
answered question	4
skipped question	3

27. What are your highest priorities for lab-based Faculty of Medicine graduate programs in the future?(eg. growth, diversity, space, stipends, fellowships, faculty contribution)

	Response Count
	5
answered question	5
skipped question	2

28. Additional comments on any of the above

	Response Count
	1
answered question	1
skipped question	6

Page 1, Q2. Have you supervised or co-supervised graduate students in other graduate programs?		
1	Clinical Epidemiology - co-supervisor of at least 4 students	Jun 12, 2012 5:48 PM
2	2 students Math & Stats (MSc and PhD)	Jun 12, 2012 5:27 AM
3	Clinical Epidemiology	Jun 7, 2012 4:33 AM
4	3 Master's students	Jun 6, 2012 2:23 PM

Page 1, Q3. Please rate your level of agreement with the following statements:		
1	a number of students from each group do not have enough Genetics experience when they begin their MSc. This definitely includes MUN students	Jun 12, 2012 5:48 PM
2	There is a wide range of skill sets in all 3 groups.	Jun 12, 2012 8:39 AM
3	the thesis review process, finding and getting the commitment of external reviews and their reviews takes around 6 months. any ways to ensure a shorter duration of this process would be appreciated. In addition, recruiting students with a genetics undergraduate degree (which would expedite their progress in course and thesis research), is difficult.	Jun 6, 2012 2:23 PM

Page 2, Q4. Under normal circumstances, what is a reasonable time period for students to complete the following degrees?

	Part-time MSc	
1	3-4 years	Jun 12, 2012 5:58 PM
2	4 yrs	Jun 12, 2012 8:43 AM
3	5	Jun 12, 2012 5:36 AM
4	3 years	Jun 11, 2012 12:21 PM
5	3 years	Jun 7, 2012 4:35 AM
7	4-6	Jun 6, 2012 12:23 PM
	Full-time MSc	
1	2 years	Jun 12, 2012 5:58 PM
2	2-3 yrs	Jun 12, 2012 8:43 AM
3	2	Jun 12, 2012 5:36 AM
4	2 years	Jun 11, 2012 12:21 PM
5	2 years	Jun 7, 2012 4:35 AM
6	2-2.5	Jun 6, 2012 2:24 PM
7	2-3	Jun 6, 2012 12:23 PM
	Part-time PhD	
1	6-7 years	Jun 12, 2012 5:58 PM
2	6 yrs	Jun 12, 2012 8:43 AM
3	8	Jun 12, 2012 5:36 AM
4	6 years	Jun 11, 2012 12:21 PM
5	7 years	Jun 7, 2012 4:35 AM
7	8	Jun 6, 2012 12:23 PM
	Full-time PhD	
1	4-5 years	Jun 12, 2012 5:58 PM
2	4 yrs	Jun 12, 2012 8:43 AM
3	4	Jun 12, 2012 5:36 AM
4	4 years	Jun 11, 2012 12:21 PM

Page 2, Q4. Under normal circumstances, what is a reasonable time period for students to complete the following degrees?		
5	3-5 years	Jun 7, 2012 4:35 AM
7	4-6	Jun 6, 2012 12:23 PM

Page 2, Q5. Should MSc students have to defend their thesis orally as part of the examination process?		
1	it could be a MUN committee if some members are outside the primary discipline. If not enough specific expertise then someone should be chosen from outside the university. It is important that the examiners are not just close colleagues of the supervisor	Jun 12, 2012 5:58 PM
2	Internal committee	Jun 12, 2012 8:43 AM
3	Probably logistically difficult to have outside examiners unless we rely on video conferences only. I suggest making it like a Honour's defense.	Jun 12, 2012 5:36 AM
4	internal committee	Jun 11, 2012 12:21 PM
5	Internal Committee (thinking of funding)	Jun 7, 2012 4:35 AM

Page 2, Q6. What are your expectations of the amount and quality of work that can be accomplished by MSc students in a two year F/T program.		
1	2 plus a 3rd course if deficient in some area when starting. for 2 and 3 above it depends on the relevance of the project results	Jun 12, 2012 5:58 PM
2	2-3	Jun 12, 2012 8:43 AM
3	2	Jun 12, 2012 5:36 AM
4	4	Jun 11, 2012 12:21 PM
5	Up to 5 depending on background	Jun 7, 2012 4:35 AM
6	2-4	Jun 6, 2012 12:23 PM

Page 2, Q7. What are your expectations of the amount and quality of work that can be accomplished in the current 4-year program that is available for full time PhD students?		
1	I don't think courses should be required if background is suffiient, but could need 1-2 courses	Jun 12, 2012 5:58 PM
2	0	Jun 12, 2012 8:43 AM
3	0-4	Jun 12, 2012 5:36 AM
4	6	Jun 11, 2012 12:21 PM
5	Up to 7 depending on background	Jun 7, 2012 4:35 AM
6	0	Jun 6, 2012 12:23 PM

Page 3, Q9. Have you previously supervised students enrolled in the MD-PhD Program?		
1	on supervisory committee- not completed yet (>8 years)	Jun 12, 2012 6:00 PM
2	Yes, on the supervisory committee of one.	Jun 12, 2012 5:49 AM

Page 3, Q10. Did the student require formal leaves of absence during this period for health, maternity or other reasons? Please explain.		
1	yes, twice for maternity leaves	Jun 12, 2012 6:00 PM
2	Yes, numerous. Including multiple maternity leaves and many postponements for going back to med school.	Jun 12, 2012 5:49 AM
3	not yet.	Jun 6, 2012 12:23 PM

Page 4, Q12. Do you have any suggestions about recruitment, program configuration or Faculty of Medicine support for this program? Please comment.		
1	It is a valuable program but should be more structured than at present	Jun 12, 2012 6:04 PM
2	Works OK as is. It will never be a popular option.	Jun 12, 2012 8:45 AM
3	1) More rigorous follow up of supervisor and student progress. This program only works efficienty with a particularly good student/supervisor team. Something we are probably lacking in quantity here. Hard to police though. 2) Better comcerted support from both Grad Studies and Undegrad Program. They have to work together understanding the value of both study programs. 3) Recruitment will be even more difficult here for this program especially considering our relative difficulty of recruiting PhD students in general. Plus the med school admission policies is not exactly conducive to bringing in physician academics IMO.	Jun 12, 2012 6:38 AM

Page 4, Q13. What has happened to your graduate trainees?		
1	I have not had graduate trainees	Jun 11, 2012 12:22 PM

Page 5, Q17. If you do not feel the minimum stipend is enough,		
	What should the minimum stipend be for a MSc student?	
1	$15000	Jun 12, 2012 6:09 PM
2	14,000	Jun 12, 2012 8:49 AM
3	20k	Jun 12, 2012 6:45 AM
4	12 000	Jun 11, 2012 12:24 PM
5	16,000	Jun 7, 2012 4:42 AM
	What should the minimum stipend be for a PhD student?	
1	$18-20000	Jun 12, 2012 6:09 PM
2	17,000	Jun 12, 2012 8:49 AM
3	30k	Jun 12, 2012 6:45 AM
4	20 000	Jun 11, 2012 12:24 PM
5	20,000	Jun 7, 2012 4:42 AM

Page 5, Q18. Comment on the match funding allocation process:		
The amount of matched funding available per year per F/T student:		
1	there needs to be more funding in order to get good students	Jun 12, 2012 6:09 PM
3	Way too low. Ridulous really.	Jun 12, 2012 6:45 AM
4	Inadequate	Jun 7, 2012 4:42 AM
5	should be increased by the RGS	Jun 6, 2012 2:28 PM
6	not adequate	Jun 6, 2012 12:28 PM
The amount of matched funding available per supervisor (three-student rule):		
1	agree, more productive faculty will presumably have more personal funding	Jun 12, 2012 6:09 PM
2	Should be max of 2, unless there are unused funds in a particular program.	Jun 12, 2012 8:49 AM
3	The 3 rule is fine.	Jun 12, 2012 6:45 AM
4	Inadequate	Jun 7, 2012 4:42 AM
5	should not be a restriction on number of students	Jun 6, 2012 2:28 PM
6	shouldn't have number limit.	Jun 6, 2012 12:28 PM
The allocation process (first come, first-served, regardless of program):		
1	there should be at least a minimum amount for each program	Jun 12, 2012 6:09 PM
2	Disagree with this. There should be allocations to all programs.	Jun 12, 2012 8:49 AM
3	Needs revision. Take into account program size too.	Jun 12, 2012 6:45 AM
4	Incorrect	Jun 7, 2012 4:42 AM
5	should not be a criteria	Jun 6, 2012 2:28 PM
6	agree	Jun 6, 2012 12:28 PM
The maximum duration of matched funding for (two -years MSc, four-years PhD):		
1	agree	Jun 12, 2012 6:09 PM
2	Agree. It encouragees students and supervisors to finish ASAP.	Jun 12, 2012 8:49 AM
3	Like it.	Jun 12, 2012 6:45 AM
4	Should have some flexibility	Jun 7, 2012 4:42 AM
5	should be available for a longer period of time to ensure students will be supported	Jun 6, 2012 2:28 PM
6	agree	Jun 6, 2012 12:28 PM

Page 5, Q19. Will the demise of the RPP program likely to affect your ability to support graduate trainees?		
1	CIHR funding very difficult to obtain. Need alternative funding programs at Provincial lvl. More foresight by Prov govn needed. We cannot solely be a resource based economy forever. Need to invest in knowledge based economy - and not necessarily making our Univ. an industrial complex.	Jun 12, 2012 6:45 AM

Page 6, Q20. Have you had any graduate students who withdrew or altered their program of study in order to enter the MD program?		
1	in the past, not so often recently	Jun 12, 2012 6:13 PM
2	Two. Both left without completion.	Jun 12, 2012 8:52 AM
3	Luckily, have spoke with all students ahead of time and managed to work something out that was beneficial for both parties.	Jun 12, 2012 7:06 AM
4	Currently 2 swtudents who intend to finish but may not 1 previous student who left and finished many years later	Jun 7, 2012 4:44 AM

Page 6, Q22. For those students who wish to complete their graduate program before Medical School admission, should there be a formal policy that would allow an applicant to defer their admission for one or more years?		
1	about 3-4 slots	Jun 12, 2012 6:13 PM
2	No limit on slots. The MD program can accomodate a small change inthe size of the class.	Jun 12, 2012 8:52 AM
3	Doesn't matter. There are so many individuals eligible for med school that this is not an issue. However, have to make sure deferral process is done early in summer and not early in fall.	Jun 12, 2012 7:06 AM
4	10	Jun 7, 2012 4:44 AM

Page 6, Q23. The university guidelines state that there should be minimal overlap between the supervisory and comprehensive exam committees for PhD students. Should any overlap in committee members be permitted (excluding supervisors)?		
1	but it is often far too much overlap now. this means it is not a proper comprehensive exam and not leading to an independent student	Jun 12, 2012 6:13 PM
2	Conflict of interest is obvious.	Jun 12, 2012 8:52 AM
3	Preferably not but sometimes difficult in a small center with limited resources and	Jun 12, 2012 7:06 AM

Page 6, Q23. The university guidelines state that there should be minimal overlap between the supervisory and comprehensive exam committees for PhD students. Should any overlap in committee members be permitted (excluding supervisors)?		
	no critical mass in most areas.	

Page 7, Q25. What are the strengths of the graduate programs as they exist now?"		
1	some very storng programs including Genetics	Jun 12, 2012 6:18 PM
2	Most students are "cared" for. There appears to be a good repoire b/w students and student/supervisors. Considering the resources, they get a pretty good education. They become used to getting the maximum from the minimum. Sort of like their supervisors! :)	Jun 12, 2012 8:08 AM
3	Faculty expertise	Jun 7, 2012 4:45 AM
4	well developed and frequently updated graduate course topics; well establshed	Jun 6, 2012 2:34 PM

Page 7, Q26. What are the limitations of the graduate programs as they exist now?"		
1	not enough space or funding	Jun 12, 2012 6:18 PM
2	Lab and office space, ability to fund multiple students simultaneously, limited funding for travel, low critical mass such that students do not get exposure to entire field of study.	Jun 12, 2012 8:08 AM
3	Space/funding	Jun 7, 2012 4:45 AM
4	fellowship opportunities for international students are limited; there should be more travel awards for the students to attend conferences, bench, office or desk space for students are almost non-existent; there must be support programs or workshops about thesis writing and presentations skills.	Jun 6, 2012 2:34 PM

Page 7, Q27. What are your highest priorities for lab-based Faculty of Medicine graduate programs in the future?(eg. growth, diversity, space, stipends, fellowships, faculty contribution)		
1	space, stipends	Jun 12, 2012 6:18 PM
2	Faculty contribution. Administrative support.	Jun 12, 2012 8:54 AM
3	1) More student funding (surprise, surprise). 2) Need overall strategy for recruitment of PhD/post docs 3) Space is ridiculously limited and/or poorly distributed. Need more resources or better allocation of what we have.	Jun 12, 2012 8:08 AM
4	Space Funding Diversity	Jun 7, 2012 4:45 AM
5	more diverse student and faculty population would be great; adequate work and desk space for students are essential; increased support for stipends and fellowship opportunities for especially international students, more internal awards for research projects, genomics facilities are required.	Jun 6, 2012 2:34 PM

Page 7, Q28. Additional comments on any of the above		
1	the space issue has hampered expansion and it will still be 2+ years before this is releaved. There must be better forward planning in the future	Jun 12, 2012 6:18 PM

Graduate Program in Human Genetics

The graduate programme in human genetics will enable students to pursue academic studies and research towards an MSc or PhD degree in a number of areas of genetics. Strengths of the faculty are in the areas of cancer genetics, genetic epidemiology, gene mapping, medical genetics, birth defects and population genetics. Faculty members from all three Divisions of the Faculty of Medicine (BioMedical Sciences, Community Health and Clinical Sciences) participate in the programme. This multi-disciplinary integrated approach to teaching and research training is designed to provide trainees with an understanding of human genetics which includes both theory and practical applications of human disease. The close association of basic and clinical researchers provide an ideal setting in which to obtain an integrated understanding of human genetics.

Students wishing to enter the programme will arrange a supervisor who will sponsor their application to the graduate programme and arrange for financial support with the School of Graduate Studies. In order to obtain an MSc or PhD degree, students will be required to have completed an advanced undergraduate course in genetics, a minimum of two graduate level courses and a thesis based on original research. Students admitted to or transferring to the PhD programme will be required to pass a comprehensive examination in accordance with the regulations governing the School of Graduate Studies.

Program Activities

Students will be expected to participate in the activities of the Genetics group. These include a weekly Journal Club/Research Discussion Group and a Genetics Seminar Series. The Journal Club/Research Discussion Group meets regularly and provides an opportunity for the presentation and discussion of recent research results, published articles or issues of general interest to the members of the group. Graduate students, faculty members and genetics counsellors act as regular presenters in this activity.

Graduate students will also be expected to attend all seminars presented by invited visitors of the Human Genetics Group.

Courses:

1. **Human Population Genetics.** (Medicine 6390). This course provides an overview of the genetic variation of human populations and the factors that influence it, and introduces basic concepts in genetic variation in liability to human disease.

2. **Selected Topics in Human Genetics.** (Medicine 6391). In this course, a student will undertake a comprehensive literature review or other directed study pertaining to a human genetics topic of interest. The student will meet weekly with the course supervisor to discuss their progress. At the end of the semester the student will provide a detailed written review of the subject area and present a seminar (one hour) to the Human Genetics Journal Club/ Discussion Group. The grade will be based on both the written review and the oral presentation.
3. **Applied Human Genetics.** (Medicine 6392). This course will deal with the application of genetics to the understanding prevention and treatment of human disease. The classification, distribution and impact of these diseases will provide background to reviews of genetic counselling, clinical service delivery and evaluation, genetic screening and the role of registers and data bases. Approaches to treatment, including gene therapy, will be discussed and ethical issues which arise, as well as genetic education of the public will be emphasized. Topics such as connective tissue disorders, cardiac and renal anomalies and neurogenic disorders will be included as well as cancer genetics and pharmacogenetics.
4. **Human Molecular Genetics.** (Medicine 6393). This course is a summary of human genetics with an emphasis on molecular aspects. It will introduce such topics as polymorphisms, linkage analysis, gene mapping, molecular diagnosis, cancer genetics, genetic imprinting, haematological genetics and gene therapy.

5. **Cancer Genetics** (Medicine 6394). This course will include material from the broad field of human cancer genetics. It will focus on the current knowledge of the molecular and clinical genetics of inherited predispositions to cancer. Mutations predisposing to cancer, clinical characteristics, natural history and management of genetic cancer syndromes and the development of screening programs for hereditary cancers will be discussed. Genetics aspects of sporadic (non-Mendelian) cancers will also be addressed.

There are a number of courses in other Graduate Programs which could be suitable for students in this program. Depending on the area of study, such courses as Med 6270 Epidemiology, Med 6580 Molecular Biology of Cancer, Med 6590 Molecular Biology I or 6591 Molecular Biology II may be taken to satisfy the course requirements for the programme. The course selections for each student are set by the supervisory committee in consultation with the student and are based on their area of study and past course credits.

MED6390 Human Population Genetics Winter/Spring 2011

Date	Lecturer	Topic	Room
Jan 12, 2011	Dr. R. Green	Mutation and genetic variation.	H4347 (12)
Jan 19, 2011	Dr. T-L. Young	Natural selection and Darwinian evolution	H4347 (12)
Jan 26, 2011	Dr. T-L. Young	Hardy-Weinberg Equilibrium, linkage and linkage disequilibrium.	H4347 (12)
Feb 2, 2011	Dr. J Green	Founder effect, bottlenecks, genetic drift and inbreeding.	H4347 (12)
February 9	Dr. S. Savas	The International HapMap project.	H4347 (12)
Feb 16, 2011	Dr. J Green	Clinical implications of population genetics.	H4347 (12)
Feb 23, 2011	Dr. K. Hodgkinson	The molecular clock, mitochondrial DNA and the Y-chromosome.	H4347 (12)
March 2, 2011	Dr. G Sun	Genetic association studies: principles, common methods, study design.	H4347 (12)
March 9, 2011	Dr. G Sun	Association studies: applications in complex diseases and latest advancement.	H4347 (12)
March 16, 2011	Dr. R. Green	Population differences in SNP genotypes.	H4347 (12)
March 23, 2011	Dr. JC. Loredo-Osti	Quantitative traits in humans.	H4347 (12)
March 30, 2011			
April 6, 2011	Dr. M. Woods	The chimpanzee, Neanderthal, and modern human genomes.	H4347 (12)

- All classes are provided from 2 – 5 pm, Wednesday, at H4337
- Facilitator: Dr. S Savas. email: savas@mun.ca; Tel: 777-2233
- **Office hour:** Fridays 11am-12pm, Dr. Savas' office (H4333)

Course structure:
1 hour lecture on the topic, followed by student presentations on the next week.

The lecturer will assign 2 research papers related to the topic on the day of lecture. In the student presentation week (usually the next week), each paper will be presented by a student randomly selected to demonstrate their understanding of the research and train their ability of critical thinking.

The instructor will also provide students with 2-4 questions related to the lecture/papers. All students will bring written answers to these questions next week (the student presentation week). The written answers will not be longer than 2 pages.

Marks and Evaluation:

1. Class participation (12%)

2. Oral presentation (44%) by students

3. Written assignment (44%) by students

Both the instructor and the course facilitator will score each part and the average will be obtained and serve as the final score.

Selected Topics in Human Genetics. (Medicine 6391).

In this course, a student will undertake a comprehensive literature review or other directed study pertaining to a human genetics topic of interest. The student will meet weekly with the course supervisor to discuss their progress. At the end of the semester the student will provide a detailed written review of the subject area and present a seminar (one hour) to the Human Genetics Journal Club/ Discussion Group. The grade will be based on both the written review and the oral presentation.

Medicine 6392
Applied Human Genetics
Fall, 2011

Applied Human Genetics. (Medicine 6392). This course will deal with the application of genetics to the understanding prevention and treatment of human disease. The classification, distribution and impact of these diseases will provide background to reviews of genetic counselling, clinical service delivery and evaluation, genetic screening and the role of registers and data bases. Approaches to treatment, including gene therapy, will be discussed and ethical issues which arise, as well as genetic education of the public will be emphasized. Topics such as connective tissue disorders, cardiac and renal anomalies and neurogenic disorders will be included as well as cancer genetics and pharmacogenetics.

The topics will be covered using clinical cases as starting points. The course will consist of a combination of didactic lectures and problem based learning sessions.

Lecture times are: **Monday 10-11:30** (1 hr didactic lecture and 30minutes for introduction of Problem-Based Learning case) and **Friday 10-11:30** (PBL case).

The course chair is **Dr Lesley Turner**. Other lecturers are Dr. Bridget Fernandez, Dr. Kathy Hodgkinson and Dr. Jane Green.

Marking scheme:

- Class participation/ scores from PBL assignments – 40%
- Take-home midterm exam – 25%
- Take-home final exam – 35%

Topics to be covered:

1. Single gene disorders
2. Chromosomal Disorders - Numerical and structural
3. Non-Mendelian Inheritance (Mitochondrial Disorders/Imprinting/UPD)
4. Inborn Errors of Metabolism
5. Hereditary Cancer Syndromes [HNPCC, HBOC] –
6. Mutifactorial Disorders
7. New technologies being used for the diagnosis of genetic disorders – benefits and limitations
8. Genetic Counseling
9. Ethics: Presymptomatic genetic diagnosis; Genetic testing of children; Non-paternity; Duty to warn
10. Impact of Genetic Disease

Human Molecular Genetics (Medicine 6393).

This course is a summary of human genetics with an emphasis on molecular aspects. It will introduce such topics as polymorphisms, linkage analysis, gene mapping, molecular diagnosis,

MED6393 Human Molecular Genetics Fall 2010

Date	Instructor	Topic	Room
Sept 15	Dr. R. Green	1.Meioses, chromosomes and linkage analyses	H4347
Sept 22	Dr. R. Green	2. The human genome	H4347
Sept 29	Dr. T. Young	3. Mendelian Disease Gene Identification	H4347
Oct 6	Dr. S. Savas	4. Bioinformatics	H4347
Oct 13	Dr. M. Woods	5. Molecular Pathology	H4347
Oct 20	Dr. J. Green	6. Cancer Genetics	H4347
Oct 27	Dr. L. Turner	7. Non-Mendelian Inheritance	H4347
Nov 3	*No class*	*- Work on grant proposal -*	-
Nov 10	Dr. S. Savas	8. Pharmocogenomics	H4347
Nov 17	Dr. T. Young	9. Gene expression studies	H4347
Nov 24	Dr. M. Woods	10. RNAs	H4347
Dec 1	Dr. A. Dorward	11. Epigenetics	H4347
Dec 8	Discussion and presentations from topic 12		H4347
Dec 15	Presentation of Student Proposals		H4347

All classes are on Wednesday from 2-5pm.

cancer genetics, genetic imprinting, hematological genetics and gene therapy

Evaluation scheme (2010) for MED6393 Human Molecular Genetics

35% for oral presentations of assigned papers

15% for discussion of assigned papers

10% for the draft of the student research proposal

30% for the final written student research proposal

10% for the Powerpoint presentation of student research proposal

Molecular Genetics MED6393
Fall 2010 Student Research Proposals

EVALUATION FORM

Student's Name:_____

Research Project/Thesis *(10 points total, breakdown is below)*

- **Hypotheses** ***(1** point)* **Score: _____**
- **Objective** ***(1** point)* **Score: _____**
- **Intro/Background** ***(2** point)* **Score: _____**
- **Rationale** ***(1** point)* **Score: _____**
- **Research design/methods** ***(3** point)* **Score: _____**
- **Conclusion/Summary/Potential Criticisms** ***(1** point)* **Score: _____**

- **Writing Skills** ***(1** point)* **Score: _____**

- **Total Score** *(out of **10** points)* **Score: _____**

Reviewer:_____

Comments in point form (please use additional space if warranted):

_____

_____

_____

_____

_____

_____

MED6393 Human Molecular Genetics Fall 2012 (Proposed)

Date	Instructor	Topic	Room
September 7	Dr. Sevtap Savas Dr. Roger Green	Introduction 1. The Human Genome	
September 21	Dr. Terry-Lynn Young	2. Mendelian diseases: gene identification	
September 28	Dr. Kathy Hodgkinson	3. Patterns of inheritance, penetrance, clinical and phenotypical variability	
October 5	Dr. Guangju Zhai	4. Complex diseases and methods to identify susceptibility alleles	
October 12	Dr. Sevtap Savas	5. Bioinformatics	
October 19	Dr. Michael Woods	6. Molecular Pathology	
October 26	Dr. Jane Green	7. Cancer Genetics	
November 2	Dr. Lesley Turner	8. Non-Mendelian inheritance	
November 9	Dr. Sevtap Savas	9. Personalized Medicine and pharmacogenetics	
November 16	Dr. Terry-Lynn Young	10. Gene expression studies	
November 23	Dr. Michael Woods	11. miRNAs	
November 30	Dr. Ann Dorward	12. Epigenetics	
December 7		13. Paper discussion and student presentations for last Lecture	

Fridays 9-12
Course coordinator: Sevtap Savas, PhD.

Cancer Genetics (Medicine 6394). Jan-April 2012

This course will include material from the broad field of human cancer genetics. It will focus on the current knowledge of the molecular and clinical genetics of inherited predispositions to cancer. Mutations predisposing to cancer, clinical characteristics, natural history and management of genetic cancer syndromes and the development of screening programs for hereditary cancers will be discussed. Genetics aspects of sporadic (non-Mendelian) cancers will also be addressed.

1. **Wed. Jan. 11** Introduction - Hereditary vs. familial vs. sporadic cancer (Roger Green)

2. **Wed. Jan. 18** Genetic predictive and prognostic factors in cancer (Sevtap Savas)

3. **Wed. Jan. 25** Specific Hereditary Cancers: Colon and Breast Cancers (Jane Green/Terry-Lynn Young)

4. **Wed. Feb. 01** **Wed. April 4** Cancer in the family & management of cancer syndromes (Jane Green)

5. **Wed. Feb. 8** Identification of genes associated with cancer - cancer as a complex disease/low penetrance genes e.g. 8q24 (Michael Woods)

6. **Wed. Feb. 15** Cell cycle & tumour suppressors (Helene Paradis)

Wed 22 **March break (no class)**

7. **Wed. Feb. 29** Cancer stem cells (Bob Gendron)

8. **Wed. Mar. 07** Chromosomal instability and cancer: DNA repair, CNVs, LOH, cytogenetic changes (Fei-Yu Han)

9. **Wed. Mar. 14** Animal Models for Cancer Research: Genes to Environment (Ann Dorward)

10. **Wed. Mar. 21** Epigenetics (Michael Woods)

11. **Wed. Mar. 28** Growth factors, receptors and such things, what are oncogenes doing? (Ken Kao)

12. **Wed. April 4** Student presentations for Lecture 11.

Winter term ends on April 5th

Course coordinator: Dr. Sevtap Savas
Genetics, Room H433

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Additional information:

1. Classes are held on Wednesdays between 2-5pm at the HSC 4th floor seminar room (H4347)

2. The first hour of the class (2-3pm): lecture
   (3-5pm): two students make presentations (related to previous lecture).

3. The lecturer selects 2 papers and asks students to present them in the next week. The students are selected to present randomly. The lecturer brings in the article figures and tables (including the supplementary tables/figures) in a USB key for student presentations. <u>The students do not prepare slides for their presentations.</u>

4. Alternatively, the students have an option to select their own papers for presentation. In this case, the student will check with the lecturer in advance to make sure the article is appropriate for the topic.

5. Each lecturer prepares 2-4 questions related to topic of their lecture and distributes these questions to the students on the day of lecture. The questions should be related to the lecture topics but also let student make extra research. The answers to each question will be 1-2 paragraphs long and the entire length of the document should not be longer than 2 pages. The lecturer grades and returns the essays to the students a week after.

Date	Lecture (lecturer)	Student presentations (lecturer)	Time	Room
Jan 11, 2012	Dr. Roger Green	-	2-5pm	H4347
Jan 18, 2012	Dr. Sevtap Savas	Dr. Roger Green	2-5pm	H4347
Jan 25, 2012	Dr. Jane Green/ Dr. Terry-Lynn Young	Dr. Sevtap Savas	2-5pm	H4347
Feb 1, 2012	Dr. Jane Green	Dr. Jane Green/ Dr. Terry-Lynn Young	2-5pm	H4347
Feb 8, 2012	Dr. Michael Woods	Dr. Jane Green	2-5pm	H4347
Feb 15, 2012	Dr. Helene Paradis	Dr. Michael Woods	2-5pm	H4347
Feb 22, 2012	**Spring break (no class)**	**Spring break (no class)**	**2-5pm**	**H4347**
Feb 29, 2012	Dr. Bob Gendron	Dr. Helene Paradis	2-5pm	H4347
March 7, 2012	Dr. Fei-Yu Han	Dr. Bob Gendron	2-5pm	H4347
March 14, 2012	Dr. Ann Dorward	Dr. Fei-Yu Han	2-5pm	H4347
March 21, 2012	Dr. Michael Woods	Dr. Ann Dorward	2-5pm	H4347
March 28, 2012	Ken Kao	Dr. Michael Woods	2-5pm	H4347
April 4, 2012	-	Dr. Ken Kao	2-5pm	H4347