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## **PROGRAM DESCRIPTION**

(Updated January 2012)

### **Mission**

The primary mission of the combined UBC MD/PhD Program is to train and nurture future clinician-scientists who excel both in clinical medicine and basic sciences. The program aims to be Canada's leader in preparing the future generation of clinician-scientists.

### **Overview**

The combined MD/PhD Program is an integrated program jointly administered by the Faculty of Medicine and the Faculty of Graduate Studies. Its purpose is to provide selected and highly qualified students the opportunity to combine their medical school experience with intensive scientific training in a PhD graduate program, in order to pursue careers as clinician-scientists. The program is designed such that students can receive the combined MD/PhD degree after successful completion of seven years of enrolment. The program of study is built upon the standard MD curriculum, but it is further "customized" to meet the unique PhD training program requirements of individual students based on their background, previous research experience, and chosen medical field of expertise.

In addition to fulfilling the requirements of the regular undergraduate MD curriculum, MD/PhD students will also undertake graduate level coursework as required by their chosen field of research. Curriculum planning, coursework, and research training are to be closely integrated and coordinated between the basic sciences and clinical disciplines throughout the 7-year program. Thus, graduates of the MD/PhD Program are trained as competent physicians as well as skilled scientists. The combined MD/PhD degree should adequately prepare the graduates to pursue a research-intensive track of residency and postdoctoral training in a specialty or discipline of their choice, ultimately leading to a competitive and independent clinical investigative career.

Student selection, curriculum planning, research supervision, and clinical training are jointly coordinated through the MD/PhD Committee. Close integration and coordination between the basic sciences and the clinical disciplines will ensure a smooth transition between academic course work, basic science training, research, and clinical rotations.

**Program Administration**

***Director:***

Dr. Lynn A. Raymond

***Associate Director:***

Dr. Torsten Nielsen

***MD/PhD Committee (2011-2012):***

Dr. Jane Buxton

Dr. Robert Holt

Dr. Claudia Krebs

Dr. Haydn Pritchard

Dr. Patrick Tang

Dr. Stuart Turvey

Dr. Stephen Yip

Dr. Youwen Zhou

Mr. Michael Copley (Student Representative)

***Ex-Officio Members (2011-2012):***

Dr. Bruce Fleming, Associate Dean, Admissions, Faculty of Medicine

Dr. Karen Joughin, Associate Dean, Undergraduate Education, Faculty of Medicine

Dr. Sharon Salloum, Associate Dean, Undergraduate Student Affairs, Faculty of Medicine

Dr. David Fedida, Associate Dean, Research, Faculty of Medicine

Dr. Peter Leung, Associate Dean, Graduate & Postdoctoral Education, Faculty of Medicine

Dr. Jill Kernahan, Co-Associate Dean, Postgraduate Medical Education, Faculty of Medicine

Dr. Eric Webber, Co-Associate Dean, Postgraduate Medical Education, Faculty of Medicine

Dr. Anita Palepu, Director, Clinical Investigator Program, Department of Medicine

Dr. Susan Porter, Dean *pro tem*, Faculty of Graduate Studies

***Coordinator:***

Ms. Jane Lee

**The MD/PhD Committee** consists of clinician-scientists, basic scientists, graduate program advisors, student research supervisors and a student representative. Membership is appointed and reviewed annually by the Program Director. Members who have completed a 3-year term will automatically be rotated off the committee, but can serve additional terms after a 3-year hiatus. The Committee meets at least once a year to review the admissions process and to finalize the ranking of MD/PhD applicants. Members of the Committee also serve on the student Thesis Research Supervisory Committees, the PhD Comprehensive Examination Committees and the PhD Final Oral Examination Committees.

### **Entrance Requirements**

To be eligible for admission, the applicant must have a Bachelor of Science with first class standing (or equivalent), and have fulfilled all the requirements of acceptance into the four-year medical curriculum of the Faculty of Medicine, and the doctoral requirements of the Faculty of Graduate Studies. All applicants are required to take the Medical College Admission Test (MCAT), but the Graduate Record Examination (GRE) is optional. Applicants who obtained their BSc degree from a university outside Canada in which English is not the primary language of instruction are required to obtain a minimum score of 550 (paper version) or 213 (computer version) or 80 (new score) in the Test of English as a Foreign Language (TOEFL). At present, admission to the MD/PhD Program is limited to Canadian citizens and permanent residents of Canada. Students with a BSc degree who are already enrolled in the first year of Medicine at UBC are also eligible for admission.

### **Application Procedure**

Application for the MD/PhD Program is made by completing: 1) the application form for admission to the MD Program, and 2) the application form for admission to the MD/PhD Program. Both application forms must be submitted concurrently. The deadline for the application for the MD/PhD Program is October 1. Deadline for UBC students in Year 1 of the Medicine program is November 1.

Applicants to the MD/PhD program should submit the completed MD/PhD application form and all supporting materials directly to the MD/PhD Program office. Applicants must identify their proposed area of research for the PhD component of their program. The application form for admission to the regular MD Program should be submitted directly to the Faculty of Medicine Admissions Office.

The application package includes the following components:

- ✦ On-line application (including Autobiographical Essay) via the Faculty of Graduate Studies webpage.
- ✦ Three reference letters specific for the MD/PhD Program. These reference letters should expand on research experience and potential. The three separate letters must be written by the referees on original letterhead, and submitted in envelopes sealed and endorsed by the referees.
- ✦ Two original copies of the official transcripts. These should be submitted in sealed envelopes and endorsed by the issuing institution.
- ✦ C\$91.80 MD/PhD application fee by visa (separate from the MD application fee). No cash will be accepted.

- ✦ A copy of the publications listed in the application form.
- ✦ One photocopy of the complete set of the Application Form for Admission to Medicine, including all supporting materials.

Incomplete and late applications will not be considered. Photocopies are not acceptable. The original and two copies of the complete application should be submitted directly to the MD/PhD Program office.

### **Selection Process**

The Faculty of Medicine and the Faculty of Graduate Studies will separately review the applicant's eligibility for admission. Applicants who meet the requirements to the MD Program and the PhD Program will be further assessed by the MD/PhD committee and short-listed for interview by the MD/PhD Admissions Committee. Short-listed applicants will be invited to separate individual interviews by the Program Director, two of the MD/PhD Advisory Committee members and one current MD/PhD student. These interviews normally take place between January 15 and March 15. For out-of-province applicants, interview schedules are coordinated with the MD Admissions Office.

Besides academic achievement, other qualities include maturity, research experience and potential, scholarship, inter-personal skills, research field of interest, and proposed research supervisor and laboratory. A standardized evaluation form is utilized for the interviews and the ranking process. The final ranking of applicants by the Selection Committee is normally completed in late March. Successful candidates for the MD/PhD Program will be announced between April and June.

### **Admission Process**

Once the MD/PhD Admissions Committee has selected the applicant, the MD/PhD Program Director will recommend the successful candidate to the Faculty of Graduate Studies for admission and for formal registration in the UBC Student Information Service Centre (SISC). A formal offer of admission is issued to the successful applicant by the Director of the MD/PhD Program in conjunction with the Dean of Graduate Studies and the Associate Dean of Admissions of the Faculty of Medicine.

Final admission into the MD/PhD Program is contingent upon the acceptance of a faculty member to supervise the MD/PhD student for the PhD thesis of the program. Typically, the faculty member will be from a department in the Faculty of Medicine (e.g., Anatomy, Biochemistry & Molecular Biology, Experimental Medicine, Health Care & Epidemiology, Pathology & Laboratory Medicine, Medical Genetics, etc.) or from a multi-disciplinary Research Program, Institute or Centre. The faculty supervisor and the Thesis Research Supervisory Committee will establish a program of study (i.e. required coursework, research proposal, timing and scope of the comprehensive examination, etc.) in conjunction with the MD/PhD Program Director. Students in the MD/PhD program must meet all standard requirements of the Faculty of Graduate Studies for doctoral degree programs.

## **MD/PhD Curriculum**

The MD/PhD Program is interdisciplinary in nature and is jointly administered by the Faculty of Medicine and the Faculty of Graduate Studies. In addition to fulfilling the requirements of the standard 4-year MD curriculum, MD/PhD students will also undertake graduate level coursework and research as recommended by their Thesis Research Supervisory Committee. Curriculum planning, coursework, and research training are to be closely integrated and coordinated between the basic sciences and clinical disciplines throughout the 7-year program.

The MD component of the MD/PhD curriculum has been developed to capitalize on a programmatic and multidisciplinary approach that represents a natural progression of the learning experience. This will allow overlap and concurrent activities in clinical training and research, and facilitate timely completion of the MD/PhD degree with the least possible interruption in either clinical experiences or research endeavours. Students must complete all the required courses in the regular Medical Undergraduate Program.

The PhD component of the MD/PhD curriculum is coordinated in conjunction with the hosting department and the Faculty of Graduate Studies. Students must complete 12 credits of coursework for the PhD component, and at least 9 credits must be 500-level or above and at least 9 credits must be of first class standing. Students must demonstrate proficiency in all required coursework by examination. Students must also successfully complete an oral comprehensive examination based on their proposed research and submit a grant proposal based on their proposed research (in the CIHR format) within the first 36 months of starting their program. Students must defend their thesis by oral examination. Additionally, each student will be evaluated at least annually by the research supervisory committee. Continuation in the combined degree program is contingent upon satisfactory scholastic and research progress.

### **Year 1 (Complete Med I curriculum)**

#### **Term 1 (late August - end of December)**

- Orientation (ORNT 400)
- Principles of Human Biology (PRIN 401)
- Family Practice Continuum (FMPR 401)
- Doctor, Patient & Society (DPAS 401)
- Introductory Clinical Skills (INDE 401)

#### **Term 2 (January - end of May)**

- Family Practice Continuum (FMPR 401)
- Clinical Skills I (INDE 410)
- Doctor, Patient & Society (DPAS 410)
- Foundations of Medicine (FMED: Host Defenses & Infection; Cardiovascular; Pulmonary; Fluids, Electrolytes, Renal & Gentiourinary; 7 hr/week).
- Identify research focus and research supervisor
- Secure MD/PhD studentship stipend
- Acceptance into hosting department

**Summer (12 weeks, June - August)**

- Summer research
- Set up Thesis Research Supervisory Committee
- Graduate coursework as required
- Develop full research proposal
- First Thesis Research Supervisory Committee meeting

**Year 2 (Partial Med II curriculum; late August - end of August, 34 weeks)**

- Family Practice Continuum (FMPR 420, 3 hr/week for both terms)
- Doctor, Patient & Society (DPAS 420, 3 hr/week for both terms)
- Graduate coursework as required
- Begin approved PhD thesis research

**Year 3 (Partial Med II curriculum; late August - end of December, 17 weeks)**

- Clinical Skills II (INDE 420, 3 hr/week)
- Foundations of Medicine (FMED: Blood & Lymphatics, Musculoskeletal & Locomotor, Endocrine & Metabolism; 7 hr/week)
- PhD Comprehensive Examination
- PhD thesis research

**Year 4 (Partial Med II curriculum; January - end of August, 18 weeks)**

- Clinical Skills II (INDE 420, 3 hr/week)
- Foundations of Medicine (FMED: Brain & Behaviour; Reproduction; Nutrition, Growth & Development; 7 hr/week)
- Final examination for FMED
- Final examination for INDE
- OSCE examination
- PhD thesis research

**Year 5 (Research only; early September - end of August)**

- PhD thesis research
- PhD Final Oral Examination
- Rural Family Practice Clerkship (4 weeks)

**Year 6 (Identical to Med III curriculum; early September - end of August, 50 weeks)**

- Clinical Clerkships (INDE 430; 1st & 2nd terms)

**Year 7 (Identical to Med IV curriculum)**

- Advanced Electives (INDE 440, 24 weeks)
- Preparation for Medical Practice (5 weeks)
- **Conferral of MD/PhD degree**

### **Curriculum Changes**

Any changes in curriculum planning must be initiated at least 6-12 months in advance, and with full discussion and approval by the Program Director/Co-Director and the Thesis Research Supervisory Committee.

The philosophy of the MD/PhD program is to be flexible, and in the interests of the student's career development. However, any contemplated change in curriculum planning requires careful consideration from all angles and must be thoroughly discussed. Furthermore, the MD undergraduate office requires advanced warning to accommodate any curriculum changes requested by MD/PhD students. The MD/PhD office coordinates the curriculum for all MD/PhD students at least 12 months in advance and liaisons closely with the MD Undergraduate office.

### **Research Co-ordination**

#### a) Research Supervisor

Each MD/PhD student must have an identified research supervisor within the first year of admission. The research supervisor must be a full member of the Faculty of Graduate Studies, and is usually from a Department, Interdisciplinary Program or Institute within the Faculty of Medicine. The research supervisor must hold a current CIHR research operating grant or from an equivalent peer-reviewed, federal or provincial granting agency.

#### b) Hosting Department

The hosting department is usually the department in which the research supervisor has a primary academic appointment. Selection of and arrangement with the hosting department must have prior approval of the MD/PhD Program Director, the Graduate Advisor of the hosting department, the research supervisor and the MD/PhD student. The primary responsibility of the hosting department is to register the MD/PhD student in the PhD thesis course, and to coordinate the student's PhD thesis and Final Oral Examination.

#### c) Thesis Research Supervisory Committee

Each MD/PhD student is required to be guided by a Thesis Research Supervisory Committee that minimally consists of: 1) the research supervisor; 2) a second faculty member from the hosting department who is also a full member of the Faculty of Graduate Studies; 3) a third faculty member from a different department; and 4) a faculty member representing the MD/PhD Program (usually a clinician-scientist or clinical investigator designated by the MD/PhD Program Director). It is the responsibility of the Thesis Research Supervisory Committee to recommend required course work, to evaluate academic and research progress at least annually, and to accept the PhD thesis before its presentation for final examination.

### **Thesis Research Supervisory Committee Meeting**

The Thesis Research Supervisory Committee is responsible for guiding the student in selecting any required courses, planning the research and preparing the thesis. The committee should be established as soon as possible after the student has registered and the thesis topic is known and within the first 12 months. Towards the end of the first year of studies in the MD/PhD Program, and not later than 15 August, the student will provide to the Graduate Advisor of the hosting department and the MD/PhD Program Director a Canadian Institute of Health Research (CIHR) research grant proposal summary (one page) of his/her planned research which has

been approved by the Thesis Research Supervisory Committee. It is expected that the student has had at least one Thesis Research Supervisory Committee meeting before the submission of this research proposal summary.

Meetings of the committee must be held at least once every 12 months, and after a Thesis Research Supervisory Committee meeting is held, the research supervisor and student should sign a formal report and send it to the MD/PhD Program Director and the Graduate Advisor of the hosting department.

### **PhD Comprehensive Examination**

Following completion of all required graduate-level course work, students in the MD/PhD Program must pass an oral Comprehensive Examination within the first 36 months of stating the 7-year MD/PhD Program. The PhD Comprehensive Examination is jointly administered by the MD/PhD Program and the hosting department. The MD/PhD Program will take primary responsibility of the student's Comprehensive Examination. Alternatively if so desired, the hosting department may wish to take over the primary responsibility for organizing the Comprehensive Examination. The MD/PhD Program must ensure that all the requirements and timelines of the Comprehensive Examination have been met. A major component of the Comprehensive Examination is based on a CIHR-style research proposal submitted by the student prior to the Comprehensive Examination. The research proposal should be approved by the Thesis Research Supervisory Committee prior to submission to the Comprehensive Examination Committee.

The intent of the Comprehensive Examination is to ensure that the student has adequately prepared for the proposed thesis research and can gain maximum benefit from this experience. The Comprehensive Examination will primarily focus on areas directly or indirectly related to the proposed PhD thesis research. The student is required to follow the general Comprehensive Examination format and specific requirements of the Thesis Research Supervisory Committee, including required reading in topics relevant to the proposed research and as recommended by the Thesis Research Supervisory Committee.

The Comprehensive Examination Committee consists of: a) an impartial Chair (not a collaborator of the research supervisor) normally selected by the MD/PhD Program Director; b) a university examiner within the same graduate department or program; c) a university examiner in a different graduate department or program; and d) minimum of two members of the PhD Thesis Research Supervisory Committee other than the research supervisor. The Graduate Advisor of the hosting department (if it is the expressed wish of the hosting department) may take primary responsibility for the examination. Normally, the Chair of the Comprehensive Examination is selected from the MD/PhD Committee. The research supervisor is expected to provide a list of possible examiners to the MD/PhD Program Director or the Graduate Advisor of the hosting department in advance of the Comprehensive Examination. The MD/PhD student is required to give a brief oral presentation (15-20 minutes) summarizing the written research proposal before the oral examination.

The Comprehensive Examination is graded as Pass/Fail. The student will be notified of the examination result in writing. The MD/PhD Program Director will notify the Faculty of Graduate Studies that the student is "admitted into candidacy" (i.e., all coursework has been completed,

the student has passed the Comprehensive Examination, and the Research Supervisor and the Thesis Research Supervisory Committee have approved the thesis research proposal).

Students should refer to the MD/PhD Comprehensive Examination guidelines.

### **PhD Thesis and Final Oral Examination**

The MD/PhD students defend their PhD thesis by oral examination (usually at the end of Year 5, i.e. before August 31), which is coordinated by the Graduate Advisor of the hosting department. The PhD Final Oral Examination is subject to the same regulations as all graduate programs of the Faculty of Graduate Studies. The MD/PhD Program Director will ensure that the oral examination is completed in a timely manner before the rural practice experience and basic clinical clerkship rotations. A final bound copy of the PhD thesis is maintained in the MD/PhD Program office.

### **Rural Family Practice Clerkship**

The Rural Family Practice Clerkship FMPR 428 (4 weeks) is a mandatory course offered in the summer months (May to August) for all students before they begin the Med III curriculum (MD/PhD Year 6) in September. MD/PhD students should only register for this course when they have completed the Med II curriculum and completed the PhD Final Oral Examination.

### **Tuition**

The 2011/2012 tuition is \$4,433.70 per year, payable in 3 instalments of \$1477.90 per year for the first six years, and a single continuation fee of \$1948.02 per year in each subsequent year. It is expected that there will be a modest tuition increase of fees for MD/PhD students in the coming years.

### **Financial Assistance and MD/PhD Studentships**

All MD/PhD students will receive a studentship award through the MD/PhD Program (annual stipend \$21,000, renewable each year for a maximum of 6 years). Funding will start in March of their first year in the Program.

#### a) **Students awarded a CIHR-funded stipend**

MD/PhD students with CIHR awards allocated through the MD/PhD Program are required to go off the award for 1 - 2 years of their research program (ideally year 4 and/or 5 of the Program). These students are required to apply ahead of time to other foundations so that they would have an externally funded stipend, freeing up that 1 - 2 years of their MD/PhD CIHR awards to cover other students without allotted CIHR funding who are entering years 6 and 7 of the Program. In the event that the student is unsuccessful in obtaining external funding, s/he will be supported by their supervisor for at least one year of the Program.

b) Students accepted outside of the CIHR awards

For students accepted outside of the CIHR awards, the MD/PhD Program would focus use of the Institutes' funding to provide initial stipend awards until such time as students can obtain an external award for research years. The maximum period of support for this initial award would be through June 30<sup>th</sup> of Year 2. In addition, under this policy, stipends for these students will be supported by the Program for all of Year 6 and up to March of Year 7 of the MD/PhD Program (i.e. while the students complete years III and IV of the MD curriculum). Students funded with Institutes' funding are required to apply for external awards right away in their first year and if unsuccessful, again in the beginning of second year. Students entering the Program outside of the CIHR award will be supported by their supervisors for Years 3 - 5 of the Program if they are unsuccessful in obtaining external funds. In agreeing to take on a new MD/PhD student accepted outside of the CIHR award, the supervisor are expected to sign off on these terms of admission.

c) All MD/PhD students

Although the program is expected to be completed in seven years, in rare cases where an additional year of graduate studies is required to complete the PhD portion, this would be funded by the student's own external foundation funds and/or the supervisor (not the MD/PhD Program CIHR award). This applies to all students in the Program, whether supported primarily by CIHR or Institutes' funding.

### **Financial Structure and Support of Students**

Due to budgetary considerations, all MD/PhD Studentship stipends and research allowance are administered by the MD/PhD Program office. These resources are pooled and shared among the students. The stipend is monitored by the Faculty of Graduate Studies and is given out in monthly payment on UBC payroll.

The CIHR research allowance is used to support research related travel by our students. As a policy, only students who have submitted an abstract are eligible for these travel funds. Other educational expenses (e.g. computer or textbook purchase) are not normally allowable costs. All expenses charged to the research allowance must receive prior approval by the Program Director(s).

Top-up stipend awarded to the students from other funding institutions (e.g. MSFHR) is currently maintained by the Faculty of Graduate Studies. The research supervisor is responsible for the legitimate use of any research allowance connected to these top-up awards.

### **Student Activities Specific to the MD/PhD Program**

The MD/PhD Program is devoted to creating a cohesive group of students, with their own identity in a medical scientist training program which is distinct from other medical or graduate programs. In order to create a supportive and nurturing ambience, special research seminars, informal gatherings and social interactions, a regular newsletter, a national journal devoted to the training clinician-scientists (Clinical and Investigative Medicine), and other communication devices have been implemented to promote morale and facilitate collegial interactions among the students. The informal monthly MD/PhD student meeting with the Program Director enables the students to

meet with clinician-scientist role models in different fields, and to carry out various discussions of special interest to MD/PhD students.

The UBC MD/PhD Student Research Forum and Open House is held annually in September. This annual function provides a valuable opportunity for the MD/PhD students to showcase their research and promote the Program to the University community. MD/PhD students are given the opportunity to meet various graduate advisors, research supervisors, other students, and potential applicants to the Program.

MD/PhD students are offered the opportunity to attend and present their research annually at national and international research forums such as the annual CSCI/CIHR Joint Program for Clinician Scientist trainees (usually in September), and the annual Western Student Medical Research Forum in conjunction with the Western American Federation for Medical Research, Western Society for Clinical Investigation, Western Association of Physicians, and the Western Society for Paediatric Research (usually in February).

MD/PhD students are also required to regularly attend and present their research in a designated research seminar series organized by the Program and the hosting department of the student.

**For additional information**, please contact:

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