PhD in Molecular Biology
FACULTY OF MEDICINE

Overview and specifics

<table>
<thead>
<tr>
<th>NUMBER</th>
<th>3-466-1-0</th>
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</thead>
<tbody>
<tr>
<td>LEVEL</td>
<td>Graduate</td>
</tr>
<tr>
<td>TYPE</td>
<td>Philosophae Doctor [Ph. D.]</td>
</tr>
<tr>
<td>CREDITS</td>
<td>90 credits</td>
</tr>
<tr>
<td>PROGRAM TYPE</td>
<td>Dissertation or thesis track</td>
</tr>
</tbody>
</table>

Resource persons

PROGRAM INFORMATION

Yan Liu  (514) 343-6111 p.27508
biologie-moleculaire@meddir.umontreal.ca

Description

The PhD in Molecular Biology program is a multidisciplinary research program offered by the Faculty of Medicine in conjunction with the Faculty of Arts and Science and the Faculty of Veterinary Medicine.

Objectives

The PhD in Molecular Biology program has four options. The name of the option is given on the diploma.

General Option

This option provides candidates with solid research training and helps students learn basic yet cutting-edge techniques and methods used to study biological macromolecules. This program delves into molecular genetics, gene activity regulation, tissue development, signalling pathways, nucleic acid and protein modifications, macromolecular chemistry, virology and biotechnology.

Systems Biology Option

In this option, students learn concepts and gain practice in the area of systems biology using high-throughput technologies such as genomics and proteomics. This training prepares students to meet the challenge of working across several complementary disciplines to study the complex problems posed by multigenic diseases such as cancer.

Complex Human Diseases Option

This option includes targeted studies that reflect research in molecular biology, genetics, signalling, and novel therapies in complex human diseases.

Cellular and Molecular Medicine Option

This option provides unique training in translational research with the goal of combining basic laboratory research with the needs of clinical practice. The focus is on the use of cutting-edge technology to study human diseases in order to develop novel diagnostic and therapeutic approaches that can be quickly incorporated into treatment for patients.

Regulations

Studies in this program are governed by the educational regulations of the Faculty of Graduate and Postdoctoral Studies and the following provisions:

1. Admission requirements

To be admitted as a regular student in the PhD [Molecular Biology] program, candidates must:

- Meet the general admission requirements (section XX) of the “Règlement pédagogique de la Faculté des études supérieures et
postdoctorales” (educational regulations of the Faculty of Graduate and Postdoctoral Studies).

- Demonstrate good knowledge of French (learn more).
- Demonstrate satisfactory knowledge of English before being accepted into the second year of the program.
- Demonstrate sufficient knowledge of any other language deemed necessary for their research.

1.1 Admission requirements – Transfer to PhD from MSc

- Have an MSc [Molecular Biology] or the equivalent.
- Have obtained a grade-point average at the graduate level of at least 3.3 out of 4.3 or the equivalent.

Candidates who have an MSc from another university or in a discipline other than molecular biology must have completed the coursework specific to the MSc in Molecular Biology Option or the equivalent. If not, these courses will be added to the student’s doctorate program as complementary courses.

1.2 Admission requirements – Direct entry to PhD from BSc

- Have a degree in medicine (MD), dental medicine (DMD) or veterinary medicine (DVM); a bachelor of science (BSc) in a relevant option; or a degree that is deemed equivalent.
- Have obtained a grade-point average of at least 3.7 out of 4.3 or the equivalent at the undergraduate level, unless (upon approval from the Dean) the student has sufficient experience or education further to the undergraduate level demonstrating the skills required for a PhD program.

Candidates must complete all master’s-level coursework that pertain to the PhD option they have enrolled in or the equivalent. These courses will be added to the student’s doctorate program as complementary or preparatory courses.

1.3 Additional documents to submit with your application

- Letter of intent or of interest
- Curriculum vitae
- Detailed description of research projects
- Two letters of recommendation
- Attestation of training, if applicable

2. Program Length

The maximum length is fifteen sessions [five years] for full-time students, excluding preparatory or “on leave” sessions. This deadline may be extended by one year with the permission of the Graduate Studies Committee.

3. Comprehensive exam

Students must take the written and oral components of the comprehensive exam by no later than the end of the sixth session of the program, and preparatory or “on leave” sessions are excluded in the calculation of this deadline. If the exam is deferred, the deadline will be extended by one session. The exam dates are set by the Program Director.

Application deadlines

Before submitting an application, check the application periods for the chosen session.

Fall
- Fall 2020: From January 1st, 2019 to July 1st, 2020

Winter
- Winter 2020: From May 1st, 2018 to November 1st, 2019
- Winter 2021: From May 1st, 2019 to September 1st, 2020

Summer
- Summer 2020: From September 1st, 2018 to February 1st, 2020

Programs of origin

Several Université de Montréal students in this program came from the following programs:

<table>
<thead>
<tr>
<th>PROGRAMS</th>
<th>TYPE</th>
<th>CREDITS</th>
<th>NUMBER</th>
<th>PERIOD</th>
<th>ENROLLMENT CAPACITY</th>
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<tbody>
<tr>
<td>Molecular Biology</td>
<td>Master’s Degree</td>
<td>45 credits</td>
<td>2-466-1-0</td>
<td>Jour</td>
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Program structure (3-466-1-0)

The doctorate program consists of 90 credits. This program has four options:

- General Option [Segment 70]
- Systems Biology Option [Segment 71]
- Complex Human Diseases Option [Segment 72]
- Cellular and Molecular Medicine Option [Segment 74]

Research must be done as a residency at either Université de Montréal or a research laboratory of an affiliated institute or hospital approved by the Advisory Board of the Faculty of Medicine.

Legend: CR: Credit, SC: Schedule, D: Day, E: Evening

### SEGMENT 70 GENERAL OPTION

This option consists of 4 mandatory course credits and 86 credits for research and a thesis.

**Block 70A**

<table>
<thead>
<tr>
<th>COURSE</th>
<th>TITLE</th>
<th>CR</th>
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<tbody>
<tr>
<td>BIM 7015</td>
<td>Research Seminar 2</td>
<td>1</td>
</tr>
<tr>
<td>BIM 7022</td>
<td>Readings in Molecular Biology</td>
<td>3</td>
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**Block 70B Research and thesis**

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<tr>
<td>BIM 7000</td>
<td>PhD Comprehensive Examination</td>
<td>0</td>
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<tr>
<td>BIM 7047</td>
<td>Thesis</td>
<td>86</td>
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### SEGMENT 71 SYSTEMS BIOLOGY OPTION

This option consists of 1 mandatory course credit, 3 optional course credits and 86 credits for research and a thesis.

**Block 71A**

<table>
<thead>
<tr>
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**Block 71B**

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<tr>
<td>BIM 7021A</td>
<td>Seminars in the Biology of Cancer 1</td>
<td>1</td>
<td>PBC 6025A</td>
<td>Advanced Cellular Signalling</td>
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<td>BIM 7021B</td>
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<td>1</td>
<td>PBC 6025B</td>
<td>Advanced Cellular Signalling</td>
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<tr>
<td>BIM 7021C</td>
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<td>1</td>
<td>PBC 6025C</td>
<td>Advanced Cellular Signalling</td>
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**Block 71C Research and thesis**

<table>
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<tr>
<th>COURSE</th>
<th>TITLE</th>
<th>CR</th>
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</thead>
<tbody>
<tr>
<td>BIM 7000</td>
<td>PhD Comprehensive Examination</td>
<td>0</td>
</tr>
<tr>
<td>BIM 7047</td>
<td>Thesis</td>
<td>86</td>
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### SEGMENT 72 COMPLEX HUMAN DISEASES OPTION

This option consists of 4 mandatory course credits and 86 credits for research and a thesis.

**Block 72A**

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<th>CR</th>
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<tbody>
<tr>
<td>BIM 7015</td>
<td>Research Seminar 2</td>
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Programs to explore

Applicants interested in this program also applied to the following programs:

<table>
<thead>
<tr>
<th>PROGRAMS</th>
<th>TYPE</th>
<th>CREDITS</th>
<th>NUMBER</th>
<th>PERIOD</th>
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<tbody>
<tr>
<td>Biochemistry</td>
<td>Doctorate</td>
<td>90 credits</td>
<td>3-465-1-0</td>
<td>Jour</td>
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<tr>
<td>Medicine</td>
<td>Undergraduate Doctorate</td>
<td>200 credits</td>
<td>1-450-1-0</td>
<td>Jour</td>
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<tr>
<td>Microbiology and Immunology</td>
<td>Doctorate</td>
<td>90 credits</td>
<td>3-500-1-0</td>
<td>Jour</td>
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<tr>
<td>Pharmacology</td>
<td>Master’s Degree</td>
<td>45 credits</td>
<td>2-520-1-0</td>
<td>Jour</td>
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<tr>
<td>Pharmacy</td>
<td>Undergraduate Doctorate</td>
<td>164 credits</td>
<td>1-675-1-1</td>
<td>Jour</td>
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Research expertise at a glance

Research areas
- Protein-protein interactions
- Intracellular signalling
- Mitosis
- Tissue differentiation and development
- Immunology and hematopoiesis
- Stem cells
- Genomics
- Endocrinology
- Cancer
- Cardiovascular disease
- Human genetics and genetic diseases
- Neurology
- Therapeutic approaches
- Model systems in molecular biology
- Plant biology
- Veterinary medicine
- Systems biology

Research centres
- Centre de recherche de l'hôpital Maisonneuve-Rosemont
- Centre de recherche de l'hôpital Ste-Justine
- Centre hospitalier de l'Université de Montréal (CHUM)
- Institut de recherche en immunologie et cancérologie (IRIC)
- Institut de recherches cliniques de Montréal (IRCM)
- Institut du cancer de Montréal

Find out more: https://biomol.umontreal.ca/en/#

Professors
Consult the list of the department’s faculty members and their specializations: http://www.biomol.umontreal.ca/larecherche/les-professeurs/

Directory of theses and dissertations
Visit Papyrus, Université de Montréal’s institutional repository, to search for research projects by our faculty and researchers as well as theses and dissertations by our students: https://papyrus.bib.umontreal.ca/xmlui/?locale-attribute=en

Research news
Read the latest research news from UdeM: http://nouvelles.umontreal.ca/en/