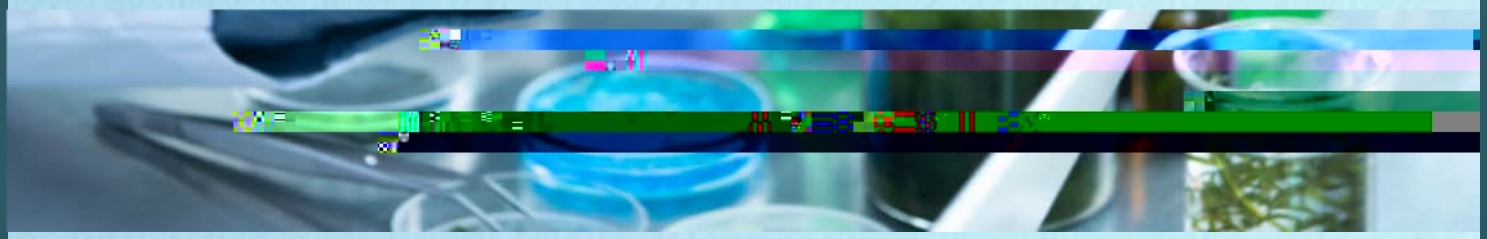
Department of Microbiology & Immunology



Undergraduate Handbook 2020-2021

WELCOME TO THE DEPARTMENT OF MICROBIOLOGY AND IMMUNOLOGY!

www.mcgill.ca/undergrad.microimm@mcgill.ca

This handbook is designed to provide you with information about undergraduate courses and programs offered in the Department of Microbiology and Immunology at McGill University. The Department offers three programs of study: The Liberal program, the Major program, and the Honours program.

The Administrative Offices are located on the 5th floor of the Duff Medical Building on University Street. Full-time faculty members have laboratories at this location, while associated staff are in nearby research institutes and teaching hospitals.

You are welcome to come and talk to our faculty members and to meet other students. We are here to help you and hope you will enjoy and be enriched by the courses you may take with us.

For specific enquiries, please contact the Studwig@2efnt fisr. -

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SCOPE OF MICROBIOLOGY AND IMMUNOLOGY

Microbiology is the study of the microorganisms such as bacteria, viruses, unicellular eukaryotes and parasites. Microorganisms play an important role in human and animal disease, food production (bread, cheese, wine), decay and spoilage, contamination and purification of water and soil, production and the recycling of food in lakes and oceans.

Microbiologists study these tiny, self-replicating machines in an attempt to understand the basic principles of life: growth, metabolism, cell division, control of gene expression, response to environmental stimuli. Microbiologists are also concerned with controlling or harnessing microorganisms for the benefit of people, by isolating antibiotics or producing vaccines to protect against disease and by developing and perfecting microorganisms for industrial uses.

Immunology is the study of the molecular and cellular basis of host resistance and immunity to external agents such as pathogenic microorganisms. Immunologists attempt to understand the mechanisms by which the body recognizes foreign antigens, generates appropriate antibodies to an enormously diverse spectrum of antigens, and sequesters and kills invading microorganisms.

Their discoveries lead to better understanding of vaccination against disease, transfusions and organ transplants, allergies, cancer, autoimmune diseases and immune-deficiency diseases such as AIDS. Immunologists have developed monoclonal antibodies as highly specific tools in

What A Degree in Microbiology & Immunology Prepares You For

Many opportunities exist for careers in basic or The Business of Science, medical microbiology, environmental microbiology, and biotechnology. They include positions in industry (pharmaceutical and biotechnology), hospitals, universities, and government agencies (environment, public health and energy, Health Research (Technician, Research Assistant). A degree in microbiology also provides an excellent basis for entering professional and postgraduate programs in medicine, dentistry, the veterinary sciences, research, and education.

For further information, consult the " Career Opportunities " section in this handbook.

INTRODUCTION

History of the Department of Microbiology and Immunology

Sixty years ago, efforts began to consolidate teaching and research in microbiology within the faculties of Medicine and Science. As a result, a new Department of Bacteriology was founded with Dr. E.G.D. Murray as its first Chairman. Dr. Murray arrived from Cambridge to find that he was the sole staff member of a department whose few laboratories were not designed for bacteriological work. With energy and determination, Murray undertook to create a new department for teaching medical students as well as undergraduate and graduate students in the science of microbial organisms and disease pathogenesis.

Murray's work set the stage for today's extensive network of collaboration with key research institutions, including the Biotechnology Research Institute of the National Research Council, Lady Davis Institute, Institut Armand-Frappier and l'Institut de Recherches Cliniques de Montréal-4(a)(g)6(y)13.681ac

and medical microbiology. There are research laboratory facilities for fourteen full-time staff members in the Duff Medical Building. Affiliated staff are in nearby research institutes or

- US loans pick-up

Faculty of Science/Sousa

The office of the Faculty of Science and the Science Office for Undergraduate Student Advising and can provide general and specific information about undergraduate science programs.

Both are located in Dawson Hall, room 405 for SOUSA services.

Contact: (514) 398-5442 or visit the website for more information.

SOUSA can be contacted for academic advising, outreach, and academic follow-up of records decisions(s)SOUSA(s)-4/S-1 Tc 0 2.1(t)-2( )n(U)3(SA s)2(e)-1(rv.4rv.4o)26 0 Td2(H)-9/SE0 Tw L Td24rvP Y Td2410 2.1(6(U o4 Tc9(WI Td24

One-stop shop for all things health and wellness: appointments with a professional, local wellness advisors, self-help resources, workshops and groups https://mcgill.ca/wellness-hub/

Hours

The Hub is **open** from 8:30 a.m. - 4:30 p.m., Monday to Friday. **Drop-ins** begin being processed at 9 a.m. Please note that **lab hours** differ.

Brown Student Services Building
3600 McTavish Street, 3rd floor
Montreal, Quebec H3A 0G3
Tel: 514-398-6017
Fax: 514-398-2559

Faculty of Arts and Science Calendar

The regulations and other important details on choosing courses are available online.

Microbiology & Immunology Undergraduate Handbook

The handbook which you are now reading supplements the calendar with more specific information on programs and courses in the Department. The required courses that are listed in this handbook take precedence over errors that may occur in the calendar. On line information can be found at: http://www.mcgill.ca/microimm/undergraduate

Departmental Notice Board

The Departmental Notice Board provides current information concerning courses and programs and is located on the fifth floor of the Duff Medical Building. Important information on available scholarships and awards is posted throughout the year.

Code of Conduct and Mistreatment Reporting

The Department of Microbiology & Immunology and the Faculty of Medicine are committed to build and promote a respectful and inclusive learning and work environment for teachers and learners. Please find below important links to learn how to report cases of alleged mistreatments.

Faculty of Medicine Code of Conduct
Wellness Enhanced Lifelong Learning (WELL)
Office and the Dean of Students Office

Student Affairs Officer

The Office of the Student Affairs Officer is located in Room 511 of the Duff Medical Building. If you wish to enquire about or discuss any aspect of the undergraduate courses or programs offered by the Department of Microbiology & Immunology, you may contact Carmen Aimee Paez, the Student Affairs Officer by calling 514-398-3915 to make an appointment or booking as appointment only here.

ACADEMIC ADVISORS

CHIEF ADVISOR	**Dr. Benoit Cousineau**	**398-8929, Room 617** **Benoit.cousineau@mcgill.ca**
Study Away and Exchange Advisor	**Dr. Benoit Cousineau**	**398-8929, Room 617 (DUFF)** **Benoit.cousineau@mcgill.ca**
Medical School Application Advisor	**Dr. Dalius Briedis**	**398-3925, Room 510 (DUFF)** **Dalius.briedis@mcgill.ca**

Academic Members

If you are looking for an individual, try checking our online list of Microimm People. This profile list will show you all academic members in the department of Microbiology & Immunology. The list can be found here.

MICROBIOLOGY AND IMMUNOLOGY STUDENTS' ASSOCIATION (MISA)

All students registered in Microbiology and Immunology are members of the Microbiology and

REGISTRATION

DESIGNATION U0, U1, U1, U3:

- first year of study by four-year students (120 credits) is: U0
- second year of study is: U1
- third year of study is: U2
- fourth year of is: U3
  Quebec students who enter from CEGEP begin their studies in the U1 year and progress to U2 and U3 (90 credits).

Courses

A complete online list of the courses available in Microbiology & Immunology.

Registration: General Information

Students register and make course changes via Minerva **http://www.mcgill.ca/minerva-students/.**

Ele

Credit Load

The normal course load is 4-5 courses (12-15 credits) per term; a full year is normally 30 credits. If you are not sure how many credits to register for each term or for the academic year, keep

Any courses dropped during this period will be deleted from your record and will not appear on your transcript. Your record will only show the courses in which you are registered for once the

Exam

MICROBIOLOGY & IMMUNOLOGY PROGRAMS

LIBERAL PROGRAM (50 REQUIRED CREDITS)

This flexible 50-credit program provides students with a strong co

U2 Required Courses (16 credits)

MIMM 301	Scientific Communication & Skills	1 Credit
MIMM 314	Intermediate Immunology	3 Credits
MIMM 323	Microbial Physiology	3 Credits
MIMM 324	Fundamental Virology	3 Credits
MIMM 384	Molecular Microbiology Lab	3 Credits
MIMM 385	Laboratory in Immunology	3 Credits

U3 Complementary Courses (6 credits)

6 credits selected from:

MIMM 387	The Business of Science	3 Credits
MIMM 413	Parasitology	3 Credits
MIMM 414	Advanced Immunology	3 Credits
MIMM 465	Bacterial Pathogenesis	3 Credits
MIMM 466	Viral Pathogenesis	3 Credits
MIMM 509		

*** Students who have taken CHEM 212 in CEGEP are exempt and must replace these credits with an elective course(s).**

**** Students who have taken CHEM 222 in CEGEP are exempt and must replace these credits with an elective course(s).**

BIOL 200	Molecular Biology	3 Credits
BIOL 202	Basic Genetics	3 Credits
CHEM 212		

MIMM 413	Parasitology	3 Credits

Complementary Courses (6 credits)

6 credits selected from:

MIMM 414	Advanced Immunology	3 Credits
MIMM 465	Bacterial Pathogenesis	3 Credits
MIMM 466	Viral Pathogenesis	3 Credits

Complementary Courses (9 credits)

9 credits selected from:

* Students may select either ANAT 458 or BIOC 458, but not both.

ANAT 261	Intro to Dynamic Histology	4 Credits
ANAT 262	Intro Molecular &Cell Biol	3 Credits
ANAT 365	Cellular Trafficking	3 Credits
ANAT 458	Membranes & Cellular Signaling	3 Credits*
BIOC 312	Biochemistry of Macromolecules	3 Credits
BIOC 450	Protein Structure and Function	3 Credits
BIOC 454	Nucleic Acids	3 Credits
BIOC 458	Membranes & Cellular Signaling	3 Credits*
BIOL 300	Molecular Biology of the Gene	3 Credits
BIOL 309	Mathematical Models in Biology	3 Credits
BIOL 314	Molecular Biology of Oncogenes	3 Credits
BIOT 505	Sel Topics in Biotechnology	3 Credits
CHEM 203	Survey of Physical Chemistry	3 Credits
CHEM 204	Physical Chem./Biol.Sci. 1	3 Credits
CHEM 302	Intro Organic Chemistry 3	3 Credits
COMP 204	Computer Programming for Life Sci	3 Credits
COMP 206	Intro to Software Systems	3 Credits
COMP 250	Intro to Computer Sciences	3 Credits
EXMD 504	Biology of Cancer	3 Credits
MIMM 387	The Business of Science	3 Credits
MIMM 414	Advanced Immunology	3 Credits
MIMM 465	Bacterial Pathogenesis	3 Credits
MIMM 466	Viral Pathogenesis	3 Credits
MIMM 496 (D1)	Micro Adv. Research Project	3 Credits
MIMM 496 (D2)	Micro Adv. Research Project	3 Credits

MIMM 497 (D1)	Immunology Adv. Research Project	3 Credits
MIMM 497 (D2)	Immunology Adv. Research Project	3 Credits
MIMM 509	Inflammatory Processes	3 Credits
PATH 300	Human Disease	3 Credits
PHAR 300	Drug Action	3 Credits
PHAR 301	Drugs and Disease	3 Credits
PHGY 209	Mammalian Physiology 1	3 Credits
PHGY 210	Mammalian Physiology 2	3 Credits

*If you have passed a CEGEP course that is equivalent to a McGill course, you are exempt from that McGill course and will not receive McGill credit if you take it. Some CEGEP courses provide McGill exemptions no matter what CEGEP you were attending when you took them, while other courses provide exemptions only if taken at certain CEGEPs. To make sure you receive all the exemptions you qualify for, please visit the McGill website for Transfer Credits & Advanced Standing.

HONOURS PROGRAM (72 REQUIRED CREDITS)

The Honours program in Microbiology and Immunology combines the substantial background given by the Major program with a challenging opportunity to carry out a laboratory research project in the U-3 year. The required courses that are part of the Honours program offer broad exposure to different areas important to the biomedical sciences, as well as a high degree of specialization in these disciplines. These courses prepare students for a significant research experience under the direct supervision of a professor in the Department. Those who are considering careers in research in the biological sciences or in medicine, or employment in the biotechnology field, are encouraged to take advantage of the special opportunities offered by this Honours program.

Students intending to apply to the Honours program must complete the Major program in U-1 and U-2. A CGPA of at least 3.5 must be obtained by the end of the U-2 year in order to enter the Honours in U-3.

For graduation in Honours, students must pass all required courses with a C or better and achieve a sessional GPA of at least 3.30 in the U3 year.
The Honours research project course, Independent Studies in Microbiology and Immunology (MIMM 502 D1, D2), is a unique opportunity to gain first-hand research experience, to design and execute scientific experiments using sophisticated methods and equipment, and to participate in the dynamic and creative interactions that contribute to scientific discovery. Students in the project course work in the laboratory alongside a professor, graduate students, and research assistants during two terms. They learn to communicate science in writing and by a seminar presentation. See the course description for registration requirements on the McGill website here.

Students who wish to apply to the Honours program must indicate in writing to Carmen Aimee Paez, Student Affairs Officer, by the fourth Friday of January of their U-2 year. Since there are a limited number of places available in MIMM 501/502 D1, D2 registration requires approval of the Department.

U1 Required Courses (26 credits)

* Students who have taken CHEM 212 in CEGEP are exempt and must replace these credits with an elective course(s).

** Students who have taken CHEM 222 in CEGEP are exempt and must replace these credits with an elective course(s).

BIOL 200	Molecular Biology	3 Credits
BIOL 202	Basic Genetics	3 Credits
CHEM 212	Intro Organic Chemistry 1	4 Credits*
CHEM 222	Intro Organic Chemistry 2	4 Credits**

MIMM 211 Introductory Microbiology 3 Credits

Undergraduate Program Comparison

DEPARTMENTAL PREFIX: **ANAT** = Anatomy **MATH =** Mathematics

3 credits selected from:

BIOC 503	Immunochemistry	3 credits
MIMM 509	Inflammatory Processes	3 credits
PHGY 531	Topics in Applied Immunology	3 credits

plus 6 credits selected from:

* Students take either ANAT 458

Applying to Graduate

Make sure you have completed these steps and satisfied these requirements. See your SOUSA advisor if you have questions or have trouble making a change on Minerva.

1. **Apply to graduate on Minerva** in your final year. Deadlines vary, and can be a few months before graduation. Do this when you are pretty sure when you will graduate. Note that applying for graduation does not affect your ability to change your courses or your programs, and you do not have to wait for your final grades to show on your transcript, even if you have deferred an exam from a previous term.

   Select the correct term of graduation:
   Winter = May graduation, June convocation
   Summer = October graduation, November convocation
   Fall = February graduation, June convocation
   This should show near the top of your Minerva transcript, on the right.
   If you cannot select the term you want on Minerva, contact your SOUSA advisor. Do NOT select any other term that is "close"!
   See the Convocation and Diploma site for instructions on attending convocation and getting your diploma.

2. **120 credits minimum** total required for Bachelor degree. Shows at bottom of transcript under "Total Credits".

3. **Freshman requirements met** (non-CEGEP students), even if you were admitted into U1. If you received 24 or more advanced standing credits and were accepted into U1, you are still responsible for ensuring that your freshman sciences are complete.

4. **Correct program(s) on transcript in final term.**
   Verify your Minerva transcript. You cannot graduate with an incomplete program on your record in your final term. If you do not intend to complete a program, drop it. Also, you will not graduate from a program if it is not listed in your final term. (Management minors can be an exception, we sometimes add those late).
   If you think you are in an Honours program, it should say so on your transcript. If it does not, see your programadvisor.

5. **All programs completed.** Checi8(e)3(d s)s6n y3(a)eC 0.00es4(o)-ept[(C)8(he)eci8(e)3(d s)s6n y3(a)es s

7. **No restricted courses outside Arts and Science!** Check our list of restricted courses. If you take a course outside Arts or Science and it is

CAREER AND EMPLOYMENT OPPORTUNITIES

Career and Placement Services

McGill University offers Career and Placement Services for its students. This service provides information regarding summer employment, preparing a curriculum vitae, contacting various governmental agencies, and employment opportunities in chosen fields. Counsellors are available to answer questions at the office, which is located in the Brown Student Services Building, Suite: 2200, 3600 McTavish St., Montreal, H3A 1Y2, telephone no.: 398-3304.

Future Opportunities

A degree in microbiology provides an excellent basis for entering professional and postgraduate programs in biomedical research, education, medicine, dentistry, and the veterinary sciences. Many opportunities exist for careers in pure or The Business of Science, medical microbiology, environmental microbiology, and biotechnology. They include positions in industry (pharmaceutical, agri-food, service and biotechnology), hospitals, universities, research institutes, and government (environment, public health and energy).

The following is a list of the major categories of employers in Microbiology and Immunology.

CATEGORY (EXAMPLE)	PROJECT AREAS
BIOLOGICAL INDUSTRIES (Cedarlane)	Monoclonals, Biological Products
ENERGY INDUSTRIES (Petrocan)	Waste Management, Petro-chemicals
ENVIRONMENT LABORATORIES (Department of Environment)	Environmental Analysis and Monitoring
FERMENTATION INDUSTRIES (Labatt, Seagram, Agropur)	Production and Quality Control
FOOD INDUSTRIES (Maple Leaf)	Quality Control, Meat, Bakeries, etc.
HEALTH AND WELFARE	Drug, Food Additives Evaluation

(Government of Canada)	
HOSPITALS (Royal Victoria Hospital)	Diagnostic, Research

CEDARLANE Immunochemical
Hornby, Ontario

BIOMEDICAL COMPANIES IN THE MONTREAL AREA

ABBOTT LABS LTD.
AMERSHAM PHARMACIA CANADA
ALGENE BIOTECHNOLOGIES
APOTEX INC.
ASTRA PHARMA CANADA
BAYER CANADA
BECKMAN INSTRUMENTS CANADA
BIOCHEM PHARMA
BIOMATRIX
BIOMERIEUX CANADA INC.
BIORECHERCHE CANADA
BIORTHEX
BIOVET

NYMOX
PERKIN ELMER CANADA
PFIZER
PHOENIX INTERNATIONAL
POLYMER SOURCE INC
QUANTUM BIOTECHNOLOGIES INC.
RHONE-POULENC-RORER
ROUGIER INC.
RTP PHARMA INC.
SABEX INC.
SARSTEDT W CANADA
SCHERING CANADA INC.
SODEXEN INC.
SPINEX MEDICAL TECHNOLOGIES INC.
THERALIPIDS INC.
THERAPEX
UPJOHN CANADA
VWR CANADA
WELLCOME INC.
WYETH AYERST LTD.

GOVERNMENT RESEARCH CENTRES

BIOTECHNOLOGY RESEARCH INSTITUTE (NRC - BRI) Montreal
AGRICULTURE CANADA
SAINT-HYACINTHE FOOD RESEARCH CENTRE Saint-Hyacinthe
LAURENTIAN FORESTRY CENTRE Sainte-Foy
ANIMAL PATHOLOGY LABORATORY Montreal
LENNOXVILLE RESEARCH STATION Lennoxville
SAINT-JEAN-SUR -RICHELIEU RESEARCH STATION Saint-Jean-sur-Richelieu
SAINTE-FOY RESEARCH STATION Sainte-Foy
CENTRE QUÉBÉCOIS DE VALORISATION DE LA BIOMASSE Sainte-Foy
INSTITUT DE TECHNOLOGIE AGRO-ALIMENTAIRE Saint-Hyacinthe (LaPocatière)
CENTRE DE RECHERCHE INDUSTRIELLE DU QUÉBEC Sainte-Foy
MONTREAL BOTANICAL GARDEN Montreal

QUÉBEC UNIVERSITIES

MCGILL UNIVERSITY
Montreal
- Sheldon Biotechnology Centre
- Office of Industrial Research
- Macdonald College, Ste-Anne-de-Bellevue

UNIVERSITÉ DE QUÉBEC

Abitibi-Témiscamingue	
Chicoutimi	
Hull	
Montréal	- Armand-Frappier Institute, Laval - Institut National de la Recherche Scientifique (INRS)
Rimouski	
Trois-Rivières	

UNIVERSITÉ DE MONTRÉAL	**-** Clinical Research Institute of Montréal (IRCM)
Montréal	- Montréal Cancer Institute - Ecole Polytechnique de Montréal/Technology Development Centre - Veterinary School of Medicine, Saint-Hyacinthe

UNIVERSITY OF SHERBROOKE
Sherbrooke

LAVAL UNIVERSITY	
Sainte-Foy	- Industrial Liaison Office - Centre Hospitalier de l'Université de Laval (CHUL)

CONCORDIA UNIVERSITY
Montreal

BISHOP'S UNIVERSITY
Lennoxville