The Human Body - what you’ll learn in Life Sciences and Biochemistry

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Faculty of Health Sciences
**What is “Life Sciences” at Queen’s?**
This is a highly sought after undergraduate program that offers students both lecture instruction and laboratory opportunities to learn about human life. With courses ranging from the anatomy and physiology of the organs in our bodies to the bacteria and viruses that compromise organ functions to the cells that give rise to carcinomas to the drugs used to cure us of infection and disease.

**What is “Biochemistry” at Queen’s?**
This undergraduate program offers students a unique opportunity to learn about the machinery in cells that governs their shape, movement, and functional importance, as well as how this machinery is altered in response to injury and disease.
Human Heart – anatomy and function
Cardiovascular and Blood – development, normal function, and disease

**Dr. Ozolins** – Cardiac defects (Pharmacology)

**Dr. Pang** – Hormone production (Cell Biology)

**Dr. Cote** – Contractile proteins (Biochemistry)

**Dr. Maurice** – Endothelial cell function (Pharmacology)

**Dr. Boyd** – Biomarkers of Cardiac arrest (Critical Care Medicine)

**Drs. James and Lilicrap** – Congenital blood diseases (Pathology)

**Dr. Funk** – Prostaglandins (Physiology)

**Dr. Adams** – Hypertension (Pharmacology)

**Dr. Zhang** – Arrhythmias (Physiology)

**Dr. Ferguson** – CNS control of hypertension (Physiology)

**Dr. Jin** – Stroke (Neurology)

**Drs. James and Lilicrap** – Congenital blood diseases (Pathology)
Olfactory Nervous System
Combining anatomy, biochemistry, genetics, neurosciences, physiology, pathology, pharmacology, etc. to understand how we process the sensation of smell.

For their discovery of odorant receptors and the organization of the olfactory nervous system.

**Nobel Prize in Physiology or Medicine 2004**

- Protein must be able to detect a large number of odorants
  - One gene, multiple combinations (like immunity)
  - A large family of genes each encoding a different receptor
- Discovered the Odorant Receptor Gene family (in 1991)

**Richard Axel**  **Linda Buck**

Introductory Neurobiology 2012

... For their discovery of odorant receptors and the organization of the olfactory nervous system
Faculty of Arts and Science

- Biology
- Chemistry
- Geology
- SKHS
- Math
- Physics
- Psychology

Faculty of Health Sciences

- Medicine
- Nursing
- Rehabilitation Therapy

LISC & BCHM
Faculty of Arts And Science

1st year declared ...
Direct Entry

- Music
- Kinesiology
- Fine art
- Physical and Health Education

1st year undeclared ...
Not Direct Entry

- Social Sciences
- Life & Physical Sciences (e.g., LISC and BCHM)
- Humanities
- Languages
- Creative Arts
- Interdisciplinary Programs
Faculty who teach in LISC and BCHM are in ...

Department of Biomedical and Molecular Sciences
Department of Pathology and Molecular Medicine
Department of Public Health Sciences
+ Departments of Biology, Chemistry, Mathematics, Physics, etc
Entry into 2nd year LISC requires:

- GPA greater than 2.5
  (automatic acceptance GPA ≥ 3.2)
- Pass in 1st year Chemistry
- No less than 27-unit load

Entry into 2nd year BCHM requires:

- GPA greater than 2.5
  (automatic acceptance GPA ≥ 2.9)
- Pass in 1st year Chemistry
- No less than 27-unit load

Maximum enrolment in Sept 2016...

350

90
DEGREE PLAN:

Life Sciences – Major (Science) - Bachelor of Science (Honours) LISC-M-BSCH

(core courses / option or supporting courses)
DEGREE PLAN:

Life Sciences – Specialization (Science) - Bachelor of Science (Honours) LISC-P-BSCH

Sub plan - Biomedical Sciences

(core courses / option or supporting courses)
DEGREE PLAN:

Life Sciences – Specialization (Science) - Bachelor of Science (Honours)
LISC-P-BSCH

Sub plan - Biomedical Discovery

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<th>(core courses / option and supporting courses)</th>
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### 1st Year
- BIOL 102/103
- CHEM 112
- MATH 121 or MATH 122
- PHYS 104, 106, or 117

### 2nd Year
- ANAT 215/216
- BCHM 218
- CHEM 281/282
- MICR 221
- PHGY 214

### 3rd Year
- BCHM 310 (lab)
- MICR 360
- (or MICR 3rd/4th level)
- STAT 263
- PHAR 340

### 4th Year
- 499 Research Project in ANAT, CANC, EPID, MICR, NSCI, PATH, PHAR, or PHGY
- PHAR 450

Sub plan - Biomedical Discovery
DEGREE PLAN:

Life Sciences – Specialization - Bachelor of Science (Honours) LISC-P-BSCH

4 Sub plans

(core courses shown)
Combined BScH/MSc Accelerated Program

Combined BScH/MSc (Biomedical & Molecular Sciences)

The Department of Biomedical & Molecular Sciences is very excited to launch a new initiative which offers a combined program of a BScH/MSc (Biomedical & Molecular Sciences). This program offers an opportunity for students in the 4th year of their Honours program (Biomedical Discovery stream of the Life Sciences or Biochemistry programs) to take up to 2 courses in Biomedical & Molecular Sciences at the graduate level which would then allow these students to enter the graduate program with advanced standing. Research begun in the 4th year thesis project could be carried forward as a foundation for the graduate thesis, which would create an opportunity for exceptional students to complete the graduate degree within 4 terms.

Admission to the combined program is a two-step process.

Step 1:

Students will have the option to apply for admission to the combined program (permission to take graduate level courses) in the winter term of the 3rd year, in parallel with the process for admittance to the Honours year and the thesis research project. All applications will then be reviewed by the DBMS Graduate Admissions Committee.

If accepted into the combined program, in Year 4 of the BSc (Honours) program students will be permitted to take up to two 3.0 graduate level courses for a total of 3 or 6 credits towards the 12 credits required for the MSc degree. It is the student's responsibility to gain admission to these graduate courses following acceptance into the program. These courses will be counted as electives or science options towards completion of the degree requirements in the BSc (Hons) program. Only 1 of these courses may be a combined undergraduate/graduate (400/800) level course. The second (and all subsequent) graduate courses must be graduate only (800 and/or 900 level).

Step 2:

For admission to the MSc program in Biomedical & Molecular Sciences with advanced standing, students will be expected to complete the standard SGS application process, have an overall A- average in the previous 2 years of their undergraduate program, and have demonstrated significant research productivity in the 4th year thesis project. In order for the student to be granted advanced standing in the M.Sc. degree program, they must have received a final grade of at least B+ (B plus) in the graduate course(s) taken during the 4th year and meet all other requirements for admission to the MSc program in Biomedical & Molecular Sciences.

Applications:

Students should apply in writing via email to (Dr Louise Winn: winnl@queensu.ca) with a copy to the Graduate Assistant Diane Sommerfeld (diane.sommerfeld@queensu.ca) and at that time should provide a copy of their transcript, a brief description (1 Paragraph) of their research project, the name of their Project Supervisor, and identify the graduate level courses they hope to enroll in during their 4th year.
2011 – 2014 Graduation Lists (n=858, 4-year LISC Honours students)

- SSP LISC (403)
- MAJ LISC (455)

*Not possible to do LISC (MAJ) / BCHM (MIN) and vice versa
*Not possible to do BIOL (MAJ) / LISC (MIN)
DEGREE PLAN:

Biochemistry – Major (Science) - Bachelor of Science (Honours)
BCHM-M-BSCH

(core courses / option and supporting courses)
DEGREE PLAN:

Biochemistry – Specialization (Science) - Bachelor of Science (Honours) 
BCHM-P-BSCH

(core courses option and supporting courses)
Queen's Undergraduate Internship Program (QUIP)

The Queen's Undergraduate Internship Program (QUIP) provides students with a 12-16 month work experience. QUIP internships are paid, professionally supervised, career-related positions designed to offer second or third year students the opportunity to learn about current advances, practices and technologies in business and industry. The program is open to students in the Faculty of Engineering and Applied Science (domestic and international), Faculty of Arts and Science (domestic and international), School of Computing (domestic and international) and the School of Business (domestic only; not for credit). Due to the longer work term (compared to a 4-month co-op), employers are highly motivated to maximize their time and investment. This means that Internship students are offered the opportunity to manage more extensive and significant projects.

Search QUIP job postings  
Contact QUIP coordinator

Got Questions?  Come and see the QUIP Coordinator during QUIP Drop-in Advising Hour – no appointment necessary!

QUIP Drop-in Advising: Every Tuesday and Thursday from 11-12 in the Career Advising and Resources Area (Sept-April)

Eligibility

The program is open to students in the Faculty of Engineering and Applied Science (domestic and international), Faculty of Arts and Science (domestic and international), School of Computing (domestic and international) and the School of Business (domestic only - please see an academic advisor in the School of Business before registering).

- Queen's students can participate in QUIP after their 2nd or 3rd year of studies and must be returning to complete their final academic term after the internship.
- Students must have a minimum GPA of 1.9 and the permission of your undergraduate chair to register in QUIP.
DEGREE PLAN:

Biochemistry – Specialization (Science) - Bachelor of Science (Honours)
BCHM-P-BSCH

Cooperative program
(core courses shown)

3rd Year
BCHM 313
BCHM 315/316
BCHM 317
+ 3.0 or 6.0 units of 300-level course with lab in ANAT, BIOL, BIOM, CHEM, LISC, PHAR or PHGY

4th Year
BCHM 411
BCHM 442
+ BCHM 421
(8-month placement away)
+ BCHM 422
(4-month period at Queen's)
Final 4-month placement away
(Research Project + Cooperative)

5th Year
BCHM 410
BCHM 432
How about an “exit” strategy?

Did you get an acceptance to medical school in your 3rd year?

Life Sciences – General (Science) Bachelor of Science
Honours routes of Major or Specialization

Biochemistry – General (Science) Bachelor of Science
Honours routes of Major or Specialization
Online Bachelor of Science

A *General Bachelor of Science plan* is a concentration of 48 units in one subject area and 42 units of electives taken from other subject areas. Queen's Arts and Science Online currently offers the following online Bachelor of Science degree plan:

- Bachelor of Science (General) in Life Sciences

Visit the Courses page to see the range of options for your electives. Please note that the option courses listed below may not be offered every year, and that you are not required to take all of them to complete your degree. You simply need to take just enough to meet the elective requirement in your chosen plan.

- **Admission Requirements (Online Bachelor of Science)**

- **Life Sciences Program Plan**

**Upcoming Key Dates**

- November 6, 2015
  - Fall and Fall/Winter Exam Centre Change Deadline
- November 6, 2015
  - Fall Term Academic Drop Deadline
- December 4, 2015
  - Fall Term End

**Apply**

The application process for our courses is entirely online. Click on this button to get started.

**Apply Now**
Australia, New Zealand, United Kingdom, China, Taiwan, Hong Kong, Singapore, France, Sweden, Germany, Netherlands, Etc...
Organized by BCHM and LISC Student Executives

Sponsored by The Office of the Associate Dean, Life Sciences and Biochemistry
You are invited to attend the 4th annual ....

“Canadians Studying Medicine Abroad”

Botterell Hall B147
Wednesday 28th of October 2015
6:30 – 7:30 PM

This is your chance to hear from Canadian docs who did their medical education in Australia, the Caribbean, or Ireland, and are now here at Queen’s as Residents. Come with lots of questions!

Host –
Dr. Michael Kawaja
Associate Dean Life Sciences and Biochemistry

Speakers –
Dr. Janique Dyba, PGY 2 Internal Medicine Queen’s
BPHE & BScH (Queen’s), MBBS (University of Queensland, Australia)

Dr. Jennifer Martins, PGY 3 Psychiatry Queen’s
BScH & MSc (Western),
MD (Medical University of the Americas, St. Kitts & Nevis)

Dr. Asad Naqvi, PGY 2 Diagnostic Radiology Queen’s
BScH (McMaster), MBBS (University of Limerick, Ireland)
LSO Networking Night
Tuesday, November 10, 2015

LSO / CIMTEC Networking Night sponsored by:

ridout & maybee LLP
CANADA'S INTELLECTUAL PROPERTY AND TECHNOLOGY LAW FIRM

Please join the LSO Board members and other Industry individuals for the November Networking Night

When: Tuesday, November 10th

Where: Marché Restaurant’s MUVBAR - Brookfield Place Street Level

N.B. Our event will be held at the INDOOR Brookfield atrium patio at MUVBAR.

Time: 5:30pm-9:00pm

Please join the LSO Board members for November’s monthly Networking Night at Marche Restaurant. It will be a casual opportunity to meet and network with people from all across the Life Sciences industry.

LSO is the voice of Ontario’s vibrant and diverse life sciences sector through advocacy, education and promotion of commercial success. Please drop by anytime after work and join us for drinks (cash bar) and build your own network. We hope to see you all there.
**What extracurricular activities are available?**

Biochemistry and Life Science students both have an active, elected student council that organize sports, social and academic related activities for their students, including an annual banquet, BBQ’s, book and clothing sales. Life Science students also have their own quarterly newspaper “Life Beat” and research publication “QSURJ”.

Maclean’s 2013 Canadian Universities Guidebook cited Life Sciences at Queen’s as a Standout Program, having strength in “the integration of basic health sciences with natural and physical science”. 
Botterell Hall (offices and research labs)  New Medical Building (teaching labs)
State-of-the-art Teaching Labs

World-class Human Anatomy Labs
Students presented their life sciences posters in the Bioscience Complex.

27. March 2013
Canadian University Life Science Challenge

Toronto / January 2014
Convocation

On the 13th of June 2013, 196 LISC students and 38 BCHM students graduated with Bachelor of Science (Honours) degrees.

71% LISC with Distinction and 53% BCHM with Distinction.
Awards Presentations

Heather Nicol – Gold Medal LISC SSP LISC (neuroscience) ...

now graduate studies at McGill

Sean Robinson – TriColour Award MAJ LISC / MIN French ...

now medicine at McMaster
Awards Reception
Fall 2015 ...

Chancellor’s recipients
Career opportunities after Life Sciences and Biochemistry at Queen’s

- Medicine
- Biomedical Research
- Law
- Health Care, Policy, Administration, etc
- Industry
- Pharmacy Pharmaceutical Sciences
- Veterinary Medicine
- Dentistry
- Education
- Chiropractic
91% of class completed undergraduate degrees
27% of class have post-graduate degrees, of which 9 are PhDs
The Life Sciences program at Queen’s University is one of its largest Bachelor of Science degree plans on campus because of its high demand by students who wish to pursue careers in biomedical research and health care.

The Biochemistry program is a comprehensive program in the Bachelor of Science degree plan, which provides students with an in-depth training in modern experimental Biochemistry and prepares for entry into graduate programs, industry, and careers in the biomedical sciences.

http://healthsci.queensu.ca/liscbchm

kawajam@queensu.ca  liscbchm@queensu.ca
Contact Our Office

Botterell Hall, Room 813
Queen's University
Kingston, ON
K7L 3N6

Office Hours are Monday to Friday
9:00 am to 4:00 pm (closed 12:00 - 1:00 pm)

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The Undergraduate Program Office is always available to advise students in all aspects of their studies at Queen's. Please contact us for assistance and if necessary an appointment.