

Biology 370 (Human Genetics Applied) is a course for upper division students interested in learning more about contemporary research in human genetics and its application to clinical and other real-world situations. My name is Roberta Palmour (roberta.palmour@mcgill.ca) and I am the official coordinator of this course. My co-coordinator is Jamie Engert (jamie.engert@mcgill.ca), and we are both available electronically for questions. We both are basic scientists with research interests in clinically relevant fields.

The course is divided roughly into two parts. The first half emphasizes genetic principles and the rapid advance of knowledge regarding genetic and genomic variation, genetic and genomic expression and the contribution of genes and the genome to both normal and abnormal traits. Because the rate of progress in human genetics is so rapid, some readings will be taken from electronically available sources.

The second half of the course comprises introductions to the multiplicity of applications in human genetics, and draws heavily on lectures from practitioners, both clinical and basic. This course will provide you with first-hand information regarding genetic medicine, genetic counselling and the development of technologies such as pre-implantation diagnosis and gene editing. It may also be the course that introduces you to vocations you hadn't previously considered.

Students who elect to take this course should already have a basic background in genetics, and should understand (and be able to apply) the science and principles that govern mitosis, meiosis and transmission genetics. If you have any doubt about your preparedness, or if you want to review more basic information prior to starting this course, please do not hesitate to contact me.

A brief word about marking in this course. We have never used multiple-choice examinations in this course, but rather have always focused on problem-based learning and short-answer questions. In addition, this is the atypical science course that requires a written essay, worth 25% of the final mark. Rather than following the usual dictum of 25% midterm examination and 50% final examination, we plan to develop a series of problem assignments and timed evaluations to track progress across the term. The written essay will remain a required component, and more information will be given early in the term.

Biology 370 has met at 8:30 Tu/Th for many years, and we will continue to provide on-line lectures (recorded) at that time. In addition, we will plan to have 2 or 3 short Q&A sessions each week via Zoom. Slides for each lecture will also be posted on MyCourses. There is no required textbook for Biology 370, but 2 good reference texts are Human Molecular Genetics (Strachan and Read) and Genetics and Genomics in Medicine (Strachan and others). Additional sources and readings will be posted as appropriate.

A more detailed outline of topics is presented on the following page, as are the required McGill elements regarding instruction.

BIOLOGY 370: Human Genetics Applied

Coordinator:	Roberta Palmour (roberta.palmour@mcgill.ca)
Instructors:	A Ao, S Bailey, J Engert, C Ernst, J Fitzpatrick, L Jerome-Majewska, J Mitchell, R Palmour, B Richards, Y Trakadis, Y Yamanaka
Purpose:	The purpose of the course is to survey contemporary genetics and genomics of man, the applications of this knowledge, and the implications of these applications.
Topics:	(not necessarily in the order they will be presented) Variation: expressed and not expressed; protein, DNA, RNA The human genome: sequencing, mapping, interrogating Mendelian inheritance and its implications; classical linkage analysis Complex traits: genetics and phenomenology; genome wide association; bridging the gap between association and causation Regulatory gene expression in complex traits; Epigenetics Population genetics and epidemiology Developmental and reproductive genetics Genetic counselling; genetic screening and therapy; identification of new and rare mutations Genetics of behaviour; cancer genetics Gene editing: are we ready for this in man?

REQUIRED POLICY STATEMENTS

- 1. "McGill University values academic integrity. Therefore, all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Conduct and Disciplinary Procedure .(approved by Senate on 29 January 2003) (see www.mcgill.ca/students/srr/honest/ for more information:***
"L'université McGill attache une haute importance à l'honnêteté académique. Il incombe par conséquent à tous les étudiants de comprendre ce que l'on entend par tricherie, plagiat et autres infractions académiques, ainsi que les conséquences que peuvent avoir de telles actions, selon le Code de conduite de l'étudiant et des procédures disciplinaires (pour de plus amples renseignements, veuillez consulter www.mcgill.ca/students/srr/honest/."
- 2. "In accord with McGill University's Charter of Students' Rights, students in this course have the right to submit in English or in French any written work that is to be graded."***
(approved by Senate on 21 January 2009 - see also the section in this document on Assignments and evaluation.)
"Conformément à la Charte des droits de l'étudiant de l'Université McGill, chaque étudiant a le droit de soumettre en français ou en anglais tout travail écrit devant être noté (sauf dans le cas des cours dont l'un des objets est la maîtrise d'une langue)."