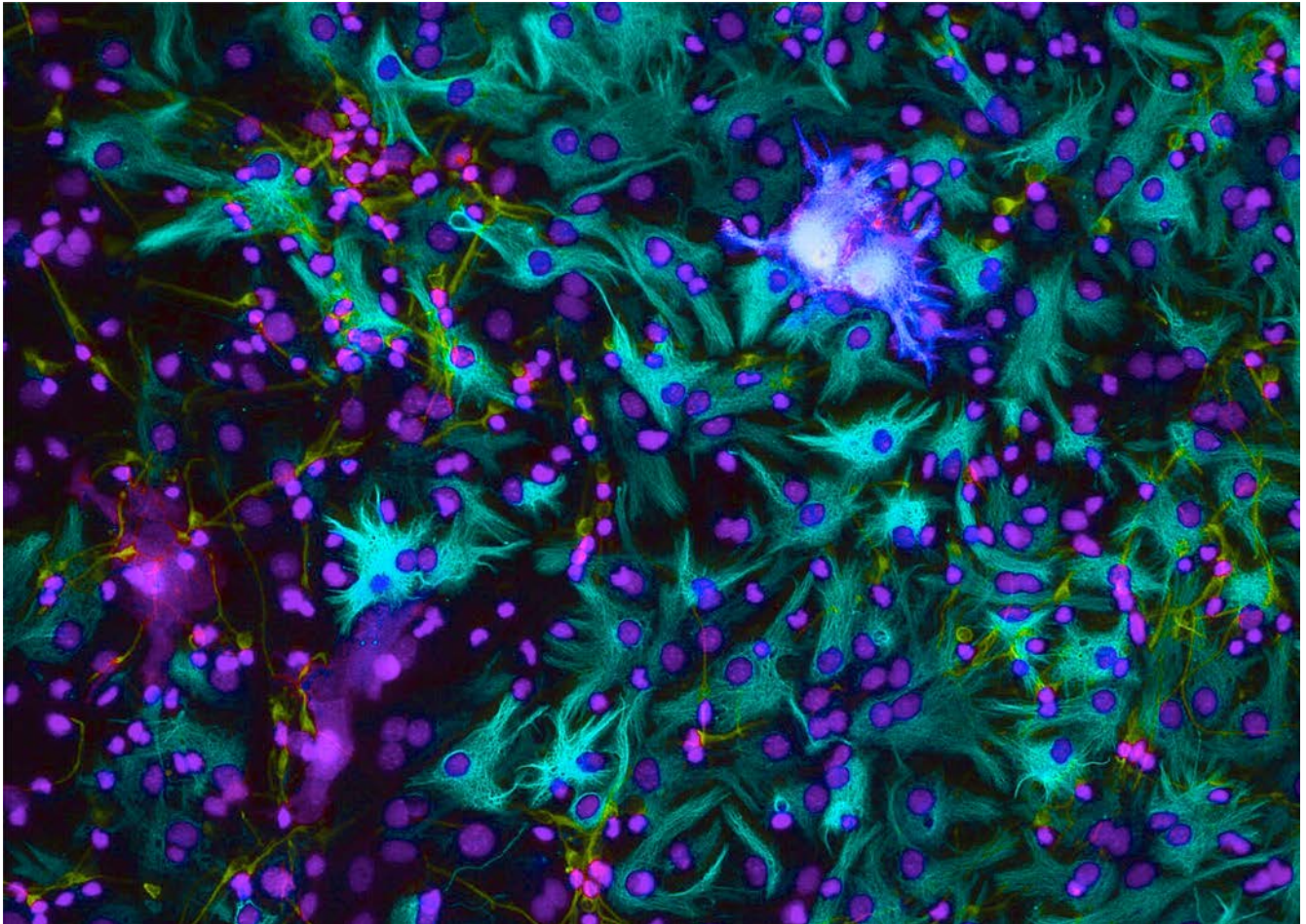

MGY250H1

Introduction to Medical Genetics

WINTER 2026 SYLLABUS



Neurons and astrocytes differentiated from mouse neural stem cells
photo courtesy of Samantha Yammine



Molecular Genetics
UNIVERSITY OF TORONTO

Welcome to MGY250!

We are thrilled to have you join us!

In this day and age, it is difficult to read the news and not encounter a story or issue related to medical genetics. As the costs and technological limitations of genome sequencing decrease and our understanding of the genetic basis of human disease increases, we find ourselves entering an era that will revolutionize the way we think about our bodies and how we treat genetic disease. For the first time in history, we are beginning to be able to see disease looming in the distance and may be capable of halting it before it strikes. This is a fascinating time to be studying genetics!

Inherent to these big ideas are ethical considerations. As more people are impacted by medical genetics, there will be a greater need for all citizens to have a basic understanding of medical genetics.

In this course we aim to provide you with a solid foundation in medical genetics, from which to build a knowledge of the mechanisms of genetic disease. We will examine the main categories of genetic disease, chromosomal, single and complex disorders. You will learn about how scientists

determine the cause of genetic disease from population studies and animal models, and how these diseases are being treated. From there we will shift to look at how this information we have acquired is being implemented in the clinic. Finally we will end with a case study that takes us on the journey beginning with the initial discovery of a gene critical for the development of a childhood cancer and ending with how that information can be useful for genetic testing in Canada and abroad.

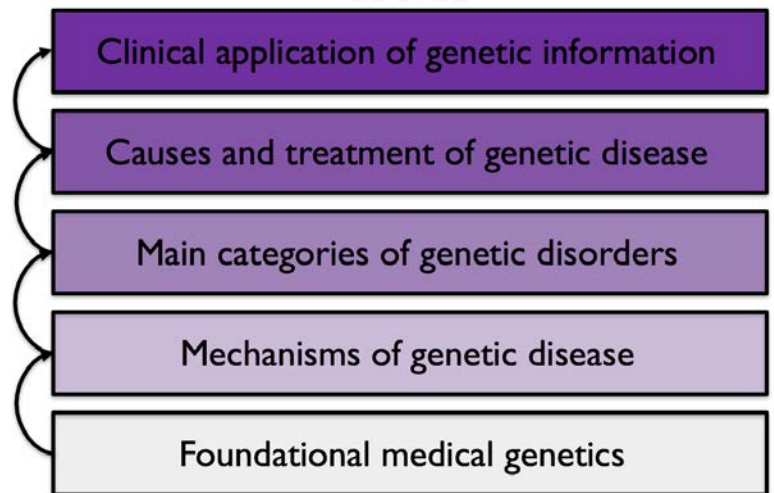
This course is sure to be an adventure. Without doubt, we will hit some bumps along the way but we will do our best to be clear about our expectations and receptive to feedback. As we move along in the course, we (and the course!) will adapt to maximize what is working and eliminate what is not.

Looking forward to an exciting semester!

Sincerely,

Jessica Hill

Associate Professor, Teaching Stream



PREREQUISITES

To succeed in MGY250, you will need a basic understanding of the cell (What is DNA? What are genes, chromosomes, proteins?) and some fundamental cellular processes (What is transcription, translation, mitosis, meiosis?).

COURSE MARKING SCHEME

Assessment	Value	Due Date(s)	Submission
Unit Quizzes	22%	Most Tuesdays see Quercus	Quercus
Assignment 1	4%	Various dates in January see Quercus	Quercus
Concept maps	12%	Most Mondays see Quercus	Quercus
Assignment 2	25%	Various dates in Feb & March see Quercus	Quercus
Final Exam	37%	During exam period	In Person

COURSE COMPONENTS

MGY250 is organized into “**units**”, each of which consist of roughly one week’s worth of material. Note that some units may be longer than others and require more time. Nearly each week, a new unit becomes available.

Each unit is composed of four main parts:

1. **Videos**
2. a **Concept Map**,
3. a **Discussion** page, and a
4. **Unit Quiz**.

In addition, two **assignments** are released throughout the course.

VIDEOS

The videos are the core of each unit. Videos are mostly lectures from one of the course contributors. The units will also contain pdf files of all lecture slides.

DISCUSSION BOARDS

Discussion boards for each unit allow you to ask questions and learn from peers. TAs monitor boards and respond within 24 hours on weekdays. Before posting, check if your question has been answered.

UNIT QUIZZES

Weekly quizzes focused on material from that unit. One attempt per quiz.

Extensions: If you need additional time, contact your TA before the deadline to receive an extension of up to one week.

ASSIGNMENTS

Two assignments using PeerScholar, each with multiple stage (eg, draft, peer review, and final submission). See Quercus for detailed instructions and rubric.

Extensions: Because these assignments involve peer review, deadlines for drafts and peer reviews cannot be extended except in exceptional circumstances (e.g., serious illness, family emergency). Missing these deadlines prevents your peers from completing their work. If you anticipate difficulty meeting assignment deadlines, contact your TA in advance - we can extend your Unit Quiz for that week so you can prioritize the assignment.

CONCEPT MAPS

Visual summaries of unit content to help you organize concepts and see connections. Details and examples on Quercus.

Extensions: If you need additional time, contact your TA before the deadline to receive an extension of up to one week.

COURSE CALENDAR

Important dates for this course can be found on the course calendar, such as release dates and due dates for Unit Quizzes and Assignments. Please ensure you are keeping up with due dates in the course via the course calendar.

IMPORTANT DATES IN THE COURSE

The release dates and due dates for Unit Quizzes, Concept Maps and Assignments have been added to the course calendar. Please check the calendar for the most recent updates of course due dates.

All Unit Quizzes and Assignments will be due at 11:59pm

UNIT SCHEDULE

Unit	Topic	Instructor(s)	Support on Quercus
1	Perspectives on medical genetics	Jessica Hill Michael Wilson	Jessica Hill
2	Human genome structure and function	Michael Wilson	Isha Datar
3	Human genome variation	James Dowling	Eva Colic
4	Single gene disorders	James Dowling	Eva Colic
5	Complex disease	Jessica Hill	Sara Pour
6	Population analysis in complex disease	Fritz Roth Philip Awadalla	Sara Pour
7	Using model organisms to understand disease	Jessica Hill Sean Egan	Isha Datar
8	Treating genetic disease	Derek van der Kooy Zhenya Ivakine	Eva Colic
9	Genetic testing	Maian Roifman George Charames Michael Szego	Sara Pour
10	Genetic counselling	Cheryl Shuman Andrea Shugar Randi Zlotnik Shaul	Isha Datar
11	Case study: childhood cancer genetics	Brenda Gallie Kahaki Kimani Helen Dimaras	Jessica Hill

HOW TO GET HELP

FOR QUESTIONS REGARDING COURSE MATERIAL

Please post course material questions to the appropriate (Unit or Assignment) discussion board. See the section on Discussion Boards above.

FOR QUESTIONS OR HELP WITH OTHER ISSUES:

(eg. sick, family issues, prerequisites, etc.)

Please contact your designated contact below.

Last name beginning with:	Contact the following:
A — Ho	Eva Colic eva.colic@sickkids.ca
Hw — Om	Isha Datar ishag.datar@mail.utoronto.ca
Ow — Z	Sara Pour sara.eslampour@mail.utoronto.ca

Your TA or the course coordinator will respond to you within **24 hours (excluding weekends)** to let you know your message has been received. However unless the need is truly urgent your matter will not be discussed and a decision will not be reached until our weekly TA meeting.

COURSE POLICIES

USE OF GENERATIVE AI

The use of generative AI (eg ChatGPT, etc) is **prohibited** for answering Unit Quiz questions and creating Concept Maps.

The use of generative AI in course assignments is **permitted within limits**. Those limits are specified for each assignment on Quercus.

TECHNOLOGY REQUIREMENTS

Access to a computer/tablet with internet access required. You are responsible for maintaining backups and scheduling work to accommodate technical issues. Technology problems are not grounds for extensions.

INSTITUTIONAL POLICIES AND SUPPORT

POLICY ON DISTRIBUTION OF THE MATERIALS OUTSIDE OF THE COURSE

At the University of Toronto and the Department of Molecular Genetics we take pride in the fact that we have unique, high-level and up-to-date expertise in the course topics. All course materials are the Intellectual Property of the lecturers. Further distribution of the lecture materials without permission constitutes an academic offence, and the instructors have the right to pursue disciplinary action.

ACADEMIC INTEGRITY

Academic integrity is essential to the pursuit of learning and scholarship in a university, and to ensuring that a degree from the University of Toronto is a strong signal of each student's individual academic achievement. As a result, the University treats cases of cheating and plagiarism very seriously. The [University of Toronto's Code of Behaviour on Academic Matters](#) outlines the behaviours

that constitute academic dishonesty and the processes for addressing academic offences. Potential offences include, but are not limited to:

In papers and assignments:

1. Using someone else's ideas or words without appropriate acknowledgement.
2. Submitting your own work in more than one course without the permission of the instructor.
3. Making up sources or facts.
4. Obtaining or providing unauthorized assistance on any assignment.

On tests and exams:

1. Using or possessing unauthorized aids.
2. Looking at someone else's answers during an exam or test.
3. Misrepresenting your identity.

In academic work:

1. Falsifying institutional documents or grades.
2. Falsifying or altering any documentation required by the University.

All suspected cases of academic dishonesty will be investigated following procedures outlined in the Code of Behaviour on Academic Matters. If you have questions or concerns about what constitutes appropriate academic behaviour or appropriate research and citation methods, please reach out to me.

FINAL EXAM

The final exam is an in-person assessment. It is scheduled by the Faculty of Arts and Sciences to take place during the exam period.

ACCOMMODATIONS

The University provides academic accommodations for students with disabilities in accordance with the terms of the Ontario Human Rights Code. This occurs through a collaborative process that acknowledges a collective obligation to develop an accessible learning environment that both meets the needs of students and preserves the essential academic requirements of the University's courses and programs.

Students with diverse learning styles and needs are welcome in this course. If you have a disability that may require accommodations, please feel free to approach [Accessibility Services](#).

EQUITY, DIVERSITY AND INCLUSION

The University of Toronto is committed to equity, human rights and respect for diversity. All members of the learning environment in this course should strive to create an atmosphere of mutual respect where all members of our community can express themselves, engage with each other, and respect

one another's differences. U of T does not condone discrimination or harassment against any persons or communities.

Equity, diversity and inclusion are essential values for the field of medical genetics. However, the field has a history of being shaped by racist and eugenic ideologies, and still faces challenges in representing and benefiting people with non-European ancestry in genomic research and clinical practice. These issues contribute to health disparities for marginalized and underrepresented populations. We recognize and address these current and historical shortcomings in the field, and strive to achieve health equity.

SERVICES AND SUPPORT

The following are some important links to help you with academic and/or technical service and support

- General student services and resources at [Student Life](#)
- Full library service through [University of Toronto Libraries](#)
- Resources on conducting online research through [University Libraries Research](#)
- Resources on academic support from the [Academic Success Centre](#)
- Learner support at the [Writing Centre](#)
- Information about [Accessibility Services](#)
- Information for [Technical Support/Blackboard Support](#) (Portal Info)