Course Description
This course addresses a number of fundamental and emerging topics in the control of Gene Expression. The course framework incorporates some lectures with an emphasis on reading and discussion of key articles on each topic. Modern experimental approaches in genome analysis and proteomics will also be discussed as they arise in the context of the articles.

Prerequisites (strictly enforced)
na

Course Instructor(s) and Contact Information
Professor John C. McDermott jmcderm@yorku.ca
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Office : 427 B Life Sciences Building

Schedule
Date and Time:  W: 6.00-9.00 pm
Location:  TBA

Evaluation
Evaluation Components of Final Grade and related information.
Final course grades may be adjusted to conform to Program or Faculty grades distribution profiles.

This course is based on primary literature in current topics of gene expression. Apart from the first class, the basis of the course will be reading, presenting and discussing primary literature. The first session will comprise of an introductory lecture and a discussion outlining the general scope and organization of logistical details that will provide a framework for the rest of the course.

CAREFUL AND IN DEPTH READING OF ASSIGNED READINGS IS IMPERATIVE FOR THIS COURSE TO BE A SUCCESS. PLEASE WRITE DOWN QUESTIONS
AND/OR COMMENTS AS YOU READ THE ARTICLES SO THAT THESE CAN BE RAISED IN CLASS DISCUSSIONS.

For each of the topics, three primary research papers will be distributed the week before (papers will only be assigned one week in advance). During class, a discussion will be held for each of the three papers. One student will be selected at random to lead the discussion for each paper. Each student will lead at least one discussion in the course, but no more than two. In preparation, students are asked to read (in depth) the assigned papers and prepare for a detailed discussion.

For the written paper, each student will select five or six published articles related to one of the five course topics, and write a synthesis article based on those articles. Students are advised to get approval from the course instructors once the articles are chosen. Papers are to be no more than 10 pages in length (double-spaced, excluding references). The date for submission will be announced in the first class.

**Evaluation**

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<thead>
<tr>
<th>Evaluation</th>
<th>Weight</th>
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<tr>
<td>Written paper</td>
<td>40%</td>
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<tr>
<td>Participation</td>
<td>60%</td>
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100%

Nb: the participation mark will be based on a) the student’s role in leading at least one article discussion in class, and 2) general contributions to the article discussions throughout the course.

**Important Dates**

To be announced

**Resources**

Access to PPT files for lectures will be provided on web site

Literature for reading/discussion will be provided in PDF format on web site
# Learning Outcomes

Upon successful completion of this course, students should be able to:

1. Read and understand modern articles and concepts in Gene Expression
2. Discuss articles on gene expression with peers
3. Write a review type essay on one topic in Gene Expression in a scientific format
4. Lead a discussion on a scientific article with peers
5. Appreciate the features, strengths and limitations of several genome based methodologies for probing gene expression

# Professional Skills

The following skills will be developed in this course.

1. Critical thinking skills related to experimental biology
2. Write a review type essay based on articles in the field
3. Discuss and analyze articles with peers
4. Lead a discussion with peers

# Course Content

**TOPICS for weeks 2-6**

1) **Protein:DNA and Protein:Protein interactions in the control of genes and gene networks.**
   Genome wide approaches (Chip-Seq, ATAC seq) and proteomic approaches (interactome analysis by mass spectrometry) will be discussed.

2) **Epigenetic control of gene expression and the 3D genome.** Chromatin remodelling and the histone code. Post-translational control of protein complexes as a means to convey extracellular signals to the genome.

3) **Regulation of gene expression by noncoding RNAs.**

4) **Gene expression networks mediating Induced pluripotent Stem cells (iPS) and cell programming/re-programming.**

5) **Hox gene expression and control of the invertebrate and vertebrate body plans.**
Experiential Education and E-Learning
A number of web based resources will be highlighted throughout the course for the students to access.

Other Information
EXPECTATIONS
Attendance is mandatory because the lectures will provide an opportunity for the students not only to listen to summary lectures by the professor but to also engage in discussion and analysis of articles.

Course Policies
Alternative dates for assignments/evaluations are not available in this course.
Academic Honesty and Integrity
York students are required to maintain the highest standards of academic honesty and they are subject to the Senate Policy on Academic Honesty (http://secretariat-policies.info.yorku.ca/policies/academic-honesty-senate-policy-on/). The Policy affirms the responsibility of faculty members to foster acceptable standards of academic conduct and of the student to abide by such standards.

There is also an academic integrity website with comprehensive information about academic honesty and how to find resources at York to help improve students’ research and writing skills, and cope with University life. Students are expected to review the materials on the Academic Integrity website at - http://www.yorku.ca/academicintegrity/

**Important** A note from the Faculty of Science Committee on Examinations and Academic Standards: Numerous students in Faculty of Science courses have been charged with academic misconduct when materials they uploaded to third party repository sites (e.g. Course Hero, One Class, etc.) were taken and used by unknown students in later offerings of the course. The Faculty’s Committee on Examinations and Academic Standards (CEAS) found in these cases that the burden of proof in a charge of aiding and abetting had been met, since the uploading students had been found in all cases to be wilfully blind to the reasonable likelihood of supporting plagiarism in this manner. Accordingly, to avoid this risk, students are urged not to upload their work to these sites. Whenever a student submits work obtained through Course Hero or One Class, the submitting student will be charged with plagiarism and the uploading student will be charged with aiding and abetting.

Note also that exams, tests, and other assignments are the copyrighted works of the professor assigning them, whether copyright is overtly claimed or not (i.e. whether the © is used or not). Scanning these documents constitutes copying, which is a breach of Canadian copyright law, and the breach is aggravated when scans are shared or uploaded to third party repository sites.

Access/Disability
York University is committed to principles of respect, inclusion and equality of all persons with disabilities across campus. The University provides services for students with disabilities (including physical, medical, learning and psychiatric disabilities) needing accommodation related to teaching and evaluation methods/materials. These services are made available to students in all Faculties and programs at York University.

Student’s in need of these services are asked to register with disability services as early as possible to ensure that appropriate academic accommodation can be provided with advance notice. You are encouraged to schedule a time early in the term to meet with each professor to discuss your accommodation needs. Please note that registering with disabilities services and discussing your needs with your professors is necessary to avoid any impediment to receiving the necessary academic accommodations to meet your needs.

Additional information is available at the following websites:
Counselling & Disability Services - http://cds.info.yorku.ca/
Counselling & Disability Services at Glendon - https://www.glendon.yorku.ca/counselling/
York Accessibility Hub - http://accessibilityhub.info.yorku.ca/

Religious Observance Accommodation
York University is committed to respecting the religious beliefs and practices of all members of the community, and making accommodations for observances of special significance to adherents.

Should any of the dates specified in this syllabus for an in-class test or examination pose such a conflict for you, contact the Course Director within the first three weeks of class. Similarly, should an assignment to be completed in a lab, practicum placement, workshop, etc., scheduled later in the term pose such a conflict, contact the Course director immediately. Please note that to arrange an alternative date or time for an examination scheduled in the formal examination periods (December and April/May), students must complete and submit an Examination Accommodation Form at least 3 weeks before the exam period begins. The form can be obtained from Student Client Services, Student Services Centre or online at http://www.registrar.yorku.ca/pdf/exam_accommodation.pdf

Student Conduct in Academic Situations
Students and instructors are expected to maintain a professional relationship characterized by courtesy and mutual respect. Moreover, it is the responsibility of the instructor to maintain an
appropriate academic atmosphere in the classroom and other academic settings, and the responsibility of the student to cooperate in that endeavour. Further, the instructor is the best person to decide, in the first instance, whether such an atmosphere is present in the class. The policy and procedures governing disruptive and/or harassing behaviour by students in academic situations is available at - [http://secretariat-policies.info.yorku.ca/policies/disruptive-andor-harassing-behaviour-in-academic-situations-senate-policy/](http://secretariat-policies.info.yorku.ca/policies/disruptive-andor-harassing-behaviour-in-academic-situations-senate-policy/)