

BIOL 512/BIOL 482 Functional Genomics Fall 2016

Tuesday & Thursday 10:15-11:30, Room LOY CC-314

Instructor: Dr. Madoka Gray-mitsumune

Office: SP-375.15 (next to graduate secretary's office)

E-mail: madoka.gray-mitsumune@concordia.ca **Please put BIOL512 in the subject line!**

Tel: 848-2424 ext. 4026

Office hours: Please make an appointment. Or ask questions after lectures.

Prerequisite (Grad students): BIOL 367 (Molecular Biology) or permission of the Diploma Program

Prerequisite (Undergrad): BIOL271, BIOL367, at least 60 credits in Biology majors AND permission of the instructor.

Course description: This course focuses on the functional analysis of expressed genes and their products. Course content includes the construction and screening of normalized cDNA libraries, analysis of expressed sequence tags (ESTs), functional analysis by gene knock-outs, localization of gene products by gene knock-ins, transcription profiling, systematic identification of proteins, and functional analysis of proteins by detection of protein-protein interactions.

Evaluation

	% of final grade
Online quizzes	2 %
Class participation, reading assignment, discussion forum	8 %
Oral presentation (Nov 17 th)	16 %
Assignments (Oct 27 th , Dec 6 th)	12 % x 2
Midterm exam (Oct 20 th)	10 %
Final exam (date determined by university)	40 %

Grading scheme for Graduate students

A⁺: 90 or more, A: 85-89, A⁻: 80-84, B⁺: 77-79, B: 74-76, B⁻: 70-73, C: 60-69, F: <60

Online quizzes: Complete three online quizzes on Moodle. One quiz is to test your knowledge on plagiarism and citation protocols. The second one is to test your knowledge on techniques in molecular biology and on class materials. The third one is to test your knowledge on class materials.

Reading assignments: Read the assigned article. Participate in pre-class discussion. Participate in the class discussions. Answer questions regarding the article during the class.

Oral presentation: Select and read a latest article (less than three years) on functional genomics. Describe the major finding of the article as oral group presentation.

Assignments

You will study and characterize a mouse gene using publically available expression and phenotype databases. Direction will be posted on Moodle.

Midterm exam

About 4 pages long. Lectures 1-13. You may bring **handwritten** cheat sheets (3 pages max). Time limit is 75 min.

Final Exam (Date & time determined by Exam office)

You may bring **handwritten** cheat sheets (6 pages max) to the exam. Time limit is 3 hours.

Tentative schedule (subject to change)

	Date	Assignment/quiz	Topic	
1	Sep 6		Gene discovery, gene annotation	Gene discovery, gene annotation
2	Sep 8			
3	Sep 13		Transcriptome analysis	Microarray RNAseq
4	Sep 15			
5	Sep 20	Article 1		
6	Sep 22			
7	Sep 27	Online quiz 1/2 due	Proteomics	2D-gel, DIGE Mass spectrometry (MS), LC-MS ICAT, iTRAQ, SILAC
8	Sep 29			
9	Oct 4	Online quiz 3 due		
10	Oct 6			
11	Oct 11			
12	Oct 13	Article 2	Protein & RNA localization	<i>in situ</i> RNA hybridization, GFP and other protein tags, laser dissection
13	Oct 18	Online quiz 4 due		
	Oct 20	Midterm exam		
14	Oct 25		Reverse genetics	Targeted deletion CRISPR-CAS RNAi Random insertion
15	Oct 27	Assignment 1 due		
16	Nov 1			
17	Nov 3	Webinar		
18	Nov 8		Protein expression	Recombinant protein production
19	Nov 10			
20	Nov 15		Oral presentations	
	Nov 17			
21	Nov 22		Protein expression	Affinity purification Cell-free protein synthesis
22	Nov 24			
23	Nov 29		Protein interaction	Two-hybrid assay, BiFC Tandem affinity purification (TAP) Synthetic interactions
24	Dec 1			
	Dec 6	Assignment 2 due		

Sep 19th: Last day of withdrawal with tuition refund.

Nov 6th: Last day of withdrawal. No refund. DISC notation on the transcript. Grade will not be included in GPA calculation.

Avoiding plagiarism

Since the course work requires written works (presentation slides and assignment), I need to remind you of good citation practice. Throughout the text, you should be clear on what part has been cited from which articles. Please visit the Academic Integrity Website <http://www.concordia.ca/students/academic-integrity/plagiarism.html> Watch self tutorial on how to acknowledge information sources (prepared by Concordia librarian Ms. Danielle Dennie): http://library.concordia.ca/guides/science/biology/plagiarism/plagiarism_video.htm

The following statements are taken from The Academic Integrity Website:

“Plagiarism:

The most common offense under the Academic Code of Conduct is plagiarism which the Code defines as "the presentation of the work of another person as one's own or without proper acknowledgement."

This could be material copied word for word from books, journals, internet sites, professor's course notes, etc. It could be material that is paraphrased but closely resembles the original source. It could be the work of a fellow student, for example, an answer on a quiz, data for a lab report, a paper or assignment completed by another student. It might be a paper purchased through one of the many available sources. Plagiarism does not refer to words alone - it can also refer to copying images, graphs, tables, and ideas. "Presentation" is not limited to written work. It also includes oral presentations, computer assignments and artistic works. Finally, if you translate the work of another person into French or English and do not cite the source, this is also plagiarism.

In Simple Words:

DO NOT COPY, PARAPHRASE OR TRANSLATE ANYTHING FROM ANYWHERE WITHOUT SAYING FROM WHERE YOU OBTAINED IT!"

If you are not sure how to paraphrase without plagiarizing, please refer to this example given by the Academic Integrity information site <http://www.concordia.ca/students/academic-integrity/plagiarism.html> . Examples are shown near the end of the web page.

LIST OF SERVICES

- **Birks Student Service Centre:** <http://www.concordia.ca/students/birks.html>
- **Examination Office:** <http://www.concordia.ca/students/exams.html>
- **International Students Office:** <http://www.concordia.ca/students/international.html>
- **Health Services:** <https://www.concordia.ca/students/health.html>
- **Counselling Service:** <http://www.concordia.ca/students/counselling.html>
- **Student Success Centre:** <http://www.concordia.ca/students/success.html>
- **Advocacy and Support Services** <http://www.concordia.ca/offices/advocacy.html/>
- **Financial Aid & Awards** <http://www.concordia.ca/offices/faao.html>
- **Citation and Style Guides:** <http://library.concordia.ca/help/citing/index.php>