

Molecular Genetics Graduate Topic Course

Course Title: Epigenetics and Transcriptional Control

Course Location: TBD

Course Time and Date: Thursdays, 2:00 – 4:00 P.M. March 20 – April 24, 2024

Course Instructor(s): Marc Meneghini and Paul Delgado Olguin

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Course Overview:

In this topics course we will explore the fascinating world of epigenetic inheritance and chromatin-based gene regulation.

The format for this course is a little different from other topics courses you may have taken and will require greater sustained effort but will not involve a lengthy final assignment. We're aiming for maximal student engagement and will in fact require you to assume much responsibility for development of the course curriculum as well as marking. Brief weekly written assignments will comprise a significant portion of your grade and will be evaluated by yourselves. The quality of the class you lead (as explained below) will comprise another major area of evaluation.

Course Objectives:

- Gain a current perspective of major advances in the field of epigenetic regulation of gene expression.
- Learn about mechanisms by which gene expression patterns are stabilized and inherited.
- Put your critical thinking, team work, and presentation and organization skills in practice.

The basic outline for what will be covered in the six weeks is below.

In this course, we will discuss major advances in the field of epigenetic control of gene expression: the histone code, DNA methylation, RNA methylation, histone inheritance, RNAi and trans-generational inheritance.

As indicated above, we're aiming for maximal student engagement and will in fact require you to assume much responsibility for development of the course curriculum as well as marking. There are 12 students and we have divided into groups of 2, who will lead the 6 classes. You will all be provided with a review article and a research paper on each Monday the week prior to when the class meets (i.e. 10 days before the class). When the class meets, the assigned lead students will provide a ~15' introduction to the topic and then oversee a ~45' interactive class presentation/discussion of the research paper. Following this, the lead students will present a ~30' discussion of the topic which should include consideration of 2-3 additional works that they have identified as relevant/important. The presenting students will design 4 study questions based on the assigned paper (2 questions each). These study questions will be provided to the class on the Monday prior to each Thursday's classes and discussion of these questions should comprise part of the ~45' 'journal club' portion of the class. This format provides the presenting students a full week to design their study questions while they prepare their class presentations. Written answers for these study questions will be due at the start of each class and will be marked by the presenting

students. Students will submit their answers anonymously using only their student number as identification.

Marking Scheme:

- 5x written study question assignments: 10% each. **50% total**
- 1x presenting students collective score: **20%**. This is a mark assesses the quality of the collective presentation taking into consideration content and organization.
- 1x presentation individual score: **20%**. This will consider the quality of the study questions you design as well as the presentation/discussion portion that you lead.
- Overall contribution: **10%**. This reflects our assessment of your overall contribution to the course, which will take into consideration, largely, the quality of your participation in the discussions.

If you anticipate missing a class you must let us know in advance to adjust the assignment. Providing that you had a legitimate reason for missing the class, you will be provided with an assignment based on the reading for that week that you can use to make up for the lost class.