

GCB 5340-401 202330 Experimental Genome Science

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Welcome to GCB534, Experimental Genome Science! The course meets every Monday/Wednesday 10:15-11:45AM in Smilow room 12-146, with the first class meeting **WEDNESDAY SEPTEMBER 4**.

You should join the course Slack group (gcb534.slack.com) prior to the first class - we will use this as a place to ask/answer questions about the course, papers etc. You can use this link to join:

https://join.slack.com/t/gcb534/shared_invite/zt-2oswbuxtg-lXys8B5uO8oouqCXcYNT5Q

The course is organized into two segments both topically and in the focus of in-class activities. The first section of the course focuses on genomics methodology, and in class activities and discussion are based on reviewing and presenting the primary literature. The second section of the course is focused on applications of genomics, with a strong focus on the genomics of human genetics. In this section, we will also focus on developing new questions and approaches from a foundation of existing work, and you will ultimately prepare a short grant proposal using the NIH application format. At the end of the class we will break the class into two “study sections” where you will review each other’s proposals.

In a typical week, we will have a lecture on Monday and discuss an assigned paper from the recent genomics literature on Wednesday (a few weeks deviate slightly from this pattern). We expect that you will have read each paper carefully before the Wednesday classes so we can discuss in detail, and to facilitate this you will be asked to submit questions through the course Slack in advance of each paper discussion session. These discussions will take different forms, depending on the paper and the professional skills being developed.

There will also be 2 take-home exams and a final project. In addition, you will do two short (~7 minute) presentations to the class based on papers you select yourself. Your final grade will be a combination of your classroom participation (1/4) and your exams (1/4), your grades on presentations and assignments (1/4) and the final project (1/4).

The other instructors and I teach this class because we enjoy thinking about the latest advances across the field of Genomics and we hope to share this enthusiasm with you during the course. Welcome!

Sincerely,

John Murray, for the course team

A detailed schedule is available at this link

<https://docs.google.com/spreadsheets/d/1WL1H-RyVICUHdhmhuQR4pKw-I76iqavDC91mrrjaKFo/edit?gid=837580298#gid=837580298>

Key assignments and dates:

9/20(F) : Paper selection due *no later than this date*. Papers must be approved by the faculty. You will likely work with the material in this paper throughout the semester as you develop their independent proposal, so choose a paper that is in an area that is significant and of interest to you. You will select a paper that uses experimental genomics techniques; note that a purely computational paper is not appropriate. You will prepare both a 1 page written review of the paper as well as a short (~5 minutes with 2 minutes for questions) “journal club” presentation with slides, focusing on providing background and highlighting ONE major result from the paper.

10/2 and 10/7: Journal Club presentations

PowerPoint or .pdf presentations due the day before you will present (announced the week before) via canvas.

10/7: Take home exam 1 assigned (based on material through 9/30) assigned - due 10/11 (tentative)

10/16: Come to class with an outline of “Next steps” ideas to workshop during class. This outline is not turned in but for your benefit in preparing for the in-class discussion.

10/30 and 11/4: Specific Aims presentations (presentations powerpoint or .pdf due the day before via canvas)

You will come up with 2-3 independent but related questions raised by EITHER the paper you selected for the first presentations OR, less ideally, a new paper. This project must be distinct from your own planned thesis or rotation project(s).

11/13(W): Aims Page due

You will further refine your ideas from the Next Steps presentation feedback to present a formal Specific Aims page in the NIH format.

11/18 Take home exam 2 assigned (based on all material since the first exam) assigned - due 11/23 (tentative)

11/27: Final Proposal due

You will write a proposal in an abbreviated NIH format (1 page Specific Aims PLUS 1 page Significance and Innovation PLUS 2 pages Approach = 4 pages total not including references).

12/5: Reviews and scores due

12/4 and 12/9: STUDY SECTION

The class will be split into two “Study Sections” and each half of the class will read the proposals from the other half, scoring them on Significance, Innovation, Approach and Overall Impact using the NIH scoring system. In “Study Section”, we will discuss the proposals and each member will score each proposal to generate a final ranking, as would happen for a real NIH proposal.