Molecular Genetics Graduate Topic Course

Course Title: Genome Duplication, Repair and Transmission (Genome DRT)
Course Location: TBD
Course Time and Date: Wednesdays 3pm- 5pm (starts March 29)
Course Instructor(s): Bri Lavoie, Dan Durocher, Christopher Pearson
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Course Overview: This discussion-based course will rely on student presentations of recent papers from the literature related to mechanisms of genome structure and function. We will take examples from model organisms to humans. Topics covered vary every year based on the very recent literature, but generally include DNA replication and repair, chromatin, checkpoint control, genetic instability, fundamental genetic elements (centromeres, telomeres), chromosome structure/function and inheritance during cell division. In teams, students will present and lead discussions on 2 assigned papers during the class, and will also participate in all class discussions. Students will write a short grant proposal on a topic related to class (but unrelated to their own area of research) and participate in a peer review grant panel providing and receiving constructive feedback to/from peers on their grants.

Course Objectives:

- Survey the current literature and hot topics in the overall field of genome duplication, repair and transmission.
- Through class presentations, students will introduce an important scientific concept in genome structure/function, focusing on telling a compelling scientific story in the style of a News & Views and placing the paper under review in the context of the larger field.
- Through presentations of paper critiques and guided class discussions, students will critically assess scientific evidence with a focus to identifying strengths and weaknesses in published data and particular approaches. Students will also identify important questions that remain to be addressed in the field and which can form the basis of post-doc grant proposals. Presentations will highlight the significance of the work, assess the quality of the published science comparing/contrasting with other work in the field with an eye towards deriving overarching models to explain phenomena.
- Based on the papers and additional readings related to the topics presented, students will identify important questions in the field that remain to be addressed and propose an appropriate experimental strategy for a post-doctoral project. Students will be provided with guidance on good grantsmanship strategies.
- Finally, students will learn to provide constructive criticism to their peers on their research grants.

Marking Scheme*:*

- **40% Class presentations**. Present & lead discussions on 2 current papers. These will be assigned team-based presentations, with 1 team member focusing on presenting the paper background/context of the question addressed in a News & Views style while the second team member tackles the critical analysis of the data in the paper (and any competing papers). Each presentation is worth 20%, and include a self-assessment of team involvement component with a view to providing helpful feedback to each student.
- **15% Participation**. Students are expected to read all papers presented during class and actively participate in peer-led discussions. Proactive rather than reactive involvement is expected.
- **30% Grant proposal.** Short post-doc proposal on a topic related to genome DRT (but unrelated to the student's graduate research work). Proposals will be evaluated based on proposal

grantsmanship (clarity of the proposal), significance of the scientific question, and feasibility of the experimental approach.

- **15% Grant reviews.** Provide constructive written and verbal feedback to colleagues on their grant proposals in an instructor led peer review grant panel format. We will distribute anonymized proposals to students for evaluation based on a provided template where the proposal strengths/weaknesses and constructive suggestions for improvements will be explicitly detailed. Students will submit their feedback to the instructors, who will summarize the comments during a grant panel discussion. Feedback should highlight where individual proposals were most/ least compelling from both the scientific and grantsmanship perspectives, and provide concrete suggestions for improvement.

The basic outline for what will be covered in the six weeks is below. Assigned reading will be provided at least one week before class starts. All students are expected to read all of the assigned papers; however presenters are expected to expand their readings to reviews/competing papers to provide a "News & Views" type context for the class on where the field was before this paper was published and where it's going now. In addition to the research articles, students with less background are expected to identify (PubMed) and read recent review articles to provide context for the lecture.

Week 1: March 29
Week 2: April 5
Week 3: April 12
Week 4: April 19
Week 5: April 26
Grant submission deadline: May 3
Grant reviews: May 9
Week 6: Grant review panel May 10:

Grant Proposal
The proposal should be based on the CCSRI innovation grant. See Sections 21 and 24 in the link below.
http://www.cancer.ca/~/media/Research/2017/Innov_i2I_18/INNOV-18_application-guide_v1.0.pdf?la=en

Your proposal should have an introduction/literature review, clearly stated question and objectives, and an experimental plan that will answer the question. The proposal should be sent either as PDF or word document and must include a cover page with your name. Please do not include your name on any other pages so we can send anonymized documents to the class for reviews.

Absence policy:
Student anticipating missing a class must let the instructor know in advance and justify the absence. Providing that a legitimate reason is provided for missing a class, an assignment based on the reading for that week may be assigned to make up for the lost class.