

College of Science and Mathematics Senate Meeting

Monday, October 17, 2022

2:30 PM – 4:00 PM

Virtual Meeting Using Zoom

<https://umassboston.zoom.us/j/92051223826>

Meeting ID: 920 5122 3826

Passcode: CSMsenate

Agenda:

1. Approval of the September 12, 2022, meetings minutes
2. Announcements
3. New business
 - a ***Motion to approve new graduate course BIOL - 682 - GENOME STABILITY: DNA DAMAGE AND REPAIR***

Catalog description: This course will cover major causes (endogenous and exogenous) of DNA damage in cells, different types of DNA damage, and DNA damage repair pathways in prokaryotic and eukaryotic organisms. We will go over the DNA damage repair pathways that the cell uses, including cell cycle/DNA damage checkpoints, to repair damaged DNA upon exposure to exogenous DNA damage or endogenous DNA damage during natural development process. We will also study how chromatin modification and epigenetics regulates DNA damage repair. CRISPR/Cas9 technology that is based on homologous and non-homologous DNA damage repair will also be covered. Cells have evolved a multitude of mechanisms to recognize and repair different kinds of DNA damage (stalled replication forks, DNA double-strand breaks, DNA mismatches, abasic sites, damaged nucleotides, etc) to preserve genome stability. DNA damage contributes to aging and in higher eukaryotes, such as humans, defective responses to DNA damage can cause genome instability and mutation overload, resulting in a number of diseases. These include cancers, neurodegenerative diseases, developmental syndromes, and many more. In this course, we will also learn how different model systems (including yeast, drosophila, zebra fish, mice and human cells) are studied in the laboratory to answer questions concerning DNA damage and genomic instability.

Rationale: DNA damage repair is a topic integral to the core graduate program in Molecular Biology. Being a DNA-centric course, this is also an ideal course to help students get a better understanding of the mechanism behind many DNA- based techniques used by them during their graduate studies and those that they will use as they venture into independent careers in academia or industry (including but not limited to CRISPR/Cas9 biology, sister chromatid exchange, choice of chemotherapeutics for cancer treatment, DNA mutation frequency/signatures etc.). Finally, the literature review and presentation

carried out by students during this course (including providing critique of a research article) will provide them with additional skills with respect to writing, editing and reviewing a manuscript. All these are essential aspects of a Molecular Biology graduate program.

Course Goals:

- Develop an in-depth understanding of mechanisms in DNA damage repair biology in prokaryotes and eukaryotes.
- Understand how defects in DNA damage repair could lead to human disease.
- Become familiar with techniques used to study DNA damage repair.
- Strengthen your skills in analyzing primary research literature and learn data presentation and interpretation.
- Strengthen your ability to evaluate the content and quality of scientific publications in this field (act as a reviewer and review an article).

Department Graduate Program Committee Comment: The Graduate Committee has discussed this proposal, suggested revisions to the original syllabus to broaden the appeal of the course. Suggested revisions included the incorporation of epigenetic regulation of DNA damage repair and the inclusion of model systems research (such as bacteria, yeast, zebrafish and mouse). The revisions have been incorporated into this current proposal and the course has been approved unanimously by the Graduate Committee.

This course will be important for students interested in the molecular mechanisms underlying genome instability and DNA repair, which are important topics in Biology. This course was successfully run as a Special Topics course.

4. Dean's office

5. Other Business

In May 2022 meeting Senate approved six committees to stay in the By-Laws. In this meeting we will discuss the membership as well as the charge of each committee. A working draft of the by-laws can be found at this [one-drive link](#).

6. Adjourn