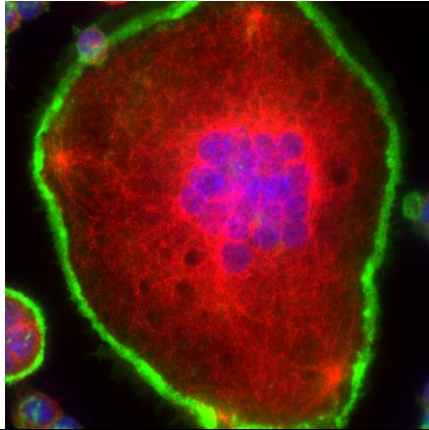


**BIOD23H3 Special Topics in Cell Biology**  
**Fall Term Syllabus, 2021** Professor Rene Harrison



*A lecture/seminar/discussion class on contemporary topics in Cell Biology. Students will explore the primary literature becoming familiar with experimental design and methodologies used to decipher cell biology phenomenon. Student seminars will join lectures and journal club discussions.*

**Lectures:** on-line via ZOOM.

Tuesdays 12-2pm, Wednesdays\* 12-1pm (\*not every week)

Lectures and student seminars will be LIVE (synchronous) with no video recordings available. Zoom links for class will be provided in Quercus announcements as well as in modules a day before lecture. Watch for announcements!

**Textbook:** None. Dr. Harrison's PowerPoint presentations and journal articles will be supplied on Quercus as PDF files for students to download and watch during class.

**Exams:** 2 Exams: Midterm worth 15% (short answer questions)- 2 hours  
- Final exam worth 15% (short answer questions)- 2 hours

**Office Hours:**

Office Hours: via Zoom by appointment.

e-mail: [rene.harrison@utoronto.ca](mailto:rene.harrison@utoronto.ca)

**Quercus Resources:**

- Outline of PowerPoint presentations will be uploaded onto Quercus prior to class.
- Students should print and bring outlines to class to take notes on additional details.

**TA:** Becky Heineman: [becky.heineman@mail.utoronto.ca](mailto:becky.heineman@mail.utoronto.ca)

**Course Prerequisites:**

Prerequisites: [BIOC12H](#) [or [IMCB08H](#) plus [IMCC03H](#) (for Industrial Microbiology students only)]

## Grading Scheme:

|                            |      |
|----------------------------|------|
| Assignments (10% x 2)      | 20%  |
| Journal critiques (5% x 2) | 10%  |
| Midterm                    | 15%  |
| Seminar                    | 15%  |
| Seminar 3-pager            | 5%   |
| Creative Project           | 10%  |
| Final                      | 15%  |
| Participation              | 10%  |
| -----                      |      |
| Total                      | 100% |

**Assignments (20%)**- Two (2) Assignments will be given, each worth 10% of your final grade. Journal articles/ grant proposals and assignments will be put on Quercus 1-2 weeks before the discussions/ due date.

Assignments must be uploaded on Quercus by NOON on the due date, which is the day that the articles are being discussed in class.

\*Late assignments will be graded as zero.

**Journal Critiques (10%)**- Two (2) journal critiques will be expected, each worth 5% of your final grade. Critiques must be uploaded on Quercus by NOON on the due date. Students will find a recent (within the last year) research article on the subject matter and then give a brief critique of the article, where they describe ONE strength of the research and ONE weakness of the study. This is meant to be a brief critique so one paragraph (5-6 sentences max) is expected for both the strength and the weakness of the study.

\*Late journal critiques will be graded as zero.

**Midterm (15%)**- A new manuscript will be provided to the students a week before the midterm and the exam will contain typical assignment questions as part of the exam. There will also be questions about the 3-page summaries written by the students in the 1<sup>st</sup> half of the course. For this reason, it is very important the 3-page student seminar summaries are clear and comprehensive. The format will be short answer questions.

**Seminar (15%)**- Students (in pairs) will give a 25 minute seminar to the class via Zoom. The microscopy topics have been assigned dates are listed on the calendar on Pages 4 and 5. Presentation dates/topics and partners will be randomly assigned unless Dr. Harrison is notified by email by Sept. 15.

Students will present a 15 minute background on the specific microscope technology and then a 10 minute overview of a manuscript (options provided) focusing on the results and discoveries using this specialized microscope technology. A 5-10 minute question period will follow. The seminar is worth 15% of your final grade, based on seminar length, clarity, content, slide presentation, and answering student questions. A double-spaced 3-page summary of the seminar is due within 1 day of your seminar for class distribution (see

details in next section). The summary should follow the script of your seminar and is worth 5% of your final grade, which will be based on writing clarity and content.

Examples of microscopy techniques include: 2-photon, spinning disc, FRAP, FRET, LSM confocal, TIRF, super-resolution/ STORM, AFM, light sheet microscopy, etc.

**Seminar 3-pager (5%)**- Presenting students must provide a 3-page summary (double-spaced) of the article to the other students within 1 day (24 hours) from their seminar. As I will advise, students should write scripts for their seminar which can form the basis of the 3-page summary.

**Creative Cell Project (10%)**- Students will individually focus their artistic flair(s) on cell biology. Projects can include but are not limited to: baked goods, artworks, paper mache, computer animations, music videos, cell poetry/ cell haiku, organelle stuffed animals, your own crazy idea... Pandemic-relevant creative projects are encouraged this year. Students must email Dr. Harrison their potential creative ideas by October 5<sup>th</sup>- this email is worth 1% of your total grade. An image file of creative project must be emailed to Dr. Harrison by November 1<sup>st</sup> at NOON- late assignments will not be accepted. Creative projects will be presented at show-and-tell on November 2<sup>nd</sup> in class.

**Final (15%)**- The final will include assignment-type questions regarding a new manuscript (provided a week before the final exam), as well as questions about the 3-page summaries written by the students in the 2<sup>nd</sup> half of the course (post-midterm). For this reason, it is very important the 3-page summaries are clear and comprehensive. The format of the final exam will be short answer questions.

**Participation (10%)**- Participation will be graded according to zoom class attendance and questions asked during student seminars. Students are expected to be on time for all lectures and watch and support all of the student seminars. If there are issues with attending zoom classes, Dr. Harrison must be notified in advance. Marks will be deducted for tardiness, absenteeism and lack of participation in student seminars.

#### **AccessAbility statement**

*"Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability/health consideration that may require accommodations, please feel free to approach me and/or the AccessAbility Services Office as soon as possible. AccessAbility Services staff, email [ability@utsc.utoronto.ca](mailto:ability@utsc.utoronto.ca). The sooner you let us know your needs the quicker we can assist you in achieving your learning goals in this course."*

#### **Academic Integrity**

*"The University treats cases of cheating and plagiarism very seriously. The University of Toronto's Code of Behaviour on Academic Matters (<http://www.governingcouncil.utoronto.ca/policies/behaveac.htm>) outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences. Potential offences in papers and assignments include using someone else's ideas or words without appropriate acknowledgement, making up sources or facts, obtaining or providing unauthorized assistance on any assignment. On tests and exams cheating includes using or possessing unauthorized aids, looking at someone else's answers during an exam or test, misrepresenting your identity, or falsifying or altering any documentation required by the University, including (but not limited to) doctor's notes."*

| DATE            | TOPIC  | RELEVANT PAPERS    |
|-----------------|--|--------------------|
| Sept. 7 (Tues)  | Class Introduction/ Tips on giving seminars  | ---                |
| Sept. 8 (Wed)   | No class: first articles posted  | Articles 1a and 1b |
| Sept. 14 (Tues) | Fluorescent Techniques/ Pathogen Infection   | Articles 1a and 1b |
| Sept. 15 (Wed)  | Seminar partner/topics DUE<br>No class   | ---                |
| Sept. 21 (Tues) | Journal Article Discussion#1<br>**Assignment#1 due                                   | Articles 1a and 1b |
| Sept.22 (Wed)   | Applying for grad school (optional)  | ---                |
| Sept.28 (Tues)  | Student seminars: Spinning Disk Confocal & TIRF<br>Journal Critique #1 SARS-Cov2 DUE |                    |
| Sept. 29 (Wed)  | No class   | ---                |
| Oct. 5 (Tues)   | Electron Microscopy Techniques/<br>Phagocytosis<br>Creative project ideas DUE        |                    |
| Oct. 6 (Wed)    | Student seminar: Cryo-EM   | ---                |
| Oct. 11-15      | READING WEEK   | ---                |
| Oct. 19 (Tues)  | Student seminars: AFM & FRET<br>- Midterm paper distributed                          | ---                |
| Oct. 20 (Wed)   | Student seminar: FRAP  | ---                |
| Oct 26 (Tues)   | MIDTERM (in class)   | ---                |
| Nov 1 (Mon)     | Creative projects DUE  | ---                |
| Nov 2 (Tues)    | Microgravity Research lecture<br>Creative project show and tell                      | Grants 2a and 2b   |
| Nov 3 (Wed)     | Creative project show and tell   | ---                |
| Nov 9 (Tues)    | Bone Microgravity Grant Discussion#2<br>**Assignment#2 due                           | Grants 2a and 2b   |
| Nov 10 (Wed)    | No class   | ---                |
| Nov 16 (Tues)   | Student seminars: LLSM & SIM   | ---                |
| Nov.17 (Wed)    | Journal critique #2 Imaging DUE.<br>No class   | ---                |
| Nov. 23 (Tues)  | Student seminars: STED & STORM   | ---                |
| Nov. 24 (Wed)   | Student seminar: Multi-photon  | ---                |
| Nov. 30 (Tues)  | Final exam manuscript distributed  | ---                |
| Dec. 1 (Wed)    | No class   | ---                |
|                 | FINAL EXAM (TBD)   |                    |

**\*\*Disclaimer:** The above schedule, policies, procedures, and assignments in this course are subject to change in the event of extenuating circumstances.

Student Seminars:

September 28 (Tuesday): Spinning disk confocal (student pair)  
TIRF- total internal reflection (student pair)

October 6 (Wed): Cryo-EM (student pair)

October 19 (Tues): AFM- atomic force microscopy (student pair)  
FRET- Forster resonance energy transfer (student pair)

October 20 (Wed): FRAP- fluorescence recovery after photobleaching (student pair)

November 16 (Tues): LLSM- lattice lightsheet microscopy (student pair)  
SIM- structured illumination microscopy (student pair)

November 23 (Tues): STED- stimulated emission depletion microscopy (student pair)  
STORM- stochastic optical resolution microscopy (student pair)

November 24 (Wed): 2-photon microscopy (student pair)

November 30 (Tues): Open topic if necessary (student pair)