**BMB/MMG/PSL 825**

**Spring 2022 DRAFT 2**

**Cell Structure and Function**

|  |
| --- |
| **Instructors** |
| Dr. Susanne Hoffmann-BenningBMB223 Biochemistry517-355-9644hoffma16@msu.edu |  Dr. Yonghui Zheng Dr. Hari Subramanian Dr. Rupali Das  MMG PSL PSL  4195 BPS 2196 BPS 2195 BPS 517-884-5314 517-884-5052 517-884-5049  zhengyo@msu.edu subram46@msu.edu dasrupal@psl.msu.edu  |

**Time:**

Classes will be held from 1:00-2:20 p.m. Tuesday and Thursday throughout Spring Semester in Room 1420 BPS.

**Office Hours:**

Appointments will be scheduled as needed. Short questions can be answered by e-mail.

**Readings:**

Readings from the text and/or the current literature will be assigned by individual instructors. The recommended text is “Molecular Biology of the Cell”, by Alberts et al., 6th Edition. You may want to purchase this book but it is not absolutely required.

**Class participation:**

Attendance/ participation is mandatory; missing more than three class periods results in a failing grade. For students in Grand Rapids, a zoom link will be provided.

**Evaluation:**

 3 Exams (70%); Exam 1 (43 points), Exam 2 (54 points), Exam 3 (33 points); 130 points total

 Term paper (20%) 40 points

 Presentations (10%) 30 points

**Examination Times:**

The examinations will be held at the following times. *Please mark these times on your calendar, as makeup exams will not be given except in MSU-approved emergencies.*

Exam 1 Tuesday, February 10h from 12:45 until 2:45pm in Room 1420 BPS Bldg. Note that we have scheduled extra time to allow students to have up to 2 hours.

Exam 2 Tuesday, March 15th from 12:45 until 2:45pm in Room 1420 BPS Bldg.

Exam 3 Wednesday, May 4 from 10:00 am -12:00pm in Room 1420 BPS Bldg.

**Presentations:** You will be expected to give a ten-minute presentation summarizing a publication assigned by the professor. This presentation is worth 15 points. There will be four presentation days of five presentations each. You will be expected to read the publications, provide one question/ comment per publication prior to the beginning of class (at least 3 questions per class day; less if you are presenting) and participate in the discussion.This participation is worth 1 point per question up to 15 points

**Term Paper:** Topics for a potential term paper will be provided by each professor. **The paper must be delivered to the office of the appropriate professor by 4:00 p.m. on Thursday, April 14th** and must closely follow the guidelines provided in the syllabus**.** Points will be deducted if the paper is late. Instructions are attached.

|  |  |  |  |
| --- | --- | --- | --- |
| **Day** | **Date** | **Lecturer** | **Topic** |
| T | Jan 11 | SHB | The Diversity of Cells; Methods in cell biology |
| Th | Jan 13 | SHB | The plasma membrane: How structure affects function |
| T | Jan 18 | SHB | The Endoplasmic Reticulum |
| Th | Jan 20 | SHB | The Secretory Pathway |
| T | Jan 25 | SHB | Lipid metabolism and Signaling |
| Th | Jan 27 | SHB | Signaling |
| T | Feb 1 | SHB | Methods in Cell Biology: Presentations and discussion |
| Th | Feb 3 | SHB | Mitochondria |
| T | Feb 8 | SHB | Plant metabolic pathways  |
| Th | Feb 10 | SHB | **Exam 1: 12:45-2:45, 1420 BPS** |
| T | Feb 15 | RD | Cytoskeleton: Actin and Actin binding proteins |
| Th | Feb 17 | RD | Cytoskeleton: Myosin and microtubules |
| T | Feb 22 | RD | Cytoskeleton: Cell polarization and migration |
| Th | Feb 24 | HS | Cell Adhesion: Cell-cell junctions |
|  | **Mar 2-6** | **Spring Break** |
| T | Mar 8 | HS | Cell Adhesion: ECM |
| Th | Mar 10 | HS | Cell Adhesion: Cell and ECM junctions |
| T | Mar 15 | RD/HS/ | Presentations and discussion |
| Th | Mar 17 | RD | Cancer: Critical pathways |
| T | Mar 22 | RD | Cancer: Prevention and treatment |
| Th | Mar 24 | HS | Developmental mechanisms and developmental timing |
| T | Mar 29 | HS | Development: morphogenesis and growth |
| Th | Mar 31 | RD/HS | Presentations and discussion |
| T | Apr 5 | RD/HS | **Exam 2: 12:45-2:45, 1420 BPS** |
| Th | Apr 7 | YZ | ER Stress |
| T | Apr 12 | YZ | Ubiquitin/proteasome  |
| Th | Apr 14 | YZ | Autophagy/lysosome |
| T | Apr 19 | YZ | Protein transport into/out of nucleus; RNA export  |
| Th | Apr 21 | YZ | Cell Cycle |
| T | Apr 26 | YZ | Apoptosis |
| Th | Apr 28 | YZ | Presentations and discussion |
| Wed | May 4 | YZ | **Final exam BPS 1420 10:00 am – 12:00 pm** |

**Instructions for the Preparation of a Term Paper**

1. **Topic Selection:** Topics for the term papers will be provided by each instructor and you will be given a chance to select a topic of interest. Discuss your area of focus with the assigned instructor BEFORE beginning work. Provide the papers you have selected and an outline of your paper before beginning the writing process. You should contact the instructor **a month in advance** of the due date.
2. **Format:** The paper should be no more than 7-10 typewritten, double-spaced pages (excluding the references). The first page or two should be an introduction to the topic that assumes the reader has some knowledge of the material presented in class but not beyond. The middle 4-6 pages should focus on 3-4 experimental reports bearing directly on your specific topic. Figures (3-5) should be used to guide the reader. Unless there is an important exception, the papers cited should be from reputable journals from the 2006-2020 literature. For the most part, they should be original articles supported as needed by review articles. One aspect of this assignment may be to narrow the topic from that provided to focus on a specific subtopic. The last page or two of the paper is VERY important. It should be a summary or synthesis that reflects your assessment of the area presented in a mature, thoughtful manner. Discuss any controversies and be sure to provide your own ideas for future directions and experiments. **The summary and proposed future experiments MUST reflect the maturity of your thinking on this topic and will play a key role in the grade.**
3. Your reference list at the very end of the paper should include all the authors for each article, the title of the article, the volume and date of journal and all page numbers.
4. Plagiarism: Copying paragraphs or sentences from your cited or non-cited references constitutes plagiarism! Rephrasing sentences and paragraphs does not represent a scholarly effort. All writing must be your synthesis of the material presented in your own words. ***Any significant form of plagiarism will result in an automatic failing grade since it constitutes scientific misconduct.***
5. **The term paper is due in the appropriate professor’s office by 4:00 p.m. Thursday, April 14th.** Points will be deducted for papers turned in late. Papers can be turned in prior to this date.