

# Eukaryotic Cell Biology Laboratory Workshop Spring 2024

---

Instructor: Luis Rodriguez, PhD

Contact: Email: [Irodri17@gmu.edu](mailto:Irodri17@gmu.edu) Office Hours: By Appointment only.

Students must use their Mason email account to receive important University information, including messages related to this class. Online lectures will be held via blackboard collaborate during the scheduled course time.

Schedule Lectures: There will be 4 online lectures prior to our week-long work shop on Thursday Feb 8<sup>th</sup>, 15<sup>th</sup>, 22<sup>th</sup>, and 29<sup>rd</sup> from 4:30-7:10 PM EST.  
Lab: Monday-Friday March 4<sup>th</sup> – 8<sup>th</sup>, 9am -6pm Discovery Hall Rm 223

General University Catalog: <http://catalog.gmu.edu/>  
University Policies: <http://universitypolicy.gmu.edu/>

## **Rationale:**

This class will introduce you general to research design, to the techniques and practice of *in vitro* cell culture, and molecular biology assays which are traditionally used in translational research and genomic studies. These concepts and techniques will be applied to address the following hypothesis:

### ***Can induction of HIF1 $\alpha$ signaling be useful as a therapeutic in lung cancer?***

This class will consist of 4 online lectures where we will hold a weekly journal club and discuss topics related to the course hypothesis and assays. These lectures are followed by a full week of laboratory exercise March 4<sup>th</sup> – 8<sup>th</sup>. **Please plan on being in the lab from 9am-6pm during the week of the course.**

## **Grading:**

### **1. Journal Club Presentation 25%**

A PowerPoint presentation summarizing the hypothesis, methodology, and findings of a primary research article in the field of oxidative stress and lung pathology. During the first lecture you will be asked to chose from a variety of articles for you presentation.

### **2. Lab Report 50%**

A complete laboratory report detailing your results and analysis of the data collected over the week. This report is to be written in the style of a primary research paper. Abstract, Introduction, Materials and Methods, Results, Discussion. A draft manuscript will be submitted for peer review as described below. Attention given to comments in peer review is expected of the final manuscript.

### **3. Peer Review 25%**

All lab reports will be drafted and submitted for peer review by your classmates. Accordingly, each member of the class will write a thoughtful and constructive review of the lab report submitted to the instructor for grading and to the original author.

## Schedule

|    | <u>Date</u>            | <u>Topics</u>  |
|----|------------------------|--|
| 1  | Feb 8 <sup>th</sup>    | Course Introduction<br>Oxidative Stress and Lung Injury  |
| 2  | Feb 15 <sup>th</sup>   | Metastasis and EMT in Lung Cancer  |
| 3  | Feb 22 <sup>th</sup>   | Angiogenesis and Lung Cancer   |
| 4  | Feb 29 <sup>th</sup>   | Model systems in Lung Cancer   |
| 5  | March 4 <sup>th</sup>  | Discussion: Introduction to Tissue Culture<br>Lab: Cell maintenance, cell seeding, isolation of nucleic acids and protein      |
| 6  | March 5 <sup>th</sup>  | Discussion: Regulation of the cell cycle and apoptosis in cancer<br>Lab: Small molecule challenge for ROS and Apoptosis Assays |
| 7  | March 6 <sup>th</sup>  | Discussion: How to assay metastasis <i>in-vitro</i><br>Lab: QPCR and Viability Assays  |
| 8  | March 7 <sup>th</sup>  | Discussion: The application RNA, DNA, and Protein analysis<br>Lab: Immunofluorescence, immunoblots, analysis of primary data   |
| 9  | March 8 <sup>th</sup>  | Discussion: Microscopy in molecular biology<br>Lab: Imaging and quantification   |
| 10 | April 5 <sup>nd</sup>  | Draft Lab Report Due   |
| 11 | April 7 <sup>th</sup>  | Peer Reviews are assigned  |
| 11 | April 17 <sup>th</sup> | Peer Reviews Due   |
| 12 | May 1 <sup>th</sup>    | Final Lab Report due   |

### **Academic Integrity**

THE HONOR CODE IS STRICTLY ENFORCED IN THIS CLASS.

The integrity of the University community is affected by the individual choices made by each of us. GMU has an Honor Code with clear guidelines regarding academic integrity. Three fundamental and rather simple principles to follow at all times are that: (1) all work submitted be your own; (2) when using the work or ideas of others, including fellow students, give full credit through accurate citations; and (3) if you are uncertain about the ground rules on a particular assignment, ask for clarification. No grade is important enough to justify academic misconduct. Plagiarism means using the exact words,

opinions, or factual information from another person without giving the person credit. Writers give credit through accepted documentation styles, such as parenthetical citation, footnotes, or endnotes. Paraphrased material must also be cited, using MLA or APA format. A simple listing of books or articles is not sufficient. Plagiarism is the equivalent of intellectual robbery and cannot be tolerated in the academic setting. If you have any doubts about what constitutes plagiarism, please see me.

### **Disability Accommodations**

If you are a student with a disability and you need academic accommodations, please see me and contact the Office of Disability Services (ODS) at 993-2474, <http://ods.gmu.edu>. All academic accommodations must be arranged through the ODS