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Fall 9-1-2021

### BIOM 451.01: Microbial Physiology Lab

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**BIOM 451: Microbial Physiology Laboratory**  
**Fall 2021**

Fridays 12:00-2:50 HS 405

**Instructor:** Dr. Patrick Secor: HS 513C | [patrick.secor@mso.umt.edu](mailto:patrick.secor@mso.umt.edu)

**Teaching Assistant:** Dominick Faith: HS 416 | [dominick1.faih@umconnect.umt.edu](mailto:dominick1.faih@umconnect.umt.edu)

<b>Dates</b>	<b>Topics</b>	<b>Due</b>
9/3/21	Introduction: Safety & Orientation	
9/10/21	Lab 1a: Phage Hunt; Environmental Sample Collection	
9/17/21	<b>No Lab (Dominick at conference)</b>	
9/24/21	Lab 1b: Phage Hunt; Isolation & Purification	
10/1/21	Lab 1c: Phage Hunt; Host & Phage Archive	
10/8/21	Lab 2a: Transposon Mutagenesis; Library Prep	
10/15/21	Lab 2b: Transposon Mutagenesis; Screening	<b>Lab 1 Report</b>
10/22/21	Lab 2c: Transposon Mutagenesis; Screening	
10/29/21	Lab 2d: Transposon Mutagenesis; Identifying Candidate Genes	
11/5/21	Lab 3a: Microbial Motility; Taxis & Pathogen/Pathogen Interactions	<b>Lab 2 Report</b>
11/12/21	<b>No Lab (Veterans Day 11/11/21)</b>	
11/19/21	Lab 3b: Microbial Motility; Taxis & Pathogen/Pathogen Interactions	
11/26/21	<b>No Lab (Thanksgiving Break)</b>	
12/3/21	Lab 4: Phenazines; Redox Chemistry	<b>Lab 3 Report</b>
12/10/21	Lab 5: Genomics Core Tour	<b>Lab 4 Report</b>
12/17/21	<b>No Lab (Finals Week)</b>	

\* Dates & topics are tentative and subject to change

<b>TOPICS</b>	<b>LEARNING OUTCOMES</b>
<b>Introduction</b>	<ul style="list-style-type: none"> <li>• Instructor and student introductions</li> <li>• Familiarize students with course expectations, assessment tools, grading, and learning resources</li> </ul>
<b>Phage Hunt (1a-1c)</b>	<ul style="list-style-type: none"> <li>• Learn how to isolate and propagate phages collected from the environment</li> <li>• Appreciate the diversity of phages in our immediate environment</li> <li>• Learn how to maintain and store novel microbes</li> </ul>
<b>Transposon Mutagenesis (2a-2d)</b>	<ul style="list-style-type: none"> <li>• Learn about bacterial retrons</li> <li>• Learn how to use genetic screens to study microbes using transposon mutagenesis</li> </ul>
<b>Microbial Motility (3a, 3b)</b>	<ul style="list-style-type: none"> <li>• Measure swimming, twitching, and swarming</li> <li>• Characterize bacterial chemotaxis towards or away from various substances</li> </ul>

	<ul style="list-style-type: none"> <li>• Appreciate the physical parameters affecting motility (osmolarity, moisture, cell density, etc.)</li> <li>• Learn how to cultivate multiple bacterial species together in the lab</li> <li>• Perform competition assays to characterize fitness of different species under different conditions</li> <li>• Learn how to identify different species of bacteria using morphological techniques</li> </ul>
<b>Phenazines (4)</b>	<ul style="list-style-type: none"> <li>• Learn how redox cycling works</li> <li>• Understand how bacteria use redox-active metabolites to shuttle electrons in the extracellular environment</li> <li>• Understand why phenazines can act as virulence factors.</li> </ul>
<b>Genomics Core Tour (5)</b>	<ul style="list-style-type: none"> <li>• Learn how genomes can be analyzed using next generation sequencing (NGS) from the experts in the UM genomics core</li> </ul>

**Office hours:**

Email me ([dominick1.faith@umconnect.umt.edu](mailto:dominick1.faith@umconnect.umt.edu)) to set up an appointment

**Lab Reports:**

Abstract:	15	pts
Introduction:	20	pts
Materials & Methods:	20	pts
Results:	35	pts
Discussion & Conclusions:	35	pts
<b>Total</b>	<b>125</b>	<b>pts</b>

125 pts/report x 4 reports = **500 pts**

Lab reports are to be uploaded to respective assignment folders in the BIOM 451 class moodle as .docx files to before start of lab (12:00 p.m.) by the date indicated on the above schedule.

**Late Policy:**

Each student will have approximately one week from the time that a lab has commenced in its entirety until the lab report is due. In most cases this is enough time for lab reports to be completed therefore, lab reports turned in late will be assessed a 10% per day penalty. Extensions may be granted if students communicate concerns prior to the assignment due date.

### **Laboratory Notebooks:**

Students are required to maintain a complete record of experiments and observations within a non-spiral bound laboratory notebook. Although not graded, lab notebooks are an invaluable resource when composing lab reports. Therefore, a complete and well-organized lab notebook should be reflected in a well-written lab report.

### **Attendance:**

Students must attend each class to receive full credit. An ~8% (~40 pts) penalty will be assessed to a student's overall grade for each class missed. If a student must miss class, contact me ([dominick1.faith@umconnect.umt.edu](mailto:dominick1.faith@umconnect.umt.edu)) as soon as possible and we can arrange for you to complete the lab at a different time.

### **Grading:**

A	90-100%	450-500 pts
B	80-89%	400-449 pts
C	70-79%	350-399 pts
D	60-69%	300-349 pts
F	<60%	<300 pts

### **Accessibility:**

The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and the Office for Disability Equity (ODE). If you anticipate or experience barriers based on disability, please contact the ODE at: (406) 243-2243, [ode@umontana.edu](mailto:ode@umontana.edu), or visit [www.umt.edu/disability](http://www.umt.edu/disability) for more information. Retroactive accommodation requests will not be honored, so please, do not delay. As your instructor, I will work with you and the ODE to implement an effective accommodation, and you are welcome to contact me privately if you wish.

### **Academic Integrity Policy:**

Academic misconduct will be reported and handled as described in UM's Student Conduct Code. All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. All students need to be familiar with the UM Student Conduct Code. The Code is available online at:

<http://www.umt.edu/vpesa/Dean%20of%20Students/default.php>

**Dropping courses:**

Dropping courses or changing grade status will strictly follow UM policies and procedures, which are described in the course catalog. Students cannot change to an audit after the 15th day of instruction. In addition, dropping the course or changing the grading status (to CR/NCR) are not automatically approved after the 30th day of the semester. These may be requested by petition, but the petition must be accompanied by documentation of extenuating circumstances. Requests to drop or change grading status to benefit a student's GPA will not be approved.