

# ME:680.712 Mouse Pathobiology and Phenotyping:

## Enhancing Rigor and Reproducibility in Translational Research

### Involving Mice

Summer Session Short Course

In Person

East Baltimore Campus.

#### Description

This course is intended for graduate students or postdocs at any level who currently work with or expect to work with mouse models and genetically engineered mice.

- There are up to ~34 contact hours: ~11hr Laboratory sessions and ~23 hr Lectures. The four (4) hands-on laboratory sessions include clinical and physical examination of mice, specimen collection, clinical pathology and anatomic pathology.
- Familiarity with basic anatomy is expected for participation in laboratory sessions.
- SOM graduate students registered to take this course FOR CREDIT must participate in all lab sessions.
- Postdocs and auditors should contact the course director (Dr. Brayton) to waitlist for lab availability

**Faculty from JHU School of Medicine and Bloomberg School of Public Health** introduce concepts in mouse biology, pathology, genetics, normal 'phenotypes', concepts, new and established phenotyping capabilities in multiple disciplines.

JHU cores and resources are highlighted. See previous course programs/schedules below.

**Laboratory Manual, Lecture material and resources are provided on line in CANVAS.**

It is NOT necessary to purchase a text book.

**Course Co-Directors:** Cory Brayton, DVM, DipACLAM, DipACVP; Jonathan Harrold, ACUC

Course Administrator: Momina Malik [mmalik21@jh.edu](mailto:mmalik21@jh.edu)

#### **Learning Objectives/ Goals:**

Students successfully completing this course will be able to:

1. Critically analyze and select mouse models and conditions for research aims;
2. Select and Implement humane and useful procedures for research aims;
3. Plan for pathology, special collections, histology, analyses to achieve useful specimens and data.

**THE OVERALL AIM** is to Achieve Rigor, Reproducibility, Validity, Translatability in research involving mice, using practical skills, and resources, from the course, for the humane and optimal use of mice and GEM in translational research.

#### **Credit/grade based on**

1. Lab participation (required).
2. IN person lecture attendance is expected unless excused. Daily AM /PM sign in.
3. Quiz A brief (Qualtrics) survey relevant to articles for the group project.
4. Quiz B (in Canvas) write/draft Animal portions of your Methods sections for a paper, an example is provided.
5. Group Project: 3 or 4 groups will each assess 'methods' of an influential article; (everyone will have read excerpted methods sections for quiz 1). On Friday morning each group will present the strengths and weaknesses of their article, and its methods reporting, in 10 or fewer minutes, and 10 or fewer PPT (or similar) slides, and the class will discuss ~10min per article. A PPT template will be provided.

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**PROGRAM July 21-25, 2025**

<b>MONDAY</b>	<b>July 21, 2025</b>	<b>Welcome, Introductions</b>	<b>SPH BD</b>
<b>815-845am</b>		<b>Registration SIGN IN</b>	
845-10	Brayton	Introduction: Phenotyping & Famous Mice	
10-11	Brayton	Common Phenotypes & Disease (Spontaneous /NON infectious)	
11-12	Villano	External Environmental (X) Factors and Reproducibility	
12-1230		INFO On Quiz & Group Work	
<b>1230-130</b>	<b>LUNCH break</b>	<b>Meet Participants/ Cores /Group Work ?</b>	
130-230	Brayton	Microbial & infectious Research Challenges	
230-330	Brayton	Immunovariability in (immune sufficient and immune deficient) mice	
330-430	Hopper	Research relevant social life and behaviors of mice	
<b>430-5pm</b>		<b>Group Work ?</b>	
<b>TUESDAY</b>	<b>July 22, 2025</b>	<b>GEM &amp; Multidisciplinary Phenotyping</b>	<b>SPH BD</b>
<b>9-10</b>	Hawkins (Tg ESC Core)	Making Mice – traditional and new transgenic technologies	
10-11	Vidaver/Gabrielson	IMAGING for Phenotyping, & pathology correlates	
11-12	Glunde	MALDI imaging for highly multiplexed molecular mapping of mouse tissues	
12-130	<b>LUNCH break</b>	<b>Meet Participants/ Cores /Group Work ?</b>	
130-230	Mitzner	Pulmonary/Respiratory Phenotypes & Phenotyping	
230-330	Aja	Metabolic Phenotypes and Phenotyping	
330-400	Vicenzio	Auditory Phenotypes and Phenotyping	
4-430	Brayton	Comparative Anatomy/Pathology (human/mouse)	
<b>430-5pm</b>		<b>Group Work ?</b>	
<b>WEDNESDAY</b>	<b>July 23, 2025</b>	<b>Practical Phenotyping 1</b>	<b>SPH BD</b>
<b>JH Phenotyping Laboratory Manual 2024 rev</b>		<b>Participants should REVIEW by Wednesday AM</b>	
<b>9-1030</b>	Lecture	Moats et al – Clinical / Physical Exam (SHIRPA/CSD)	
1030-12	Lecture	Brayton – Practical Clinical Pathology (Hematology Chemistry, etc for research)	
<b>12-130</b>	<b>LUNCH break</b>	<b>Group Work / Meet Cores</b>	
<b>130-4</b>	<b>LAB 1 2</b>	<b>Harrold Cederberg Hull Villano et al: CSD/SHIRPA, collections, procedures</b>	<b>SPH WB</b>
4-5		Discuss Project specific Questions / GROUP WORK / interactive REVIEW (Quiz format)	
<b>5pm!!</b>		<b>QUIZ A DUE = short Qualtrics survey</b>	
<b>THURSDAY</b>	<b>July 24, 2025</b>	<b>Practical Phenotyping 2</b>	
<b>9-10</b>	<b>Doyle</b>	Ophthalmic Phenotypes and Phenotyping	
10-1130	Lecture	Brayton – Practical Pathology – Necropsy, examination, tissue collection trimming	
1130-1230	<b>LUNCH break</b>	Group Work etc	
<b>1230-430</b>	<b>LAB 3:</b>	<b>Brayton et al Anatomic Pathology – Necropsy</b>	<b>SPH WB</b>
4-5		Discuss Project specific Questions / GROUP WORK / interactive REVIEW (Quiz format)	
<b>FRIDAY</b>	<b>July 25, 2025</b>	<b>Practical Phenotyping 3 Advanced Pathology</b>	
<b>9-10</b>	<b>LAB 4</b>	<b>Brayton et al Trimming for histopathology</b>	<b>SPH WB</b>
10-11		GROUP PROJECT PRESENTATIONS	<b>SPH BD</b>
1130-1230	<b>LUNCH break + +</b>	<b>L Bassel NCI Preclinical Cancer Models /Cases</b>	
1230-130	S Beck	Practical Pre GLP Pathology (efficacy/safety assessments in academic settings)	
130-230	E Edmundson et al	NCI Immunohistochemistry Principles and practice + Mouse resources	
230-330	B Kang Novartis	Digital Pathology: options for image analysis and quantitative pathology	
330-430	J Ward (NCI etc)	Embryo and Developmental Phenotyping	
430-5		Pathology Faculty Discussion of participants research questions	
<b>5pm</b>		<b>Quiz B DUE ! for course ME680.712</b>	