

ME:680.712 Mouse Pathobiology and Phenotyping: Enhancing Rigor and Reproducibility in Translational Research Involving Mice

July 22-26, 2024 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 laboratory sessions.
- Postdocs and auditors should contact the course director (Dr. Cory Brayton) to waitlist for lab session 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

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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PRELIMINARY PROGRAM July 22-26, 2024

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|--|---|---|-------------------------|
| MONDAY | July 22, 2024 | Welcome, Introductions | TURNER /TILGHMAN |
| 815-845am | | Registration SIGN IN | |
| 845-10 | Brayton | – Introduction: Phenotyping & Famous Mice | |
| 10-11 | Brayton | – Common Phenotypes & Disease (Spontaneous /NON infectious) | |
| 11-12 | External Environmental (X) Factors and Reproducibility | | |
| 12-1230 | INFO On Quiz & Group Work | | |
| 1230-130 | LUNCH | – Meet Participants/ Cores /Group Work ? | |
| 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 | |
| 430-5pm | Group Work ? | | |
| TUESDAY | July 23, 2024 | GEM & Multidisciplinary Phenotyping | TURNER /TILGHMAN |
| 9-10 | Hawkins (Tg ESC Core) | – Making Mice – traditional and new transgenic technologies | |
| 10-11 | Aja | – Metabolic Phenotypes and Phenotyping | |
| 11-12 | Mitzner | – Pulmonary/Respiratory Phenotypes & Phenotyping | |
| 12-130 | LUNCH /Group Work / Meet Cores CSMR (metabolic), MRB Behavioral, ESC, OTS | | |
| 130-230 | Vicenzio/Lauer | – Auditory Phenotypes and Phenotyping | |
| 230-330 | VIDAVER/Gabrielson | – IMAGING for Phenotyping | |
| 330-400 | Glunde | – MALDI imaging for highly multiplexed molecular mapping of mouse tissues | |
| 4-430 | Brayton | – Comparative Anatomy/Pathology (human/mouse) | |
| 430-5pm | Group Work ? | | |
| WEDNESDAY | July 24, 2024 | Practical Phenotyping 1 | TURNER /TILGHMAN |
| JH Phenotyping Laboratory Manual 2024 rev | Participants should REVIEW by Wednesday AM | | |
| 9-1030 | Lecture | Moats et al – Clinical / Physical Exam (SHIRPA/CSD) | |
| 1030-12 | Lecture | Brayton – Practical Clinical Pathology (Hematology Chemistry, etc for research) | |
| 12-130 | LUNCH /Group Work / Meet Cores CSMR (metabolic), MRB Behavioral, ESC, OTS | | |
| 130-4 | LAB 1 2 Harrold Cederberg Hull Villano et al: SHIRPA exam, collections, procedures | PCTB G17 | |
| 4-5 | Discuss Project specific Questions / GROUP WORK / interactive REVIEW (Quiz format) | | |
| 5pm!! | QUIZ A DUE = short Qualtrics survey | | |
| THURSDAY | July 25, 2024 | Practical Phenotyping 2 | |
| 9-10 | Doyle | – Ophthalmic Phenotypes and Phenotyping | |
| 10-1130 | Lecture | Brayton – Practical Pathology – Necropsy, examination, tissue collection trimming | |
| 1130-1230 | LUNCH BREAK (on your own) | | |
| 1230-430 | LAB 3: Brayton et al Anatomic Pathology | – Necropsy, | |
| 4-5 | Discuss Project specific Questions / GROUP WORK / interactive REVIEW (Quiz format) | | |
| FRIDAY | July 26, 2024 | Practical Phenotyping 3 Advanced Pathology | |
| 9-10 LAB4 | Brayton et al | trimming for histopathology | |
| 10-1130 | GROUP WORK PRESENTATIONS | | |
| 1130-1230 | LUNCH | | |
| 1230-130 | McDorman/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 | | |
| 5pm | Quiz B Due ! for course ME680.712 | | |