ME:680.712 Mouse Pathobiology and Phenotyping:

Enhancing Rigor and Reproducibility in Translational Research Involving Mice

July 17-21, 2023 **In person** **East Baltimore Campus.**

Graduate Student & Postdoc Registration via https://my.jh.edu/myJH/ EDUCATION SIS/SEAM
Postdocs and auditors should contact the course director (Dr. Cory Brayton) to waitlist for lab session availability.
SOM post-doc fellows should submit all registration requests via SEAM, using the case reason "Add/Drop" or "Interdivisional Registration", depending on the course.
The SOM Change of Schedule form, is optional for post-docs and no program director signature is required.

FACULTY/STAFF: TR /Tuition Remission option may become available. For now please register using https://jhmi.co1.qualtrics.com/jfe/form/SV_0rfaOR8rRLcz4vI

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.
Syllabus material is provided: Hard copy laboratory manual is provided to all enrolled in laboratory sessions. Lecture and laboratory syllabus material is provided as pdf's. It is NOT necessary to purchase a text book.
Course Co-Directors: Cory Brayton, DVM, DipACLAM, DipACVP, Jason Villano, DVM, MS, DipACLAM; Jonathan Harrold, ACUC
Course Administrator: Momina Malik mmalik21@jh.edu

This course offers up to ~34 contact hours: ~11hr Laboratory sessions and ~23 hr Lectures.
The three 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.

Learning objectives/aims:

A. Provide information, practical tools and skills essential to humane and optimal use of mice and GEM in translational research;
B. Achieve Rigor, Reproducibility, Validity, Translatability in research involving mice.

Learning Outcomes:

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

Credit/grade based on

1. Lab participation (required)
2. Quiz A short take home multi-choice questions based on 3 methods sections
3. Quiz B Write your next methods section (animal portion), aligning with NIH STAR FASEB ARRIVE guidance

JOHNS HOPKINS SCHOOL of MEDICINE | MCP
Department of Molecular & Comparative Pathobiology

PRELIMINARY PROGRAM

MONDAY July 17 2023 Welcome, Introduction **TURNER TILGHMAN/720 Rutland Ave, Balt 21205**

8am Registration
845-10 Brayton – Introduction: Phenotyping & Famous Mice
10-11 Brayton – Common Phenotypes & Disease (Spontaneous /NON infectious)
11-12 Bailey – External Environmental (X) Factors and Reproducibility
12-1 LUNCH BREAK: Meet participants / Cores /Faculty
1-2 Brayton – FREE RANGE RODENTS ? Are we ready?
2-3 Brayton – Microbial & infectious Research Challenges
3-4 Brayton – Immunovariability in (immune sufficient and deficient) mice
4-5 Hutchinson – Research relevant social life and behaviors of mice
5-6pm Q&A MEET THE PARTICIPANTS

TUESDAY July 18 2023 GEM & Multidisciplinary Phenotyping **TURNER TILGHMAN**

9-1 **Hawkins/Reeves** – Making Mice – traditional and new transgenic technologies
10-11 **Aja** – Metabolic Phenotypes and Phenotyping
11-12 **Mitzner** – Pulmonary/Respiratory Phenotypes & Phenotyping
12-130 LUNCH BREAK: Meet participants / Cores /Faculty
130-230 **Doyle** – Ophthalmic Phenotypes and Phenotyping
230-330 **Vicenzio/Lauer** – Auditory Phenotypes and Phenotyping
330-430 **Foss/Gabrielson** – IMAGING for Phenotyping

WEDNESDAY July 19 2023 Practical Phenotyping 1 In Vivo **AM Turner /MRB G PM PCTB G17**

JH Phenotyping Laboratory Manual **Participants should REVIEW by Wednesday AM**

9-1030 **Bailey –** Clinical / Physical Exam + DEMO
1030-12 **Brayton** – Practical Clinical Pathology (Hematology Chemistry, etc for research)
12-130 LUNCH BREAK: Meet participants / Cores / Faculty
130-4 LAB 1 PCTB G17 Harrold Cederberg et al: Collections and common procedures
4-5 **Faculty** Discussion of participants questions
Brayton Research Relevant Mouse Phenotypes & Pathology – interactive REVIEW (Quiz format)

THURSDAY July 20 2023 Practical Phenotyping 2 Pathology **AM Turner /MRB G PM PCTB G17**

9-1030 Brayton – Practical Pathology – Necropsy, examination, tissue collection trimming Lecture
1030-1130 Brayton – Comparative Anatomy/Pathology (human/mouse)
1130-1230 LUNCH BREAK: Meet participants / Cores /Faculty
1230-430 LAB 2 PM PCTB G17 Brayton et al: Anatomic Pathology – Necropsy, perfusion etc
4-5 Faculty Discussion of participants research questions &/or **Quiz A Review**

FRIDAY July 21 2023 Practical Phenotyping 3 Pathology **AM PM PCTB G17 PM Turner /MRB G**

9-1030 **LAB 3 PCTB G17 BRAYTON et al: trimming for histopathology** (& your research aims)
1030-1130 Brayton **Quiz A (Review)**
1130-1230 **LUNCH BREAK: Meet participants / Cores /Faculty**
1230-130 **D Rao** Practical Pre GLP Pathology (efficacy/safety assessments in academic settings)
130-230 E Edmondson Immunohistochemistry Principles and practice
230-330 **B Kang** Digital Pathology: options for image analysis and quantitative pathology
330-430 J Ward Embryo and Developmental Phenotyping
430-5 Pathology Faculty Discussion of participants research questions
5pm Quiz part B Due ! for course ME680.712

PARTICIPATING CORES

Phenotyping Core Johns Hopkins Phenotyping and Comparative Pathology Core (MRB)
Animal Care and Use Committee (ACUC)
Applied Imaging Mass Spectrometry (AIMS) Core
Behavioral Core School of Medicine (MRB)
CSMR Centralized Services for Metabolism Research Indirect calorimetry, food intake (Rangos)
ES Cell and Transgenic Core
MRB Molecular Imaging Core
OTS Oncology Tissue Services Core
iLAB information and submission https://johnshopkins.corefacilities.org/

Laboratory Manual and Previous Programs.
JH Phenotyping Laboratory Manual 5th ed 2019 (PDF 58p ~6MB)

- 2021 Schedule of Lecture and Laboratory Topics and Faculty (PDF)
- 2020 Schedule of Lecture and Laboratory Topics and Faculty (PDF)
- 2019 Schedule of Lecture and Laboratory Topics and Faculty (PDF)
- 2016 Schedule of Lecture and Laboratory Topics and Faculty (PDF)
- 2015 Schedule of Lecture and Laboratory Topics and Faculty (PDF)
- 2013 Schedule of Lecture and Laboratory Topics and Faculty (PDF)
- 2012 Schedule of Lecture and Laboratory Topics and Faculty (PDF)
- 2011 Schedule of Lecture and Laboratory Topics and Faculty (PDF)
- 2010 Schedule of Lecture and Laboratory Topics and Faculty (PDF)
- 2008 Schedule of Lecture and Laboratory Topics and Faculty (PDF)
- 2007 Schedule of Lecture and Laboratory Topics and Faculty (PDF)
- 2009 Phenotyping Symposium (PDF)
- 2008 Phenotyping Symposium (PDF)
- 2007 Phenotyping Symposium (PDF)
- 2006 Phenotyping Symposium (PDF)

- ADDITIONAL MATERIALS RESOURCES

2022 Brayton Intro Mice 0704
2022 Brayton Reporting Workshop
Research-Relevant Conditions and Pathology of Laboratory Mice, Rats, Gerbils, Guinea Pigs, Hamsters, Naked Mole Rats, and Rabbits. Cooper TK, Meyerholz DK Delaney MA, Piersigilli A, Southard TL, Brayton CF. ILAR J. 2022. https://pubmed.ncbi.nlm.nih.gov/34979559/
Research-Relevant Clinical Pathology Resources: Emphasis on Mice, Rats, Rabbits, Dogs, Minipigs, and Non-Human Primates. Bau-Gaudreault L, Arndt T, Pro Brayton CF. ILAR J. 2021. https://pubmed.ncbi.nlm.nih.gov/34877602/
Research Relevant Background Lesions and Conditions: Ferrets, Dogs, Swine, Sheep, and Goats. Helke KL, Meyerholz DK, Beck AP, Burrough ER, Derscheid RJ, L EF, Scudamore CL, Brayton CF. ILAR J. 2021. https://pubmed.ncbi.nlm.nih.gov/33712827/
Research-Relevant Background Lesions and Conditions in Common Avian and Aquatic Species. Mangus LM, França MS, Shivaprasad HL, Wolf JC. ILAR https://pubmed.ncbi.nlm.nih.gov/33782706/
Research Relevant Conditions and Pathology in Nonhuman Primates. Saravanan C, Flandre T, Hodo CL, Lewis AD, Mecklenburg L, Romeike A, Turner OC, Yen H
Rehttps://pubmed.ncbi.nlm.nih.gov/34129672/
Immune Relevant and Immune De cient Mice: Options and Opportunities in Translational Research. Radaelli E, Santagostino SF, Sellers RS, Brayton CF.ILA https://pubmed.ncbi.nlm.nih.gov/31197363/