



Draft Schedule – Subject to Change

21ST CENTURY MOUSE GENETICS
Monday, August 8 – Friday, August 12, 2016

Course Organizers:

Ken Paigen, Ph.D., The Jackson Laboratory,
Charles Wray, Ph.D., The Jackson Laboratory and
Kelly LaRue, Ph.D., The Jackson Laboratory

For more information please contact Kelly LaRue, kelly.larue@jax.org

Course Goals

At the conclusion of this course, participants will be able to:

- Describe the unique advantages of using mice in genomics research
- Design experiments using appropriate genetic tools in the mouse
- Evaluate the advances and caveats of modern genomic methods
- Justify the use of mouse models in translational research
- Apply modern genetic principles and tools to personal research projects
- **Students will leave this course with a comprehensive view of the use of the mouse in modern genetics and genomics research.**

Monday, August 8

The Power of the Mouse, Leader: Mary Ann Handel

8:30 am	Primer Mary Ann Handel, Ph.D., The Jackson Laboratory
8:45	Inbred strains, background effects, RI, DO, CC, consomics/congenics Gregory Cox, Ph.D., The Jackson Laboratory
9:45	cytology, Meiosis, reproductive bio Mary Ann Handel, Ph.D., The Jackson Laboratory
10:45	Break
11:00	recombination/hotspots and Mendelian mapping Petko Petkov, Ph.D., The Jackson Laboratory
12:00 pm	Lunch

- 1:00 Genetic quality control, genotyping
Melissa Osborne, Ph.D., The Jackson Laboratory
- 2:00 *Hands on Activities*: mouse handling basics, sexing and mouse clinic
Kristin Cough, The Jackson Laboratory
- 5:00 Dinner on your own
- 7:00 *Evening Keynote Lecture*: History of the field
Ken Paigen, Ph.D., The Jackson Laboratory

Tuesday, August 9

Harnessing Genetic Variation, Leader: Charlie Wray

- 8:30 am Primer
Charles Wray, Ph.D., The Jackson Laboratory
- 8:45 Spontaneous mutations, exome sequencing
Dave Bergstrom, Ph.D., The Jackson Laboratory
- 9:25 ENU Mutagenesis
Patsy Nishina, Ph.D., The Jackson Laboratory
- 10:05 Transgenics
Kevin Peterson, Ph.D., The Jackson Laboratory
- 10:45 Break
- 11:00 KOMP
Karen Svenson, Ph.D., The Jackson Laboratory
- 12:00 pm Lunch
- 1:00 Complex trait genetics
Elissa Chesler, Ph.D., The Jackson Laboratory
- 2:00 *Hands on Activities*: DO/QTL workshop
Dan Gatti, Ph.D., The Jackson Laboratory
- 5:00 Dinner on your own
- 7:00 *Evening homework*: Problem set
Vivek Kumar, Ph.D., The Jackson Laboratory

Wednesday, August 10

Genetic tools, Leader: Michael Wiles

- 8:30 am Primer
Michael Wiles, Ph.D., The Jackson Laboratory

- 8:45 CRISPR-Cas
Michael Wiles, Ph.D., The Jackson Laboratory
- 9:45 Epigenetics
Jennifer Trowbridge, Ph.D., The Jackson Laboratory
- 10:45 Break
- 11:00 Viral vectors
Ryuta Ishimura, Ph.D., D.V.M., The Jackson Laboratory
- 12:00 pm Lunch
- 1:00 CRE/LOX
Michael Sasner, Ph.D., The Jackson Laboratory
- 2:00 *Hands on activities: Molecular biology of CRISPR-Cas (gRNA design and genotyping)*
Michael Wiles, Ph.D. and Ben Low, The Jackson Laboratory
- 5:00 *Wine and Cheese Round Table Discussion: Topics in Genetic Tools*
Michael Wiles, Ph.D., Ben Low, Pete Kutny, Ryuta Ishimura, Ph.D., D.V.M., Michael Sasner, Ph.D. and Jennifer Trowbridge, Ph.D.
The Jackson Laboratory

Thursday, August 11

Computational Approaches to Mouse Genetics, Leader: Elissa Chesler

- 8:30 am Primer
Elissa Chesler, Ph.D., The Jackson Laboratory
- 8:45 genome assembly and browsers
Carol Bult, Ph.D., The Jackson Laboratory
- 9:45 Databases, biological ontologies
Judith Blake, Ph.D., The Jackson Laboratory
- 10:45 Break
- 11:00 Systems Genetics
Greg Carter, Ph.D., The Jackson Laboratory
- 12:00 pm Lunch
- 1:00 Proteomic analysis
Steve Munger, Ph.D., The Jackson Laboratory
- 2:00 RNA-seq basics
Steve Munger, Ph.D., The Jackson Laboratory

- 2:30 *Hands-on activities:* RNA seq data analysis
Narayanan Raghupathy, Ph.D., The Jackson Laboratory
- 5:00 Dinner on your own
- 7:00 *Evening Keynote Lecture:* Computational Applications
Fernando Pardo Manuel de Villena, University of North Carolina, Chapel Hill

Friday, August 12

The Mouse as a Model for Human Biology, Leader: Rob Burgess

- 8:30 am Primer
Robert Burgess, Ph.D., The Jackson Laboratory
- 8:45 The mouse as a *model* and precision genetics
Robert Burgess, Ph.D., The Jackson Laboratory
- 9:45 Metabolic disease research, kidney
Ron Korstanje, Ph.D., The Jackson Laboratory
- 10:45 Break
- 11:00 Cancer research, PDX
Carol Bult, Ph.D., The Jackson Laboratory
- 12:00 pm Lunch
- 1:00 Building / testing translational models
Gareth Howell, Ph.D., The Jackson Laboratory
- 2:00 *Hands-on activities:* “Mouse goes to the neurologist”
Stacey Rizzo, Ph.D., The Jackson Laboratory
- 3:00 *Hands-on activities:* “Mouse goes to the doctor”
Karen Svenson, Ph.D., Patsy Nishina, Ph.D., Laurent Bogdanik, Ph.D.,
The Jackson Laboratory
- 6:00 Lobster Banquet
Activity: the future of mouse genetics response board

Saturday, August 13

Optional outdoor activity, please e-mail Kelly (kelly.larue@jax.org) if you're interested!

Late February

6 month research check-up

