

## 2019 ZEBRAFISH GENETICS AND DEVELOPMENT COURSE SCHEDULE

### **Mon 5 Aug**

- 2:00 – 5:00 Student check-in (Swope)  
6:00 – 6:30 Light dinner – cold cuts & veggies (Lobby of Candle House 104/5)  
6:30 – 6:45 Welcome: Sharon Amacher and Debbie Yelon (Candle House 104/5)  
6:45 – 7:45 Overview: Zebrafish development and genetics: Lila Solnica-Krezel (Candle House 104/5)  
7:45 – 9:30 Student 3-min oral presentations and poster session (Candle House 104/5)

### **Tues 6 Aug**

- 8:30 – 9:15 Introduction to stereoscopes, iPad/camera and server setup: Dave Raible & faculty (Loeb 260)  
9:15 – noon Pit Talk and Lab: Zebrafish development (temporal dynamics, tissue organization, early embryo anatomy): Lila Solnica-Krezel, Dave Raible (Loeb 260)  
Noon – 1:30 Faculty (Lila Solnica-Krezel and Dave Raible) lunch with students (Swope)  
1:30 – 6:00 Adult dissection and Regeneration lab (fin and heart): Ken Poss (Loeb 260)  
7:30 – 9:00 Research Lectures and Discussion: Alex Schier and Dave Raible (Starr 209)  
9:00 – 11:00 Overnight time-lapse microscopy: Andres Collazo and Jim Fadool (Group 1)  
9:00 – 11:00 Overnight time-lapse microscopy: Jan Huisken (Group 4)

### **Wed 7 Aug**

- 9:00 – 10:00 Orientation, Health and Safety and Biosafety, IACUC Training (Meigs Room, Swope)  
10:00 – 11:00 Lecture: Introduction to Microscopy: Andres Collazo (Loeb 260)  
11:00 – noon Hands-on microscopy & imaging (fluorescent dissecting scopes plus larval anatomy): Andres Collazo, Dave Raible, Jim Fadool, Debbie Yelon (Loeb 260)  
Noon – 1:30 Faculty (Ken Poss and Alex Schier) lunch with students (Swope)  
1:30 – 3:30 Hands-on microscopy & imaging (compound scopes): Andres Collazo, Dave Raible, Jim Fadool, Debbie Yelon (Loeb 260)  
3:30 – 5:00 Lecture and Discussion: Light Sheet Microscopy: Jan Huisken (Starr 209)  
5:00 – 6:00 Round Table: Responsible Conduct in Research: Amacher and Yelon (Starr 209)  
7:30 – 9:00 Research Lectures & Discussion: Lila Solnica-Krezel and Ken Poss (Starr 209)  
9:00 – 11:00 Overnight time-lapse microscopy: Andres Collazo and Jim Fadool (Group 2)  
9:00 – 11:00 Overnight time-lapse microscopy: Jan Huisken (Group 3)

### **Thurs 8 Aug**

- 8:30 – 11:30 Pit Talk and Lab: mRNA and CRISPR injections: Andi Pauli & Mary Mullins (Loeb 260)  
11:30 – noon Needle pulling demo: Adair Oesterle (Sutter Instruments) (Loeb 260)  
Noon – 1:00 Faculty (Jan Huisken and Andi Pauli) lunch with students (Swope)  
1:00 – 2:00 Developmental Genetics review: Mary Mullins (Starr 209)  
2:00 – 3:00 Round Table: Morpholino use: Mary Mullins, Sharon Amacher, Andi Pauli (Starr 209)  
3:00 – 5:00 CRISPR design workshop: Antonio Giraldez (Starr 209)  
5:00 – 6:00 Round Table: Genome Editing: Giraldez and faculty (Starr 209)  
7:30 – 9:00 Research Lectures and Discussion: Andi Pauli and Antonio Giraldez (Starr 209)  
9:00 – 9:45 Wrap-up mRNA injected embryos: Andi Pauli & Mary Mullins (Loeb 260)  
9:45 – 11:45 Overnight time-lapse microscopy: Andres Collazo and Jim Fadool (Group 3)  
9:45 – 11:45 Overnight time-lapse microscopy: Jan Huisken (Group 1)

### **Fri 9 Aug**

- 9:00 – 11:45 Pit Talk and Lab: Morpholino and CRISPR injections: Andi Pauli & Mary Mullins (Loeb 260)  
Noon – 2:00 Facility visit and Lunch: Aquatic Systems: Sharon Amacher, Debbie Yelon, & suppliers (meet in courtyard; travel to Rowe; back to courtyard for pizza lunch with vendors)  
2:00 – 6:00 Bioinformatics Pit Talk and Lab – Functional genomics, epigenomics and resources, including RNA-seq analysis: Antonio Giraldez (Starr 209)  
7:00 – 7:45 Research Lecture and Discussion: Mary Mullins (Starr 209)  
8:00 – 9:00 MBL Friday Evening Lecture: Steven Haddock (Lillie Auditorium)

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- 9:00 – 9:30 Check injected embryos from the AM: Andi Pauli and Mary Mullins (Loeb 260)  
9:30 – 11:30 Overnight time-lapse microscopy: Andres Collazo and Jim Fadool (Group 4)  
9:30 – 11:30 Overnight time-lapse microscopy: Jan Huisken (Group 2)

### **Sat 10 Aug**

- 8:30 – 9:30 Introduction to ZFIN, atlases, and web resources: Houart and Amacher (Loeb 263)  
9:30 – 10:00 Pit Talk: Immunostaining & in situ hybridization: Houart and Amacher (Loeb 260)  
10:00 – Noon Mounting, analysis, and imaging of fixed embryos: Houart and Amacher (Loeb 260)  
Noon – 1:00 Faculty lunch (Mary Mullins and Antonio Giraldez) with students (Swope)  
1:00 – 5:00 Lab: Continuation from morning (Loeb 260)  
5:00 – 6:00 Make presentations of immunostaining and in situ hybridization images (Loeb 260)  
7:30 – 8:15 Research Lecture and Discussion: Corinne Houart (Starr 209)  
8:15 – 10:00 Wrap-up: student presentations with Corinne Houart and Sharon Amacher (Starr 209)

### **Sun 11 Aug**

- 9:00 - 9:45 Research Lecture and Discussion: Anna Huttenlocher (Loeb 263)  
9:45 – 10:45 Round Table: Disease models: Anna Huttenlocher and faculty (Loeb 263)  
10:45 – noon Pit Talk: Chimeric Analysis: Sharon Amacher and Jim Fadool (Loeb 260)  
Noon – 1:00 Faculty lunch (Corinne Houart and Andres Collazo) with students (Swope)  
1:00 – 6:00 Chimeric analysis Lab: Blastula transplants: Sharon Amacher, Jim Fadool, Andres Collazo, and Tom Schilling (Loeb 260)  
7:30 – 10:00 Faculty & Staff Event; Student Social Time (Starr 209)  
10:00 – 11:00 Optional overnight time-lapse microscopy of transplants (on your own)

### **Mon 12 Aug**

- 8:30 – 9:00 Check CRISPR injected embryos for pigmentation (and other) phenotypes (Loeb 260)  
9:00 – 9:30 Pit Talk: “High resolution” transplants  
9:30 – noon Lab: “High resolution” transplants (Houart; small groups rotate) and imaging early transplants (Michael Granato, Tom Schilling, Jim Fadool, Andres Collazo)  
Noon – 1:00 Faculty lunch (Anna Huttenlocher and Sharon Amacher) with students (Swope)  
1:00 – 2:30 Continuation of the morning lab (Houart); Check on regenerating fins (Poss and Yelon)  
2:30 – 4:30 Free Time (*Faculty meeting held for 1 hour during this time*)  
4:30 – 6:00 Student/Faculty Challenge (Scavenger Hunt)  
6:30 – 9:00 Course BBQ (courtyard between Loeb/Rowe/Starr)

### **Tues 13 Aug**

- 8:30 – 10:30 Wrap up chimeric analysis: Sharon Amacher, Jim Fadool, Michael Granato, Corinne Houart: Transplant show and tell by group (Loeb 260)  
10:30 – noon Lecture and Discussion: Husbandry, breeding and raising fry: April Freeman (Starr 209)  
Noon – 1:00 Faculty lunch (Kara Cerveney and Dave Daggett) with students (Swope)  
1:00 – 2:00 Pit Talk: Imaging + Quantification of cell signaling *in vivo*: Anna Huttenlocher (Loeb 260)  
2:00 – 6:00 Lab: Imaging + Quantification of cell signaling *in vivo*: Anna Huttenlocher (Loeb 260)  
7:30 – 9:00 Research Lectures and Discussion: Sharon Amacher and Michael Granato (Starr 209)  
9:00 - 9:30 Wrap-up of Imaging/Quantification: Anna Huttenlocher (Loeb G70)  
10:00 Stony Beach evening quiet field trip to see bioluminescence

### **Wed 14 Aug**

- 9:00 – 10:00 Pit Talk Behaviors: Michael Granato, Jim Fadool, Andy Pendergast (Team Wyart) (Loeb 260)  
10:00 – noon Lab: Motor, visual, and sensory-motor integration: Granato, Fadool & Dowling, Team Wyart (Loeb 260)  
Noon – 1:30 Faculty (Michael Granato and John Dowling) lunch with students (Swope)  
1:30 – 3:30 Lab: continuation: Behaviors: Granato, Fadool, Team Wyart (Loeb 260)

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- 4:00 – 5:00 Round Table: Behavior: Michael Granato and Jim Fadool (Starr 209)
- 5:00 – 6:00 Round Table: Transgenesis: Flo Marlow (Starr 209)
- 7:30 – 9:00 Research Lectures and Discussion: Jim Fadool and Tom Schilling (Starr 209)
- 9:00 – 10:30 Fin regeneration results and terminal imaging: Poss and Yelon (Loeb 260)
- 10:30 Download materials for Quantitative morphometrics lab, if not already done

### **Thurs 15 Aug**

- 9:00 – 11:30 Pit Talk and Lab: In vitro fertilization (IVF) Sharon Amacher (Loeb 260)
- 11:30 - noon Last check that all materials for Quantitative morphometrics lab are downloaded
- Noon – 1:00 Faculty (Jim Fadool and Tom Schilling) lunch with students (Swope)
- 1:00 – 6:00 Pit Talk and Lab: Quantitative morphometrics: Tom Schilling (Loeb 260)
- 7:30 – 9:00 Research Lectures and Discussion: Jon Clarke and Flo Marlow (Starr 209)
- 9:00 – 9:30 IVF wrap-up (plus look again in the morning)

### **Fri 16 Aug**

- 8:30 – 9:00 Pit Talk: Photoconversion and optogenetics: Yelon and Clarke (Loeb 260)
- 9:00 – noon Rotations/Demonstrations: Photoconversion: Yelon, Protein mis-localization: Clarke, Lipid metabolism, part 1: Farber (Loeb 260)
- Noon – 1:30 Faculty (Jon Clarke and Flo Marlow) lunch with students (Swope)
- 1:30 – 2:00 Pit Talk: Imaging metabolism and subcellular structures: Marlow and Farber (Loeb 260)
- 2:00 – 5:45 Rotations/Demonstrations: Subcellular structures: Marlow; Lipid metabolism: Farber; Cardiac conduction: Yelon (Loeb 260)
- 7:30 – 9:00 Research Lectures and Discussion: Debbie Yelon and Steve Farber (Starr 209)

### **Sat 17 Aug**

- 9:30 – noon Cardiac regeneration results and terminal imaging: Poss and Yelon (Loeb 260)
- Noon – 1:30 Faculty (Debbie Yelon and Steve Farber) lunch with students (Swope)
- 1:30 – 3:00 Round Table: Zebrafish in Education: Kara Cerveny, Dave Daggett, Steve Farber (Starr 209)
- 3:00 – 6:00 Prepare photo contest submissions and 5-minute student presentations of favorite data (Starr 209). Photo contest images (individual & group entries) must be submitted by 6 pm.
- 7:30 – 9:00 Chi-Bin Chien Memorial Research Lecture: Sarah Kucenas (Speck Auditorium, Rowe)

### **Sun 18 Aug**

- 9:00 – noon Falmouth Road Race and/or finalize preparation of 5-min presentations
- Noon – 1:30 Faculty (Sarah Kucenas) lunch with students (Swope)
- 1:30 – 3:30 Five-minute student presentations of favorite piece of data (Starr 209)
- 3:30 – 4:30 Course Wrap-up discussion with Amacher and Yelon (Starr 209)
- 6:00 – 10:00 Course Dinner and Student Awards (Swope Patio)

### **Mon 19 Aug**

- Breakfast, room checkout and departure