### 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)

### 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 1)
- **9:00 – 11:00** | Overnight time-lapse microscopy: Jan Huisken (Group 4)

### 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 & Discussion: Lila Solnica-Krezel and Ken Poss (Starr 209)
- **9:00 – 11:45** | Overnight time-lapse microscopy: Andres Collazo and Jim Fadool (Group 1)
- **9:45 – 11:45** | Overnight time-lapse microscopy: Jan Huisken (Group 3)

### 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)
2019 ZEBRAFISH GENETICS AND DEVELOPMENT COURSE SCHEDULE

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 – 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)

**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)
2:00 – 4:00  Lab: Imaging + Quantification of cell signaling in vivo: Anna Huttenlocher (Loeb 260)
4:30 – 6:00  Research Lectures and Discussion: Sharon Amacher and Michael Granato (Starr 209)
7:30 – 9:00  Wrap-up of Imaging/Quantification: Anna Huttenlocher (Loeb G70)
10:00  Stony Beach evening quiet field trip to see bioluminescence

**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 Cerveny 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)
2019 ZEBRAFISH GENETICS AND DEVELOPMENT COURSE SCHEDULE

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