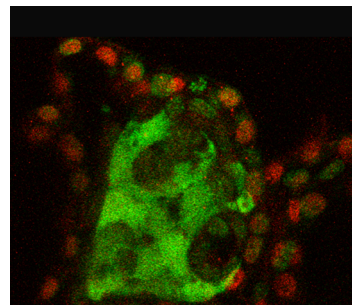


Frontiers in Stem Cells and Regeneration
Advanced Training Course
Oct. 8 - October 14, 2017
MBL • Woods Hole, MA



Course Directors:

Gerald Schatten, PhD
Pittsburgh Development Center

Jennifer Morgan, PhD
Marine Biological Lab

Organizing Committee: Diane Carlisle, PhD; Gloria Perez, DVM; Dorianne Mebane MBA

*All lectures are in Loeb G70, unless otherwise specified. Lab exercises are held in Loeb 306.
Meals are in the Swope dining room, 2nd floor. Breakfast: 7-8:30 AM; Lunch: 11:30 AM-1 PM;
Dinner: 5-7 PM.
Coffee breaks will be served in the Loeb basement corridor adjacent to the lecture hall.*

Sunday, October 8

5:30 PM Dinner, Café Swope (first floor)

7:00 PM **Lecture: Brief Introduction to Stem Cells and Regeneration**
Jerry Schatten, U. Pittsburgh

7:30 PM **PIONEER LECTURE: Principles of early human development from the origin of germ cells**
Azim Surani, Gurdon Institute Univ. of Cambridge

EEO Information and Logistics:
Biosafety, Regulatory Restrictions, MOUs, and Team Assignments
Diane Carlisle, U. Pittsburgh

Monday, October 9

8:00 AM **MBL Welcome**
Rae Nishi, MBL Director of Education
MBL Orientation, MBL Staff

8:45 AM **Lecture: Large Animal Models to Study Germ Line Stem Cells**
Ina Dobrinski, University of Calgary

9:30 AM **Lecture: Directed Differentiation and hESC as Developmental Sensors**
Diane Carlisle, U. Pittsburgh

10:15 AM Coffee Break

10:30 AM **Lecture: TBD (Regenerative Approaches for the Aging Brain)**
Saul Villeda, UCSF

11:15 AM **Lab Introduction: mESC derivation**
Cal Simerly, U. Pittsburgh

11:30 AM	Lab Intro: Charles Easley
11:45 AM	Dori takes students on visas to sign paperwork
Noon	Lunch
1:00 PM	Lab 1: <i>Instructor: Chas Easley. TA: Alyse Steves (U. Georgia)</i>
	Lab 2: <i>Instructor: Cal Simerly (U. Pitt). TA: Gloria Perez (NYSCF)</i> Mouse embryonic stem cell (mESC) derivation: Students will do immunosurgery technique on mouse expanded blastocysts to isolate the ICM in order to derive mESCs.
5:45 PM	Lab 3: <i>Instructor: Diane Carlisle. TA: TBD (U. Pittsburgh).</i> Students differentiate hESC into their cell lineage of choice using an embryoid body-based method. On Day 1, trainees will make embryoid bodies to work with during the rest of the week.
6:15 PM	Dinner
7:00 PM	Bioethics Lecture: TBD Glenn McGee, Univ. of New Haven
8:00 PM	Course Participants' Introductions

Tuesday, October 10

8:30 AM	Lecture: Growth Control of Regenerating Limbs James Monaghan, Northeastern University
9:15 AM	Lecture: Drawing and Manipulating the Blueprint of the Amphibian Limb Regenerate Kate McCusker, UMass Boston
10:00 AM	Coffee Break
10:15 AM	Lecture and Lab Intro: Stem cells and Regeneration in Planarians David Forsthoefel, Oklahoma Medical Research Foundation
11:00 AM	Lab Introduction: James Monaghan and Kate McCusker, Salamander limb regeneration
11:30 AM	Special Topics Lunch – with vendor sponsors TBD: Promega, Thermo Fisher, Charles River, others?
1:00 PM	Lab 1: <i>Instructors: James Monaghan and Kate McCusker; TAs: TBD;</i> Regeneration in Salamanders: limb regeneration
	Lab 2: <i>Instructor: David Forsthoefel; TA: Christina Bruxvoort (OMRF).</i> Regeneration in planarians: blastema formation, proliferation, and remodeling

6:00 PM Dinner
7:00 PM **Course Participants' Introductions**

Wednesday, October 11

8:30 AM **Lecture: Picking your favorite - cell identification and selection strategies in human neural stem cell biology**
Jan Pruszek, U. Freiburg

9:15 AM **Lecture: Spinal Cord Regeneration in a Non-Mammalian Model**
Jen Morgan, MBL

10:00 AM Coffee Break

10:15 AM **Lecture: Discovering gene regulatory networks that drive successful CNS regeneration in zebrafish**
Ava Udvardia, Univ. of Wisc. Milwaukee

11:00 AM **Lab Introduction:** Isolating and Characterizing Neural stem cells using FACS strategy.
Jan Pruszek

11:30 AM **Lab Introduction:**
Ava Udvardia and Jen Morgan

Noon **Lunch**

1:00 PM **Lab 1:** *Instructor: Jan Pruszek; TA: TBA* . In this laboratory, trainees will learn the techniques for isolating specific PSC-derived subsets of therapeutic and scientific relevance using flow cytometry.

Lab 2: *Instructors: Ava Udvardia, Jen Morgan. TAs: Kendra Hanslik (MBL), Maria Replogle (UW-M)*. Students will learn to quantify functional recovery after spinal cord injury in lampreys; and will perform experiments on optic nerve regeneration in zebrafish.

6:00 PM Dinner

7:00 PM **Discussion: Stem Cell and Regeneration Research Funding**
Ravi Ravindranath, NIH

8:00 PM **Career Mentoring Discussion**
Facilitated by Jennifer Morgan (MBL) and other course faculty (*Please bring a copy of your CV)

Thursday, October 12

8:30 AM **Lecture: Using Patient Specific Stem Cells to Model and Treat Male Factor Infertility**
Charles Easley, U. Georgia

9:15 AM **Lecture: Translating Spermatogonial Stem Cell Transplantation to the Clinic**
Kyle Orwig, U. Pittsburgh

10:00 AM Coffee Break

10:10 AM **Lab Intro: Directed differentiation**
Diane Carlisle

10:35 AM **Lab Intro: Spermatogonial Stem Cell Transplantation**
Kyle Orwig

11:00 AM **Orwig Lab Prep:** Differential separation of cells and apply antibodies for staining
Carlisle Lab Prep: Preparing differentiated cells for IF staining

Noon Lunch

1:00 PM **Lab 1:** *Instructor: Diane Carlisle. TA: TBD (U. Pittsburgh).* We will use differential immunocytochemistry staining to identify enriched populations in cells after directed differentiation.

Lab 2: *Instructor: Kyle Orwig. TAs: Meena Sukhwani (U. Pittsburgh), Chatchanan Doungkamchan (U. Pittsburgh).* Germ stem cell isolation, identification, and transplantation using a magnetic sorting (MACS) strategy.

6:00 PM Dinner

7:00 PM **Lecture: Evolution of Regeneration in Annelids**
Alexa Bely, U. Maryland

8:30 PM **T-Shirt Night Celebration**

Friday, October 13

8:30 AM **Lecture: TBA**

9:15 AM **Lecture: Preimplantation Genetic Diagnosis**
Mark Hughes, Genesis Genetics

10:00 AM Coffee Break

10:15 AM **Somatic Stem Cells in Regenerative Medicine**
Jerry Shay, UT-Southwestern

11:00 AM **Lab Introduction for ongoing experiments:** Kyle Orwig, Charles Easley,
James Monaghan

11:45 AM	Course Photo
Noon	Lunch
1:00 PM	<i>Finish all ongoing experiments, ~30 min per lab:</i> Lab 1: <i>Instructor: Kyle Orwig. TA: Meena Sukwhani, Chatchanan Doungkamchan:</i> Analyze stem cell preparations. Lab 2: <i>Instructor: Gloria Perez. TA: Kristin Fowler:</i> Check on mESC derivation.
2:00 PM	Lab 3: <i>Instructor: James Monaghan:</i> Image blastemas. Lab 4: <i>Instructor: Chas Easley. TA: Alyse Steves:</i> Analysis of iPSCs using microscopy. Lab 5: <i>Instructor: David Forsthoefel, Christina Bruxvoort:</i> Evaluate blastema formation and intestinal remodeling
3:00 PM	Optional: Tour of Marine Resources Center and MBL
6:30 PM	Banquet: Café Swope
8:00 PM	Presentation of Pioneer Awards and Student Certificates Jennifer Morgan, Gerald Schatten

Saturday, October 14

Check out of rooms before 10:00 AM

Thank you to the following course sponsors who have contributed to the course by loaning equipment and/or donating reagents and supplies:

Vendor	Contact	Email
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