

Developmental Biology Teaching Laboratory

Tentative Workshop Schedule

The University of Maine Darling Marine Center, June 14-June 18, 2016.

Eric Cole, Leland Johnson and Jennifer Wolff: Workshop Leaders.

Steven Black: Guest Instructor

Tuesday Morning (8:30 am Meeting) Tool-Building Workshop.

Invert Regeneration and Microscopy.

- 1) Introduction to the Darling Center and the Workshop; Safety.
- 2) Darkfield, Rheinberg, and polarizing techniques, inexpensive and useful microscopy tools in the developmental biology laboratory.
- 3) Acquiring, making, and maintaining some basic instruments that students use in the Developmental Bio. laboratory: **Worm Tools. Frog Tools. Chick surgery tools.**
- 4) **Planaria/ Dugesia**: regeneration techniques, a classic system revisited.
(*With assist from workshop participant: John Chan, UMN*).

Tuesday Afternoon and Evening Urchin Fertilization.

- 1) Acquiring and handling sea urchins and sand dollars.
- 2) Sea urchin fertilization and experiments with sea urchin sperm.
- 3) Feet of clay, observe the fertilization reaction.
- 3) **Observe Frog prep: Inject female/ Harvest testes from male.**

Evening

- 1) Urchin husbandry.
- 2) Early cleavage divisions (from earlier fertilization).
- 3) Urchin DAPI Stain (Immunofluorescence dry-lab).
- 4) Sand Dollars, Plutei, Cortical Lawns (*alt techniques as time permits*).

Wednesday Morning (Frog Day, Chick Day)

- 1) **8:30 Fertilize Frogs for Hosts**
- 2) Studying early chick embryo development.
Chick Handling & Candling
Chick 48 hr, 96hr.
- 3) Surgery:
 - a) Blastoderm removal
 - b) The Spratt culture technique
 - c) Windows

Wednesday Afternoon

- 1) **Amphibian Surgical Twinning. 1:00-4:00.**

Wednesday Evening

- 1) **Chick Surgery: *Cardia bifida*.**
- 2) Participant resource round table (# 1)

Thursday Morning (Worm Day).

- 1) Observe chick culture results.
- 2) Continue sea urchin development/ flatworm regeneration observations.
- 3) **Worm Husbandry** and Introduction to mutant gallery.
- 4) In vivo fluorescence including GFP and DiI staining.
- 5) Set up chemotaxis assay.

Thursday Afternoon

- 1) Score **worm chemotaxis** assay.
- 2) DAPI staining of meiotic germline and/or tubulin stain of early embryos.
- 3) Set up RNAi plates.

Thursday Evening

- 1) Media resources.
- 2) Participant resource round table (# 2).

Friday Morning (Fly Day).

- 1) Observe regeneration experiments. Report.
- 2) Continue Urchin Observations.
- 3) *Drosophila* background:
 - Life cycle. Husbandry. Genetics
 - Identify male/ female/ unmated females.
- 4) Fluorescence imaging of GFP-larvae.

Friday Afternoon

- 1) Pattern Genes and embryonic development.
 - A word about Hox Genes. UAS::Gal4 system.
 - *Drosophila* resources.
- 2) Peel pupae to examine dpp::ey expression.
- 3) Embryo labeling/ DAPI staining.

Saturday Morning

- 1) Assess regeneration experiments.
- 2) **Observe Amphibian Twinning results.**
- 3) **Caenorhabditis RNAi** observations.
- 4) Workshop evaluation.
- 5) Lobster anatomy! See below!

The workshop ends with an outdoor Lobster Dinner that probably will be held at either scenic Round Pond Harbor or the Pemaquid Fishermen's Coop overlooking Pemaquid Harbor and the historic Pemaquid Village site.
