

## **Developmental Biology Teaching Laboratory**

Tentative Workshop Schedule

The University of Maine Darling Marine Center, June 15-18, 2010

Leland Johnson and Eric Cole, Workshop Leaders

### **Tuesday Morning (8:30 am Meeting)**

- 0) Introduction to the Darling Center and the Workshop; Safety.
- 1) Dark field, Rheinberg, and polarizing techniques, inexpensive and useful microscopy tools in the developmental biology laboratory.
- 2) Acquiring, making, and maintaining some basic instruments that students use in the Developmental Biology laboratory.
- 3) A protistan cell reorganization experiment using the giant protozoan, *Spirostomum*.
- 4) Planarian regeneration techniques, a classic system revisited
- 5) Hydra regeneration techniques.
- 6) Regeneration patterns in *Lumbriculus* and *Nematostella*

Arboreal Ponds (over lunch hour) Inoculate hay infusions.

### **Tuesday Afternoon and Evening**

- 1) Continue regeneration/re-organization experiments.
- 2) Acquiring and handling sea urchins and sand dollars.
- 3) Sea urchin fertilization and experiments with sea urchin sperm.
- 4) Eric Cole introduces some special microscopy techniques for use with early embryos of sea urchins and sand dollars.
- 5) Techniques: Feet of clay, Fertilization reactions (Optional. Cortical lawns)
- 6) Early cleavages (from earlier fertilization).

### **Wednesday Morning**

- 1) Fluorescence microscopy techniques continued through morning.
- 2) PABA stripping (nitex).
- 3) DAPI and Immunofluorescence.
- 4) May be Interspersed as time permits:
  - a) Blastomere separation and artificial twinning.
  - b) Sand dollar gametes and fertilization.

### **Wednesday Afternoon and Evening**

- 1) Complete fluorescence work: Report.
- 2) Continue sea urchin and regeneration observations: Report
- 3) Information on storage and incubation of fertile chicken eggs.
- 4) Chick husbandry. Stages. Logistics. Applications.

**Continued.....**

### **Wednesday Afternoon and Evening, Continued**

- 5) Studying early chick embryo development:
  - a) Blastoderm removal
  - b) The Spratt culture technique
  - c) Windows and "egg nests" for surgery and CAM grafts (If time permits),  
Candling
- 6) Cardia bifida.
- 7) Optional: Media resources (as time permits).

### **Thursday Morning**

- 1) Observe chick culture results.
- 2) Continue sea urchin observations.
- 3) *Drosophila* background:
  - a) Life cycle. Husbandry. Genetics
  - b) Collect eggs for embryogenesis
- 4) Imaging of embryonic development (DAPI, IF, Toluidine Blue O?).

### **Thursday Afternoon and Evening**

- 1) Pattern Genes and embryonic development.
  - A word about Hox Genes.
  - *Drosophila* resources.
- 2) Peel pupae to examine *dpp::ey* expression.
- 3) Complete some regeneration/re-organization experiments.
- 4) Plant developmental control and gravitropism experiment.
- 5) Tracing gut enzyme differentiation in sea urchins or sand dollars (as time permits).
- 6) Optional: Media resources (as time permits).

### **Friday Morning**

- 1) Assess Auxin-gravitropism results.
- 2) Assess regeneration experiments & arboreal ponds.
- 3) Collect embryos/ larvae & image reporter genes with GFP.
- 4) Workshop evaluation.
- 5) Lobster anatomy! See below!

### **Friday Afternoon**

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.

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