Bi 227 Syllabus Fall 2007

Scott Fraser, Michael Liebling, TA: Louisa Liberman

Week 1

October 1 Administrative Session

Room keys, class program, attendance (Bi177 and Bi227), grading, general microscope rules signup calendars, students choose groups.

October 5 No class

Week 2

October 8 Widefield Microscopy

Topics: Brightfield (Köhler illumination), polarization, and epi-fluorescence microscopy

Samples: fixed slides

October 12 Q+A Widefield Microscopy

Week 3

October 15 Confocal Laser Scanning Microscopy (LSM) Training, Groups I-IV (Chris Waters)

(Hand out LSM 310 and LSM 410 documentation)

Samples: fixed slides

October 19 LSM Training, Groups V-VIII (Chris Waters)

(Hand out LSM 310 and LSM 410 documentation)

Samples: fixed slides

Week 4

October 22 LSM Thin Fixed Samples

Goal: effects on image quality of laser intensity, integration time, pinhole aperture; bleaching

Samples: fixed pollen, stem, mold, and cell slides, point spread functions

October 26 No class (Biology Retreat)

Week 5

October 29 LSM Live Thin Samples

Goal: controlled imaging environment, phototoxicity, time-series, multiple-channel imaging

Samples: ES cells or C.elegans

November 2 Student Presentations 1 (Thin Fixed Samples)

Week 6

November 5 Dissecting Microscopes (and Fluorescence Stereo-Microscope)

Goal: sample mounting

Sample: zebrafish embryos

November 9 Student Presentations 2 (Live Thin Samples)

Week 7

November 12 Zebrafish Timelapse Imaging for Cell Tracking

Goal: In vivo timelapse imaging, working distance

Samples: Bodipy TR, Histone-GFP injected zebrafish embryos

November 16 Student Presentations 3 (Zebrafish Imaging)

Week 8

November 19 Bi 177 (1:00-2:30 BBB24): 3D Reconstruction and Rendering

November 19(3-4pm) Image Analysis I: Introduction to Visualization and Tracking

Data: Zebrafish timelapses

November 23 No class (Thanksgiving)

Week 9

November 26 Drosophila Timelapse Imaging

November 30 Student Presentations 4 (Zebrafish Cell Tracking and Visualization)

Week 10

November 3 Image Analysis II: Colocalization

Data: multi-channel data from live thin sample session

November 7 Student Presentations 5 (Drosophila Imaging and Cell Tracking)

Week 11

December 14 11:59pm Final Paper Due

Grading:

50% Lab work
50% Final paper (choose one topic from Presentations 1-5)

Office Hours: by appointment

Scott Fraser, sefraser@caltech.edu
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Obtaining key (Church 68) for the lab:

Contact:

Mary Marsh
105 Kerckhoff
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Note: you may also need a key to access Church building during off-hours