

BIOLOGY 557: ULTRASTRUCTURAL TECHNIQUES
Fall 2010

Use of the Facility is predicated on successful completion of a portfolio of images utilizing these techniques and instruments. All images generated as part of this class are the property of the EM Facility.

This laboratory is intended to train students in electron and light microscopic techniques and will take a minimum average of 8 hours per week in the laboratory. Students are not permitted to work in the lab outside of 8:30 am-5 p.m. M-F without express permission of Dr. Barlow.

Students will learn how to

prepare grids to support samples in the TEM	negatively stain small samples
preserve and embed samples for slicing	prepare knives used in slicing
create surface replicas of samples	record and process images
align and use the light and transmission electron microscope	slice both thick and thin slices for light and electron microscopic examination

Text: ELECTRON MICROSCOPY, J. Bozzola and L.Russell
2nd edition, Jones & Bartlett (1999)
EM Facility instrument tutorials

GRADING: Late assignments incur a grading penalty:

Time Sheets	All work hours in lab	5%	Every 2nd and 4th Friday, 3 pm (Includes weekly meetings)
Lab report I	Negative staining	15%	Friday noon, October 15
Lab report II	Thick sections	15%	Friday noon, October 29
Lab report III	Thin slicing	20%	Tuesday 1pm, November 30
Lab report IV	Shadowing	15%	Friday noon, December 3
Lab report V	Class presentation	10%	Tuesday class, December 7
Lab report VI	Tomography	20%	Friday noon, December 10
Lab Practicals	TEM solo exam Trimmed Blocks Thick sections Light scopes & cameras	Credit Credit Credit Credit	No later than October 1 No later than October 8 No later than October 15 No later than October 22

Lab activities will consist primarily of labeled micrographs highlighting each of the techniques discussed. Additional guidelines will be given out in class.

Lab work will be graded on attendance, quality, timeliness, and adherence to guidelines

All techniques have sections in the Bozollo and Russel Book. Read the pertinent sections in the book BEFORE you come to the lab.

Tentative schedule:

Week	Date	Exercise	To be performed BEFORE lab
Week 1	8/31	Introduction to laboratory	
Week 2	9/7	Grids, negative stain, TEM operation	Watch grid loading insertion, neg. stain, grids videos Read TEM operation handout
Week 3	9/14	TEM operation, camera	Read TEM/camera operation handout
Week 4	9/21	Knives, trimming blocks, thick sections	Watch Sectioning videos
Week 5	9/28	Thick sections	Prepare 2 trimmed blocks
Week 6	10/5	Light microscopes, digital cameras	
Week 7	10/12	Fixation	Read Fixation handout
Week 8	10/19	Thin sectioning	
Week 9	10/26	Tomography	Read Tomo handouts
Week 10	11/2	Tomography	Read IMOD handouts
Week 11	11/9	Shadowing	Read Shadowing handout
Week 12	11/16	SEM/STEM demonstration	
Week 13	11/23	Open Lab	
Week 14	11/30	Open Lab	
Week 15	12/7	Class presentation	