



# Georgia Electron Microscopy

## UNIVERSITY OF GEORGIA

### Biological TEM Workshop

This intensive, three-day workshop provides a practical and basic theoretical introduction to Transmission Electron Microscopy and biological sample preparation techniques. Each day will consist of lectures, discussions and hands-on training led by GEM staff.

**Instructors:** Eric Formo (eformo@uga.edu)  
Mary Ard (maryard@uga.edu)

#### Schedule

#### Session 1: Introduction and Sample Preparation

- 8:30 am      *Overview and introductions*
- 9:00 am      Begin preparation from GA fixed and rinsed tissue (OsO<sub>4</sub> Fix)  
**Lecture (Eric)** - *Overview of Electron Microscopy*  
*Laboratory Safety in an EM Lab*
- 10:00 am      Sample preparation (Rinse and dehydrate, PO)  
**Discussion/Lecture** of *Sample Preparation:*  
*Fixatives, Buffers (include agar-enrobing), Enbloc*  
*Staining; Dehydration, Infiltration, Intro to*  
*Resins*
- 11:40 am      Sample preparation (Begin resin infiltration 25%)
- 12:00 pm      *Lunch*
- 1:30 pm      Sample preparation (Resin Infiltration 50%)  
**Discussion/Lecture** – *Different types of*  
*Resins*
- 2:30 pm      Sample preparation (Resin Infiltration 75%)  
**Discussion/Lecture** - *Handling grids;*  
*Formvar on copper grids*

3:30 pm Sample preparation (Exchange resin 100% - overnight)  
Sub grids with Formvar

4:30 pm ***Reflection of the day's tasks***

## **Session 2: Electron Microscopy and TEM operation**

8:30 am Sample preparation (Exchange resin 100%)  
*Prepare labels and molds – make fresh resin*  
*Start vacuum evaporator*

9:00 am ***Lecture*** – *Negative Staining*  
*Load grids in bell jar (vacuum evaporator)*

10:00 am Sample preparation (Embed in molds and into oven)  
*Vacuum evaporator – carbon-coat formvar grids*  
*Glow-discharge grids*

11:00 am Negative staining on unknown samples

12:00 *Lunch*

1:30 pm ***TEM Training (Eric or Mary)*** – *Training on the JEM-2100PLUS*

3:00 pm Review unknown samples on the JEM-2100PLUS

4:30 pm ***Reflection of the day's tasks***

## **Session 3: Ultramicrotomy**

8:30 am ***Lecture*** – *Sectioning and Post Staining*  
***Discussion*** – *group feedback*

10:00 am Ultramicrotomy Demonstration – Trimming blocks;  
semi-thin sectioning; Toluidine Blue staining  
***Discussion*** – *ultramicrotomy/diamond knives*

12:00 pm *Lunch*

1:30 pm Ultramicrotomy Demonstration – Thin sectioning;  
post staining;

3:00 pm Ultramicrotome practice/TEM operation practice

4:30 pm Presentation of Certificates, Overall Evaluation and Feedback