Biochem 9001 Summer Semester 2016

Protein Structure Determination by 3-Dimensional Electron Microscopy

Instructors:
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Recommended Texts:

- "Getting Started in Cryo-EM with Professor Grant Jensen" http://cryo-em-course.caltech.edu/
- *Three-Dimensional Electron Microscopy of Macromolecular Assemblies,* J.Frank, 2nd edition
- *Electron Tomography: Methods for Three-Dimensional Visualization of Structures in the Cell*, J. Frank, 2nd Edition
- *Transmission Electron Microscopy: a Textbook for Materials Science,* Williams and Carter, 2nd edition

Lectures:
M 10:30am – noon**,** Bond Life Sciences Center, Room 121

Demos/Labs:
Electron Microscopy Core, W125-W137 Vet Med Bldg (basement) – 2 hour individual sessions

DATE	FORMAT	TOPIC
6/6	Lecture 1	Course Outline; Lab Schedules; *What is 3DEM*; Intro to TEM & EMC Tour
6/7-6/10	Lab 1	TEM: Basic Operations
6/13	Lecture 2	*TEM Basics*: Electron Optics; Resolution, Signal and Image Formation, Negative Staining
6/14-6/17	Lab 2	Negative Staining on Keyhole Limpet Hemocyanin (KLH)
6/20	Lecture 3	*Single particle Analysis*: Particle Picking, 2D Classification and 3D Reconstruction (*Guest Lecture Narahari Akkaladevi*)
6/21-6/24	Lab 3	Image Processing on Negatively Stained KLH
6/27	Lecture 4	*Cryo-electron Microscopy*: Vitrification, Radiation Damage, Contrast Transfer Function & Focusing
6/28-7/1	Lab 4	Vitrification of Proteins: KLH
7/5	Lecture 5	*Advanced Topics in 3DEM*: Direct Detection, Phase Plates Tomography
7/5-8	Lab 5	Imaging vitrified proteins KLH
7/11	121	Abstract Presentations for Individual Projects
7/11-7/15	EMC	Individual Projects
7/18-7/22	EMC	Individual Projects
7/22-7/29	EMC	Individual Projects
7/29	TBD	Final Presentation
7/29	email	Final Project Report Due