**Cryo-EM mini-course (I/2 credit)**

This is an introductory course on methods and applications of cryo-EM single-particle analysis and tomography. The course will be broken up into three parts: 1) Principles of single-particle reconstruction including hands-on experience with the technology; 2) Principles of cryo-EM tomography including data analysis; 3) Student presentations of their 3D reconstructions and research article.

**Co-Directors**

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**Time and place**

Lectures will be on Tuesdays and Thursdays 10:30 AM – 12:00 PM from January 8 - February 28. In BRB 253 (Unless otherwise indicated)

**Required Text**

http://cryo-em-course.caltech.edu/

**Course Outline**

The course will be broken up into three parts

1. Principles and practical workshop of cryo-EM single particle analysis
2. Principles and practical workshop of cryo-electron tomography

(3) Student presentations

Grading will be based on the following: the results of 3D reconstructions (40%), presentation (40%) and a final exam (20%)

**Tentative Schedules:**

Jan. 8, 10, 15, 17, 22, 24, 29, 31

Coordinators: Kenji Murakami and Sudheer Molugu

1. Principles of cryo-EM single particle analysis (Fourier Transform, CTF correction, single-particle reconstruction) (Jan 8, 10, 15)
2. Hands-on workshop of sample freezing and data collection (Jan. 17)
3. Data analysis (Jan. 22, 24, 29, 31)

Feb. 5, 7, 12, 14

Coordinators: Yi-Wei Chang and Sudheer Molugu

1. Principles of cryo-electron tomography (Feb. 5, 7)
2. Hands-on workshop of cryo-electron tomography (Feb. 12, 14)

Feb. 19, 21, 26, 28

Coordinators: Sudheer Molugu, Yi-Wei Chang, Kenji Murakami

Students will present a 5 min lecture on their cryo-EM reconstructions followed by a 15 min presentation of research article. The final exam will be held on the finals day assigned to the course.