Cryo-EM mini-course (1 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.

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**Time and place**
Lectures will be on Wednesday 2:00 PM – 3:00 PM (4:00 PM) from January 15 - April 29. (except March 11 in spring break) in 202 Anat-Chem (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. 15, 22,**
Coordinators: Kenji Murakami, Sudheer Molugu,
Principles of cryo-EM single particle analysis (Fourier Transform, CTF correction, single-particle reconstruction)

**Jan. 29, Feb. 5, 12, 19, 26, Mar. 4**
Coordinators: Kenji Murakami, Sudheer Molugu, Trevor Van Eeuwen
(1) Hands-on workshop of sample freezing and data collection (Jan. 29, Feb 5)
(2) Data analysis (Feb 12, 19, 26, Mar. 4)

**Mar 18, 25, Apr. 1**
Coordinators: Yi-Wei Chang
(1) Principles of cryo-electron tomography (Mar 18, 25)
(2) Hands-on workshop of cryo-electron tomography data analysis (Apr 1)

**Apr. 8, 15, 22**
Students will present a 10 min lecture on their cryo-EM single-particle analysis and 15 min presentation of research article.

**Apr. 29**
The final exam will be held on the final day assigned to the course.