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Project Name(s):  Structural perspective of mitochondrial biogenesis

General Topic (Keywords):  Electron cryo-tomography, protein structure, bioenergetics, organelle biogenesis

Project Description(s):

Mitochondria are the powerhouse of eukaryotic cells. Using the energy derived from the breakdown of food, the mitochondria generate vast quantities of ATP necessary for driving many cellular processes. The ATP is generated on specialized invaginations of the inner mitochondrial membrane called cristae. The shape of the cristae varies remarkable between different species and between different tissues of the same organism. The molecular basis underlying this variation and its affect on the efficiency of energy conversion is unclear. However, many degenerative human diseases are often associated with changes in cristae structure. Using a combination of molecular biology, biochemistry and the latest electron cryo-microscopy techniques, we are investigating how specific proteins and lipids influence the structure and function of mitochondria.

The types of techniques routinely performed in our lab include: Molecular cloning, protein and organelle purification, protein electrophoresis, mass spectrometry, electron cryo-tomography, 3D data analysis and protein structure determination.
**Desired Skills or Experience:** Basic laboratory skills and an interest in electron microscopy

**Time Commitment:** Hours are negotiable. We are looking for students with a keen interest in research who are willing to work 25 hrs or more per week during vacations and 2-6 hours per week during semesters.

**Preferred Starting Date:** Flexible