Faculty Name:  Manfred Auer, Ph.D. (Molecular Biophysics and Integrated Bioimaging Division, Lawrence Berkeley National Lab, Donner Lab – on campus)

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Project Name(s): Structural Cell Biology: Neurobiology, Cancer Biology & Microbiology

General Topic (Keywords): architectural 3D organization of cells and tissues/microbial communities

Project Description(s):
As can be seen from our group webpage:

http://www.lbl.gov/lsd/People_&_Organization/Scientific_Staff_Directory/Auer_Lab.html
http://auerlab.lbl.gov
http://auerlab.lbl.gov/research/

our research is fairly diverse and ranges from the molecular mechanisms of hearing, over breast cancer, plant cell walls and biofuels to microbial communities/biofilms:

We excel in ultrastructural characterization of a variety of biological samples, using ultrarapid freezing samples preparation, scanning and transmission electron microscopic imaging (2D and 3D) at macromolecular resolution, involving state-of-the-art computer graphics-assisted 3D visualization and quantitative analysis of complex cellular 3D volumes.

There are a number of possible projects, depending on the exact need at the time of the internship and preference of the student. We highly recommend you check out our webpage profiles so you already know what kind of topics we are engaged in and these fit with your respective interests.

Mission

Our mission is to gain fundamental insight into (various kinds of) biology, in part by visualizing cells, organelles and molecular machines at molecular resolution, and to identify their protein
composition through novel labeling approaches. While 2D electron microscopy and 3D electron tomography continue to be the major tools for the analysis of macromolecular machines in their native cellular environment, our tomographic studies are often complemented by biochemical, cell biological, biophysical and high-end optical and TEM and SEM imaging techniques, as well as computational data analysis including sophisticated visualization, segmentation and quantitative analysis. Although the task of studying supramolecular complexes in their native cellular environment is challenging, we feel rewarded by the discovery of the fascinating complexity of molecular machines. The models derived from our structural studies then often serve as a platform for simulations and/or further neurobiological, cell biological, pharmacological or microbiological testing. Where we do not possess the expertise in our own laboratory, we do collaborate with a variety of experts (US and world-wide), both on the biological as well as the technical side.

**The Lab's Philosophy**

Our efforts are fueled by the excitement of scientific discovery, and we believe that studying important biological problems requires an atmosphere of true team spirit where everybody's contribution is important and welcome. We consider a true passion for science as the most important ingredient for doing good science, but also aim keep a healthy balance between work and life outside the lab.

**Desired Skills or Experience:** no specific experience needed (as you cannot possibly have the skill set needed), but assuming you are willing to learn, can teach you the needed skills, with that said mathematics or computer science interests are particularly welcome, but not needed. Also, a wide range of interests find a good home in our lab.

**Time Commitment:** Must be serious about research, be able to commit full time for first summer, part time during the year and ideally full time for the second summer. This lab is ideal for students who know that they want to do research, are driven and willing to join a diverse dedicated and fun team of scientists. While we do not expect you to know much (and will thus teach you), you must be self-motivated and serious

**Preferred Starting Date:** We will conduct an orientation session where we will tell you more about the lab, as well as two ~30 min interviews (one with the PI, the other with members of my lab), after which we will offer internships to a total of ~2-4 candidates. Once you are part of the “Auer lab family”, we decide together what is a good starting date.