3D Imaging at the Limits with Photo-Actovated Labels and Electrons

Fluorescence microscopy, is limited in its ability to resolve densely labeled features smaller than the optical diffraction limit, however special photoactivated fluorescent proteins or dyes can be harnessed in a technique called Photo-Activated Localization Microscopy, PALM. Enhanced resolution PALM images of protein location and organization are illustrated with mitochondria, endoplasmic reticulum, bacteria, and focal adhesions. An extension to 3D, using an interferometry, can measure the vertical position of fluorescent molecules to nanometer precision with the highest photon efficiency. This can be combined with PALM to give full 3 dimensional molecular coordinates of genetically tagged proteins with ~ 10-20 nm resolution and has revealed the protein nanostructure architecture of focal adhesions. In another 3D project, electron microscopes, EM, can be customized for high throughput imaging for neural tissue or cells. Correlating PALM and electron microscopy gives EM images which can be colorized with specific protein locations.

Wednesday, February 27, 2013
4:00pm
106 Hannan Hall
Refreshments will be served at 3:45

Sponsored in part by the Graduate Student Association
For more information, please contact:

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If you would like to request disability accommodations, please contact Gail Hershey at (202)-319-5315 to make arrangements.