MINI-COURSES

I. (Required) VMD

1) The VMD tutorial can be found here: (HTML)
   http://www.ks.uiuc.edu/Training/Tutorials/vmd/tutorial-html/index.html or (PDF)
can be downloaded here: (Tar-gz) http://www.ks.uiuc.edu/Training/Tutorials/vmd/vmd-tutorial-
files.tar.gz or (Zip) http://www.ks.uiuc.edu/Training/Tutorials/vmd/vmd-tutorial-files.zip

We ask that all students complete the VMD tutorial in advance of the VMD mini-course. If this is
not possible or one has questions about the VMD, we have reserved a small amount of time to
go over a reduced VMD tutorial during the mini-course.

2) (Highly recommended): We also encourage all students to bring their own systems/structures
   (PDB format if possible).

3) (Recommended): For other tutorials that may be of interest, please see:
   http://www.ks.uiuc.edu/Training/Tutorials/

II. OPTICS

- We will provide the following chapter to use as a handout at the summer school
  Selvin, P.R. and T. Ha, Editors, Single Molecule Techniques: A Laboratory Manual, Cold Spring
  other acronyms for watching molecular motors walk.” If you have access to the manual in your
department already, please read in advance

- Roy, R., S. Hohng and T. Ha., "A practical guide to single-molecule FRET.", Nature Methods 5,
  507-516 (2008)

III-IV MATLAB & LABVIEW

- None – we will provide handout at class
- We will also provide computer stations

ADVANCED MODULES

A. Computational Analysis of Ribosome Structure, Function, and Networks

Required reading:

- T. Martin Schmeing & V. Ramakrishnan (2009) What recent ribosome structures have revealed
- Daniel N Wilson, Roland Beckmann (2011) The ribosomal tunnel as a functional environment for

Optional advanced reading:
Network analysis


Lattice Microbe simulations


B. Fast Relaxation Imaging: heat shock response dynamics in living cells *(Gruebele)*

Required advanced reading:


Recommended advanced reading


C. Following transcription kinetics in individual cells *(Golding)*


D. Membrane Dynamics in Living Fruit Fly Embryos

Select references for cellularization:

E. Optical trapping & fluorescence imaging of individual swimming cells (Golding & Chemla)

Advanced reading (in order of importance)

F. Optical trapping – single-molecule force spectroscopy of protein-DNA interaction (Chemla)


G. SiMPull: Single-Molecule Pull-Down (Ha)


H. Single-Molecule FIONA (Selvin)

- Selvin, P.R. and T. Ha, Editors, Single Molecule Techniques: A Laboratory Manual, Cold Spring Harbor Laboratory Press ISBN 978-087969775-4 (2008). “Ch. 3: In Vitro and In Vivo FIONA and Other Acronyms for Watching Molecular Motors Walk” (We will provide a printout of this chapter at the Summer School. If you have access to the manual in your department already, you can read in advance)

I. Single-Molecule FRET (Ha & Myong)

J. Super-resolution fluorescence microscopy (Selvin & Ha)
- For principles of PALM, please visit: http://zeisscampus.magnet.fsu.edu/tutorials/superresolution/palmbasics/index.html
- For PALM setup and data analysis, please visit: http://code.google.com/p/quickpalm/wiki/