

Postdoctoral Fellow – Single Molecule Imaging of Bacterial Protein Export

Location Description: Texas A&M University
College of Medicine
College Station, TX

Disciplines: Life Sciences, Biophysics, Biochemistry, Biomedical Sciences, Cell Biology, Microbiology, Molecular Biology, Physical Sciences, Nanotechnology, Optics and Laser Physics

Position Type: Full time

Salary: ~\$47K; NIH-funded, commensurate with experience

A postdoctoral fellow is sought to decipher the mechanism of bacterial Tat protein export by using single molecule fluorescence microscopy approaches.

Job Summary:

A postdoctoral fellow is sought to decipher the mechanism of protein export by the bacterial Tat protein transport system using single molecule fluorescence (SMF) microscopy and single particle tracking approaches. The focus will be on testing our recently proposed Hairpin-Hinge Model, which postulates a molecular mechanism whereby signal peptide conformational changes are intimately connected with pore assembly and cargo transport through the translocation pore.

Candidates with experience and/or interest in single molecule fluorescence microscopy, image analysis, adherent vesicles, protein translocation systems, MATLAB programming, and in vitro biochemistry and biophysics are strongly encouraged to apply. A strong background and training in quantitative biology, with PhD emphasis ranging from physics to cell biology, is expected. An interest in method development is essential. The ideal candidate will be highly-motivated, and will be able to work independently. The successful applicant will purify his/her own reagents, perform the single molecule experiments, and develop algorithms to analyze the results.

The Tat Protein Transport Project:

The twin-arginine translocation (Tat) machinery translocates folded proteins across the thylakoid membrane of plants and the cytoplasmic membrane of bacteria. Using an efficient in vitro protein translocation assay, the *Escherichia coli* Tat system is amenable to characterization by a range of in vitro biochemical and biophysical assays. The successful candidate will characterize the sub-steps of Tat transport using single molecule fluorescence microscopy methods. A major focus will be to use single molecule fluorescence energy transfer to monitor conformational changes. In addition to single molecule fluorescence microscopy, the project provides training in molecular biology, protein chemistry, membrane proteins, and image analysis.