Postdoctoral Fellowship at the National Cancer Institute, National Institutes of Health, Bethesda, MD.

The Role of Nuclear Architecture in Gene Regulation

Understanding transcriptional regulation in a cellular context has become a central challenge in cell biology. In recent years, through parallel advances in microscopy, fluorescent probe development, and computational modeling, it has become possible to describe transcription in a fundamentally different way: one can now directly observe single molecules of RNA and protein in cells using the fluorescence microscope. The view that has emerged from these studies is that gene regulation is an extremely dynamic process occurring over a wide range of time-scales. Similarly, the nucleus shows extensive compartmentalization on multiple length scales. The relationship between nuclear architecture and gene expression is an area of intense investigation. The goal of the Systems Biology of Gene Expression Lab headed by Dan Larson is to develop a holistic understanding of the interplay between genetic elements, nuclear structure, epigenetic factors, and dynamics in controlling mRNA levels.

A fellowship is available to study the regulation of nuclear-receptor regulated genes in human cells using recently developed live-cell single-molecule methods. In particular, the research project entails the development of a new microscope modality to simultaneously observe transcription and chromosome conformation with high spatial and temporal resolution. The successful candidate will be a highly motivated individual with a strong background in microscopy and optics. Exposure to live-cell imaging, mathematical modeling, and biophysical methods is also desirable. Experience with molecular cell biology, biochemistry, or quantitative analysis of biological systems is preferred but not required. The candidate will engage in cutting-edge research, which requires advancement on multiple fronts, and must therefore have the ability/interest to learn new techniques and interact with scientists from multiple disciplines. These interactions are facilitated by the location of the lab at the National Institutes of Health, one of the premier biomedical research institutions in the world.

Interested individuals must send a cover letter and CV to Dan Larson (dan.larson@nih.gov). Applications will be accepted until the position is filled. See www.larsonlab.net for additional information. NIH is an EO/AA employer.