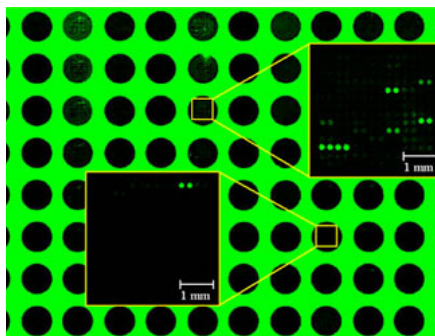


## Faculty Career Development Program

The Chicago Center for System Biology (CCSB) seeks highly qualified, junior faculty and senior faculty for **FACULTY CAREER DEVELOPMENT PILOT GRANTS** funded by a P50 NIH Grant. Junior faculty are interested in enhancing their scientific training and broadening their investigative skills through close, one-on-one mentoring. Senior faculty are interested in working collaboratively in a host lab as part of a sabbatical leave program. CCSB is based at The University of Chicago (UC) with participating investigators from Northwestern University (NU) and University of Illinois at Chicago (UIC). The Center focuses on how networks of genes work together to enable cells and organisms to respond to environmental and genetic changes. The pilot grants will support the study of transcriptional regulatory networks that respond to different types of environmental and genetic variation. New investigations related to transcriptional dynamics involving modeling and using the Center's core resources will be encouraged. Successful candidates will have a Ph.D and/or M.D. degree, successful post-doc training, and a

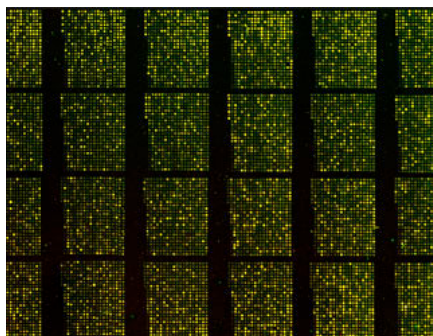
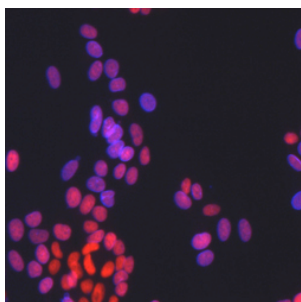
### Review Committee

- Kevin White, Ph.D., University of Chicago
- Marty Kreitman, Ph.D., University of Chicago
- Andrey Rzhetsky, Ph.D, University of Chicago
- Richard Morimoto, Ph.D., Northwestern University
- Robert Grossman, Ph.D., University of Illinois at Chicago
- Andrew Murray, Ph.D., Harvard University



strong publication record in genomics and molecular biology. In addition, Junior faculty fellows will be required to identify a primary mentor among Center core leaders. Senior faculty fellows will identify a collaborative host lab.

In this way, junior and senior faculty participants will serve as effective bridges between different laboratories and will help further the Center's interdisciplinary goal. Junior faculty are beginning their research career, although advanced postdoctoral fellows who will be independent investigators within the next year may also apply. Senior faculty have a proven track record and extensive success in experimental research. They are interested in venturing outside their established research area. Up to \$50,000 per year for two-year terms will be awarded to participants in the Faculty Career Development Program. Applicants will be responsible for developing an innovative and feasible research project.

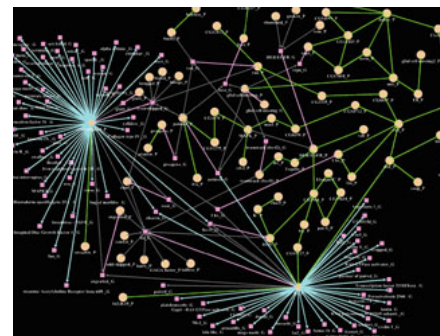
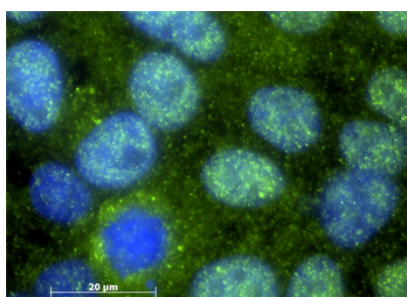


To apply, please send a cover letter detailing both your previous scientific work experience and your interest in this position. Also include: a curriculum vitae, 5-page research proposal, career goals (Junior faculty), and contact information for three references to: Barry Aprison, Ph.D., Education and Outreach Director, Institute for Genomics & Systems Biology, The University of Chicago, Rm. 424, CLSC, 920 East 58th Street, Chicago, IL 60637 or by e-mail:

[baprisson@bsd.uchicago.edu](mailto:baprisson@bsd.uchicago.edu).

## The Center's Goals & Projects

The Chicago Center for Systems Biology (CCSB) is studying the robustness of transcriptional networks in physiological, developmental and evolutionary time scales. Most experimental studies to date have focused on mapping transcriptional regulatory network topologies. The CCSB



goes beyond mapping topologies to develop models of behavior of transcriptional regulatory networks during physiological stress, cellular and organismal development, and species evolution. The scientific aim of the CCSB is to reveal structure-function relationships in transcriptional regulatory networks that lead to physiological robustness. The training, education and outreach aim of the CCSB is to establish programs for teaching Systems Biology from grade school to graduate school, and to promote and enable interdisciplinary Systems Biology research for investigators at the three CBC institutions.

There are five interrelated core projects (see below) that examine and compare both the structure and dynamics of a series of different transcriptional regulatory networks. Modeling and experimentation on complex transcriptional network responses to environmental stresses, and an examination of the evolution of transcriptional networks, will be important components of the studies. Building on an

understanding of basic network responses to environmental perturbations, transcriptional networks will be examined that are “designed” to integrate information from complex signaling environments in a developmental context. Systematic data collection, modeling, prediction, and hypothesis testing represent the four phases of each core project. There is feedback among the phases so that each guides the other. Each core project provides both unique and common perspectives on how transcriptional networks respond to changing environments.

## Core Projects

**Project 1: Transcriptional Robustness of Staphylococcus to Host and Environmental Stresses.** The project goal is to dissect and model the transcriptional network in Staphylococcus that responds to host and environmental stresses and controls/regulates bacterial antibiotic resistance, virulence, and other properties. (Chuan He, Philippe Cluzel, Kevin White, Andrew Rzhetsky, Aaron Dinner).

**Project 2: Structure and Physiological and Evolutionary Robustness of Stress Response Networks in Eukaryotes.** Yeast, C. elegans and Drosophila models are examined to determine the primordial metazoan stress response circuits. (Richard Morimoto, Ilya Ruvinsky, and Luis Amaral).

**Project 3: Dynamics of the Drosophila Segmentation Network, Decoding the Mechanistic Basis of Stability Under Stress and Evolution.** Stability and flexibility of the segmentation network is examined under physiological stress conditions using a novel microfluidics system. (Kevin White, Martin Kreitman, Rustem Ismagilov, John Reinitz).

**Project 4: Drosophila Eye Differentiation: The Yan Network** As a model for development of two different cell

types in a field of cells, the project examines the networks that drive the choice between differentiation between R7 and cone cell fates. The focus is on understanding how transcriptional regulatory networks impart robustness to responses from intrinsic signals originating from the organism itself. (Ilaria Rebay, Richard Carthew Aaron Dinner).

**Project 5: Elucidation of Design Principles, Dynamics and Robustness of Gene Regulatory Networks Orchestrating Hematopoietic Cell Fates.** This project analyzes developmental regulatory networks that govern cell fate choice and spatially or lineage-restricted patterns of gene expression. (Harinder Singh, John Crispino, Aaron Dinner).

The core projects are designed to analyze the structure and function of increasingly complex transcriptional regulatory networks that respond to environmental cues. Studies are designed to examine the dynamics of transcriptional networks on physiological, developmental and evolutionary time scales.

Successful execution of the core projects are possible through the establishment of a "core" infrastructure, providing data-gathering and databasing technology, as well as computational and theoretical modeling expertise. The common representation of data for all projects and shared approaches to modeling link the projects intellectually, thus promoting the synergism required to achieve the overarching scientific aims of the Center.