

Sixth International Conference on Systems Biology
Conference Center at Harvard Medical School
77 Avenue Louis Pasteur
Boston, MA 02115

Workshop 4: Systems level studies of model microbial cells: What do we need and how can we do it?

Date: Sunday, October 23rd, 2005

Time: 9:00am-1:00pm

Location: Room 216, Conference Center

Organizers: Barry Wanner & Hans Westerhoff

Schedule

9:00 AM Introduction

Barry Wanner, Purdue University, West Lafayette, USA

9:10 AM Imaging Gene Expression in *E. coli*, One Molecule at a Time

Sunney Xie, Harvard University, Boston, USA

9:50 AM A Comprehensive Library of Fluorescent Transcriptional Reporters for *E. coli*

Anat Bren, Weizmann Institute, Rehovot, Isreal (Uri Alon's Group)

10:30 AM Coffee Break (continental breakfast will be provided)

10:50 AM Towards systems biology of *E. coli* - contribution from experimental side

Hirotsada Mori, NAIST, Nara, Japan

11:30 AM *Escherichia coli* K-12: a cooperatively developed annotation snapshot – 2005

Barry Wanner

12:00 PM Round table. Open discussion led by Julio Collado, Igor Goryanin, Hirotsada Mori, and

Barry Wanner

13:00 PM end

Overview: The contrast between our tremendously increased computational and biological powers and technologies on the one hand, and our continuing lack of understanding of any whole cell on the other, has been the major inspiration for the formation of the IECA – the International *E. coli* Alliance (Holden, 2002. Science 297: 1459-60). The IECA effort is emblematic of systems biology as a whole. The ambitious goal of the IECA is beyond the means of any single investigator or laboratory. It requires an integrative research program and collaborations between scientists with expertise in biology, chemistry, computer sciences, engineering, mathematics and physics. Success will depend crucially on bringing to bear both social and technological tools: namely, consortia that help forge collaborations and common understanding, computational tools that permit analysis of vast and complex data, and agreed-upon standards and tools that enable researchers to communicate, integrate, and use their results in practical and unambiguous ways.

Understanding a living cell will require concerted efforts on many fronts. We need new software tools and modeling that can facilitate interactions and collaboration among diverse groups. We need enabling technology to share these models. We need standardization and ways to carry out standardized experiments in different groups and locations. We need new databases that are readily accessible and interoperable that would not only store massive amounts of data in different formats but would have the capability of interrogating other meaningful databases. We need biological resources, strains of different kinds, measurement technologies, high-throughput detection systems for different biomolecules. We need ways that not only the "big" groups can participate but also smaller groups can contribute as well. The goal of this workshop will be to present examples in these areas and to help formulate a plan for moving forward in model organism systems biology. When appropriate, examples will be taken from studies with different microbial systems, both bacteria and single-cell eukaryotes.

Be sure to register for Workshop 4 at <http://csbi.mit.edu/icsb-2005/workshops/workshops.htm>.

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