



BECKMAN SYMPOSIUM

**MICROBIAL
GENOMICS
AND
PATHOGENESIS**

Sponsored by
ELI LILLY AND COMPANY

**Friday, October 27, 2000
Fairchild Auditorium
Stanford Medical Center
8:50 am - 5:30 pm**

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Answers That Matter.



BECKMAN SYMPOSIUM

MICROBIAL GENOMICS AND PATHOGENESIS

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| 8:50-9:00 | Paul Berg | |
| 9:00-9:15 | Introduction Gail Cassell, Eli Lilly and Company | |
| 9:15 - 10:00 | John Mekalanos Harvard University | Genomics and the Emergence of Bacterial Pathogens |
| 10:00 - 10:45 | Lucy Shapiro Stanford University | Microarray Analysis of a Bacterial Cell Cycle |
| 10:45 - 11:00 | BREAK | |
| 11:00 - 11:45 | Nick Cozzarelli UC Berkeley | <i>E. coli</i> Microarrays and Chromosome Replication |
| 11:45 - 12:30 | Sung-Hou Kim UC Berkeley | Microbial Structural Genomics |
| 12:30 - 2:00 | LUNCH | |
| 2:00 - 2:45 | Scott Hultgren Washington University | Drug Discovery Through Protein Structure |
| 2:45 - 3:30 | Ron Davis Stanford University | High Through-Put Parallel Drug Discovery Using Genomics |
| 3:30 - 4:15 | Elizabeth Winzeler GNF and The Scripps Research Institute | Bar Coding <i>Yersinia pestis</i> |
| 4:15 | Lucy Shapiro | |
| 4:20 - 5:30 | RECEPTION | |

John J. Mekalanos, Ph.D., is the Adele Lehman Professor of Microbiology and Molecular Genetics and Chair of the Department of Microbiology and Molecular Genetics at Harvard University School of Medicine. Dr. Mekalanos is well known for his work on gene regulation in pathogenic bacteria. He and his colleagues have devised powerful genetic methods for identifying virulence genes and studying their expression within the host. His work on *Cholera vibrio* established two key steps in the emergence of this organism as a human pathogen. Dr. Mekalanos has recently become interested in using genomics in the exploration of bacterial cell biology and the host-pathogen interaction.

Lucy Shapiro, Ph.D., is Professor of Developmental Biology at Stanford University School of Medicine and Director Designate of the Beckman Center. She holds the Ludwig Chair in Cancer Research. Dr. Shapiro's research is focused on the regulation of cell differentiation and the progression of the bacterial cell cycle. Her approach is to study the bacterial genome and all its functions as an integrated system. Analysis of the genetic circuitry that runs the cell cycle has revealed multiple drug targets and one of these has led to the identification of a potentially new class of antibiotic.

Nicholas Cozzarelli, Ph.D., is Professor of Biochemistry and Molecular Biology at UC Berkeley. He is also Editor-in-Chief of the Proceedings of the National Academy of Science. His work addresses the partitioning of chromosomes, the structure and function of supercoiled DNA, and the mechanism of recombination. He uses *E. coli* and *S. cerevisiae* systems to study the requisite DNA-protein interactions *in vitro* and the physiological roles *in vivo*. Structural, enzymological and genomics techniques are used to develop an integrated picture of the biochemistry and physiology of these systems.

Sung-Hou Kim, Ph.D., is Professor of Chemistry at the University of California, Berkeley and Head of the Structural Biology Department, Lawrence Berkeley National Laboratory. His principal research is in two areas: (1) To discover the structural basis for molecular communication. His group determined the crystal structure of transfer RNA, chemotaxis receptors, Ras proteins, and cell cycle dependent kinases, some of which at signal "on" and "off" states, and (2) To establish structural representations of genomes in an effort to organize the protein-fold space and to discover the molecular functions of genes of "unknown" function.

Scott Hultgren, Ph.D., is The Helen L. Stoeber Professor of Molecular Microbiology at Washington University School of Medicine. Dr. Hultgren's

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work has been focused on elucidating the molecular details and consequences of host-pathogen interactions, specifically in the urinary tract. Hultgren's studies on macromolecular assembly of adhesive organelles in uropathogenic *E. coli* led to a fundamental discovery of how proteins fold into three dimensional domains that can serve as assembly modules for building larger macromolecular structures important in pathogenesis. Hultgren and his colleagues have uncovered a mechanism by which *E. coli* are able to persist in the urinary tract and cause disease. This has led to the development of a vaccine that is currently in clinical trials and to novel antimicrobial therapeutics.

Ronald W. Davis, Ph.D., is Professor of Biochemistry and Genetics at Stanford University School of Medicine and Director of Stanford's Genome Technology Center in Palo Alto, CA. His research interests are on the development and application of new molecular biology and manipulative genetic techniques to a variety of biological problems. These include new instruments for rapid DNA sequencing, microfluidic approaches for re-sequencing, robotics, nanofabrication, DNA arrays, and novel approaches for whole genome functional analysis. Dr. Davis' most recent award is the Chiron Corp. Biotechnology Research Award, 1998.

Elizabeth Winzeler, Ph.D., is a Scientist at the Genomics Institute of the Novartis Research Foundation and Assistant Professor at the Scripps Research Institute, La Jolla, California. Her research interests include determining the function of genome sequence in microorganisms using high-throughput methods.