

Improving Human Health Through Collaborative Scientific Discovery

The Life Sciences Institute serves as Michigan's hub for collaborative biomedical research on human health problems. The LSI harnesses the strength and tradition of academic excellence at the University of Michigan by forging links between the health sciences, basic sciences, engineering, the social sciences, and the humanities.

Interdisciplinary science is the feature of LSI's annual symposia. They are designed to encourage the exchange of ideas and to provide the opportunity for students and scientists alike to interact with and learn from prominent scientific leaders about recent developments.



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THURSDAY 8 MAY

FOCUS ON Chemical Biology

University of Michigan Life Sciences Institute
SEVENTH ANNUAL SYMPOSIUM

BIOMEDICAL SCIENCE RESEARCH BUILDING AUDITORIUM

9:00 am

Welcome

Alan Saltiel
Director of the Life Sciences Institute

MORNING SESSION

Lecturers

**Stuart Schreiber, PhD
Alanna Schepartz, PhD
Chaitan Khosla, PhD**

AFTERNOON SESSION

Lecturers

**Joseph Noel, PhD
Jin Zhang, PhD**

4:00 pm

Reception

Public invited

2008

9:00 am

Welcome

Alan Saltiel
Director of the Life Sciences Institute

MORNING SESSION

9:15 am

Many Sue and Kenneth Coleman Life Sciences Lecture:

Small-Molecule Probe and Drug Discovery

Stuart L. Schreiber, PhD
Morris Loeb Professor in Chemistry and Chemical Biology, Harvard University; Investigator, Howard Hughes Medical Institute; Broad Institute

Introduction by Terrence J. McDonald, Dean, U-M College of Literature, Science & the Arts

Dr. Schreiber is Director of Chemical Biology at and Founding Member of the Broad Institute of Harvard and MIT, Investigator at the Howard Hughes Medical Institute, and Morris Loeb Professor of Chemistry and Chemical Biology at Harvard University. He is a member of the National Academy of Sciences and the American Academy of Arts & Sciences (1995). Dr. Schreiber is known for having developed systematic ways to explore biology, especially disease biology, using small molecules (precursors to therapeutic drugs that are used as bioprobes) and for his role in the development of the field of chemical biology. Using his chemical approach, he has discovered principles that underlie information transfer and storage in cells. These include discoveries concerning both cell circuitry by signaling proteins calcineurin and mTOR and gene regulation by chromatin-modifying histone deacetylases. In 2007, two new anti-cancer drugs that target proteins discovered in the Schreiber laboratory using his small-molecule approach were approved by the U.S. FDA. Schreiber also extended chemical biology principles to medicine by participating in the founding of three biopharmaceutical companies, Vertex Pharmaceuticals (1989), ARIAD Pharmaceuticals (1991) and Infinity Pharmaceuticals (2001), each of which has devised new therapeutic agents that are being tested in human clinical trials or used as FDA-approved drugs.

10:15 am

Break

10:30 am

Illuminating Protein Conformations and Associations in Live Cells with Small Molecules

Alanna Schepartz, PhD
Milton Harris '29 PhD Professor of Chemistry
Professor of Molecular, Cellular, and Developmental Biology, Yale University

Dr. Schepartz is Milton Harris '29 PhD Professor of Chemistry and Professor of Molecular, Cellular, and Developmental Biology at Yale University. She received her PhD in 1987 from Columbia University for research on the mechanism of catalysis by the enzyme carboxypeptidase A and spent two years at Caltech as an NIH Fellow studying the topology of the eukaryotic ribosome. In 1988 she joined the Chemistry Department at Yale where her laboratory develops and applies chemical tools to study, manipulate, and visualize protein-protein and protein-DNA interactions inside the cell. Alanna Schepartz has received a Presidential Young Investigator Award, a David and Lucile Packard Fellowship Award, an Eli Lilly Fellowship, a Camille and Henry Dreyfus Teacher-Scholar Award, an Alfred P. Sloan Research Fellowship, an Arthur C. Cope Scholar Award, the A.C.S. Lilly Award in Biological Chemistry, the Dylan Hixon '88 Award for Teaching Excellence in the Natural Sciences, and the Iota Sigma Pi Agnes Fay Morgan Research Award. She currently serves as an Associate Editor for the Journal of the American Chemical Society.

11:30 am

Chemistry and Biology of Celiac Sprue

Chaitan Khosla, PhD
Wells J. Rauser and Harold M. Petiprin Professor
Chair, Chemical Engineering, Stanford University

Dr. Khosla received his PhD in 1990 at Caltech. After completing postdoctoral studies at the John Innes Centre in the UK, he joined Stanford in 1992. Over the past two decades he has studied polyketide synthases as paradigms for modular catalysis, and has exploited their properties for engineering novel antibiotics. More recently, he has investigated celiac sprue pathogenesis with the goal of developing therapies for this widespread but overlooked disease. He has co-authored over 200 publications, and is the recipient of several awards and honors including a National Science Foundation Young Investigator Award, a David and Lucile Packard Fellowship for Science and Engineering, the Allan P. Colburn Award from the American Institute of Chemical Engineers, the Eli Lilly Award in Biological Chemistry and the Pure Chemistry Award from the American Chemical Society, and the Alan T. Waterman Award from the National Science Foundation. He was elected Fellow of the American Association for Advancement of Science and is a Member of the American Academy for Arts and Science. He is a founder of Kosan Biosciences, a company that develops new polyketide antibiotics, and of Alvine Pharmaceuticals, a company that is developing an oral enzyme drug identified by his laboratory for the treatment of celiac disease.

12:30 pm

Lunch

AFTERNOON SESSION

2:00 pm

Quantitative Exploration of the Catalytic Landscape Separating Divergent Plant Sesquiterpene Synthases

Joseph Noel, PhD
Professor, Chemical Biology; Investigator, Howard Hughes Medical Institute; Jack H. Skirball Center for Chemical Biology and Proteomics, Salk Institute

Dr. Noel received a BS in natural sciences/chemistry from the University of Pittsburgh at Johnstown and a PhD in chemistry from The Ohio State University and postdoctoral studies at Yale University in structural biology with the late Paul B. Sigler. He is a Professor in the newly formed Jack H. Skirball Center for Chemical Biology and Proteomics at The Salk Institute for Biological Studies. Noel seeks to understand the intricate biosynthetic pathways plants and microbes use to produce a vast array of compounds that allow them to survive and prosper in the multitude of challenging ecosystems found all over the earth. His work has concentrated on the biosynthetic machinery for three important classes of natural compounds, polyketides and terpenes. These chemicals have played an important role in the pharmaceutical industry as sources of new drugs. By understanding the detailed structures and functions of the enzymes that produce these compounds, how these enzyme structures have evolved over time, and how these enzymes organize themselves in space and time in cells forming complex metabolic pathways, Noel seeks to engineer new versions of the biosynthetic enzymes and pathways that can create altered compounds as a potential source of new biological tools and future pharmaceuticals.

3:00 pm

Visualization of Dynamic Signaling Activities in Living Cells

Jin Zhang, PhD
Assistant Professor, Pharmacology and Molecular Sciences, Johns Hopkins School of Medicine

Dr. Zhang received her BS degree in chemistry from Tsinghua University, and her PhD in chemistry from the University of Chicago working with Dr. David Lynn. After finishing her postdoctoral training with Dr. Roger Tsien and Dr. Susan Taylor at the University of California, San Diego, she joined the Department of Pharmacology and Molecular Sciences at the Johns Hopkins University School of Medicine. She is currently an Assistant Professor of Pharmacology, Neuroscience and Oncology. Current research in her lab focuses on development of molecular tools to monitor and perturb specific signaling activities in living cells, and investigation of spatiotemporal regulation (or dysregulation) of protein kinases and second messengers in cell migration, energy metabolism and tumorigenesis.

4:00 pm

Reception