### **RISE OF THE** С Μ

FIFTEENTH ANNUAL LSI SYMPOSIUM

### SALTI ΕL LIFE SCIENCES SYMPOSIUM MAY 10, 2016



LIFE SCIENCES INSTITUTE

Illustration based on cryo-electron microscopy images of polyketide synthase structures from recent work by the Sherman, Skiniotis and Smith labs at the Life Sciences Institute.

### SCHEDULE

### 8:15 A.M.

#### Welcome | Stephen J. Weiss, M.D.

Interim Director, Life Sciences Institute; Upjohn Professor of Internal Medicine and Oncology, University of Michigan Medical School

### 8:30 A.M.

Introduction of the Mary Sue and Kenneth Coleman Life Sciences Lecturer | Alan Saltiel, Ph.D.

*Director, Comprehensive Diabetes Center, Professor, University of California, San Diego School of Medicine; Director, Life Sciences Institute 2002-2015* 

### 8:40 A.M.

Mary Sue and Kenneth Coleman Life Sciences Lecture: The Split Personality of Human O-GlcNAc Transferase | **Suzanne Walker, Ph.D.** *Professor of Microbiology and Immunobiology, Harvard Medical School* 

MORNING BREAK

### 10:00 A.M.

The Structure of the Nuclear Pore | André Hoelz, Ph.D. Professor of Chemistry, California Institute of Technology

### 10:55 A.M.

The Structural Basis for Signal Transmission at Chemical Synapses of the Brain | **Eric Gouaux**, **Ph.D**.

Senior Scientist, Vollum Institute, Jennifer and Bernard Lacroute Term Chair in Neuroscience Research, Oregon Health and Science University; Investigator, Howard Hughes Medical Institute

### LUNCH BREAK

### 1:00 P.M.

Targeting Cullin Ring Ligases by Inhibiting the DCN1-UBC12 Interaction | **R. Kiplin Guy, Ph.D.** *Robert J. Ulrich Chair of Chemical Biology and Therapeutics, St. Jude Children's Research Hospital* 

### 1:55 P.M.

Engineering New Chemistry in Living Cells | **Michelle Chang, Ph.D.**  *Associate Professor of Chemistry and Molecular & Cell Biology, University of California, Berkeley* 

### AFTERNOON BREAK

### 3:15 P.M.

Elucidating and Understanding Plant Metabolic Pathways | Sarah O'Connor, Ph.D. Project Leader and Professor, Department of Biological

Chemistry, John Innes Centre, U.K.

### 4:10 P.M.

CoREST in Peace: A Dual Action Inhibitor of Histone Demethylase and Deacetylase | **Philip Cole, M.D., Ph.D.** *Marshall-Maren Professor of Pharmacology, Director, Department of Pharmacology and Molecular Sciences, Johns Hopkins University* 

### 5:00 P.M.

### Closing Remarks | Stephen J. Weiss, M.D.

Interim Director, Life Sciences Institute; Upjohn Professor of Internal Medicine and Oncology, University of Michigan Medical School

LIGHT REFRESHMENTS WILL BE AVAILABLE IN THE ATRIUM DURING BREAKS. ATTENDEES ARE ON THEIR OWN FOR LUNCH.

## SPEAKER BIOGRAPHIES



#### Michelle Chang, Ph.D.

Associate Professor of Chemistry and Molecular & Cell Biology, University of California, Berkeley

Michelle Chang received her Ph.D. from the Massachusetts Institute of Technology, working with Drs. JoAnne Stubbe and Daniel Nocera, and did her postdoctoral training with Dr. Jay Keasling at the University of California, Berkeley. Her research group works at the interface of enzymology and synthetic biology, with a focus on studying biological fluorine chemistry, formation of mixed-valent nanomaterials by directional-sensing bacteria, and processes involved in developing synthetic biofuel pathways. She is the recipient of a number of awards, including the NIH New Innovator Award, DARPA Young Faculty Award, Camille Dreyfus Teacher-Scholar Award and Arthur C. Cope Scholar Award.



### Philip Cole, M.D., Ph.D.

Marshall-Maren Professor of Pharmacology, Director, Department of Pharmacology and Molecular Sciences, Johns Hopkins University

Phil Cole graduated from Yale University with a B.S. in Chemistry in 1984 and then spent a year as a Churchill Scholar at the University of Cambridge. Cole went on to obtain an M.D. and Ph.D. from Johns Hopkins, where he pursued research in bioorganic chemistry in 1991. Cole then entered postdoctoral training at Harvard Medical School prior to joining Rockefeller University in 1996 as a junior lab head. In 1999, Cole moved back to Johns Hopkins as the Marshall-Maren professor and director of pharmacology. His research interests are in the area of protein post-translational modifications and chemical biology. His group developed the method of expressed protein ligation and reported the first potent and selective histone acetyltransferase inhibitors, which led to the founding of Acylin Therapeutics, Inc. His honors include election as an American Association for the Advancement of Science fellow and receipt of an National Institutes of Health MERIT Award.



#### Eric Gouaux, Ph.D.

Senior Scientist, Vollum Institute, Jennifer and Bernard Lacroute Term Chair in Neuroscience Research, Oregon Health and Science University; Investigator, Howard Hughes Medical Institute

After receiving his B.A. and Ph.D. degrees in chemistry at Harvard University, Eric Gouaux did his postdoctoral studies at Harvard and at the Massachusetts Institute of Technology. He began his professional career at the University of Chicago, then moved to Columbia University in 1996. In 2000, he was appointed associate professor at Columbia University, reaching full professor the following year. In 2005, he moved to Oregon Health and Science University as a senior scientist at the Vollum Institute, and in 2006 he was appointed to the graduate faculty in the Department of Biochemistry and Molecular Biology. In 2015, Gouaux was appointed the Jennifer and Bernard Lacroute Term Chair in Neuroscience Research. Gouaux has also had an appointment as an investigator with the Howard Hughes Medical Institute since 2000.



### R. Kiplin Guy, Ph.D.

Robert J. Ulrich Chair of Chemical Biology and Therapeutics, St. Jude Children's Research Hospital

R. Kip Guy obtained his B.A. in chemistry from Reed College in Portland, Oregon and received his Ph.D. in organic chemistry from the Scripps Research Institute in La Jolla, California. From 1996 to 1998, he was a Helen Hay Whitney Postdoctoral Fellow in Cellular Biology focusing on the relationship between hedgehog signalling and sterol homeostasis at University of Texas Southwestern Medical Center in Dallas. In 1998, he joined the University of California, San Francisco as an assistant professor with joint appointments in pharmaceutical chemistry and cellular and molecular pharmacology; he was promoted to full professor in 2005. He also founded the Small Molecule Discovery Center at UCSF. In 2005, he was recruited to St. Jude Children's Research Hospital to found and chair the new department of Chemical Biology and Therapeutics. He currently has academic positions at St. Jude Children's Research Hospital, UCSF, University of Tennessee, and Vanderbilt University. His research is focused on the discovery and development of novel small molecules that target the pathophysiology of orphan pediatric diseases, particularly pediatric oncology and protozoal infectious diseases. Most of his group's work falls into the areas of chemical validation of novel targets, lead discovery and optimization of novel chemical matter for validated disease targets, and use of non-targeted whole-cell strategies for lead discovery and optimization.

## SPEAKER BIOGRAPHIES



#### André Hoelz, Ph.D.

Professor of Chemistry, California Institute of Technology

André Hoelz joined the California Institute of Technology faculty as an assistant professor in 2010 and he was promoted to full professor in 2016. Hoelz received his undergraduate training at the Albert Ludwigs University of Freiburg, Germany before moving to the United States to attend graduate school at The Rockefeller University. For his Ph.D., Hoelz studied the structural and functional characterization of protein kinases with Dr. John Kuriyan. It was during this time he developed his fascination with large macromolecular assemblies. Upon his graduation in 2004, Hoelz set up his own structural biology subgroup in the laboratory of Nobel laureate Günter Blobel, with the intent of starting the structural characterization of the ~120 million Dalton nuclear pore complex, one of the largest proteinaceous assemblies in the eukaryotic cell. At Caltech, his major research accomplishments include the elucidation of the near-atomic architecture of the nuclear pore's entire symmetric core and the development of technical methods that will enable similar feats on other giant macromolecular assemblies. He is the recipient of a number of awards. including a Camille Dreyfus Teacher-Scholar Award and a Kimmel Scholar Award, and he is an Inaugural Heritage Principal Investigator.

### Sarah O'Connor, Ph.D.

Project Leader and Professor, Department of Biological Chemistry, John Innes Centre, U.K.

Sarah O'Connor has been a professor and project leader in biological chemistry at the John Innes Centre since 2011. She performed her graduate work at both Caltech and the Massachusetts Institute of Technology, and was an Irving Sigal postdoctoral fellow in biological chemistry at Harvard Medical School. Her work focuses on the elucidation, enzymology and engineering of terpene and alkaloid pathways, particularly from plants.



#### Suzanne Walker, Ph.D.

Professor of Microbiology and Immunobiology, Harvard Medical School

After receiving a B.A. in English Literature at the University of Chicago and a Ph.D. in Organic Chemistry at Princeton, Suzanne Walker joined the faculty at Princeton as an instructor of chemistry in 1995. She was promoted to associate professor in 2001 and, in 2003, became the first woman to achieve the rank of full professor of chemistry at Princeton. She joined the faculty at Harvard Medical School in 2004 and is currently the director of the Harvard University chemical biology Ph.D. program. Walker is known for her work on bacterial cell envelope biosynthesis. She is an expert on antibiotic mechanism of action and has pioneered approaches to discover and characterize new antibiotic targets and compounds. She also has an interest in glycosyltransferases, including OGT. Her research is characterized by the creative integration of chemistry and biology. Walker has received a number of awards, including an Alfred P. Sloan Foundation Fellowship, a Camille Drevfus Teacher-Scholar Award, the Emil Thomas Kaiser Award in Protein Chemistry, and an Arthur C. Cope Scholar Award. Of all her professional achievements, she is most proud of being a pretty good mentor to her many wonderful students, past and present.

## ABOUT THE LIFE SCIENCES INSTITUTE

The Life Sciences Institute is a nucleus of interdisciplinary biomedical research at the University of Michigan. LSI faculty members conduct research in their labs in the institute and hold academic appointments in other schools or colleges at U-M, including the Medical School, College of Pharmacy, College of Literature, Science and the Arts, and in departments including Chemistry, Cell and Developmental Biology, Physiology, Human Genetics, Bioinformatics, Hematology and Oncology, and Medicinal Chemistry.

# ABOUT THE ANNUAL SYMPOSIUM

In 2002, while construction of the institute was still underway, the LSI held its first symposium. The event continues to represent the LSI's most important values: excellence in science, investment in high-impact research, and especially the synergy that happens when top scientists from a range of fields meet and share their work around a common theme.

# PAST SYMPOSIA

2015	Defense Mechanisms in Life: From Bacteria to the	
	Human Body	
2014	Victors for Discovery: Biomedicine at Michigan	
2013	Exploring Epigenetics and RNA	
2012	Development and Diseases of the Nervous System	
2011	Autophagy	
2010	Macromolecular Complexes in Cell Biology	

2009 Evolutionary Biology

2008	Focus on Chemical Biology
2007	Frontiers in Stem Cell Biology
2006	Molecular Insights into Metabolic Disease
2005	Cancer Insights: Molecules to Medicine
2004	Exploring the Complexity of Life
2003	Genetic Insights into Biology and Disease
2002	Structural Biology of Cell Signaling

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