

# VIRAL PATHOGENS: US VS. THEM



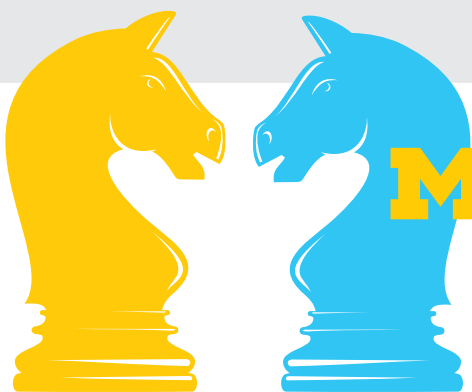
**SALTIEL LIFE SCIENCES SYMPOSIUM**

**MAY 13, 2022**

TWENTIETH ANNUAL LSI SYMPOSIUM

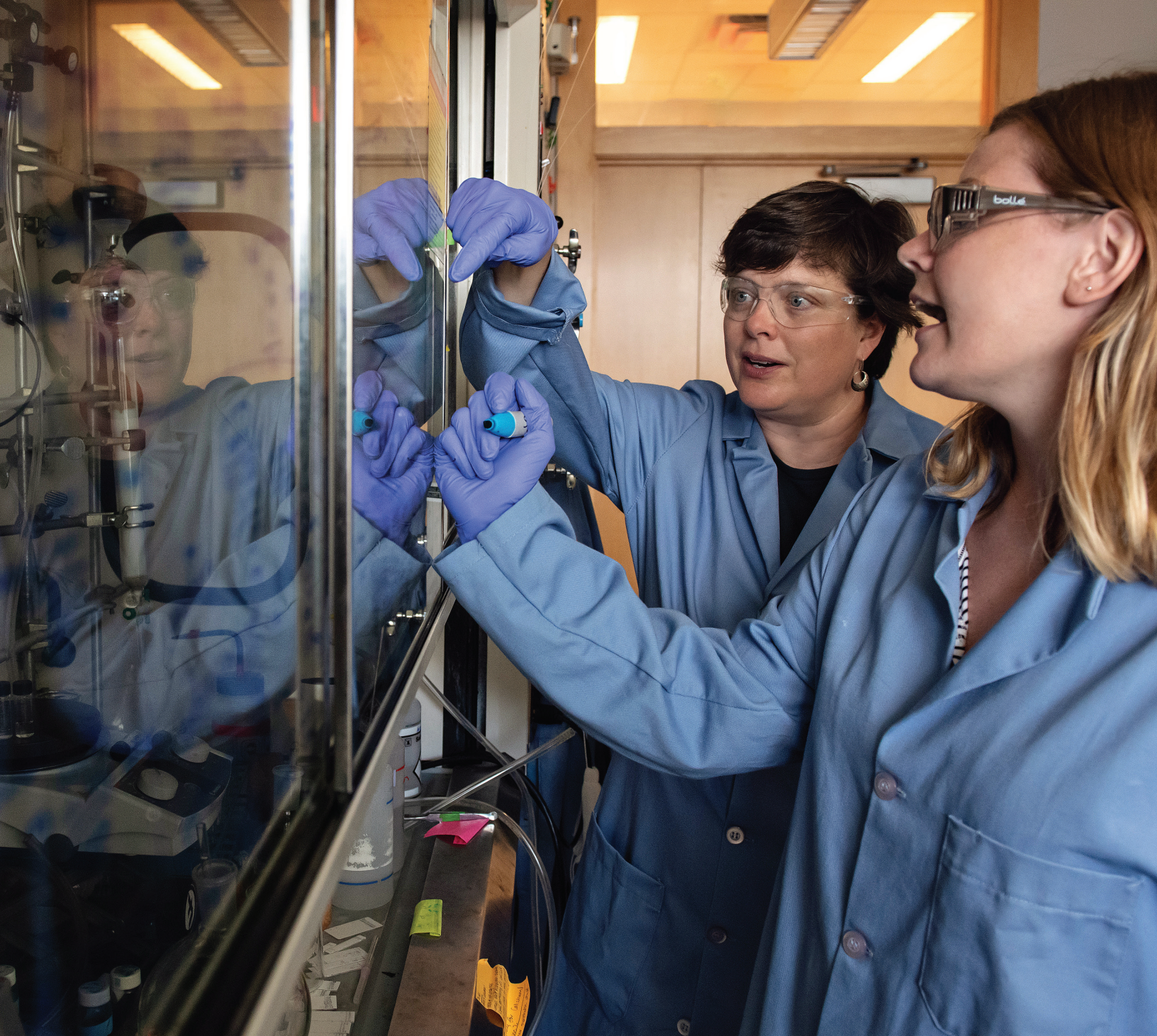
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**#LSIsymposium2022**



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# SCHEDULE

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## 8:45 A.M.

Welcome

### **Roger D. Cone, Ph.D.**

*Vice Provost and Director, U-M Biosciences Initiative; Mary Sue Coleman Director, Life Sciences Institute; Professor of Molecular and Integrative Physiology, Medical School; Professor of Molecular, Cellular, and Developmental Biology, College of Literature, Science, and the Arts*

## 8:50 A.M.

Introduction of the Mary Sue and Kenneth Coleman Life Sciences Lecturer

### **Mary Sue Coleman, Ph.D.**

*President of the University of Michigan*

## 9:00 A.M.

Mary Sue and Kenneth Coleman Life Sciences Lecture: Structural correlates of antibody neutralization of viruses

### **Pamela Bjorkman, Ph.D.**

*David Baltimore Professor of Biology and Biological Engineering, Merkin Institute Professor, California Institute of Technology*

## 9:50 A.M.

Morning break

## 10:10 A.M.

Next generation nucleic acid vaccines

### **Deborah Fuller, Ph.D.**

*Professor of Microbiology; Associate Director of Research, Washington National Primate Research Center, University of Washington*

## 11:00 A.M.

Molecular mechanism for self vs. non-self RNA discrimination

### **Sun Hur, Ph.D.**

*Senior Investigator, Program in Cellular & Molecular Medicine; Oscar M. Schloss, MD Professor of Pediatrics, Professor of Biological Chemistry and Molecular Pharmacology, Harvard Medical School and Boston Children's Hospital; Investigator, Howard Hughes Medical Institute*

## 11:50 A.M.

Poster session & lunch

## 1:20 P.M.

Noncoding RNA and triphosphate balance in virus infection

### **Chris Sullivan, Ph.D.**

*Professor of Molecular Biosciences, University of Texas at Austin*

## 2:10 P.M.

Influenza in vulnerable populations

### **Stacey Schultz-Cherry, Ph.D.**

*Full Member, Department of Infectious Diseases; Deputy Director, World Health Organization Collaborating Center for Studies on the Ecology of Influenza in Animals and Birds; Associate Dean of Student Affairs, St. Jude Graduate School for Biomedical Sciences, St. Jude Children's Research Hospital*

## 3:00 P.M.

Afternoon break

## 3:20 P.M.

Rules of engagement between primate and viral genomes

### **Harmit Malik, Ph.D.**

*Professor and Associate Director, Basic Sciences Division, Fred Hutchinson Cancer Research Center; Investigator, Howard Hughes Medical Institute*

## 4:10 P.M.

Closing remarks

### **Roger D. Cone, Ph.D.**

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#### **Special thanks to the Saitel Life Sciences Symposium organizing committee:**

**Janet Smith, Ph.D.**, Associate Institute Director, Research Professor and Center for Structural Biology Director, U-M Life Sciences Institute; Margaret J. Hunter Collegiate Professor in the Life Sciences; Martha L. Ludwig Distinguished University Professor of Biological Chemistry, U-M Medical School; Professor of Biophysics, U-M College of Literature, Science, and the Arts

**Shyamal Mosalaganti, Ph.D.**, Research Assistant Professor, Life Sciences Institute; Assistant Professor of Cell and Developmental Biology, U-M Medical School

**Melanie Ohi, Ph.D.**, Rowena G. Matthews Collegiate Professor in the Life Sciences; Research Professor, U-M Life Sciences Institute; Professor of Cell and Developmental Biology, U-M Medical School

**Kathy Spindler, Ph.D.**, Professor of Microbiology and Immunology, U-M Medical School

# SPEAKER BIOGRAPHIES

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## **Pamela Bjorkman, Ph.D.**

*David Baltimore Professor of Biology and Biological Engineering, Merkin Institute Professor, California Institute of Technology*

Pamela Bjorkman received a B.A. in chemistry from the University of Oregon and a Ph.D. in biochemistry from Harvard University. As a graduate student and postdoctoral fellow with Don Wiley, she solved the first 3D structure of a major histocompatibility complex molecule, HLA-A2. At the California Institute of Technology, Bjorkman's lab studies the structural basis of the host immune response to HIV-1 and other viruses, including SARS-CoV-2.

Bjorkman is a member of the National Academy of Sciences, the American Academy of Arts and Sciences and the American Philosophical Society, and is an elected Fellow of AAAS. She received the William B. Coley Award for Distinguished Research in Immunology, the James R. Klinenberg Science Award, the Gairdner Foundation International Award, the Paul Ehrlich and Ludwig Darmstaedter Award, the Max Planck Research Award, the Rose Payne Distinguished Scientist Award, an NIH Director's Pioneer Award and the Pearl Meister Greengard Prize, and she was a L'OREAL-UNESCO Women in Science Laureate.

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## **Deborah Fuller, Ph.D.**

*Professor of Microbiology, Associate Director of Research, Washington National Primate Research Center, University of Washington*

At the University of Washington School of Medicine, Deborah Fuller leads a team that is developing nucleic acid-based vaccines and antivirals, including DNA and RNA vaccines for infectious diseases. She led the translation of two vaccines from bench to clinical trials, including the first DNA vaccine to induce protective levels of immunity in humans. In the past year, she played a key role in advancing several vaccines and antivirals for the prevention and treatment of COVID-19, including a second-generation RNA vaccine for COVID-19 that entered human clinical trials in Spring 2021.

Fuller has authored over 100 manuscripts and book chapters and is a co-inventor on more than a dozen patents. She has served as a member of several National Institutes of Health study sections for vaccines and HIV and is currently serving on the leadership team for the NIH's COVID-19 Vaccines and Therapeutics Evaluation Network (COVTEN). She is also the co-founder of Orance Inc., a biotechnology company that aims to develop a needle-free nucleic acid vaccine platform. Since the start of the COVID-19 pandemic, she has played a key role as an expert in vaccines to inform the community and public on the science behind the COVID-19 vaccines. She has been featured on Bloomberg TV, CNN and NPR, and has contributed to numerous news articles, op-eds, podcasts and instructional videos published by The Washington Post, The Associated Press, The Wall Street Journal, Huffpost, Vox, Conversation.com and others. Her op-ed articles have been translated into multiple languages and read by millions of readers worldwide. Her most recent honors include the University of Washington Latinx Faculty Excellence in Research Awards in 2019 and 2020 and the Hope College Distinguished Alumni Award in 2021.

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## **Sun Hur, Ph.D.**

*Senior Investigator, Program in Cellular & Molecular Medicine; Oscar M. Schloss, MD Professor of Pediatrics, Professor of Biological Chemistry and Molecular Pharmacology, Harvard Medical School and Boston Children's Hospital; Investigator, Howard Hughes Medical Institute*

Sun Hur received her B.S. in physics from Ewha Women's University in Korea and her Ph.D. in physical chemistry from the University of California, Santa Barbara. Hur completed her postdoctoral training in X-ray crystallography with Robert M. Stroud at the University of California, San Francisco, before joining Harvard Medical School in 2008 as an assistant professor with a joint appointment at Boston Children's Hospital. She was promoted to Professor in 2019 and Oscar Schloss Professor in 2020.

Hur's research focuses on molecular mechanisms of foreign RNA sensors in the vertebrate innate immune system and transcription factors involved in development of the vertebrate adaptive immune system. Her approaches range from structural characterization of important molecular complexes, to biochemical reconstitution of immune signaling pathway, to cellular imaging and genetic screens to identify new molecular components in the pathway. She is a recipient of the Massachusetts Life Sciences Young Investigator Award, the Pew Scholar Award, the Vilcek Prize for Creative Promise in Biomedical Science, the Burroughs Wellcome Infectious Disease Investigator Award, an NIH Director's Pioneer Award and the Paul Marks Prize for Cancer Research.

# SPEAKER BIOGRAPHIES

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## Harmit Malik, Ph.D.

*Professor and Associate Director, Basic Sciences Division, Fred Hutchinson Cancer Research Center; Investigator, Howard Hughes Medical Institute*

Harmit Malik received his B.Tech. in Chemical Engineering from the Indian Institute of Technology, Mumbai, India, where he became interested in molecular biology due to Prof. K.K. Rao and in evolution by reading Richard Dawkins' *The Selfish Gene*. He then moved to the United States to complete his Ph.D. in biology at the University of Rochester.

After completing his postdoctoral research at the Fred Hutchinson Cancer Research Center (the "Hutch"), he started his own lab at the Hutch, where he studies the causes and consequences of genetic conflicts that take place between different genomes (e.g., host-virus interactions) or between components of the same genome (e.g., centromeres). He is interested in understanding these "molecular arms races" and how they drive recurrent genetic innovation, from the perspective of both evolutionary biology and human disease. Malik and his colleagues, especially Michael Emerman, have used an evolutionary lens to dissect and discover both primate antiviral as well as viral adaptation strategies.

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## Stacey Schultz-Cherry, Ph.D.

*Full Member, St. Jude Faculty; Deputy Director, World Health Organization Collaborating Centre for Studies on the Ecology of Influenza in Animals and Birds; Associate Dean, Student Affairs, St. Jude Graduate School of Biomedical Sciences, St. Jude Children's Research Hospital*

Stacey Schultz-Cherry received her Ph.D. in molecular and cellular pathology from the University of Alabama at Birmingham and completed her postdoctoral training in influenza virology at the University of Wisconsin. Before joining the faculty at St. Jude Children's Research Hospital in 2009, she was an associate professor in the Department of Medical Microbiology and Immunology at the University of Wisconsin-Madison.

At St. Jude Children's Research Hospital, Schultz-Cherry serves as a full member (professor) in the Department of Infectious Diseases, the deputy director of the World Health Organization Influenza Collaborating Center, co-director for the NIAID-funded Center for Excellence in Influenza Research and Surveillance (CEIRS) and co-director for the NIAID-funded Collaborative Influenza Vaccine Innovation Center (CIVIC). She was recently appointed the Associate Dean of Students for the St. Jude Graduate School of the Biomedical Sciences.

Schultz-Cherry is recognized internationally for her studies on the pathogenesis of influenza and enteric viruses in high-risk populations and influenza at the animal-human interface. She is the author and co-author of over 200 research articles, reviews and book chapters; the past President of the American Society for Virology; and the current chair of the Public and Scientific Affairs Committee for the American Society for Microbiology (ASM).

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## Chris Sullivan, Ph.D.

*Professor of Molecular Biosciences, University of Texas at Austin*

Chris Sullivan received his B.S. in biology from The Pennsylvania State University and his Ph.D. in molecular, cellular, and developmental biology from the University of Pittsburgh. He conducted his postdoctoral studies at the University of California, San Francisco, where he worked on the Kaposi's Sarcoma-associated Herpesvirus and began to develop a program on viral-encoded noncoding RNAs (ncRNAs). He then joined the faculty of the University of Texas at Austin.

Since its inception, Sullivan's at UT Austin lab has focused on the intersection of virology and nc RNA. He received the National Science Foundation Career Award for his lab's efforts to understand the role of RNA interference (RNAi) in the antiviral response. Sullivan has also received the Burroughs Wellcome Investigators in Pathogenesis Award for work on microRNAs and viruses. His lab has made several contributions to better understanding virus-encoded ncRNAs, including identifying new ncRNAs and their targets spanning diverse families of viruses. The group currently is focused on understanding how both host and viral ncRNAs control infection and can be used as probes to understand host biology.

In addition to research, Sullivan serves as a permanent member of the NIH Virology study section and strives to be an impactful teacher.

# POSTER SESSION

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“A direct interaction between HIV-1 capsid and dynein is required for HIV-1 retrograde microtubule trafficking”

*Somaye Badieyan, Drew Lichon, Jiong Shi, Christopher R. Aiken, Edward M. Campbell, Michael A. Cianfrocco*

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“Development of potent HIV-Nef inhibitors”

*Matthew Huston, Alanna Condren, Morgan McCauley, Gretchen Zimmerman, Marianne Maresh, Mark Painter, Nolan Carney, Andrew Robertson, Matt DeMars, Ashootosh Tripathi, David H. Sherman, Kathy Collins*

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“Differential downmodulation of human leukocyte antigen B (HLA-B) allotypes by HIV infection”

*Oloche Owoicho, Jie Geng, Kathleen Collins, Malini Raghavan*

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“E-PurE: Cheminformatic platform for discovery of viral protease inhibitors”

*Osama G. Mohamed, Pam Schultz, Ashootosh Tripathi*

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“KHNYN is a zinc-finger antiviral protein (ZAP) co-factor that degrades ZAP-bound RNA”

*Zoe C. Yeoh, Jennifer L. Meagher, Chia-yu Kang, Melanie D. Ohi, Janet L. Smith*

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“Macrophage-specific suppression of Influenza A virus particle assembly”

*Sukhmani Bedi, Rajat Mudgal, Amanda Haag, Akira Ono*

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“Macropinocytosis promotes HIV-1 entry into primary CD4+ T cells”

*Tomoyuki Murakami, Praveen Manivannan, Ya-Ting Chang, John C. Charpentier, Kazuaki Monde, Joel A. Swanson, Philip D. King, Akira Ono*

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“Phosphatidylinositol-(4,5)-bisphosphate is a key determinant for incorporation of CD43, PSGL-1, and CD44 into HIV-1 particles”

*Ricardo de Souza Cardoso, Tomoyuki Murakami, Binyamin Jacobovitz, Sarah, L. Veatch, Akira Ono*

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“Preferential and MA highly basic region-dependent binding of specific tRNAs to HIV-1 Gag in cells”

*Rajat Mudgal, Dishari Thornhill, Akira Ono*

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“Structure guided protection against flavivirus pathogenesis”

*Nicholas J. Bockhaus, Scott B. Biering, W. Clay Brown, David L. Akey, Henry Puerta-Guardo, Jamie R. Konwerski, Eva Harris, Janet L. Smith*

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# ABOUT THE LIFE SCIENCES INSTITUTE

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The Life Sciences Institute is a hub for collaborative bioscience discovery at the University of Michigan. Our faculty, who hold joint appointments in schools and colleges across the campus, work to advance the understanding of fundamental biology in important areas of human health and disease. In addition to faculty labs, the LSI houses a world-class cryo-electron microscopy facility, a high-throughput screening center with extensive chemical libraries, a unique library of natural products and a comprehensive protein production and X-ray crystallography facility. The LSI is also the administrative home for the U-M Program in Chemical Biology, Michigan Drug Discovery and the Michigan Life Sciences Fellows program.

## ABOUT THE ANNUAL SYMPOSIUM

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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.

In 2016, the annual LSI symposium was named the Saliel Life Sciences Symposium thanks to an endowment made possible by the generous support of the LSI's faculty, Leadership Council, Scientific Advisory Board and friends. The name recognizes the leadership and scientific contributions made by former LSI Director Alan R. Saliel during his 13-year tenure.

## PAST SYMPOSIA

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2020	Broadening the Biosciences: Exploring Diverse Approaches to Biological and Biomedical Research	2012	Development and Diseases of the Nervous System
2019	Protein Engineering & Biological Design	2011	Autophagy
2018	The Power of One: Frontiers in Single Cell Biology	2010	Macromolecular Complexes in Cell Biology
2017	Game Changers: Technologies that Are Rewriting the Future of the Life Sciences	2009	Evolutionary Biology
2016	Chemical Biology: Rise of the Cellular Machine	2008	Focus on Chemical Biology
2015	Defense Mechanisms in Life: From Bacteria to the Human Body	2007	Frontiers in Stem Cell Biology
2014	Victors for Discovery: Biomedicine at Michigan	2006	Molecular Insights into Metabolic Disease
2013	Exploring Epigenetics and RNA	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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