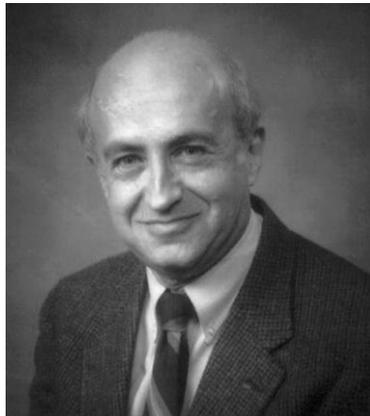




Presents

**The Twenty-First Annual
Norman P. Salzman Memorial Award
and Symposium in Virology**

Monday, November 18, 2019



**The Warren Grant Magnuson Clinical Center
Lipsett Amphitheater
National Institutes of Health**

Norman P. Salzman, Ph.D.

Dr. Norman P. Salzman was a noted pioneer in the field of molecular virology and a founding editor of the Journal of Virology. In 1967 Dr. Salzman became Chief of the Laboratory of Biology of Viruses at the National Institute of Allergy and Infectious Diseases (NIAID) where he encouraged independence and excellence among his Fellows. Upon his retirement from NIH in 1986, Dr. Salzman moved to Georgetown University to head the Laboratory of Molecular Retrovirology, where he began his research on AIDS. This important work continued after he moved his laboratory in 1994 to the Frederick Cancer and Development Center (SAIC Program), where Dr. Salzman was appointed Director of an innovative mentoring program for post-doctoral fellows.

Dr. Salzman was among the first to characterize viral mRNAs and to visualize replicating viral DNA. During his distinguished career at NIH, Dr. Salzman made many important and innovative contributions to our basic understanding of the replication of poliovirus, vaccinia virus, polyoma virus, SV40 virus and BK virus.

Dr. Salzman's studies on human immunodeficiency virus led to his discovery that ongoing evolution of viral quasi-species, despite combination antiretroviral therapy, characterized the relationship among viruses from different compartments and elucidated novel mechanisms of antiretroviral drug resistance. This work set the stage for today's work focusing on the role of viral reservoirs and challenges to HIV cure.

Dr. Salzman's memorable achievements in virology are paralleled by the recognition that his laboratory was a training ground for many young scientists, several of whom went on to become laboratory or section Chiefs at the NIH, and others to hold leadership positions in academia and industry all over the world. Six have been elected to the National Academy of Sciences and one received the Nobel Prize.

- H. Clifford Lane, M.D., NIAID

Norman P. Salzman Memorial Award and Twenty-First Annual Symposium in Virology

9:00 – 9:05 AM	Opening Remarks Nihal Altan-Bonnet, NHLBI, NIH
9:05 – 9:15 AM	Welcome Address Anthony S. Fauci, NIAID, NIH
9:15 – 10:00 AM	Keynote Presentation <i>Development of a broadly protective HIV vaccine: How and when will we get there?</i> Barton F. Haynes, Duke University
10:00 – 10:30 AM	<i>Breaking barriers – How viruses bypass the placenta and GI tract</i> Carolyn B. Coyne, University of Pittsburgh
10:30 – 10:55 AM	Coffee Break
10:55 – 11:00 AM	Foundation for the National Institutes of Health Robert L. Balthaser, Vice President of Advancement
11:00 – 11:10 AM	Tribute to Dr. Norman P. Salzman Malcolm A. Martin, NIAID, NIH
11:10 – 11:20 AM	Presentation of the 2019 Norman P. Salzman Memorial Award in Virology Lenore Salzman
11:20 – 11:40 AM	Award Lecture <i>New insights into respiratory syncytial virus (RSV) entry: The alpha-1 subunit of the Na⁺,K⁺-ATPase (ATP1A1) is required for macropinocytic entry in human respiratory epithelial cells</i> Matthias Lingemann, NIAID, NIH
11:40 – 12:10 PM	<i>Cancer immunotherapy with recombinant poliovirus</i> Matthias Gromeier, Duke University
12:10 – 12:40 PM	<i>A short walk from the physics of virus assembly to hepatitis B virus-specific antivirals</i> Adam Zlotnick, Indiana University
12:40 – 12:45 PM	Closing Remarks Nihal Altan-Bonnet, NHLBI, NIH
12:45 PM	Luncheon and Poster Presentations at FAES Terrace

The 2019 Norman P. Salzman Memorial Award in Virology

Matthias Lingemann, Ph.D.

Laboratory of Infectious Diseases, NIAID



Dr. Lingemann received his BSc degree in Biology in 2011 from the University Wuerzburg in Germany and his MSc (2013) and PhD (2019) from the Technical University Braunschweig in Germany. He performed his MSc and PhD dissertation research under the supervision of Dr. Peter L. Collins through the NIH Graduate Partnership Program. Dr. Lingemann's dissertation research focused on virus-host interactions of human respiratory syncytial virus (RSV) during viral entry and developed live-attenuated HPIV-based vaccine candidates against Ebola virus.

During his graduate studies, Dr. Lingemann published 9 papers with 3 first-author publications. In addition, Dr. Lingemann is an inventor on an US patent application. After receiving his PhD degree in April 2019, he joined the Laboratory of Viral Diseases, NIAID, NIH to study Flaviviruses and to contribute to the development of Flavivirus vaccines.

The 2019 Norman P. Salzman Memorial Mentor Award in Virology

Peter L. Collins, Ph.D.

Senior Investigator, RNA Viruses Section, Laboratory of Infectious Diseases, NIAID



Peter L. Collins, PhD is Chief of the RNA Viruses Section in the Laboratory of Infectious Diseases (LID) in the National Institute of Allergy and Infectious Diseases (NIAID), NIH, in Bethesda, MD. He received his PhD from the University of Connecticut in 1981 (Andrew Ball, advisor) for work that elucidated the gene maps and mode of gene expression of Newcastle disease virus and Sindbis virus. He was a postdoctoral fellow at the University of North Carolina (Gail Wertz, advisor) from 1981-1984, and then joined LID/NIAID/NIH as a tenure-track Staff Scientist.

Beginning with his postdoctoral fellowship, Collins cloned, sequenced, characterized, and mapped the genomes and gene products of human respiratory syncytial virus (RSV) and later extended this to the human parainfluenza viruses, human metapneumovirus (HMPV), and other viruses. Working with colleagues, he identified neutralization and protective antigens, evaluated vaccination approaches, and contributed to the development of palivizumab used in passive immunoprophylaxis of infants at high risk for severe RSV disease. Collins developed reverse genetics systems to produce infectious RSV and other viruses from cloned cDNAs and applied these systems to the development of live, attenuated pediatric vaccines. Collins and colleagues also developed adult challenge models with cDNA-derived wild-type RSV and HMPV. Collins and colleagues presently are collaborating to develop a pediatric RSV vaccine with Sanofi Pasteur, Inc. through a Cooperative Research and Development Agreement, and have additional RSV vaccine candidates under development with Codagenix, Inc.

Poster Presentation Awardees

Translational science of tick-borne diseases: flavivirus infection of tick *ex vivo* organotypic cultures and applications for disease control

Fellow: Jeffrey M. Grabowski, Ph.D.

Mentor: Marshall E. Bloom, M.D.

Rocky Mountain Laboratory, NIAID, NIH

Next-generation HIV-1 entry inhibitors that potently blocks the conformational changes required for membrane fusion

Fellow: Yen-Ting Lai, Ph.D.

Mentors: John R. Mascola, M.D. and Peter D. Kwong, Ph.D.

Vaccine Research Center, NIAID, NIH

Human and viral circular RNAs during infection of KSHV

Fellow: Takanaobu Tagawa, Ph.D.

Mentor: Joseph Ziegelbauer, Ph.D.

Center for Cancer Research, NCI, NIH

Single-cell RNA-seq reveals TOX as a key regulator of CD8+ T cell persistence in chronic infection

Fellow: Chen Yao, Ph.D.

Mentor: John O'Shea, M.D.

Arthritis and Rheumatism Branch, NIAMS, NIH

Past Recipients

Norman P. Salzman Memorial Award in Virology

- 1999 Joanna Shisler, NIAID
- 2000 Herman Edskes, NIDDK
- 2001 Alonzo Garcia, NIAID
- 2002 Sonja Best, NIAID, Rocky Mountain Laboratories
- 2003 Kay Grünewald, NIAMS
- 2004 Jason Brenchley, NIAID
- 2005 Yamina Bennasser, NIAID
- 2006 Christopher Buck, NCI
- 2007 Adriano Boasso, NCI
with Special Recognition of Audray Harris, NIAMS
- 2008 Alberto Bartesaghi, NCI
- 2009 Yu Liang, NIAID
- 2010 Silvia Kang, NINDS
- 2011 Tobias Paprotka, NCI
- 2012 Jason McLellan, VRC, NIAID
- 2013 Rachael M. Schowalter, NCI
- 2014 Darryl Falzarano, NIAID, Rocky Mountain Laboratories
- 2015 Christina Guzzo, NIAID; Elisavet Serti, NIDDK
- 2016 Ashley Moseman, NINDS
- 2017 David Angeletti, NIAID; Tuoqi Wu, NHGRI
- 2018 Marianita Santiana, NHLBI

Norman P. Salzman Memorial Mentor Award in Virology

- 1999 Bernard Moss, NIAID
- 2000 Reed Wickner, NIDDK
- 2001 Bernard Moss, NIAID
- 2002 Marshall Bloom, NIAID, Rocky Mountain Laboratories
- 2003 Alasdair Steven, NIAMS
- 2004 Daniel Douek, NIAID
- 2005 Kuan-Teh Jeang, NIAID
- 2006 Douglas Lowy, NCI and John Schiller, NCI
- 2007 Gene M. Shearer, NCI
with Special Recognition of Alasdair C. Steven, NIAMS
- 2008 Sriram Subramaniam, NCI
- 2009 Thomas Kristie, NIAID
- 2010 Dorian McGavern, NINDS
- 2011 Vinay K. Pathak, NCI
- 2012 Peter Kwong, VRC, NIAID
- 2013 Chris Buck, NCI
- 2014 Heinz Feldmann, NIAID, Rocky Mountain Laboratories
- 2015 Paolo Lusso, NIAID; Barbara Rehermann, NIDDK
- 2016 Dorian McGavern, NINDS
- 2017 Jon Yewdell, NIAID; Pamela Schwartzberg, NHGRI
- 2018 Nihal Altan-Bonnet, NHLBI

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The Foundation for the National Institutes of Health gratefully acknowledges the generous contributions made by the family, friends, and colleagues of Norman P. Salzman to honor his memory and to establish this annual award.

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A Brief History of the Norman P. Salzman Memorial Award and Symposium

Dr. Norman P. Salzman was an honored and respected member of the NIH biomedical research community. After his passing on December 11, 1997, Dr. Clifford Lane proposed the idea of a virology memorial award to Mrs. Lenore Salzman as a fitting tribute to Dr. Salzman. Drs. Lane and Salzman had been colleagues, with Dr. Lane as Clinical Director of the National Institute of Allergy and Infectious Diseases (NIAID) and Dr. Salzman as the former Chief of the Laboratory of the Biology of Viruses, NIAID. This kind of memorial would emphasize Dr. Salzman's unique contributions not only as a noted pioneer in the field of molecular virology but also for his mentorship of many younger scientists, some of them who went on to become famous researchers worldwide.

Dr. Lane thought that the newly created Foundation for the National Institutes of Health (FNIH) would be an excellent sponsor for an annual award in virology. Mrs. Salzman met with the first Executive Director of the Foundation to propose the idea of an award, which was greeted enthusiastically as the first award for the new Foundation. The FNIH was chartered by the United States Congress in 1990, but began its work in 1996 "to support the life-saving research mission of the National Institutes of Health by raising private sector funds to stimulate and facilitate the formation of public-private partnerships" to support NIH's research priorities.

A significant amount of capital was needed to establish this novel memorial. Mrs. Salzman contacted Dr. James Darnell, a friend and former colleague of Dr. Salzman's for his help. Dr. Darnell, the Vincent Astor Professor at the Rockefeller Institute in New York, began immediately to contact colleagues, members of scientific societies, and friends of Dr. Salzman. In his letter, dated May 4, 1998, Dr. Darnell asked colleagues to "honor our longtime friend and colleague, Norman P. Salzman, and to provide a stimulus to virological research by young scientists at NIH with a goal that Norman achieved by himself through almost 40 years of outstanding research at NIH, Georgetown University, and the Frederick Cancer and Development Center. His laboratory was the training ground for many young virologists and his work on polio virus, vaccinia virus, SV40, and his most recent work on HIV was widely admired."

Added to this grassroots support were the contributions from friends and family of Norman's favorite aunt, Sylvia Edelman, who died two years after Dr. Salzman. These funds proved to be a significant addition to the funds already collected. Within three years, with a start-up of only \$15,000 from Mrs. Salzman, the goal of \$100,000 to support this memorial in perpetuity was reached. The efforts of the small staff at the FNIH and their support made the first award and subsequent awards a possibility. The first Norman P. Salzman Memorial Award was presented on November 18, 1999 to Dr. Joanna Shisler, a young Ph.D. in Dr. Bernard Moss's Laboratory of Viral Diseases, NIAID. Dr. Clifford Lane provided the introduction to the program with tributes to Dr. Salzman by Dr. Bernard Moss, NIAID, Dr. Robert Wagner, University of Virginia, and Dr. Joseph Kates, SAIC-Frederick. Following the award presentation, Dr. Shisler, presented a lecture on her work on poxvirus gene functions. About 80

colleagues, friends, and young scientists turned out for this first scientific award held at The Cloisters on the grounds of NIH.

In the spring of 2000, the Virology Interest Group at the NIH contacted Mrs. Salzman and indicated an interest in expanding the program into a half-day symposium and award, with virologists from the NIH, FDA, and SAIC (now Leidos) community assisting with the scientific management of the event. That partnership was the catalyst for the birth of the current Norman P. Salzman Memorial Award and Symposium in Virology. The scientific organizing committee has since become self-sustaining, drawing the participation of junior and senior virologists in planning the meeting and overseeing the award selection. This annual event has expanded from an audience of about 80 in 1999 to over 250 in 2011. Attendees include fellows, medical students, researchers, and allied health professionals from the NIH, SAIC (LEIDOS), FDA, and distinguished universities.

The memorial serves as a living legacy to Dr. Salzman, who was a mentor to many young scientists and postdoctoral fellows in his lab at the NIH. The program gives an award for innovative and creative research in the field of virology to an outstanding postdoctoral fellow from NIH, FDA, or Leidos. The awardee's mentor is also honored and recognized at the ceremony.

As the Foundation for the NIH grew over the years, so too did its support for the Salzman Memorial. Through the efforts of past Presidents, Boards of Directors, and staff, additional funds were raised for the Salzman Award along with donations from scientists, friends and family. With the continuing and enthusiastic support from Maria Freire, Ph.D., President & Executive Director over the past eight years, along with her administrative staff, the Norman P. Salzman Memorial Award and Symposium has reached its 21st year.

- Lenore Salzman, Founder

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On behalf of the Foundation for the NIH and Lenore Salzman, we would like to thank the NIH Office of Intramural Research and the Virology Interest Group for their support and generosity in making this year's symposium a tremendous success.



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