

# HIV/AIDS RESEARCH: ITS HISTORY & FUTURE

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October 13 - October 16, 2016



Cold Spring Harbor Laboratory

Genentech Center for the History of Molecular Biology and Biotechnology  
with the CSHL Meetings & Courses Program



Program and posters presented at the 2016 meeting on

# HIV/AIDS RESEARCH: ITS HISTORY AND FUTURE

October 13—October 16, 2016

Co-organizers:

Robert C. Gallo, University of Maryland School of Medicine

John M. Coffin, Tufts University

Mila Pollock, Cold Spring Harbor Laboratory

Bruce D. Walker, The Ragon Institute of MGH, MIT and Harvard



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Contributions from the following companies and institutions provided core support for this meeting:



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*Front Cover:* Scrabble board highlighting current HIV-AIDS combination and single treatments including Highly Active Antiretroviral Therapeutics (HAART), Fusion Inhibitors (FUSIONI), Entry Inhibitors (ENTRYI), Protease Inhibitors (PI), Non-Nucleoside Reverse Transcriptase Inhibitors (NNRTIs), Nucleoside Reverse Transcriptase Inhibitors (NRTIs), Integrase Strand Transfer Inhibitor (INSTI) and Pre-Exposure Prophylaxis (PREP).

Image concept: David Stewart (CSHL) / Design & Photo: Meredith Cassuto (CSHL)

Thursday, October 13, 2016

**SESSION I THE STORY OF ANIMAL RETROVIRUSES**

Chairs: Julie Overbaugh, Fred Hutchinson Cancer Research Center

Steve Goff, HHMI Investigator, Columbia University

7:30 pm - Welcome: James D. Watson, Chancellor Emeritus, Cold Spring Harbor Laboratory

7:40 pm - Introduction: Mila Pollock & Robert Gallo

7:45 pm - Robin Weiss, *Retrovirus History, Early Searches for Human Retroviruses*

8:15 pm - John Coffin, *Origins of Molecular Retrovirology*

8:45 pm                      **COFFEE BREAK**

9:05 pm - Harold Varmus, *Animal Retroviruses & Cancer Research*

9:35 pm - Myron Essex, *From Feline Leukemia Virus to AIDS in Africa*

10:00 pm                    **RECEPTION**

Friday, October 14, 2016

**SESSION II THE PANDEMIC BEGINS: EARLY DISCOVERIES**

Chairs: Michael Gottlieb, UCLA Medical Center

Bruce Walker, The Ragon Institute of MGH, MIT and Harvard

9:00 am - Paul Volberding, *The First Patients*

9:30 am - James Curran, *Deciphering the Epidemiology of AIDS*

10:00 am - Mark Harrington, *The Importance of Activism to the US Response*

10:30 am                    **COFFEE BREAK**

11:00 am - Robert Gallo, *Discoveries of Human Retroviruses their Linkage to  
Disease as Causative Agents & Preparation for the Future*

11:30 am - Francoise Barre-Sinoussi, *Discovery of HIV*

12:00 am - Anthony Fauci, *35 Years of HIV/AIDS: Science and Policy*

12:30 pm                    **LUNCH**

Friday, October 14, 2016

**SESSION III ANTIRETROVIRAL THERAPY**

Chairs: Sandra Lehrman, Merck

John Mellors, University of Pittsburgh

2:00 pm - Marty St. Clair, *Discovery of AZT as the First Anti-HIV Drug*

2:30 pm - Samuel Broder, *The First Clinical Trials of Antiretroviral Drugs*

3:00 pm - Douglas Richman, *Antiviral Drug Resistance and Combination ART*

**3:30 pm                      COFFEE BREAK**

4:00 pm - Raymond Schinazi, *Discovery and Development of Novel NRTIs*

4:30 pm - Daria Hazuda, *Discovery and Development of Integrase Inhibitors*

5:00 pm - John Martin, *Making it Simpler: a Single Pill to Treat HIV*

**5:30 pm                      POSTER/RECEPTION**

**6:00 PM                      DINNER**

**SESSION IV HUMAN & PRIMATE RETROVIRUSES, ORIGIN OF HIV**

Chairs: Jeffrey Lifson, National Cancer Institute

Ruth Ruprecht, Texas Biomedical Research Institute

7:30 pm - Ronald Desrosiers, *The Origin of SIVmac: Non-human Primate Models for HIV*

8:00 pm - Martine Peeters, *On the Road to HIV: Primate Lentiviruses*

**8:30 pm                      COFFEE BREAK**

9:00 pm - Beatrice Hahn, *Apes to Humans: The Origin of HIV*

9:30 pm - Michael Worobey, *Spread of HIV in the New World*

Saturday, October 15, 2016

**SESSION V THE EXTRAORDINARY VIRUS: MOLECULAR BIOLOGY**

Chairs: Paul Bieniasz, HHMI Investigator, The Rockefeller University

Anna Marie Skalka, Fox Chase Cancer Center, Temple Health

8:30 am - Flossie Wong-Staal, *Discovery of Human Retroviral Transactivators*

9:00 am - Joseph Sodroski, *Primate Host-Specific Selection of Immunodeficiency  
Virus Gag and Env Proteins*

9:30 am - Michael Malim, *Discovery of APOBEC Restriction*

**10:00 am                    COFFEE BREAK**

10:30 am - Edward Berger, *Discovery of HIV Co-receptors*

11:00 am - Andrew Rice, *Mechanism of Tat Transactivation*

11:30 am - Michel Emerman, *Host-virus Co-evolution*

**12:00 pm                    LUNCH**

**SESSION VI IMMUNOLOGY AND PREVENTION**

Chairs: Harriet Robinson, GeoVax Incorporated

Dan Barouch, BIDMC/Ragon Institute of MGH, MIT and Harvard

1:00 pm - Sharon Hillier, *Development and Application of Pre-exposure Prophylaxis*

1:30 pm - Dennis Burton, *How Does HIV Evade the Antibody Response?*

2:00 pm - Bruce Walker, *Role of T Cells in Controlling HIV Infection*

2:30 pm - Barton Haynes, *Development of HIV Vaccine: Steps and Missteps*

**3:00 pm                    COFFEE BREAK**

Session VI Immunology and Prevention (continued)

3:20 pm - Emilio Emini, *Issues in HIV Vaccine Development: Will the Future be any Easier than the Past?*

3:50 pm - Robert Redfield, *The PEPFAR Program to Treat HIV in Africa*

4:20 pm - Salim Abdool-Karim, *Stopping the Spread of HIV in Developing Countries*

5:00 pm - Panel Discussion: **Prospects for an HIV Vaccine**

**Moderator:** Glenda Gray, South African Medical Research Center

Genoveffa Franchini (NCI)

Susan Zolla-Pazner (MSSM)

Lawrence Corey (Fred Hutchinson Cancer Research Center)

Peter Mugenyi (JCRC)

Dan Barouch (BIDMC/Ragon)

6:00 pm                COCKTAILS

7:00 pm                BANQUET

**Sunday, October 16, 2016**

**SESSION VII PATHOGENESIS AND PROSPECTS**

Chairs: Alan Perelson, Los Alamos National Laboratory, Santa Fe Institute

Ashley Haase, University of Minnesota

9:00 am - John Mellors, *MACS and Beyond: Epidemiology, Viremia and Pathogenesis*

9:30 am - David Ho, *Understanding of HIV Infection through Dynamics*

10:00 am - George Shaw, *Transmitted/Founder HIV Genomes: What They Teach Us*

10:30 am                COFFEE BREAK



### Session VII Patogenesis and Prospects (continued)

11:00 am - Robert Siliciano, *The Challenge of the HIV Reservoir*

11:30 am - Sharon Lewin, *Research to a Cure: A Possible Goal?*

12:00 am - David Baltimore, *Bringing it to an End (and where are we going?)*

12:30 pm                      LUNCH

### SESSION VIII PUBLIC EVENT / PANEL

Chairs: Anders Vahlne, Karolinska Institute

Warner Greene, Gladstone Institute of Virology & Immunology / USCF

2:00 pm                      Jon Cohen, *Responding to AIDS—A Journalist's View*

Staffan Hildebrand, *Face of AIDS Project*

Victoria Harden, *The Future of the History of AIDS*

3:00 pm                      Public Wrap Up and Discussion: *What Have We Learned?*

Organizers: Robert Gallo, John Coffin, Mila Pollock, and Bruce Walker

4:00 pm                      Departures

The talks and posters from this meeting will be available on the CSHL History of Science website: <http://library.cshl.edu/Meetings/History-of-Science/>



Cold Spring Harbor Laboratory

## POSTERS

(See handout for complete poster abstracts)

### 1. Assessing intra-patient hiv genetic diversity to identify genomic regions with appropriate phylogenetic signal for targeted ngs sequencing

Michael J Bale<sup>1</sup>, Jon Spindler<sup>1</sup>, Ann Wiegand<sup>1</sup>, Frank Maldarelli<sup>1</sup>, John W Mellors<sup>2</sup>, John M Coffin<sup>3</sup>, Wei Shao<sup>4</sup>, Mary F Kearney<sup>1</sup>

NCI, HIV dynamics and Replication Program, Frederick, MD, <sup>2</sup>University of Pittsburgh, , Pittsburgh, PA, <sup>3</sup>Tufts University, , Boston, MA, <sup>4</sup>Leidos Biomedical, Inc, , Frederick, MD

### 2. Development of the full length single chain gp120-cd4 (flsc), a novel vaccine for hiv prevention

Timothy Fouts<sup>1</sup>, Ilia Prado<sup>1</sup>, Kathryn Bobb<sup>1</sup>, Wenlei Zhang<sup>1</sup>, Jennifer Schwartz<sup>1</sup>, Terry Higgins<sup>1</sup>, Anthony Cristillo<sup>2</sup>, Ranajit Pal<sup>2</sup>, Ian Collins<sup>4</sup>, Greg Bleck<sup>4</sup>, Brian Woodrow<sup>4</sup>, Ronald Salerno<sup>5</sup>, Melanie Hartsough<sup>5</sup>, Robert Gallo<sup>6</sup>, Bruce Gilliam<sup>6</sup>, Robert Redfield<sup>6</sup>, George Lewis<sup>6</sup>, Anthony DeVico<sup>6</sup>

<sup>1</sup>Profectus BioSciences, , Baltimore, MD, <sup>2</sup>ABL, , Rockville, MD, <sup>3</sup>Bioqual, , Rockville, MD, <sup>4</sup>Catalent Pharma Solutions, , Madison, WI, <sup>5</sup>BCG, , Alexandria, VA, <sup>6</sup>IHV, , Baltimore, MD

### 3. Estimates of achieving hiv cure with anti-proliferative therapy

Daniel B Reeves<sup>1</sup>, Elizabeth R Duke<sup>1</sup>, Martin Prlic<sup>1</sup>, Florian Hladik<sup>1,2,3</sup>, Joshua T Schiffer<sup>1,3</sup>

<sup>1</sup>Fred Hutchinson Cancer Research Center, Vaccine and Infectious Disease Division, Seattle, WA, <sup>2</sup>University of Washington, Obstetrics and Gynecology, Seattle, WA, <sup>3</sup>University of Washington, Department of Medicine, Seattle, WA

### 4. Documenting the epidemic: ucsf archives experience building aids history collection

Polina Ilieva

University of California, San Francisco, , San Francisco, CA

### 5. Resources for researching the history of hiv/aids at the national institutes of health

Michele T Lyons, Barbara F Harkins

National Institutes of Health, Office of NIH History and Stetten Museum, Bethesda, MD

### 6. Cryoem structure and atomic model of the hiv-1 intasome

Dario Passos<sup>\*1</sup>, Min Li<sup>\*2</sup>, Renbin Yang<sup>2</sup>, Rodolfo Ghirlando<sup>2</sup>, Youngmin Jeon<sup>1</sup>, Mamuka Kvaratskhelia<sup>3</sup>, Robert Craigie<sup>2</sup>, Dmitry Lyumkis<sup>1</sup>

<sup>1</sup>The Salk Institute for Biological Studies, Laboratory of Genetics and Helmsley Center for Genomic Medicine, La Jolla, CA, <sup>2</sup>National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health, Laboratory of Molecular Biology, Bethesda, MD, <sup>3</sup>Ohio State University, Center for Retrovirus Research and College of Pharmacy, Columbus, OH

### 7. A small fraction of proviruses in expanded cell clones express unspliced hiv rna in vivo

A. T Musick<sup>1</sup>, J. Spindler<sup>1</sup>, M. Sobolewski<sup>2</sup>, M. J .Bale<sup>1</sup>, W. Shao<sup>3</sup>, A. Weigand<sup>1</sup>, S. Hughes<sup>1</sup>, J. Mellors<sup>2</sup>, J. M .Coffin<sup>4</sup>, F. Maldarelli<sup>1</sup>, M. F .Kearney<sup>1</sup>

<sup>1</sup>CCR, NCI-Frederick, HIV Dynamics and Replication Program, Frederick, MD, <sup>2</sup>University of Pittsburgh, Department of Medicine, Pittsburgh, PA, <sup>3</sup>Leidos Biomedical, Inc, Advanced Biomedical Computing Center, Frederick, MD, <sup>4</sup>Tufts University, Department of Molecular Biology and Microbiology, Boston, MA

## POSTERS

### **8. Targeted metabolomic profiling of plasma metabolites in hiv-infected kenyan and german patients on first-line antiretroviral therapy: an exploratory cohort study**

Frank N Ndakala<sup>1,2</sup>, Julius O Oyugi<sup>2,4</sup>, Margaret N Oluka<sup>2</sup>, Joshua Kimani<sup>2,4</sup>, Alexandra Jablonka<sup>5</sup>, Georg M Behrens<sup>5,6</sup>

<sup>1</sup>Ministry of Higher Education, Science and Technology, Department of Research Management and Development, Nairobi, Kenya, <sup>2</sup>University of Nairobi, Institute of Tropical and Infectious Diseases, Nairobi, Kenya, <sup>3</sup>University of Nairobi, Department of Pharmacology and Pharmacognosy, Nairobi, Kenya, <sup>4</sup>University of Manitoba, Department of Medical Microbiology, Winnipeg, Manitoba, Canada, <sup>5</sup>Hannover Medical School, Department of Clinical Immunology and Rheumatology, Hannover, Germany, <sup>6</sup>German Centre for Infection Research, Infectious Diseases, Hannover, Germany

### **9. Cd62l functions as an hiv adhesion receptor on cd4 t cells and the virus induces its shedding for release**

Joseph Kononchik<sup>1</sup>, Joanna Ireland<sup>1</sup>, Zhongcheng Zou<sup>1</sup>, Genevieve Holzapfel<sup>1</sup>, Ashley Chastain<sup>1</sup>, Nicole Stutzman<sup>1</sup>, James Arthos<sup>2</sup>, Tae-Wook Chun<sup>2</sup>, Susan Moir<sup>2</sup>, Peter Sun<sup>1</sup>

<sup>1</sup>NIAID/NIH, Structural Immunology Section, Rockville, MD, <sup>2</sup>NIAID/NIH, Lab of Immunoregulation, Bethesda, MD

### **10. Evidence for retroviral activity in dogs and wild canids**

Abigail S. Jarosz<sup>1</sup>, Julia H Wildschutte<sup>1,2</sup>, Malika L Day<sup>1</sup>, Amanda L Pendelton<sup>2</sup>, Thomas Marques-Bonet<sup>3</sup>, Adam R Boyko<sup>4</sup>, Jeffrey M Kidd<sup>2,5</sup>

<sup>1</sup>Bowling Green State University, Dept. of Biological Sciences, Bowling Green, OH, <sup>2</sup>University of Michigan Medical School, Dept. of Human Genetics, Ann Arbor, MI, <sup>3</sup>CSIC-University Pompeu Fabra & ICREA, Institut de Biologia Evolutiva, Barcelona, Spain, <sup>4</sup>Cornell University, Dept. of Biomedical Sciences, College of Veterinary Medicine, Ithaca, NY, <sup>5</sup>University of Michigan Medical School, Dept. of Computational Medicine & Bioinformatics, Ann Arbor, MI

### **11. The Contribution of Cold Spring Harbor Laboratory Scientists to HIV/AIDS Research**

Matthew Covey, Cold Spring Harbor Laboratory, Cold Spring Harbor, NY

### **12. Documented In Time: A look at HIV/AIDS from the desks of James D. Watson & Sydney Brenner**

Stephanie Satalino, Cold Spring Harbor Laboratory, Cold Spring Harbor, NY

### **13. CSHL and the HIV field through 35 Years: Science, Research, and Education**

Clare Clark, Cold Spring Harbor Laboratory, Cold Spring Harbor, NY

### **14. The HIV/AIDS Pandemic and its larger place in history**

Monica H Green, Arizona State University

## **Cold Spring Harbor Laboratory**

Founded in 1890, Cold Spring Harbor Laboratory is a preeminent international research institution, achieving breakthroughs in molecular biology and genetics and enhancing scientific knowledge worldwide. It has shaped contemporary biomedical research and education with programs in cancer, neuroscience, plant biology and quantitative biology. Home to eight Nobel Prize winners, the private, not-for-profit Laboratory employs 1,100 people including 600 scientists, students and technicians.

### **CSHL Archives**

The CSHL Archives strives to develop novel ways of presenting and preserving the records of the discoveries in biomedical sciences as a topic of historical interest. We try to bring together important figures in the history of the molecular biology and genetics fields by presenting biographical information, collecting the original materials that these individuals generated over their careers and collecting oral history interviews with them. As a result, we will be able to merge discussions of the past and the future, thereby framing cutting-edge research in terms of detailed knowledge of the past. We are focusing on creating a “living history” of important aspects of molecular biology and genetics research that blend the traditional discussions of current scientific research with lectures on the history of science; scholarly works; using our collections in public exhibitions; and scientific meetings in which the pioneers of the field interact with the current scientific community.

### **Genentech Center for the History of Molecular Biology and Biotechnology**

The Genentech Center, a part of the CSHL Archives, focuses on documenting the basic scientific research that was the foundation for the development of molecular biology and biotechnology. This research, carried out initially in academic laboratories, led to the development of recombinant DNA techniques, which in turn stimulated entrepreneurial scientists to create biotechnology companies. The mission of the Genentech Center is to identify, acquire, preserve, digitize, and promote the original correspondence, papers, and research material of the individuals and institutions that were crucial to the development of molecular biology and biotechnology worldwide. Our annual History of Science meetings, are each made up of presentations given by the pioneers of a specific scientific field along with those who are working in the field today. These key figures come together with historians, students and archivists to discuss the history of the field.

### **Meetings & Courses**

Meetings and conferences at Cold Spring Harbor Laboratory (CSHL) bring together scientists from all over the world to present and evaluate new data and ideas in rapidly moving areas of biological research. CSHL short courses and workshops complement our conferences by providing immersive training opportunities in a diversity of topics across the spectrum of biological sciences. The Meetings & Courses Program hosts more than 12,000 scientists each year on its campuses in Long Island and in Suzhou, China.

## NOTES





