



Cold Spring Harbor Laboratory

2014 BANBURY CENTER

BANBURY CENTER

Cold Spring Harbor Laboratory's Banbury Center holds meetings for between 24 and 36 invited participants on topics in biology and biomedical sciences as well as science and healthcare policy. More than 10,000 scientists have participated in the over 600 meetings held since the Center opened in 1978. As of 2013, 69 Nobel laureates have taken part in Banbury Center meetings.

The Center is on a 55-acre estate on the north shore of Long Island, approximately 40 miles east of downtown Manhattan. The estate was donated to the Laboratory in 1976 by Charles Sammis Robertson. The estate's seven-car garage is now the Conference Room, and the family house provides housing for participants. Sammis Hall and Meier House provide additional housing so that everyone attending a Banbury Center meeting can stay on the estate.

Banbury Center meetings are unique among the hundreds of meetings held each year in the United States. The small number of participants ensures that discussions have a major role in each meeting, and the relative isolation of the estate allows participants to focus on the task at hand. Furthermore, because the expenses of participants are covered, selection of scientists is guided by the needs of the science and not dictated by whether those invited can find the funds to attend.

Some of the important Banbury Center meetings include

Patenting of Life Forms. Held just one year after the famous decision in the Diamond vs. Chakrabarty case, patent lawyers and scientists met to discuss the implications of approving patenting of genetically modified bacteria. Nobel laureate Sydney Brenner was a participant.

The Ethos of Scientific Research. Scientific fraud first became a major issue in the late 1980s. This meeting included congressional investigators as well as scientists and ethicists. No fewer than six then or future Nobel laureates attended the meeting.

DNA Technology and Forensic Science. The forensic world began using DNA fingerprinting but without a good understanding of its limitations. The meeting included scientists, prosecutors, defense attorneys, and judges and led to the founding of the Innocence Project by Peter Neufeld and Barry Scheck.

Support for the Center has come from many sources including companies contributing to the Cold Spring Harbor Laboratory Corporate Sponsor Program. Specific meetings have been funded by Pfizer Inc., GlaxoSmithKline, Janssen Pharmaceuticals Inc., Illumina Inc., Sanofi US, and others. The Federal Government has supported meetings through the National Institutes of Health, the National Science Foundation, and the Departments of Energy, Defense, Justice, Agriculture, and Homeland Security. Many foundations have used the Center, including the Amyotrophic Lateral Sclerosis Association, the FRAXA Research Foundation, the Ovarian Cancer Research Fund, and the Swartz Foundation.

Cover: Robertson House in the winter

Mailing address: Banbury Center, Cold Spring Harbor Laboratory,
P.O. Box 534, Cold Spring Harbor, New York 11724

Street address: Banbury Center, Banbury Lane, Lloyd Harbor,
New York 11743

Telephone: (516) 367-8398

Fax: (516) 367-5106

E-mail: banbury@cshl.edu

Internet: <http://www.cshl.edu/banbury>

BANBURY CENTER

Cold Spring Harbor Laboratory's Banbury Center holds meetings for between 24 and 36 invited participants on topics in biology and biomedical sciences as well as science and healthcare policy. More than 10,000 scientists have participated in the over 600 meetings held since the Center opened in 1978. As of 2013, 69 Nobel laureates have taken part in Banbury Center meetings.

The Center is on a 55-acre estate on the north shore of Long Island, approximately 40 miles east of downtown Manhattan. The estate was donated to the Laboratory in 1976 by Charles Sammis Robertson. The estate's seven-car garage is now the Conference Room, and the family house provides housing for participants. Sammis Hall and Meier House provide additional housing so that everyone attending a Banbury Center meeting can stay on the estate.

Banbury Center meetings are unique among the hundreds of meetings held each year in the United States. The small number of participants ensures that discussions have a major role in each meeting, and the relative isolation of the estate allows participants to focus on the task at hand. Furthermore, because the expenses of participants are covered, selection of scientists is guided by the needs of the science and not dictated by whether those invited can find the funds to attend.

Some of the important Banbury Center meetings include

Patenting of Life Forms. Held just one year after the famous decision in the Diamond vs. Chakrabarty case, patent lawyers and scientists met to discuss the implications of approving patenting of genetically modified bacteria. Nobel laureate Sydney Brenner was a participant.

The Ethos of Scientific Research. Scientific fraud first became a major issue in the late 1980s. This meeting included congressional investigators as well as scientists and ethicists. No fewer than six then or future Nobel laureates attended the meeting.

DNA Technology and Forensic Science. The forensic world began using DNA fingerprinting but without a good understanding of its limitations. The meeting included scientists, prosecutors, defense attorneys, and judges and led to the founding of the Innocence Project by Peter Neufeld and Barry Scheck.

Support for the Center has come from many sources including companies contributing to the Cold Spring Harbor Laboratory Corporate Sponsor Program. Specific meetings have been funded by Pfizer Inc., GlaxoSmithKline, Janssen Pharmaceuticals Inc., Illumina Inc., Sanofi US, and others. The Federal Government has supported meetings through the National Institutes of Health, the National Science Foundation, and the Departments of Energy, Defense, Justice, Agriculture, and Homeland Security. Many foundations have used the Center, including the Amyotrophic Lateral Sclerosis Association, the FRAXA Research Foundation, the Ovarian Cancer Research Fund, and the Swartz Foundation.

Cover: Robertson House in the winter

Mailing address: Banbury Center, Cold Spring Harbor Laboratory,
P.O. Box 534, Cold Spring Harbor, New York 11724

Street address: Banbury Center, Banbury Lane, Lloyd Harbor,
New York 11743

Telephone: (516) 367-8398

Fax: (516) 367-5106

E-mail: banbury@cshl.edu

Internet: <http://www.cshl.edu/banbury>

BANBURY CENTER

EXECUTIVE DIRECTOR'S REPORT

We were relieved after the overwhelming program of 2013 that 2014 was a little less hectic, but we were nevertheless still busy dealing with 15 events and 500 participants.

Participants in the meetings were drawn from 37 states, and as usual, four states—California, Maryland, Massachusetts, and New York—accounted for 60% of participants. Banbury meetings continue to have strong international participation, with 19% of participants coming from 21 countries. Thirty-five percent of participants were female, an unusually high percentage. The number of female participants has doubled over the years since 1988.

Education

The majority of the Banbury Center program is devoted to meetings dealing with research topics in biomedical research—meetings that might be considered as high-level continuing education for scientists. But each year, the Center also provides a venue for the education of young scientists who are in the early stages of their careers.

One such meeting was the Workshop on Leadership in BioScience, taught by Carl M. Cohen (Science Management Associates) and Danielle Kennedy (Worklab Consulting LLC). David Stewart was awarded a 4-year grant from American Express to support the program. The course is attended primarily by senior postdocs who are going to run their own laboratory and by young faculty. They receive training in, for example, the characteristics of a good manager, how to interact with people, and how to control the dynamics of meetings.

The Boehringer Ingelheim Fonds holds two retreats each year for its fellows, one in Europe and one in the United States. Rather like the Workshop on Leadership in BioScience course, the Boehringer fellows receive intense instruction in writing, making presentations, and the skills



Cocktails on Robertson House patio

needed to carry out research. The Foundation first came to Banbury in 2005 and in alternate years until 2011, and now comes annually.

Finally, there was the NIMH Brain Camp. Tom Insel, director of the National Institute of Mental Health, has long been passionate about the need to base psychiatry and the treatment of psychiatric disorders on the findings of neuroscience. To that end, beginning in 2009, Insel has brought 24 of his brightest clinical psychiatric fellows to Banbury to expose them to the highest-quality research and to persuade them that they should consider research careers. Speakers have included Eric Nestler, Karl Deisseroth, Eric Kandel, Steven Paul, and Huda Zoghbi.



Robertson House

Banbury Meetings on Health

A second meeting demonstrating the power of personal experience was *Rhabdomyosarcoma: A Critical Review of Research and What It Means for Developing Therapies*. Rhabdomyosarcoma is the most common soft tissue sarcoma of childhood, but despite four decades of advances in therapy, the outcome for metastatic or relapsed disease is particularly poor. This meeting, funded by families determined that others should not suffer, examined all aspects of rhabdomyosarcoma biology with three questions in mind: What are the key areas for future research? What can be done to ensure funding for research? How can promising laboratory findings be turned to developing drugs for clinical trials?

The meeting with the rather prosaic title *Interpreting Personal Genomes: How Are We to Set Appropriate Statistical Standards for Identifying Pathogenic Genetic Variants?* dealt with a critical issue in personal medicine: How can we determine whether a genetic variant may be responsible for an observed disease phenotype? Current tools for identifying variants as potentially disease-causing are far from optimal, raising the risk of false clinical diagnoses. Participants in this meeting examined current methods and discussed how standards could be set for ensuring that appropriate analyses are performed.

Compared with other disorders, research on and care of the mentally ill is notoriously underfunded relative to the impact the illnesses have on society. Other disorders, such as AIDS, have strong advocates, but the stigma associated with mental illness seems to inhibit advocacy. Not so for Glenn Close, whose sister and nephew are afflicted with bipolar disorder. Close's Bring Change 2 Mind Foundation is dedicated to reducing stigma and has embarked on developing a "college toolbox" to eliminate stigma that can be implemented in a 4-year university course. This meeting brought together individuals whose knowledge and expertise can help plan a pilot project. It was a fascinating meeting in which Close played a very active role.

Another meeting dealing with mental health was *Lewy Body Dementia: Current Status, Future Directions*.



Sammis, Spring 2014



Reception at Robertson House



Coffee break

This is the second most common cause of cognitive impairment after Alzheimer's disease. Although a great deal is known about the molecular processes of Alzheimer's, much less is known about Lewy body dementia (LBD) despite the fact that it makes up 30% of all dementia cases. Participants in the meeting critically reviewed the current state of knowledge of the genetics of LBD and the usefulness or otherwise of current clinical, imaging, and biological markers. There was much discussion of how global research efforts on LBD could be delivered in conjunction with the goals of NINDS, NAPA, the G8 Summit Objectives, and related initiatives.

Finally, *The Genetics of Pain and Pain Inhibition: Where to from Here?* considered what is the most prevalent human health problem, with a lifetime prevalence of almost one in two. Association studies and exome sequencing studies of chronic pain disorders are now being published, and rare genetic variants responsible for pain disorders have been identified. Participants reviewed the relative merits of the association studies and single-gene approaches for the study of chronic pain, along with various current therapies in the field.

Other Notable Meetings

Epigenetic regulation plays a pivotal role in plant development and offers a largely untapped resource for crop improvement strategies aimed at enhancing productivity. The *Epigenetics and Agriculture* meeting focused on epigenetic mechanisms of gene regulation and their roles in heterosis, epigenetic programming of plant reproduction, transgenerational inheritance, and adaptation to abiotic and biotic stresses. Participants also explored the needs of agricultural biotechnology, and how epigenetic research can help efforts to manipulate gene expression in crops toward increasing sustainable food and feed production, to meet the needs of a growing population. The meeting brought leading researchers in plant epigenetics together with scientists representing agricultural biotechnology companies.

One of the more unusual meetings was *Interdisciplinary Symposium on Creativity*, organized by Suzanne Nalbantian, C.W. Post College, Westbury, New York. This was the fourth, and the third held at Banbury, in a series of meetings bringing together neuroscientists and scholars from the humanities. The neuroscientists described the functioning of the brain in creative acts of scientific discovery or aesthetic production. The comparatists described instances of creativity in the composition of major literary works, of musical compositions, or of works of visual art.

Banbury Center History

As Banbury approaches the 40th anniversary of its founding, we are trying to produce as true a record as possible of the activities of the Banbury Center since the first meeting in 1978. The current database goes back only to 1987 when I arrived, so we have made a second database covering the years 1978–1986 using the information recorded in the annual reports. However, as these record only those who gave talks at Banbury and not all attendees, we are going back through the files using other information such as housing lists. The historical database currently lists 7000 participants, and the contemporary database lists more than 11,000.

A second project concerns the black-and-white photographs of Banbury meetings taken from 1978 to 2003 when digital photography began. These images have been inaccessible because they exist only as negatives, and there is no catalog of them and no way of knowing whether a particular scientist is in an image. Now the negatives have been scanned and entered into a database. The difficult job remains—to identify every individual in more than 20,000 negatives!

The default position regarding publication of reports of Banbury Center meetings is that we do not do so. This is in part so as not to deter people from attending by making submission of a manuscript a prerequisite for participating in a Banbury meeting; we also want to encourage presentation of unpublished material. However, if the participants choose to develop a publication, they are strongly encouraged to do so. With the help of Richard Sever, we have created a category called “Banbury White Paper” in the CSHL Press’s *Perspectives* series edited by Richard. Publications in 2014 included:

Erlich Y, et al. 2014. Redefining genomic privacy: Trust and empowerment. *PLOS Biology* **12**: 1–5.

Hettmer S, et al. 2014. Rhabdomyosarcoma: Current challenges and their implications for developing therapies. *Cold Spring Harb Perspect Med* **4**: a025650.

Lee FS, et al. 2014. Adolescent mental health—Opportunity and obligation: Emerging neuroscience offers hope for treatments. *Science* **346**: 547–549.

Acknowledgments

For more than 6 years, Hakon Heimer has been helping develop meetings in neuroscience and mental health. Hakon’s background is in neurobiology, but for many years, he has been a writer and advocate for mental health research. He established the Schizophrenia Research Forum, the top online source for information for both the public and professionals. Hakon is a member of



the National Institute of Mental Health Council and of the National Institutes of Health Council of Councils. Hakon's help has been invaluable in thinking of topics for meetings and in finding funding for them. The current funding situation is so difficult that for every meeting we hold, we have to be working on at least six others concurrently—an impossible task for one person.

And, of course, Banbury could not function at the level it does without the hard work and help of others: Janice Tozzo and Pat Iannotti in the Banbury office and Basia Polakowski at Robertson House. Culinary Services, Facilities, and the Meetings Office play key roles in the operation of the Center, and Jose Covera, Joe McCoy, and Fredy Vasquez keep the Banbury estate looking beautiful. The meetings could not take place without the enthusiasm and hard work of the organizers, the contributions made by all participants, the generosity of the Laboratory's Corporate Sponsors and the other donors who fund our meetings, and the Laboratory's scientists who continue to support the Center.

Jan A. Witkowski
Executive Director

BANBURY CENTER MEETINGS

<i>Date</i>	<i>Title</i>	<i>Organizer(s)</i>
February 23–26	Banbury Summit III: Genetics Training in the Genomic Era	Bruce Korf, ACMG Work Group
March 28–April 2	Communicating Science	Claudia Walther, Sandra Schedler
April 6–9	Connections and Communications in the Brain	Bijan Pesaran, Nicolas Brunel
April 16–18	The College Toolbox Project: Eliminating Stigma	Bernice Pescosolido
April 21–23	Defeating Ovarian Cancer	Ronald Buckanovich, Gordon Mills, David Tuveson
May 10–12	NIMH Brain Camp VI	Joyce Chung, Thomas Insel
May 13–16	Rhabdomyosarcoma: A Critical Review of Research and What It Means for Developing Therapies	Charles Keller, Amy Wagers
June 22–25	The Genetics of Pain and Pain Inhibition: Where to from Here?	Jeffrey Mogil, Clifford Woolf
September 3–5	High-Performance Computing in Undergraduate Biology Education: Scanning the Landscape	David Micklos, Dan Stanzione
September 7–10	The Immune System and Cancer	Glenn Dranoff, Douglas Fearon
September 15–18	Interpreting Personal Genomes: How Are We to Set Appropriate Statistical Standards for Identifying Pathogenic Genetic Variants?	David Goldstein, Daniel MacArthur
October 21–24	Interdisciplinary Symposium on Creativity	Suzanne Nalbantian
October 26–29	ROS in Biology and Cancer	Arne Holmgren, Navdeep Chandel, Nicholas Tonks, David Tuveson
November 9–12	Epigenetics and Agriculture	Brian Hauge, Rob Martienssen
November 16–19	Lewy Body Dementia: Current Status, Future Directions	James Galvin, Ian McKeith

BANBURY CENTER MEETINGS

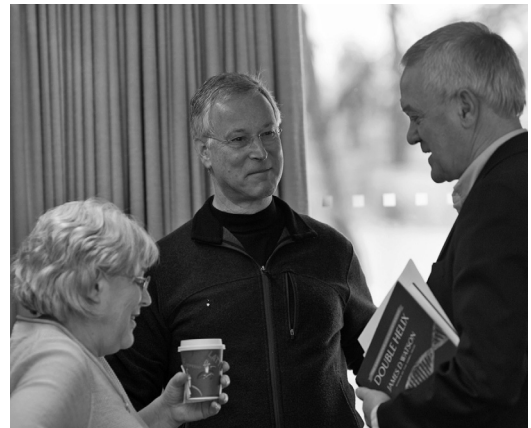
Banbury Summit III: Genetics Training in the Genomic Era

February 23–26

FUNDED BY American College of Medical Genetics

ARRANGED BY B. Korf, University of Alabama, Birmingham and the ACMG Work Group

The field of medical genetics is in a rapid state of flux as genomic approaches revolutionize the diagnosis of both rare and common genetic conditions, and insights into pathogenesis open possibilities for treatment of an increasing number of disorders. These changes not only require new approaches to training medical geneticists, but also raise questions about the scope of practice of medical geneticists versus other medical specialists, as genomic tests become increasingly available and accessible. These issues may warrant changes in the system of training of medical geneticists. This conference brought together major stakeholders in the medical genetics community to review current approaches to training and consider development of new approaches.



G. Herman, B. Korf, J. Witkowski

Introductory Remarks: J.A. Witkowski, Banbury Center, Cold Spring Harbor Laboratory

Welcome and Overview: B. Korf, University of Alabama, Birmingham



SESSION 1: Medical Genetics Education and Training

Current Status of Clinical Genetics Training and Board Certification

ABMG	M. Blitzer, University of Maryland School of Medicine, Baltimore
ACMG	B. Korf, University of Alabama, Birmingham
RRC	R. Sutton, Baylor College of Medicine, Houston, Texas
AMGF	M. Watson, American College of Medical Genetics, Bethesda, Maryland
APHMG	L. Demmer, Carolinas Medical Center, Charlotte, North Carolina

Current Status of Laboratory Genetics Training and Board Certification

ABMG	M. Blitzer, University of Maryland School of Medicine, Baltimore
Cytogenetics	K. Rao, University of North Carolina, Chapel Hill
	J. Gastier-Foster, Nationwide Children's Hospital, Columbus, Ohio
Molecular Genetics	J. Feldman, Wayne State University School of Medicine, Detroit, Michigan
	J. Gastier-Foster, Nationwide Children's Hospital, Columbus, Ohio
Biochemical Genetics	M. Blitzer, University of Maryland School of Medicine, Baltimore
ACMG	M. Watson, American College of Medical Genetics, Bethesda, Maryland
APHMG	L. Demmer, Carolinas Medical Center, Charlotte, North Carolina
ASHG	C. Morton, Brigham & Women's Hospital, Boston, Massachusetts

SESSION 2: New Opportunities and Challenges in a Genomics World

Integration of Genetics into Medical Specialties

Moderator: L. Demmer, Carolinas Medical Center, Charlotte, North Carolina
 Cancer Genetics: W. Chung, Columbia University, New York
 Cardiovascular Genetics: A. Roberts, Boston Children's Hospital, Boston, Massachusetts
 Neurogenetics: B. Korf, University of Alabama, Birmingham

Genomics and Genome Sequencing

Introduction: J. Feldman, Wayne State University School of Medicine, Detroit, Michigan
 Genetic Counseling for Genome Sequencing: Genetic Counselors
 Training Medical Geneticists for Genome Sequencing: R. Sutton, Baylor College of Medicine, Houston, Texas



J. Hoskovec, A. Matthews, S. Hahn, R. Bennett

Should There be a Medical Genomics Training Pathway?:
J. Feldman, Wayne State University School of Medicine,
Detroit, Michigan
Discussion

Training in Therapeutics and Clinical Trials

Moderator: B. Korf, University of Alabama, Birmingham
Introduction: B. Korf, University of Alabama, Birmingham
Biochemical Genetics: G. Herman, Nationwide Children's
Hospital Research Institute, Columbus, Ohio
Small-Molecule and Other Treatments for Genetic Disorders,
e.g., Rasopathies: A. Roberts, Boston Children's Hospital,
Boston, Massachusetts
Discussion

Future of Laboratory Training

Moderators: J. Gastier-Foster, Nationwide Children's Hospital,
Columbus, Ohio, and M. Blitzner, University of Maryland,
Baltimore

Future of Biochemical Genetics Training: R. Sutton, Baylor
College of Medicine, Houston, Texas

Training in Laboratory Genomics: K. Rao, University of
North Carolina, Chapel Hill

Discussion

Review of Meeting Statement

Continued discussion and action items.

Communicating Science

March 28–April 2

FUNDED BY **Boehringer Ingelheim Fonds Foundation for Basic Research in Medicine**

ARRANGED BY **C. Walther**, **Boehringer Ingelheim Fonds**, Mainz, Germany
 S. Schedler, **Boehringer Ingelheim Fonds**, Mainz, Germany

The **Boehringer Ingelheim Fonds** has an international program of support for Ph.D. fellowships, and it first brought its fellows to the **Banbury Center** for their annual North American retreat in 2005. It has been a great pleasure to have them return, and their 2014 stay at Banbury was the seventh occasion that they have been here. At Banbury, the fellows receive intensive instruction in matters such as giving presentations and writing papers—topics usually learned by default (and often poorly) during graduate research.

Introductory Remarks: J.A. Witkowski, Banbury Center, Cold Spring Harbor Laboratory

Opening Remarks and All About BIF (Part 1): C. Walther, **Boehringer Ingelheim Foundation**, Mainz, Germany

K. Achenbach, **Boehringer Ingelheim Foundation**, Mainz, Germany: Communication: Why and how?

N. LeBrasseur, **DNA Medical Communications**, New York: Writing techniques and how to structure papers; Writing assignment 1.

B. Tansey, **Vanderbilt University**, Nashville, Tennessee: Preparing and delivering a scientific talk; Group A: 4-min Powerpoint presentations, videotaped with replay and feedback.

N. LeBrasseur, **DNA Medical Communications**, New York: Discussion of writing assignment 1; Writing assignment 2.

B. Tansey, **Vanderbilt University**, Nashville, Tennessee
Group B: 4-min Powerpoint presentations, videotaped with replay and feedback.

Group A: Time for preparing 3-min presentations.

Group B: 4-min presentations, Group A: 3-min preparation.



Group A: 3-min Powerpoint presentations, videotaped with replay and feedback.

Group B: Time for preparing 3-min presentations.

N. LeBrasseur, DNA Medical Communications, New York: Return and discussion of writing assignment 2.

B. Tansey, Vanderbilt University, Nashville, Tennessee: Group B: 3-min PowerPoint presentations, videotaped with replay and feedback.

S. Pfeiffer, Lazard Frères & Co. LLC, New York: Career talk.

K. Ris-Vicari, Katie Ris-Vicari Graphic Design, Bethpage, New York, and M. Hansen, Nature Publishing Group, New York: How to design figures.

C. Walther, Boehringer Ingelheim Foundation, Mainz, Germany: All about BIF: Part 2 and feedback.

Guided Walking Tour on CSHL Campus

Connections and Communications in the Brain

April 6–9

FUNDED BY The Swartz Foundation, Setauket, New York

ARRANGED BY B. Pesaran, New York University, New York
 N. Brunel, University of Chicago, Illinois

Over many decades, neuroscience has been deeply influenced by evidence that specific behavioral processes are localized to particular brain regions. Anatomical studies have revealed how the brain is organized into different regions. Functional studies have shown how activity in different brain regions is specific for different behavioral processes. Focal damage to the brain has been shown to result in remarkably precise behavioral deficits. However, it is also clear that brain areas interact to guide behavior by communicating with each other, and they do so over neuronal projection systems formed by large populations of neurons that are not localized to specific brain regions. To understand how different areas cooperate to engage in a particular behavior, we must understand both the structure of the connectivity between these areas and the rules that govern the communication between them. The goal of this workshop was to encourage researchers using experimental and theoretical approaches to bring new data, tools, concepts, and ideas to bear on understanding the mechanisms and functional significance of communication in the brain.

Welcoming Remarks: J.A. Witkowski, Banbury Center, Cold Spring Harbor Laboratory

Introduction: N. Brunel, University of Chicago, Illinois
 B. Pesaran, New York University, New York



SESSION 1

- H. Kennedy, INSERM, Bron, France: What inconsistent data fail to tell you about cortical networks.
- A. Burkhalter, Washington University School of Medicine, St. Louis, Missouri: Neuronal network of the mouse visual cortex.
- H. Monyer, University of Heidelberg, Germany: GABAergic cells in the hippocampal–entorhinal formation and their role in spatial coding and memory.
- G. Buzsaki, New York University, New York: Communication by spikes in the hippocampal–entorhinal system.

SESSION 2

- X.-J. Wang, New York University, New York: Building a large-scale model of the primate cortex: Structure and dynamics.
- D. Bassett, University of Pennsylvania, Philadelphia: Probing human brain network dynamics during learning.
- O. Jensen, Radboud University, Nijmegen, The Netherlands: Temporal coding organized by coupled α and γ oscillations prioritize visual processing.
- S. Bressler, Florida Atlantic University, Boca Raton, Florida: Beta synchrony and top-down feedforward processing in visual expectation.

General Discussion**SESSION 3**

- M. Siegel, University of Tuebingen, Germany: Spectral fingerprints of large-scale neuronal interactions in the human brain.
- P. Fries, Ernst Strüngmann Institute for Neuroscience, Frankfurt, Germany: Brain-wide and cell-type-specific synchronization at the service of attention.

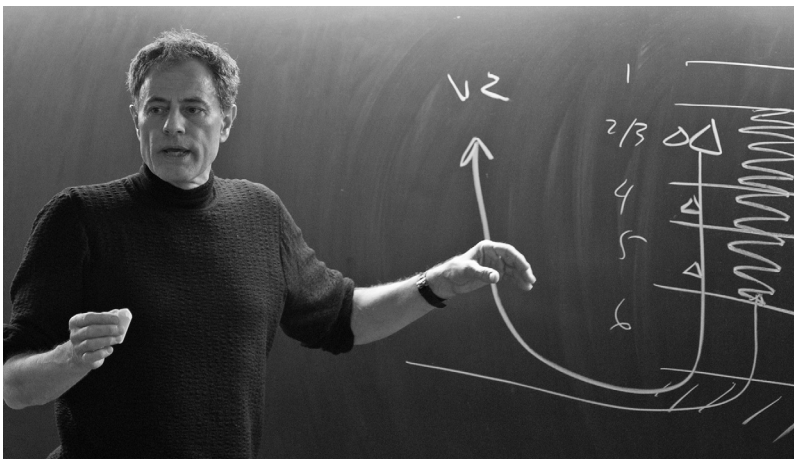
- J. Maunsell, Harvard University, Boston, Massachusetts: Cerebral cortex as a look-up table.
- C. Gray, Montana State University, Bozeman: Distributed cortical processing during visual working memory.

SESSION 4

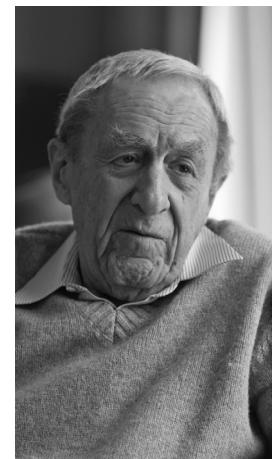
- N. Kopell, Boston University, Massachusetts: Cortical rhythms facilitate bottom-up and top-down processing.
- T. Akam, Centro Champalimaud, Lisboa, Portugal: Neural codes supporting oscillatory control of effective connectivity among brain regions.
- D. Battaglia, Institute for System Neuroscience, Marseille, France: Collective dynamics of multiscale circuits shape functional interactions.
- T. Buschman, Princeton University, New Jersey: Neural dynamics of cognitive flexibility.
- S. Fusi, Columbia University, New York: High dimensional neural representations in prefrontal cortex.

General Discussion**SESSION 5**

- B. Pesaran, New York University, New York: A role for coherent neural activity in coordination and decision making.
- T. Akam, Centro Champalimaud, Lisboa, Portugal: Neural codes supporting oscillatory control of effective connectivity among brain regions.
- A. Compte, IDIBAPS, Barcelona, Spain: Stimulus fluctuations and top-down feedback can account for the dynamics of choice probability in MT.

General Discussion**Closing Remarks**

A. Burkhalter



H. Cohen

The College Toolbox Project: Eliminating Stigma

April 16–18

FUNDED BY **Bring Change 2 Mind, Indiana University Foundation, The Margaret Clark Morgan Foundation and individual participants**

ARRANGED BY **B. Pescosolido, Indiana University, Bloomington, Indiana**

Since the mid-1990s, there has been a resurgence of research in the United States on the stigma attached to mental illness. That research has provided clear findings for efforts to reduce prejudice and discrimination. “Contact”—whether face-to-face or video—has been shown to be the most effective means of reducing stigma. Older individuals tend to harbor more out-of-date notions, while younger individuals have become more open to discussing these issues.

As a result, to eliminate stigma, Bring Change 2 Mind (BC2M) has decided to embark on the development of a “college toolbox” that can be designed and implemented as a 4-year project that will be piloted at Indiana University and disseminated through a national effort.

This meeting brought together individuals whose knowledge and expertise can help plan a pilot project. Participants included the best minds in research and intervention on stigma, as well as administrators, student groups, and the community. By the end of the meeting, it was expected that the group would have developed a clear outline of what the next steps should be and a timeline for their implementation.



B. Pescosolido

Welcoming Remarks: J.A. Witkowski, Banbury Center, Cold Spring Harbor Laboratory, **B. Pescosolido**, Indiana University, Bloomington, and G. Close, Bring Change 2 Mind, San Francisco, California



SESSION 1: BC2M's Vision

G. Close and P. Harrington, Bring Change 2 Mind, San Francisco, California: What do we know about mental illness and/or stigma among college students?

Group Discussion

C. Boyer, J. Lee, and B. Pescosolido, Indiana University, Bloomington

SESSION 2: The Foundations of the College Toolbox Program

B. Pescosolido, Indiana University, and G. Close and P. Harrington, Bring Change 2 Mind, San Francisco, California

SESSION 3: Basic Study Goals and Design

J. Martin, Y.Y. Ahn, B. Pescosolido, and E. Wright, Indiana University

SESSION 4: What Do We Know About Stigma Interventions?

B. Angell, Rutgers University, New Brunswick, New Jersey
S. Evans-Lacko, University of London, United Kingdom

N. Bonfine, Northeast Ohio Medical University, Rootstown, Ohio

H. Heimer, Schizophrenia Research Forum, Providence, Rhode Island

J. Macphee, The Jed Foundation, New York

R. Kellar, The Margaret Clark Morgan Foundation, Hudson, Ohio

S. Barnett, Indiana University, Bloomington

Group Discussion

SESSION 5: By Students, For Students

L. Fasone, M. Oppenheim, R. Green, R. Martinez, and A. Parrill, Indiana University, Bloomington

Group Discussion

SESSION 6: Next Steps, Action Steps

B. Pescosolido, Indiana University, Bloomington, Indiana: Developing partnerships, getting permissions, setting program rollout.



R. Green, H. Heimer, G. Close, R. Martinez, Y.Y. Ahn

Defeating Ovarian Cancer

April 21–23

FUNDED BY **Jonathan Gray; Cold Spring Harbor Laboratory Office of Development**

ARRANGED BY **R. Buckanovich, University of Michigan, Ann Arbor**
G. Mills, MD Anderson Cancer Center, University of Texas, Houston
D. Tuveson, Cold Spring Harbor Laboratory

This was the first Cold Spring Harbor Laboratory meeting on ovarian cancer. The organizers thought that the time was right for a critical review of current research that could illuminate new avenues for basic and translational research. Among the topics discussed were the molecular pathology of human ovarian cancer, models of ovarian cancer, and the best current and investigational approaches to patient management: cytotoxic, targeted, epigenetic, immunological, metabolic, and stem-cell-directed therapies.

Welcoming Remarks: J.A. Witkowski, Banbury Center, Cold Spring Harbor Laboratory



R. Buckanovich, J. Carstens

Introduction: D. Tuveson, Cold Spring Harbor Laboratory



SESSION 1: Models: Cell Lines PDXs and Gemms

- D. Dinulescu, Brigham and Women's Hospital, Boston, Massachusetts: Can animal models of disease improve early detection of tumors and precursor lesions?
- T. Ince, University of Miami Miller School of Medicine, Florida: Novel ovarian cell culture systems.
- K. Cho, University of Michigan Medical School, Ann Arbor: Mouse models in the context of the dualistic pathway of ovarian cancer pathogenesis.

SESSION 2: TME

- P. Sabbatini, Memorial Sloan-Kettering Cancer Center, New York: Tumor vaccines in ovarian cancer.
- J. Wolchok, Memorial Sloan-Kettering Cancer Center, New York: Immune modulators for cancer therapy: Assessing antagonists and agonists.

SESSION 3: Traditional and Targeted Therapy for Ovarian Cancer

- S. Domchek, Abramson Cancer Center, Philadelphia, Pennsylvania: Germline genetics and implications for ovarian cancer therapeutics.
- U. Matulonis, Dana-Farber Cancer Institute, Boston, Massachusetts: Combinations of biologic agents + PARP inhibitors and immunotherapy approaches to ovarian cancer.
- D. Bowtell, Peter MacCallum Cancer Centre, East Melbourne, Australia: Primary and acquired resistance in high-grade serous cancer.

SESSION 4: Genetics/Epigenetics

- D. Huntsman, BC Cancer Agency Research Centre, Vancouver, British Columbia: Endometriosis-associated ovarian cancers.
- D. Levine, Memorial Sloan-Kettering Cancer Center, New York: Clinically relevant genomic signatures and pathways.
- J. Brenton, Li Ka Shing Centre, Cambridge, United Kingdom: Monitoring disease response and genomic change with circulating tumor DNA.
- D. Solit, Memorial Sloan-Kettering Cancer Center, New York: Insights from the study of extraordinary responders.

SESSION 5: CSC/Heterogeneity

- S. Shah, University of British Columbia, Vancouver, Canada: Phylogenetic portraits of high-grade serous ovarian cancers.
- B. Neel, Princess Margaret Research/University Health Network, Toronto, Canada: Patient-derived xenografts for evaluating ovarian cancer drug response and tumor initiating cells.
- R. Buckanovich, University of Michigan, Ann Arbor: An ovarian cancer stem-like cell hierarchy and why it matters.

SESSION 6: Circulating Tumor Cells

- D. Tuveson, Cold Spring Harbor Laboratory: Discussion on advances.

General Discussion



D. Bowtell, C. Bales



S. Shah, J. Watson

NIMH Brain Camp VI

May 10–12

FUNDED BY **National Institute of Mental Health, National Institutes of Health**

ARRANGED BY **J. Chung**, National Institute of Mental Health, NIH, Bethesda, Maryland
 T. Insel, National Institute of Mental Health, NIH, Bethesda, Maryland

Cold Spring Harbor Laboratory is renowned worldwide for its education programs, from high school level to the highest professional levels. One of the Banbury Center's contributions is to host the NIMH-sponsored "Brain Camp." The goal of the Brain Camp is to identify areas of neuroscience that are of interest and relevance to psychiatrists and to communicate these to a small group of outstanding psychiatry residents and research fellows. Some of the most distinguished and thoughtful neuroscientists in the country have come to the meetings as guest speakers. The goal of the series of meetings is to develop a neuroscience curriculum that can eventually be shared with psychiatry training programs around the country.

Introductions and Opening Session

T. Insel, National Institute of Mental Health, NIH, Bethesda, Maryland: Psychiatry 2024.

S. Paul, Weill Cornell Medical College, New York, New York: Alzheimer's disease: A prototype for drug discovery and diagnostics in neuropsychiatry.

S. Lisanby, Duke University School of Medicine, Durham, North Carolina: Device-based neuromodulation: From engineering bench to bedside.

Roundtable Discussion with All Participants

SESSION 1: New Diagnostics/New Therapeutics

M. State, University of California, San Francisco: From genes to therapeutics in neurodevelopmental disorders.

S. Vinogradov, University of California, San Francisco: Neuroscience-informed cognitive training for impaired neural systems in schizophrenia.

SESSION 2: New Diagnostics/New Therapeutics

C. Tamminga, Southwestern Medical Center, Dallas, Texas: From biomarkers to biotypes in psychosis.

SESSION 3: New Diagnostics/New Therapeutics

E. Leibenluft, National Institute of Mental Health, Bethesda, Maryland: From DSM Bipolar disorder to RDoC irritability: A nosologic journey.

B. Teachman, University of Virginia, Charlottesville, Virginia: Regaining Control: Interventions for automatic and strategic cognitive biases in adult anxiety.

D. Pine, National Institute of Mental Health, Bethesda, Maryland: RDoC and mechanism-based therapeutics: Attention bias modification in pediatric anxiety.

Rhabdomyosarcoma: A Critical Review of Research and What It Means for Developing Therapies

May 13–16

FUNDED BY Friends of the TJ Foundation, Inc., The Michelle Paternoster Foundation for Sarcoma Research

ARRANGED BY C. Keller, Oregon Health & Science University, Portland
A. Wagers, Harvard Medical School, Boston, Massachusetts

Rhabdomyosarcoma is the most common soft tissue sarcoma of childhood, but despite four decades of advances in chemotherapy, radiation, and surgery, the outcome for metastatic or relapsed disease is particularly poor. Why is this? What are the biological characteristics of these recurring tumors? Can these characteristics be exploited for new therapies? This was an auspicious time to ask these questions. Recent changes to the NCI Cancer Therapy Evaluation Program and the Children's Oncology Clinical Trial process, in conjunction with FDA incentives, are facilitating the movement of basic science discoveries from bench to clinical trial. The meeting provided an opportunity for researchers to present data, to review critically the state of the field, to highlight areas for future research, and to establish new collaborations.



C. Keller, A. Billin

Welcome and Background: B. Stillman, Cold Spring Harbor Laboratory

Introduction: C. Keller, Oregon Health & Science University, Portland
A. Wagers, Harvard University, Boston, Massachusetts



SESSION 1

Chairperson: A. Wagers, Harvard University, Boston, Massachusetts

- L. Wexler, Memorial Sloan-Kettering Cancer Center, New York: Sleeping Beauty, The Sequel: The search for Prince Charming.
- L. Helman, National Cancer Institute, Bethesda, Maryland: Development of novel combination targeted therapies for rhabdomyosarcoma.
- J. Khan, National Cancer Institute, Bethesda, Maryland: The application of Omics to identify novel targets and treatments for rhabdomyosarcoma.
- P. Houghton, Nationwide Children's Research Institute, Columbus, Ohio: Exploiting the IGF-mTOR pathway for treatment of rhabdomyosarcoma.
- C. Keller, Oregon Health & Science University, Portland: Three novel target-therapy pairs for potential clinical trials within 18 months.

SESSION 2

Chairperson: P. Houghton, Nationwide Children's Research Institute, Columbus, Ohio

- T.A. Partridge, Children's National Medical Center, Washington DC: A model of reversible context-dependent rhabdomyosarcoma in the dystrophic mouse.
- B. Schaefer, University Children's Hospital, Zurich, Switzerland: Cancer stem cells in RMS: Fact or fiction?
- J. Shipley, Institute of Cancer Research, Sutton, United Kingdom: Histone methylation status and differentiation therapy.
- D. Cornelison, University of Missouri, Columbia: Comparative medicine-Eph/eprin expression profiles in RMS samples from canine and human patients.

General Discussion



R. Rota

SESSION 3

Chairperson: D. Langenau, Massachusetts General Hospital, Charlestown

- A. Wagers, Harvard University, Boston, Massachusetts: A transplant-based model for rhabdomyosarcoma in mice.
- F. Barr, National Cancer Institute, Bethesda, Maryland: The molecular correlates of fusion status in rhabdomyosarcoma.
- D.C. Guttridge, Ohio State University, Columbus: Regulation and function of NF-kB in rhabdomyosarcoma.
- C.M. Linardic, Duke University, Durham, North Carolina: Hippo pathway signaling in ARMS.

General Discussion

SESSION 4

Chairperson: L. Helman, National Cancer Institute, Bethesda, Maryland

- R. Pal, Texas Tech University, Lubbock: Predictive modeling of drug sensitivity.
- S. Hettmer, Charite-Universitaets-Medizin Berlin, Berlin, Germany: Asparagine homeostasis and its contributions to rhabdomyosarcoma growth.
- G. Pavlath, Emory University, Atlanta, Georgia: Nuclear transport receptors and myogenesis.
- R. Rota, Ospedale Pediatrico Bambino Gesù, Rome, Italy: Potential cross-talk involving Notch and epigenetic pathways in rhabdomyosarcoma.
- A.R. Ehrlich, Focus on Rhabdo, Plainsboro, New Jersey: An ad hoc framework for community: Scientific collaboration for rhabdomyosarcoma survivability.

General Discussion



P. Houghton, J. Shipley

SESSION 5

Chairperson: B. Schaefer, University Children's Hospital, Zurich, Switzerland

D. Langenau, Massachusetts General Hospital, Charlestown: Self-renewal mechanisms in embryonal rhabdomyosarcoma.

A. Hayes-Jordan, MD Anderson Cancer Center, Houston, Texas: The potential role of TOX-4 in rhabdomyosarcoma: Implications for metastatic disease.

Z. Li, Genomics Institute of Novartis Research Foundation, San Diego, California: Study and screen rhabdomyosarcoma in NIBR.

Discussion: Charting Future Research

- What have we learned at this meeting?
- What are the key areas for research that will advance our understanding of rhabdomyosarcoma?
- What can be done to ensure funding for research?
- How can we fund the development of promising laboratory findings into drugs for clinical trials?

The Genetics of Pain and Pain Inhibition: Where to from Here?

June 22–25

FUNDED BY The Mayday Fund

ARRANGED BY J. Mogil, McGill University, Montreal, Quebec, Canada
 C. Woolf, Harvard University, Boston, Massachusetts

Chronic pain is the most prevalent human health problem, with a lifetime prevalence of almost one in two. It is now 10 years since the first human genetic association studies of pain began appearing in the literature; association studies and exome sequencing studies of chronic pain disorders are also now being published. At the same time, progress has been made in identifying rare genetic variants responsible for monogenic pain disorders, both loss-of-function congenital insensitivity to pain and gain-of-function (e.g., erythromelalgia).

The time was right for a meeting to address the relative merits of the association studies and single-gene approaches for the study of chronic pain, along with various current practices in the field. Some of the questions that may be considered are the following: Will pain researchers ever be able to amass cohort sizes appropriate for replicable genome-wide association studies? What is the optimal way to phenotype patients and controls in pain genetics studies? Are genetic studies in model organisms broadly translatable to human clinical pain?

This discussion meeting reviewed the findings and promise of human genetic studies of pain, with the primary aim to compare the usefulness of rare versus common variant approaches in this field.

Welcoming Remarks: J.A. Witkowski, Banbury Center, Cold Spring Harbor Laboratory



SESSION 1: Introductory Session

C. Woolf, Boston Children's Hospital, Boston, Massachusetts: Why pain genes?

J. Mogil, McGill University, Montreal, Canada: History of pain genetics.

SESSION 2: Lessons from Other Fields

T. Grosser, University of Pennsylvania, Philadelphia: Pharmacogenetics.

A. Bowcock, National Heart & Lung Institute, London, United Kingdom: Molecular genetics of inflammatory diseases.

General Discussion

SESSION 3: Single-Gene Pain Trait

G. Woods, Cambridge Institute for Medical Research, United Kingdom: SCN9A loss of function.

S. Waxman, Yale University, New Haven, Connecticut: SCN9A gain of function.

M. Ferrari, Leiden University, The Netherlands: FHM genes.

I. Belfer, University of Pittsburgh, Pennsylvania: COMT: A complex story.

General Discussion

SESSION 4: Complex Pain Genetics Session

L. Diatchenko, McGill University, Montreal, Canada: Complex pain genetics: Progress so far.



M. Ferrari



C. Spellman, P. Thyne, C. Stebbins



I. Belfer, L. Diatchenko, A. Apkarian

W. Maixner, University of North Carolina, Chapel Hill: OPPIERA update.

V. Anttila, Harvard University, Boston, Massachusetts: Migraine GWAS.

SESSION 5: Translational Pain Genetics Session

A. van den Maagdenberg, Leiden University Medical Centre, The Netherlands: Transgenic mouse models of single-gene disorders: Migraine as the example.

G. Peltz, Stanford University, California: Haplotype mapping in mice.

M. Costigan, Harvard University, Boston, Massachusetts: Expression profiling and target validation.

G. Neely, Garvin Institute of Medical Research, Sydney, Australia: Pain genetics in nonmammalian organisms.

SESSION 6: Phenotyping

C. Nielsen, Norwegian Institute of Public Health, Oslo, Norway: What can/should be measured in large cohorts?

V. Apkarian, Northwestern University, Chicago, Illinois: Brain imaging and genetic studies.

SESSION 7: Breakout Groups: What Is the Best Way Forward?

Four breakout groups 1.5 hours. Group people and give each a mandate?

SESSION 8: New Approaches

D. Bennett, University of Oxford, United Kingdom: Applying RNA-Seq to both animal and human pain models.

R. Ratan, Burke Medical Research Institute, White Plains, New York: Epigenetics.

Report Back to Other Groups

Group Review, Conclusion, and Summary

High-Performance Computing in Undergraduate Biology Education: Scanning the Landscape

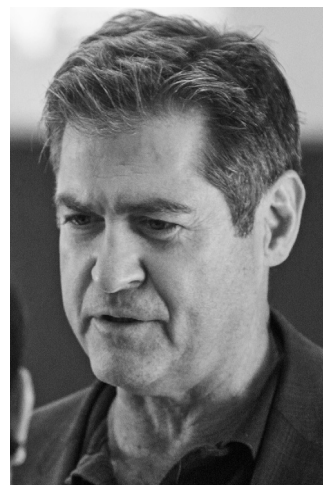
September 3–5

FUNDED BY Alfred P. Sloan Foundation and the National Science Foundation

ARRANGED BY D. Micklos, DNA Learning Center, Cold Spring Harbor Laboratory
D. Stanzione, University of Texas, Austin

“Big data” are rapidly becoming the currency of modern biology, including data from DNA/RNA sequencing, ecology and range mapping, remote sensing, automated phenotyping, visualization, and modeling. The generation and subsequent analysis of these data via high-performance computing (HPC) have traditionally been confined to research institutions. However, many underutilized data sets are now freely available to anyone with an Internet connection, and the technology for generating local data sets is coming within reach of faculty and students in primarily undergraduate institutions (PUIs).

Generating and analyzing large data sets hold the promise of bringing undergraduate students up-to-the-minute with biological research and of learning firsthand the modern synthesis of biochemistry and bioinformatics. Big data analysis can potentially support course-based research, which scales authentic student research to reach into introductory biology courses. Large data analysis also provides opportunities for distributed projects in which many students look at different aspects of the same problem. The time is right to discuss *IF* and *HOW* access to HPC resources can be extended to undergraduate institutions.



D. Micklos



The meeting format alternated between “perspective briefings” that presented the current state of knowledge, with free discussions that focused on the practicalities of extending HPC to undergraduate education. The meeting drew together 30 leaders and stakeholders from undergraduate biology education, HPC, and funding agencies to set a course for the future.

Welcoming Remarks: J.A. Witkowski, Banbury Center, Cold Spring Harbor Laboratory

Introduction:

D. Micklos, DNA Learning Center, Cold Spring Harbor Laboratory: Making HPC egalitarian.

T. Woodin, National Science Foundation, Arlington, Virginia: Vision and change.

SESSION 1: The Biological Landscape

M. Schatz, Cold Spring Harbor Laboratory: Genome structure and function.

B. Heidorn, University of Arizona, Tucson: Small data sets and biodiversity informatics.

T. Brettin, Argonne National Laboratory, Lemont, Illinois: Genomics and systems analysis.

J. Watkins, University of Arizona, Tucson: Statistical modeling of biological phenomena.

M. Cabrera, University of Puerto Rico, Mayaguez: Mathematical modeling and optimization in biology.

SESSION 2: The HPC Landscape

D. Stanzione, Texas Advanced Computing Center, Austin: HPC, XSEDE, and lessons from iPlant.

P. Blood, Pittsburgh Supercomputing Center, Pennsylvania: Engaging genomics researchers, developers, and gateways through XSEDE.

B. Rekepalli, Oak Ridge National Laboratory, Knoxville, Tennessee: Small cluster applications in science gateways.

S. Gordon, Ohio Supercomputer Center, Columbus: XSEDED education program.

K. Gaither, Texas Advanced Computing Center, Austin: Visualization and girls in STEM.

SESSION 3: The Undergraduate Research/Education Landscape

J. Jungck, University of Delaware, Newark: BioQUEST curriculum consortium and HPC.

S. Donovan, University of Pittsburgh, Pennsylvania: QUBES: Supporting quantitative thinking across the biology curriculum.

C. Ghiban, M. Khalfan, and J. Williams, Cold Spring Harbor Laboratory; U. Hilgert, University of Arizona, Tucson: A GUI for biological HPC.

J. Brusslan, California State University, Long Beach; B. Buckner, Truman State University, Kirksville, Missouri; S. Lewis, Prairie View A&M University, Texas; J. Seto, New York City College of Technology, Brooklyn, New York: iPlant tools in course-based research.

L. Fletcher, Austin Community College, Texas: Workforce development in biotechnology.

V. Byrd and L. Tanner, Clemson University, South Carolina: Broadening participation in next-generation computing.

B. Panoff, Shodor Education Foundation, Durham, North Carolina: Supporting computational thinking.

B. Barnett, National Center for Genome Analysis Support, Bloomington, Indiana: Support for genome analysis.

H. Neeman, Oklahoma University, Norman: HPC in plain english, starting from scratch.

SESSION 4: The Funding Landscape

Recommendations, Funding Priorities, Collaborations, and Distributed Projects



J. Williams

The Immune System and Cancer

September 7–10

FUNDED BY Oliver Grace Cancer Fund

ARRANGED BY G. Dranoff, Dana-Farber Cancer Institute, Boston, Massachusetts
D. Fearon, Cold Spring Harbor Laboratory

The recent reports that immunotherapy may induce durable responses in some cancer patients prompted the organization of a meeting to discuss multiple aspects of the biology of the interaction between the immune system and cancer. The topics that were discussed included imaging the tumor microenvironment, monitoring tumor immune reactions, current immunological therapies in human cancer, and newer approaches to immune interventions.

Welcoming Remarks: J.A. Witkowski, Banbury Center, Cold Spring Harbor Laboratory



G. Dranoff, A. Korman

Introduction: G. Dranoff, Dana-Farber Cancer Institute, Boston, Massachusetts



SESSION 1

Chairperson: S. Topalian, Johns Hopkins University, Baltimore, Maryland

A. Korman, Bristol-Myers Squibb, Redwood City, California: Antitumor activity of immunomodulatory antibodies.

S. Topalian, Johns Hopkins University, Baltimore, Maryland: PD-1 pathway blockade in cancer therapy.

T. Mempel, Harvard Medical School, Boston, Massachusetts: Local regulation of the T-cell response in the tumor microenvironment.

S. Riddell, Fred Hutchinson Cancer Research Center, Seattle, Washington: Adoptive cellular therapy.

General Discussion

SESSION 2

Chairperson: D. Felsner, Stanford University School of Medicine, California

D. Bar-Sagi, New York University School of Medicine, New York: Mapping the immune landscape during early pancreatic neoplasia.

S. Leach, Memorial Sloan-Kettering Cancer Center, New York: IL-17, gut microbiome, and pancreatic cancer.

E. Sahai, Cancer Research UK, London, United Kingdom: Imaging the tumor microenvironment and localized responses to therapy.

D. Felsner, Stanford University School of Medicine, California: MYC inactivation elicits an innate and adaptive immune response.

B. Van den Eynde, Ludwig Institute for Cancer Research, Brussels, Belgium: Tumor-induced apoptosis of tumor-specific T lymphocytes in an autochthonous melanoma model.

General Discussion

SESSION 3

Chairperson: R. Schreiber, Washington University School of Medicine, St. Louis, Missouri

R. Schreiber, Washington University School of Medicine, St. Louis, Missouri: The importance of tumor-specific mutant antigens in endogenous and therapeutically induced immune responses to cancer.

M. Krummel, University of California, San Francisco: The dynamics of tumor surveillance at primary and metastatic sites.

D. Irvine, Koch Institute for Integrative Cancer, Cambridge, Massachusetts: Engineering cancer vaccine potency through lymph node targeting.

G. Dranoff, Dana-Farber Cancer Institute, Boston, Massachusetts: Engineering improved cancer vaccines.

G. Nolan, Stanford University School of Medicine, California: Single-cell proteomics and genomics at high scale.

General Discussion

SESSION 4

Chairperson: E. Vivier, Centre d'Immunologie de Marseille-Luminy, Marseille, France

E. Vivier, Centre d'Immunologie de Marseille-Luminy, Marseille, France: Natural killer cells: Development, regulation, and treatment.

L. Lanier, University of California, San Francisco: Immune evasion mediated by tumor-derived lactate dehydrogenase induction of NKG2D ligands on myeloid cells in cancer patients.

K. Wucherpfenning, Dana-Farber Cancer Institute, Boston, Massachusetts: Isolation of antibodies from patients responding to cancer immunotherapy.



D. Bar-Sagi



G. Trinchieri, E. Vivier

A. Rudensky, Memorial Sloan-Kettering Cancer Center, New York: Regulatory T cells in cancer.

A. Prevost-Blondel, Cochin Institute, INSERM, Paris, France: Immunoregulatory properties of NOS2: Impact on gd T cells and PMN-MDSC.

General Discussion

SESSION 5

Chairperson: G. Trinchieri, National Cancer Institute, Frederick, Maryland

G. Trinchieri, National Cancer Institute, Frederick, Maryland: Microbiota and cancer therapy.

M. Egeblad, Cold Spring Harbor Laboratory: Cancer cells hijack neutrophils' pathogen eradicating function to promote metastasis.

D. Fearon, Cold Spring Harbor Laboratory: T-cell exclusion: A dominant means for tumoral immune suppression.

Wrap-Up Discussion

Interpreting Personal Genomes: How Are We to Set Appropriate Statistical Standards for Identifying Pathogenic Genetic Variants?

September 15–18

FUNDED BY Cold Spring Harbor Laboratory Corporate Sponsor Program

ARRANGED BY D. Goldstein, Center for Human Genome Variation, Duke University, Durham, North Carolina
D. MacArthur, Analytic and Translational Genetics Unit, Massachusetts General Hospital, Boston

Genome-scale sequencing—both exome and whole-genome sequencing—are already being used in the clinical setting for both molecular diagnosis and gene discovery in severe disease patients. Current sequencing methods produce vast amounts of data that must be sifted for variants, but appropriate standards are still lacking for the robust identification of pathogenic variants and for assessing the evidence for new disease-linked genes. There is increasing concern that this lack of standards may lead to a proliferation of false positive claims, contaminating the literature and mutation databases and influencing clinical decisions.

The meeting had two aims. First, the participants reviewed the different approaches taken to assess potential for pathogenicity, including statistical and population genetic evidence, functional evaluation, and assessment of clinical “similarity” among patients with similar presentations.

Second, the meeting reviewed how to ensure that the highest standards are maintained both in the published literature and in any evaluations that influence clinical decision making. Although



D. Goldstein, D. Valle



many elements of what was covered have been addressed in other settings, a Banbury meeting affords a unique environment to review the central questions in detail. Moreover, the meeting ensured that the full range of relevant expertise was represented.

Introduction: J.A. Witkowski, Banbury Center, Cold Spring Harbor Laboratory

SESSION 1

Chairperson: R. Myers, HudsonAlpha Institute for Biotechnology, Huntsville, Alabama

Topic 1: Interpreting Patient Genomes: Real World Experiences

A. Beaudet, Baylor College of Medicine, Houston, Texas: Challenges in clinical implementation.

M. Bamshad, University of Washington, Seattle: Mendelian Disease Center.

D. Valle, The Johns Hopkins School of Medicine, Baltimore, Maryland: Mendelian Disease Center 2.

W. Chung, Columbia University, New York: Lessons learned from clinical implementation of exome sequencing.

General Discussion

Topic 2: Framing the Discussion

T. Manolio, National Human Genome Research Institute, Rockville, Maryland: NHGRI programs relevant to variant interpretation.

H. Rehm, Brigham and Women's Hospital, Cambridge, Massachusetts: The new ACMG guidelines for interpreting sequence variants: Where are we today and what's next?

D. MacArthur, Massachusetts General Hospital, Boston: Lessons from previous efforts.

General Discussion

SESSION 2

Chairperson: J. Hirschhorn, Boston Children's Hospital, Massachusetts

Topic 3: Evaluating Evidence for Variant Pathogenicity Determination

D. Conrad, Washington University School of Medicine, St. Louis, Missouri: Statistical approaches for the $n = 1$ problem.

S. Petrovski, Duke University, Durham, North Carolina: Bioinformatic approaches for prioritizing variants.

D. MacArthur, Massachusetts General Hospital, Boston: Resources for assessing variant frequency and likely pathogenicity.

A. Allen, Duke University, Durham, North Carolina: Statistical approaches for identifying statistical anomalies in patient genomes.

K. Samocha, Massachusetts General Hospital, Boston: Assessing de novo mutations and gene constraint.

General Discussion

Topic 4: What Is the Best Model for Sharing Genomic and Phenotypic Data?

R. Sever, Cold Spring Harbor Laboratory: Molecular case studies journal.

SESSION 3

Chairperson: H. Rehm, Brigham and Women's Hospital, Cambridge, Massachusetts

Topic 5: Evaluating Evidence for Implicating Genes in Disease

M. Daly, Massachusetts General Hospital, Boston: Classes of evidence for implicating new genes in human disease.

J.-L. Casanova, The Rockefeller University, New York: The value of single families in identifying new disease genes.

Topic 6: Computational Tools

G. Cooper, HudsonAlpha Institute for Biotechnology, Huntsville, Alabama: Overview of bioinformatics tools for variant classification.

C. Bustamante, Stanford School of Medicine, California: Machine-learning algorithms and other high-throughput approaches to variant assessment.

Topic 7: Use of Phenotype to Inform Pathogenicity

D. Adams, National Human Genome Research Institute, Bethesda, Maryland: Using deep phenotyping to inform DNA-sequence-variant classification: Practical challenges.

L. Biesecker, National Human Genome Research Institute, Rockville, Maryland: POST-HOC phenotyping and pathogenicity.

General Discussion

SESSION 4

Chairperson: D. MacArthur, Massachusetts General Hospital, Boston

Topic 8: Functional Assessment of Genetic Variation

L. Pennacchio, Lawrence Berkeley National Laboratory, Berkeley, California: Beyond exomes: Noncoding in vivo function and human disease.

R. Xavier, Broad Institute, Boston, Massachusetts: Genes to biology.

Topic 9: Systems to Support Variant and Case Data Aggregation

H. Rehm, Brigham and Women's Hospital, Cambridge, Massachusetts: Advances in variant databases.

M. Brudno, University of Toronto, Ontario, Canada: Phenotyping tools and the matchmaker exchange project.

Topic 10: Approaches to Support Variant and Gene Curation

M. Lebo, Brigham and Women's Hospital, Cambridge, Massachusetts: Clinical approaches to variant interpretation.

C. Cassa, Brigham and Women's Hospital, Boston, Massachusetts: Literature mining.

B. Funke, Massachusetts General Hospital, Cambridge: Clinical approaches to gene evidence evaluation.

General Discussion

SESSION 5

Chairperson: L. Biesecker, National Human Genome Research Institute, Bethesda, Maryland

Topic 11: Striking the Right Balance in Interpreting Personal Genomes

E. Worthey, Medical College of Wisconsin, Wauwatosa: A review of our 2014 lessons learned and the challenges and opportunities for 2015.

D. Goldstein, Duke University, Durham, North Carolina: Lessons from 150 diagnostic exomes.

Topic 12: The Way Forward: Discussion and Summary

Discussion Leaders:

D. Goldstein, Duke University, Durham, North Carolina

H. Rehm, Brigham and Women's Hospital, Cambridge, Massachusetts

D. MacArthur, Massachusetts General Hospital, Boston



H. Rehm



A. Allen

Interdisciplinary Symposium on Creativity

October 21–24

FUNDED BY The Daniel & Joanna S. Rose Foundation; Mr. & Mrs. Howard Phipps

ARRANGED BY S. Nalbantian, Long Island University, Brookville, New York

This conference brought together a small group of comparatist scholars from the humanities with neuroscientists for an interdisciplinary investigation of creativity. The neuroscientists described the functioning of the brain in creative acts of scientific discovery or aesthetic production. The comparatists described instances of creativity that they analyze in the composition of major literary works, of musical compositions, or of works of visual art.

The conference covered such topics as mechanisms of creativity: How creativity is linked to brain structure and function; MRI tracking creativity in the brain; Inputs of specific brain regions; Components of creativity—memory, emotion, decision making, and intelligence; Pathology and creativity; Creativity and its reception: Empathy with reader, viewer, collaborator.



S. Nalbantian

Introduction: J.A. Witkowski, Banbury Center, Cold Spring Harbor Laboratory



SESSION I: Mechanisms of Creativity in the Brain

- S. Nalbantian, Long Island University, Brookville, New York: Introduction to the symposium.
- J.-P. Changeux, Kavli Brain-Mind Institute, La Jolla, California: Creativity in art: A neuronal hypothesis.
- R. Stickgold, Harvard Medical School, Boston, Massachusetts: The roles of REM sleep, dreaming, and quiet wake in the creative process.
- R. Jung, University of New Mexico, Albuquerque: Interacting networks of creative cognition: Perspectives from structural neuroimaging.

SESSION II: Components of Creativity in the Arts

- S. Nalbantian, Long Island University, Brookville, New York: Creativity in modernist literary writers: Acts of mental transformation.
- E. Fiorentini, Humboldt University, Berlin, Germany: The mind's eye?: Questions about imaging and creativity.
- M. Hussey, Pace University, New York: Significant form and the "aesthetic emotion": Clive Bell, Roger Fry, and Virginia Woolf.
- J. Wirtz, Hunter College, New York: Interdisciplinary convergence on writerly invention.

SESSION III: Outlier Cases for Studying Creativity: From Pathology to Genius

- P. Matthews, Imperial College, London, United Kingdom: Insights into creativity from diseases of the brain.
- S. Henke, University of Louisville, Kentucky: Posttraumatic fiction: Twentieth-century pathological writers and their creativity.

- N. Andreasen, University of Iowa, Iowa City: The creative brain: The neuroscience of genius.

SESSION IV: Moments of Creativity; Methodologies for the Study of Creativity

- M. Beeman, Northwestern University, Evanston, Illinois: Eureka: The "aha" moments in the creative process.

Discussion by Participants of Useful Methodologies for Studying Creativity

Creativity in Music, Film, and Neuroscience

- Talks by B. Adolphe and A. Gambis, introduced by S. Nalbantian, Grace Auditorium

SESSION V: Creativity: Its Reception, Its Reduction

- P. Schneck, University of Osnabruck, Germany: Henry James and the creative process: Demons, nuggets, and the stewpot of the imagination.
- D. Wehrs, Auburn University, Alabama: Literary innovation and re-imagining memory: Chivalric romance, renaissance genre, and plasticity.
- J. Bickle, Mississippi State University, Starkville: Are creative humans poor recallers? A functional hypothesis suggested by ruthlessly reductive molecular neuroscience.

Concluding Round Table Discussion of All Participants

- Includes discussion of plans for a volume on creativity to be edited by S. Nalbantian and P. Matthews.



E. Fiorentini



D. Wehrs



J. Bickle

ROS in Biology and Cancer

October 26–29

FUNDED BY Oliver Grace Cancer Research Fund

ARRANGED BY A. Holmgren, Karolinska Institute, Stockholm, Sweden
 N. Chandel, Northwestern University, Chicago, Illinois
 N. Tonks, Cold Spring Harbor Laboratory
 D. Tuveson, Cold Spring Harbor Laboratory

This meeting delved more deeply into the biology of reactive oxygen species (ROS) to explore its role in cancer genesis and relevance for therapeutics than did the 2013 Banbury meeting. In addition to ROS's ability to stimulate cancer initiation, it is now apparent that the cellular anti-oxidant machinery has important roles in protecting cancer cells from oxidative damage. Furthermore, the anti-oxidant machinery can be up-regulated in response to oncogenes and may confer drug resistance and "stemness." Such observations suggest that redox modulation may offer a novel approach for selective targeting of cancer cells. Participants explored the chemical, biochemical, and genetic facets of ROS biology in relation to cancer, with the goal of determining whether ROS can be manipulated *in vivo* to alter cancer pathogenesis and the response of cancer cells to therapy.

Welcoming Remarks: J.A. Witkowski, Banbury Center, Cold Spring Harbor Laboratory

Introduction: D. Tuveson, Cold Spring Harbor Laboratory



WHAT ARE ROS AND WHERE IS THE ROS COMING FROM?

SESSION 1: Redox Biology

- M. Ristow, Swiss Federal Institute of Technology, Zurich, Switzerland: Mitohormesis: How mitochondrial ROS production promotes metabolic health and life span.
- M. Haigis, Harvard Medical School, Boston, Massachusetts: Posttranslational control of mitochondria.
- G. Shadel, Yale University School of Medicine, New Haven, Connecticut: Novel roles for mitochondrial ROS in signaling and disease pathology and potential roles for mitochondria in activating the immune system in the context of cancer.

SESSION 2: ROS Biology and Chemistry

- C. Winterbourn, University of Otago, Christchurch, New Zealand: Identifying cellular targets for reactive oxidants and the influence of peroxiredoxins.
- Y. Janssen-Heininger, University of Vermont, Burlington: Targeting *S*-glutathionylation chemistry in lung cancer.
- T. Miller, IC MedTech Corporation, El Cajon, California: Can targeted ROS = affordable new anti-neoplastics?

CAN TARGETED ROS MODULATION = AFFORDABLE NEW ANTINEOPLASTICS?

SESSION 3: ROS Pathways and Redox

- M. Murphy, MRC Mitochondrial Biology Unit, Cambridge, United Kingdom: Complex I as a source of superoxide during ischaemia-reperfusion injury.
- H. McNeil, Lunenfeld-Tanenbaum Research Institute, Mount Sinai Hospital, Toronto, Ontario, Canada: Fat cadherins regulation of mitochondrial function.
- P. Puigserver, Dana-Farber Cancer Institute, Boston, Massachusetts: The PGC1 pathway programs mitochondrial and ROS detoxification in tumor cells.

SESSION 4: ROS Methods and Therapeutic Development

- T. Dick, German Cancer Research Center, Heidelberg, Germany: Mechanisms of regulatory protein thiol oxidation.
- E. White, The Cancer Institute of New Jersey, New Brunswick: Role of mitochondria quality control in cancer.

General Discussion

- Moderator:** M. Espey, National Cancer Institute, NIH, Rockville, Maryland

WHAT IS ROS DOING?

SESSION 5: Exogenous and Endogenous Anti-Oxidants and Cancer

- A. Holmgren, Karolinska Institute, Stockholm, Sweden: Thioredoxin and peroxiredoxin in ROS signaling.
- C. Neumann, University of Pittsburgh Cancer Institute, Pennsylvania: Prdx1.
- N. Chandel, Northwestern University, Chicago, Illinois: Targeting redox for cancer therapy.

- P. Schumacker, Northwestern University, Chicago, Illinois: Mitochondrial ROS in cancer: Initiators, facilitators, or innocent bystanders?

SESSION 6: NRF2 and ROS Regulation

- D. Tuveson, Cold Spring Harbor Laboratory: Nrf2 in pancreatic cancer.
- E. Schmidt, Montana State University, Bozeman: Functional antagonism of Nrf2 activity by the disulfide reductase systems.
- D. Zhang, University of Arizona, Tucson: Nrf2 regulation and its dual role in cancer.

SESSION 7: ROS Signaling

- D. Pappin, Cold Spring Harbor Laboratory: A double-labeling approach for quantitative cysteine proteomics.



T. Dick, C. Neumann

SESSION 8: ROS Sensors

N. Hay, University of Illinois, Chicago: Selective targeting of cancer cells with ROS inducers: The Achilles' heel of Akt.

A. Kimmelman, Dana-Farber Cancer Institute, Boston, Massachusetts: Redox balance in pancreatic cancer.

General Discussion

Moderators: D. Tuveson, Cold Spring Harbor Laboratory; N. Chandel, Northwestern University, Chicago, Illinois; A. Holmgren, Karolinska Institute, Stockholm, Sweden.

SESSION 9: ROS and Therapies I

J. Doroshow, National Cancer Institute, Bethesda, Maryland: NADPH oxidases and cancer.

P. Huang, MD Anderson Cancer Center, Houston, Texas: ROS in cancer therapeutics.

M. Bergo, University of Gothenburg, Sweden: Antioxidants and lung cancer progression.

SESSION 10: ROS and Therapies II

L. Trotman, Cold Spring Harbor Laboratory: Redox therapy in prostate cancer.

B. Stockwell, Columbia University, New York: Metabolic control of lipid peroxidation and cell death.

Discussion

Moderator: S. Biller, Agios Pharmaceuticals, Cambridge, Massachusetts

Final Meeting Summary

N. Chandel, Northwestern University, Chicago, Illinois

A. Holmgren, Karolinska Institute, Stockholm, Sweden

D. Tuveson, Cold Spring Harbor Laboratory



C. Winterbourn



H. McNeil, M. Murphy



T. Miller

Epigenetics and Agriculture

November 9–12

FUNDED BY Cold Spring Harbor Laboratory Corporate Sponsor Program

ARRANGED BY B. Hauge, Monsanto Company, Chesterfield, Missouri
R. Martienssen, Cold Spring Harbor Laboratory

Epigenetic regulation has a pivotal role in plant development, the response to the signals from the environment, and natural variation of gene expression. Epigenetics therefore offers a largely untapped resource for crop improvement strategies aimed at enhancing productivity through the selection of favorable epialleles, plant adaptation to abiotic and biotic stresses, and strategies for durable efficacious expression of transgenes. The goal of this meeting was to explore these opportunities by bringing together leading researchers in the plant epigenetics field with scientists representing agricultural biotechnology companies.

The meeting focused on epigenetic mechanisms of gene regulation and their roles in heterosis, epigenetic programming of plant reproduction, transgenerational inheritance, and adaptation to abiotic and biotic stresses.

Participants also explored the needs of agricultural biotechnology, and how epigenetic research can help efforts to manipulate gene expression in crops toward enhancing sustainable food and feed production, to meet the needs of a growing population.

Welcoming Remarks: J.A. Witkowski, Banbury Center, Cold Spring Harbor Laboratory

Introduction: V. Shukla, The Bill & Melinda Gates Foundation, Seattle, Washington

From Insight to Impact: How Do We Translate Epigenetics Research into Developing World Agriculture?





V. Colot, D. Weigel



E. Dennis

SESSION 1: Epialleles: Utility and Transgenerational Inheritance

Chairperson: R. Martienssen, Cold Spring Harbor Laboratory

D. Weigel, Max-Planck Institute for Developmental Biology, Tübingen, Germany: Computational methods for detection of DNA methylation differences and their application to the study of natural and spontaneous variation.

V. Colot, Institut de Biologie de l'Ecole Normale Supérieure, Paris, France: Stability and potential of transgenerational epigenetics in plant breeding.

S. Jacobsen, University of California, Los Angeles: Epigenetic mechanisms in *Arabidopsis*.

E. Richards, Boyce Thomas Institute, Ithaca, New York: 3D epigenetics and stress responses.

R. Schmitz, University of Georgia, Athens: Exploring genome-wide patterns of DNA methylation throughout the plant kingdom.

J. Hollick, Ohio State University, Columbus: Paramutation in *Zea mays*.

SESSION 2: Heterosis, Polyploidy, and Chromosome Dosage

Chairperson: D. Jackson, Cold Spring Harbor Laboratory

E. Dennis, CSIRO Plant Industry, Canberra, Australia: Heterosis and the role of epigenetics.

D. Baulcombe, University of Cambridge, United Kingdom: Paramutation in hybrid tomato.

Z. Lippman, Cold Spring Harbor Laboratory: Optimization of crop productivity using induced mutations in the florigen flowering pathway.

J. Chen, University of Texas, Austin: Maternal small RNAs and seed development.

N. Springer, University of Minnesota, St. Paul: Variation for DNA methylation patterns in maize populations.

C. Pikaard, Indiana University, Bloomington: Epigenetic inheritance and RNA silencing.

SESSION 3: GxE Epigenetic Contribution to Stress Adaptation

Chairperson: D. Ware, Cold Spring Harbor Laboratory

J. Paszkowski, University of Cambridge, United Kingdom: Genetic determinants of epiallelic switches.

J. Gutierrez-Marcos, University of Warwick, Coventry, United Kingdom: Myths and facts about transgenerational epigenetic inheritance in plants.

U. Grossniklaus, University of Zurich, Switzerland: Selection of epigenetic variation in *Arabidopsis*.

O. Mittelsten Scheid, Gregor Mendel Institute, Vienna, Austria: Epigenetics and genetics: A complex relationship.

J.-K. Zhu, Purdue University, West Lafayette, Indiana: Epigenetic antisilencing mechanisms in plants.

General Discussion

SESSION 4: Gametogenesis, Apomixis, and Imprinting

Chairperson: P. Schnable, Iowa State University, Ames

R. Martienssen, Cold Spring Harbor Laboratory: Genome reprogramming and epigenetic inheritance.

M. Gehring, Whitehead Institute for Biomedical Research, Cambridge, Massachusetts: Epigenetics and seed development.

D. Grimanelli, Institut Recherche pour le Développement, Montpellier, France: Epigenome dynamics and reproductive development.

F. Berger, Gregor Mendel Institute of Molecular Plant Biology, Vienna, Austria: Higher-order chromatin structure and its impact on genome activities in plants.

General Discussion

SESSION 5: Agricultural Applications and Translational Epigenetics

Chairperson: T. Osborn, Monsanto, Chesterfield, Missouri

F. Van Ex, Bayer CropScience, Zwijnaarde, Belgium: Exploring the epigenetic potential of crops.

S. Mackenzie, University of Nebraska, Lincoln: Heritable epigenomic reprogramming in crop species by plastid perturbation.

P. Schnable, Iowa State University, Ames: How well does DNA variation predict phenotypes in maize? Can we improve these predictions?

J. Reinders, DuPont Experimental Station, Johnston, Iowa: Assessing the impact of epigenetic variation on phenotypic variation in maize.

Conclusion and Future Work



S. Mackenzie



E. Richards, D. Baulcomb

Lewy Body Dementia: Current Status, Future Directions

November 16–19

FUNDED BY The Dana Foundation; Prothena Biosciences, Inc.; Sandy and Nelson DeMille

ARRANGED BY J. Galvin, New York University, New York
 I. McKeith, Newcastle University, Newcastle upon Tyne, United Kingdom

Lewy body dementia (LBD) is the second most common cause of cognitive impairment after Alzheimer's disease (AD), affecting more than 1.3 million Americans and perhaps over 4 million people worldwide. However, much less is known about LBD despite the fact that the prevalence rate of LBD approaches 5% in the elderly population and makes up 30% of all dementia cases.

We are only just beginning to understand the genetics of LBD. A family history of dementia may be more common in LBD compared with healthy older adults, suggesting some form of inheritance pattern. Mutations in at least four genes are now associated with LBD— α -synuclein, β -synuclein, glucocerebrosidase, and new candidate loci linked to chromosome 2. There is increasing evidence that although MRI may have a limited role in discriminating LBD from AD, nuclear imaging studies using novel markers with single photon emission computerized tomography (SPECT) and positron emission tomography (PET) scans may be able to improve diagnoses and be used as outcomes for clinical trials.

Participants in the meeting critically reviewed the current state of knowledge of the genetics of LBD and the usefulness or otherwise of current clinical, imaging, and biological markers. There was much discussion of how global research efforts on LBD could be delivered in conjunction with the goals of NINDS, NAPA, the G8 Summit Objectives, and related initiatives.

Welcoming Remarks: J.A. Witkowski, Banbury Center, Cold Spring Harbor Laboratory

Introductions and Work Plan:

I. McKeith, Newcastle University, Newcastle upon Tyne, United Kingdom

J. Galvin, New York University, New York



SESSION 1

Chairperson: J. Leverenz, Cleveland Center for Brain Health, Ohio

A. Singleton, National Institute on Aging, Bethesda, Maryland: DLB genetics: Progress and priorities.

J. Bras, University College London, United Kingdom: Genetic risk for DLB: A genome-wide assessment of genetic variability in DLB.

J. Leverenz, Cleveland Center for Brain Health, Ohio: Genetics of cognition in the Lewy body disorders.

SESSION 2

Chairperson: D. Dickson, Mayo Clinic, Jacksonville, Florida

D. Dickson, Mayo Clinic, Jacksonville, Florida: Neuropathology of diffuse Lewy body disease: Familial and sporadic forms.

G. Halliday, University of New South Wales and Neuroscience Research, Australia: The dynamics of Lewy body formation in Lewy body diseases.

SESSION 3

Chairperson: O. El-Agnaf, HBK University, Doha, United Arab Emirates

P. Brundin, Van Andel Institute, Grand Rapids, Michigan: What is the possible role of cell-to-cell transfer of α -synuclein in the pathogenesis of Lewy body dementia?

J. Duda, Philadelphia VA Medical Center, Pennsylvania: Olfactory dysfunction in sporadic and genetic forms of Lewy body disorders.

O. El-Agnaf, HBK University, Doha, United Arab Emirates: Detection of α -synuclein pathogenic conformations as a strategy for biomarker development for Lewy body diseases.

General Discussion: Genetics and Pathology

SESSION 4: Coordination of DLB Research Initiatives to Include NAPA/ADRD, ADC-DLB Module, JPND, G8, and Others

Chairpersons: T. Montine, University of Washington, Seattle, and D. Aarsland, Karolinska Institute, Huddinge, Sweden

SESSION 5

Chairperson: J. O'Brien, University of Cambridge, United Kingdom

D. Aarsland, Karolinska Institute, Huddinge, Sweden: Prognosis of DLB and the potential of predictive biomarkers in DLB.

J.-P. Taylor, Institute of Neuroscience, Newcastle, United Kingdom: Neurophysiological biomarkers in Lewy body dementia.

J. O'Brien, University of Cambridge, United Kingdom: Neuroimaging biomarkers for Lewy body dementia.

E. Masliah, University of California, La Jolla: Novel therapeutics for Lewy body disease in transgenic models: Bridging the gap.

General Discussion

SESSION 6

Chairperson: D. Weintraub, University of Pennsylvania, Philadelphia

A. Muhs, AC Immune SA, Lausanne, Switzerland: Identification of small-molecule inhibitors of α -synuclein aggregate toxicity.

R. Mills, ACADIA Pharmaceuticals, Inc. San Diego, California: Novel antipsychotics in Lewy body disease.

E. Mori, Tohoku University, Sendai, Japan: Cholinesterase inhibitors in Lewy body dementia.

D. Weintraub, University of Pennsylvania, Philadelphia: Design and conduct of clinical trials in Lewy body dementia.

Discussion: Management Strategies for LBD

J. O'Brien, University of Cambridge, United Kingdom

J.-P. Taylor, Institute of Neuroscience, United Kingdom

SESSION 7

Chairperson: J. Galvin, New York University, New York

B. Boeve, Mayo Clinic, Rochester, Minnesota: REM sleep behavior disorder as an early manifestation of evolving dementia with Lewy bodies.



E. Mori

- J. Galvin, New York University, New York: Improving the detection and diagnosis of LBD in the office setting.
- I. McKeith, Newcastle University, Newcastle upon Tyne, United Kingdom: Prodromal DLB: Diagnosing, managing, and trialling it.
- A. Taylor, Lewy Body Dementia Association, Inc., Lilburn, Georgia: The role of the nonprofit in LBD education and research.

SESSION 8

Chairperson: B. Boeve, Mayo Clinic, Rochester, Minnesota
Proposal for DLB 6 Consortium Meeting

B. Boeve, D. Dickson, J. Leverenz, and I. McKeith

Wrap-Up Discussion



J. O'Brien



E. Masliah, O. El-Agnaf

BANBURY CENTER GRANTS

<i>Grantor</i>	<i>Program</i>	<i>Duration of Grant</i>	<i>2014 Funding</i>
FEDERAL SUPPORT			
National Institute of Mental Health	Brain Camp VI	2014	\$ 26,500
National Science Foundation	High Performance Computing in Undergraduate Biology Education: Scanning the Landscape	2014	29,000
NONFEDERAL SUPPORT			
American College of Medical Genetics and Genomics (ACMG)	Genetics Training in the Genomic Era	2014	33,920
Boehringer Ingelheim Fonds	Science—Get It Across!	2014	60,967
Bring Change 2 Mind	The College Toolbox Project: Eliminating Stigma	2014	7,500
Cold Spring Harbor Laboratory Corporate Sponsor Program	Interpreting Personal Genomes: How Are We to Set Appropriate Statistical Standards for Identifying Pathogenic Variants?	2014	52,362
Cold Spring Harbor Laboratory Corporate Sponsor Program	Epigenetics and Agriculture	2014	59,398
Cold Spring Harbor Laboratory Office of Development	Defeating Ovarian Cancer	2014	10,000
Dana Foundation	Lewy Body Dementia: Current Status, Future Directions	2014	10,000
Friends of TJ Foundation	Rhabdomyosarcoma: A Critical Review of Research and What It Means for Developing Therapies	2014	20,000
Nelson DeMille	Lewy Body Dementia: Current Status, Future Directions	2014	5,000
Jonathan Gray	Defeating Ovarian Cancer	2014	25,000
Indiana University Foundation	The College Toolbox Project: Eliminating Stigma	2014	7,500
Indiana University	The College Toolbox Project: Eliminating Stigma	2014	6,360
The Margaret Clark Morgan Foundation	The College Toolbox Project: Eliminating Stigma	2014	2,120
The Mayday Fund	Genetics of Pain and Pain Inhibition	2014	56,250
Oliver Grace Cancer Fund	The Immune System and Cancer	2014	40,852
Oliver Grace Cancer Fund	ROS in Biology and Cancer	2014	53,801
Oliver Grace Fund	Lewy Body Dementia: Current Status, Future Directions	2014	20,700
Michelle Paternoster Foundation for Sarcoma Research	Rhabdomyosarcoma: A Critical Review of Research and What It Means for Developing Therapies	2014	20,000
Mr. & Mrs. Howard Phipps	Interdisciplinary Symposium on Creativity	2014	15,000
Prothema Biosciences Inc.	Lewy Body Dementia: Current Status, Future Directions	2014	10,000
The Daniel & Joanna S. Rose Fund	Interdisciplinary Symposium on Creativity	2014	15,000
Alfred P. Sloan Foundation	High Performance Computing in Undergraduate Biology Education: Scanning the Landscape	2014	15,500
Society of Biological Psychiatry	Brain Camp VI	2014	710
The Swartz Foundation	Connections and Communications in the Brain	2014	44,337

Banbury Center

Jan A. Witkowski, Executive Director

Janice Tozzo, Executive Assistant

Patricia Iannotti, Secretary

Barbara Polakowski, Hostess

Jose Pena Corvera, Supervisor, Grounds

Fredy Vasquez, Groundskeeper

Joseph McCoy, Groundskeeper

Cold Spring Harbor Laboratory

Jamie C. Nicholls, Chairman

Bruce Stillman, President & Chief Executive Officer

W. Dillaway Ayres, Jr., Chief Operating Officer

Founded in 1890, Cold Spring Harbor Laboratory (CSHL) has shaped contemporary biomedical research and education with programs in cancer, neuroscience, plant biology, and quantitative biology. A 501(c)(3) nonprofit organization, CSHL is independently ranked in the top 1% of charities by Charity Navigator. For more information, visit www.cshl.edu.