

International Summit on Human Genome Editing

Committee

David Baltimore

Chair

David Baltimore, former president of the California Institute of Technology (1997-2006) is President Emeritus and the Robert Andrews Millikan Professor of Biology. He is an accomplished researcher, educator, administrator, and public advocate for science and engineering and is considered one of the world's most influential biologists. Awarded the Nobel Prize in Physiology or Medicine in 1975 for his research into viral replication that provided the key to understanding the life cycle of retroviruses, Baltimore has profoundly influenced national science policy on such issues as recombinant DNA research and the AIDS epidemic.

His present research focuses on control of inflammatory and immune responses as well as on the use of gene therapy methods to treat HIV and cancer in a program called "Engineering Immunity." In addition, he co-directs the Joint Center for Translational Medicine, an activity that joins Caltech and UCLA in a program to translate basic science discoveries into clinical realities.

Baltimore's numerous honors include the 1999 National Medal of Science and 2000 Warren Alpert Foundation Prize. He is past president and chair of the American Association for the Advancement of Science, a member of the National Academy of Sciences and National Academy of Medicine, and was recently appointed by NAS and NAM as chair of the International Summit on Human Gene Editing. He has published nearly 700 peer-reviewed articles. Baltimore received his BA in chemistry from Swarthmore College in 1960 and a PhD in 1964 from The Rockefeller University.

Francoise Baylis

Member

Françoise Baylis is professor and Canada Research Chair in Bioethics and Philosophy at Dalhousie University. She is an elected fellow of the Royal Society of Canada and the Canadian Academy of Health Sciences. Her research aims to move the limits of mainstream bioethics and develop new strategies to allow bioethicists to make just and lasting policy contributions.

Baylis believes that bioethicists need to take on greater advocacy roles and use their talents and expertise in pursuit of social justice. They need to exercise their moral imagination and find creative ways to make policymakers and others in positions of power care. Her current research interests concern women's reproductive health, research involving humans, embryo research, novel genetic technologies, and access to health care. Her work challenges readers to think broadly and deeply about the direction of health, science, and biotechnology. Her most recent book with Carolyn McLeod is *Family-making: Contemporary Ethical Challenges* (2014). Her next book with Angela Ballantyne is *Clinical Research Involving Pregnant Women: Missed Trials* (2016).

Paul Berg

Member

Paul Berg is currently Robert W. and Vivian K. Cahill Professor Emeritus and Director Emeritus of the Beckman Center for Molecular and Genetic Medicine, Stanford University School of Medicine. He received his undergraduate degree from Pennsylvania State University and a PhD in biochemistry from Case Western Reserve University. He joined the faculty of the Stanford School of Medicine in 1959.

Berg has received international recognition for his work on the genetic mechanisms through which cells form proteins. He was awarded the Lasker Basic Medical Research Award and the Nobel Prize in Chemistry for developing methods to map the structure and function of DNA and the development of the recombinant DNA technology. He has also received the National Medal of Science and is an elected member of the U.S. National Academy of Sciences, American Philosophical Society, French Academy of Science, and the Royal Society (London).

George Q. Daley

Member

George Q. Daley is the Samuel Lux IV Chair in Hematology/Oncology and the director of the Stem Cell Transplantation Program at Boston Children's Hospital, professor of biological chemistry and molecular pharmacology at Harvard Medical School, and an investigator of the Howard Hughes Medical Institute. His research explores mechanisms of hematopoietic development, stem cell reprogramming, and cancer.

Daley received his bachelor's degree from Harvard University, a PhD in biology from the Massachusetts Institute of Technology, and his MD from Harvard Medical School. He is a member of the National Academy of Medicine and has received the National Institutes of Health Director's Pioneer Award and the E. Donnall Thomas Prize from the American Society for Hematology.

Jennifer A. Doudna

Member

Jennifer A. Doudna, PhD, is the Li Ka Shing Chancellor's Chair in Biomedical and Health Sciences and a professor of molecular and cell biology and of chemistry at the University of California, Berkeley. Doudna's research seeks to understand how RNA molecules control the expression of genetic information. Her research led to insights about CRISPR-Cas9-mediated bacterial immunity that enabled her lab and that of collaborator Emmanuelle Charpentier to re-design this system for efficient genome engineering in animals and plants, creating a transformative technology that is revolutionizing the fields of genetics, molecular biology, and medicine.

She is a Howard Hughes Medical Institute investigator and a member of the National Academy of Sciences, National Academy of Medicine, American Academy of Arts and Sciences, and the National Academy of Inventors. She is a recipient of awards that include the National Science Foundation's Waterman Award, the Foundation for the National Institutes of Health's Lurie Prize in Biomedical Sciences, the Paul Janssen Award for Biomedical Research, the Breakthrough Prize in Life Sciences, the Princess of Asturias Award (Spain), the Gruber Genetics Prize, and the Massry Prize.

Eric S. Lander

Member

Eric S. Lander is the founding director of the Broad Institute of Harvard and MIT. A geneticist, molecular biologist, and mathematician, he pioneered key principles for discovering the genes underlying human diseases and helped to bring these principles into reality as one of the leaders of the international Human Genome Project. His research has ranged over many aspects of the human genome -- including the genetic basis of inherited diseases and cancer, human population history, evolutionary forces, regulatory elements, long non-coding RNAs, and three-dimensional folding of the genome.

Lander was appointed by President Obama in 2008 to co-chair the President's Council of Advisors on Science and Technology, which advises the White House on matters including health, manufacturing, energy, communications, nanotechnology and national security. He earned his BA from Princeton and PhD from Oxford as a Rhodes Scholar and has co-founded several successful biotechnology firms.

Robin Lovell-Badge

Member

Robin Lovell-Badge is a group leader and head of the Division of Stem Cell Biology and Developmental Genetics at the Francis Crick Institute. He obtained his B.Sc. in zoology and PhD in embryology at University College London, carrying out mouse stem cell and embryo research with Martin Evans. After postdoctoral research in Cambridge and then in Paris, he established his independent laboratory in 1982 at the Medical Research Council (MRC) Mammalian Development Unit, University College, London, directed by Anne McLaren.

In 1988, Lovell-Badge moved to the MRC National Institute for Medical Research, becoming head of division in 1993. He has had long-standing interests in the biology of stem cells, in how genes work in the context of embryo development, and how decisions of cell fate are made. Major themes of his current work include sex determination, development of the nervous system and pituitary, and the biology of stem cells within the early embryo, the central nervous system, and the pituitary. He is also very active in both public engagement and policy work, notably around stem cells, genetics, human embryo and animal research, and in ways science is regulated and disseminated.

Lovell-Badge is a member of the European Molecular Biology Organization, fellow of the Academy of Medical Sciences, and fellow of the Royal Society. He has received the Louis Jeantet Prize for Medicine, the Amory Prize (Awarded by the American Academy of Arts and Sciences), the Feldberg Foundation Prize, and the Waddington Medal of the British Society for Developmental Biology. He is also a distinguished visiting professor at the University of Hong Kong and the president of the Institute of Animal Technologists.

Pilar N. Ossorio

Member

Pilar N. Ossorio, PhD, JD, is a professor of law and bioethics, co-director of the Neurobiology and Law Program, and co-director of the Research Ethics Consultation Service at the University of Wisconsin-Madison. Ossorio is also the Inaugural Ethics Scholar-in-Residence at the Morgridge Institute for Research. Her research interests include governance of large-scale bioscience research, ethical issues in computational biology and big data science, regulation of research with human participants, data sharing in bioscience, ethical issues in genetics, and the use of racial categories in biomedical research and health care.

Ossorio has served on advisory committees for the National Institutes of Health, Food and Drug Administration, Institute of Medicine, Health Canada, and the White House. She is currently a member of the Secretary's Advisory Committee on Human Research Protections, advising the U.S. Department of Health and Human Services on regulatory reform and improvements in regulatory implementation, and also a member of the Council of Advisors for the National Heart, Lung, and Blood Institute. She has been involved in several large genomics projects, including the 1,000 Genomes Project and the U.S. Human Microbiome Project.

Duanqing Pei

Member

Duanqing Pei, PhD, is a professor of stem cell biology and also serves as the director general at the Guangzhou Institutes of Biomedicine and Health (GIBH), in Guangzhou, China. He obtained his PhD from the University of Pennsylvania in 1991 and trained as a postdoctoral fellow at the University of Michigan before becoming a faculty member at the University of Minnesota School of Medicine in 1996. He joined the Medical Faculty at Tsinghua University in Beijing in 2002 and moved to the newly formed GIBH in 2004.

Pei studied the transcription regulation of hepatitis B virus (HBV) for his thesis by identifying C/EBP as a repressor for HBV transcription and dissecting the transactivation domains in C/EBP. Then he shifted his research interest into the field of extracellular matrix remodeling by studying the structure and function of matrix metalloproteinases (MMPs). He cloned several novel members of the MMP family, uncovered the unique intracellular activation mechanism of MMPs with the proprotein convertase system, and the intracellular trafficking of membrane-bound MMPs.

Upon returning to China, he once again changed his field of study and started working on pluripotency first and then reprogramming. The Pei lab in Tsinghua began to publish in the stem cell field on the structure and function of Oct4, Sox2, FoxD3, Esrrb, and Nanog, and their interdependent relationship toward pluripotency. Based the understanding of these factors, the Pei lab was the first in China to create mouse iPSCs using a non-selective system, and then improved the iPS process systematically. The Pei lab subsequently disseminated the iPS technology in China by providing not only resources but also training workshops. Recent publications from the Pei lab includes the discovery of vitamin C as a potent booster for iPSC generation and a mesenchymal to epithelial transition initiates the reprogramming process of mouse fibroblasts. Now, his lab continues to explore new ways to improve iPS technology, dissect the reprogramming mechanisms driven by Oct4/Sox2/Klf4 or fewer factors, and employ iPSCs to model human diseases in vitro.

Adrian Thrasher

Member

Adrian Thrasher is professor of paediatric immunology, Wellcome Trust Principal Research Fellow, and head of the Infection, Immunity, Inflammation, and Physiological Medicine Academic Programme at the University College London Institute of Child Health (ICH). He is also director of the Clinical Gene Therapy Programme and Gene Stem and Cellular Therapies theme leader of the Biomedical Research Centre at ICH / Great Ormond Street Hospital for Children (GOSH). Thrasher is principal investigator on several clinical trials for immunodeficiency and directs the clinical gene therapy Good Manufacturing Practices (GMP) facility, managing a team of trial coordinators, clinical scientists, and quality systems personnel.

Thrasher has a long-standing research and clinical interest in development and application of gene therapy. His clinical focus is the diagnosis and treatment of patients with primary immunodeficiency (PID). His specialist interests include the pathophysiology of primary immunodeficiency syndromes especially Wiskott-Aldrich Syndrome (WAS), disorders of innate immunity, Autoimmune Lymphoproliferative Syndrome, the actin cytoskeleton in haematopoietic cells, and thymus transplantation. His team at ICH / GOSH is conducting trials of somatic gene therapy for various forms of PID including SCID-X1, CGD, ADA-SCID, and WAS.

Ernst-Ludwig Winnacker

Member

Ernst-Ludwig Winnacker is currently professor emeritus at the University of Munich. He studied chemistry at ETH Zurich, Switzerland, where he obtained his PhD. He did postdoctoral research at the University of California, Berkeley, and the Karolinska Institute. Winnacker held professorships at the University of Cologne and the University of Munich's Institute of Biochemistry, and from 1984-1997 he was director of the Laboratory of Molecular Biology at the Gene Center in Munich. Winnacker's main research interests are virus/cell interactions and the mechanisms of gene expression in higher cells and prion diseases.

Winnacker served as president of the German Research Foundation and as first secretary general of the European Research Council. He was also secretary general of the Human Frontier Science Program Organization. Winnacker was awarded an honorary doctorate from the Veterinary University of Vienna, and the Medical Faculties of the Universities of Würzburg and Munich. He is a member of Leopoldina and the U.S. National Academy of Medicine. He has received several awards, among them the Order of the Rising Sun Gold and Silver Star from Japan, the International Science and Technology Cooperation Award from the People's Republic of China, the Leibniz Medal, and the Robert Koch Medal.

Anne-Marie C. Mazza

Staff Officer