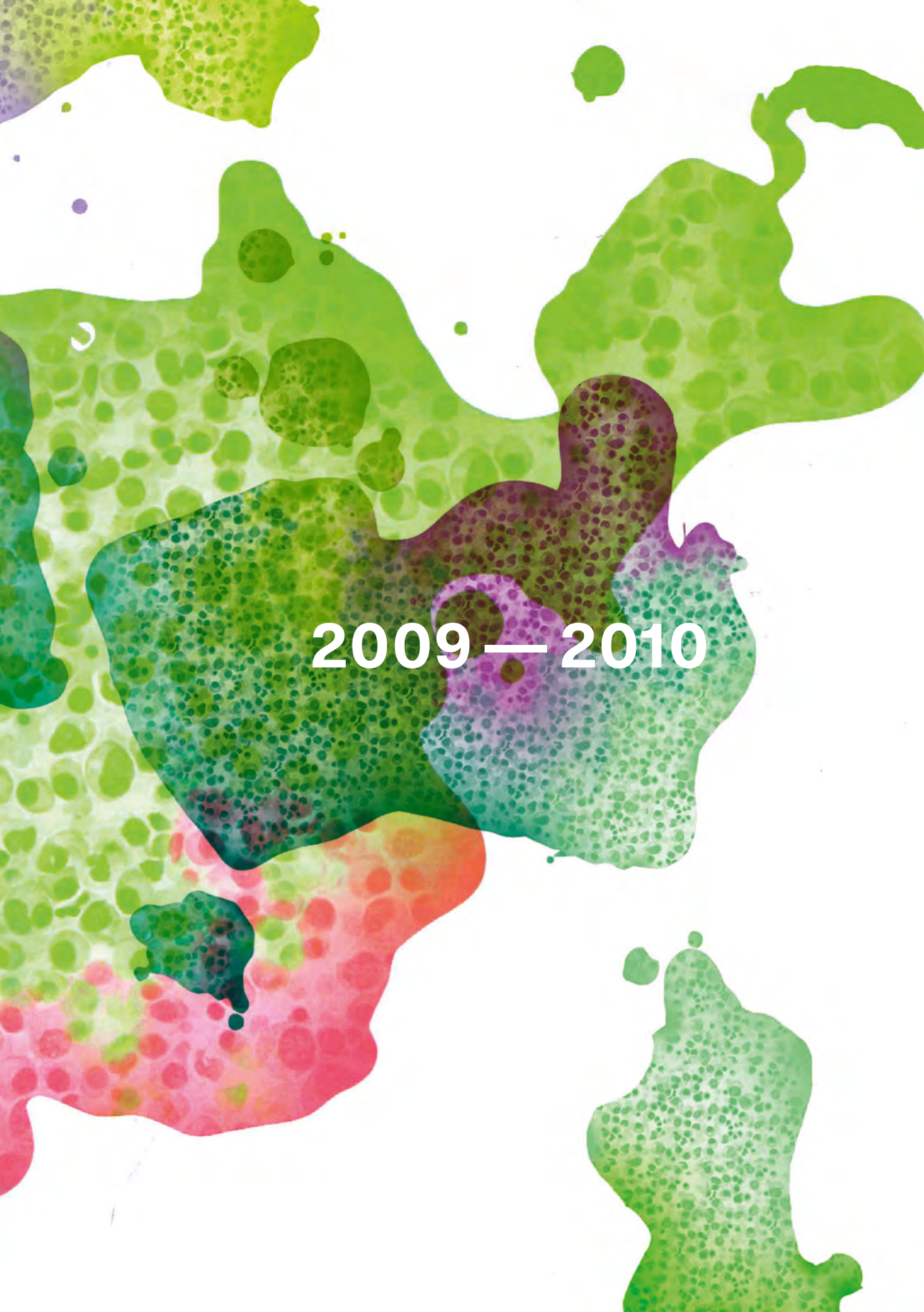
Mendel Lectures
2009—2010


2009—2010

Meinrad Busslinger

*1952

Research Institute of Molecular Pathology IMP, Vienna, Austria

October 15, 2009

Meinrad Busslinger is a biochemist and immunologist, renowned for his work on B cells.

Busslinger studied natural sciences at the Swiss Federal Institute of Technology (ETH) in Zurich, where he majored in biochemistry in 1976. He received a PhD degree in molecular biology in 1981 from the University of Zurich. After a postdoctoral stay at the MRC Institute Mill Hill in London, he became a group leader at the Institute of Molecular Biology II of the University of Zurich (1983). Here, he discovered a new set of histone genes of the sea urchin and identified a tissue-specific transcription factor (TSAP) as an essential regulator of these genes.

In 1987, Busslinger was recruited to join the newly founded Research Institute of Molecular Pathology (IMP) in Vienna, Austria, as one of the first senior scientists. In 1996, he was appointed professor at the University of Vienna. In 2007, he became the IMP's Director of Academic Affairs and, in 2013 Scientific Deputy Director. At the IMP, Busslinger shifted his research focus from sea urchin embryogenesis to B cell immunology, promoted by the identification of a B-cell-specific transcription factor as a mammalian homologue of the sea urchin regulator TSAP. This B-cell-specific transcription factor, Pax5, was defined as an essential regulator of B cell development. To date, Pax5 is known to function as a guardian of B cell identity from early to late B cell development and to function as an important tumour suppressor or oncoprotein in B cell leukaemia. He has also investigated the role of other transcription factors in regulating distinct aspects of B cell development and immunity.

Busslinger became a member of the European Molecular Biology Organization (EMBO) in 1990, the Academia Europaea in 2000, the Austrian Academy of Sciences in 2009, and the Swiss Society for Allergology and Immunology in 2015. He received the Wittgenstein Award in 2001, the Virchow Medal from the University of Würzburg in 2010, and the Prize of the City of Vienna for Natural Sciences in 2020.

Lineage Commitment and Developmental Plasticity of Lymphocytes

Jason Chin

*1973

Medical Research Council Laboratory of Molecular Biology, Cambridge, UK

October 22, 2009

Jason Chin is a British chemist and biologist, whose work focuses on approaches to systematically expand the genetic code of eukaryotic cells.

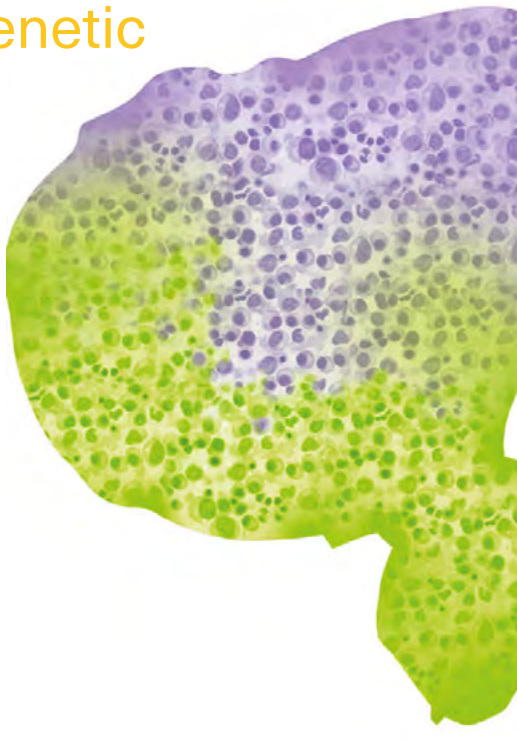
Chin was an undergraduate at Oxford University, where he obtained his MA in chemistry in 1996. For his PhD studies he moved to Yale University, obtaining his degree in 2001. He was a Damon Runyon Fellow at the Scripps Research Institute where he developed the first approaches that are now widely used for defining protein interactions by genetically encoding photocrosslinking amino acids. Chin moved to Cambridge in 2003. He became an EMBO Young Investigator in 2005 and a tenured group leader in 2007. He was awarded the Francis Crick Prize by the Royal Society in 2009.

During his career he has pioneered the development and application of methods for reprogramming the genetic code of living organisms, allowing for the site-specific incorporation of designed unnatural amino acids into proteins in diverse cells and organisms. These approaches make previously inaccessible protein carry post-translational modifications (lysine acetylation, methylation and ubiquitination) possible, providing new insights into their role in the regulation of protein structure and function. Additional approaches include rapid control of enzymatic activity and protein transport in cells with millisecond pulses of light as well as allowing rapid, specific and efficient labelling of proteins *in vivo*.

Chin received the Royal Society of Chemistry's Corday Morgan Prize in 2010. The same year he was also awarded the EMBO Gold Medal and was elected a member of EMBO. He was the inaugural recipient (2011) of the Louis-Jeantet Young Investigator Career Award, was inducted into the European Inventors Hall of Fame in 2013, and was elected a Fellow of the Academy of Medical Sciences in 2016.

Chin is currently a programme leader at the Medical Research Council Laboratory of Molecular Biology (MRC-LMB), where he is also head of the Centre for Chemical and Synthetic Biology (CCSB). He holds a joint appointment in the Department of Chemistry at the University of Cambridge and is also a fellow in Natural Sciences at Trinity College, Cambridge.

New Genetic Codes



James E. Haber

*1943

Brandeis University, Waltham, USA

November 23, 2009

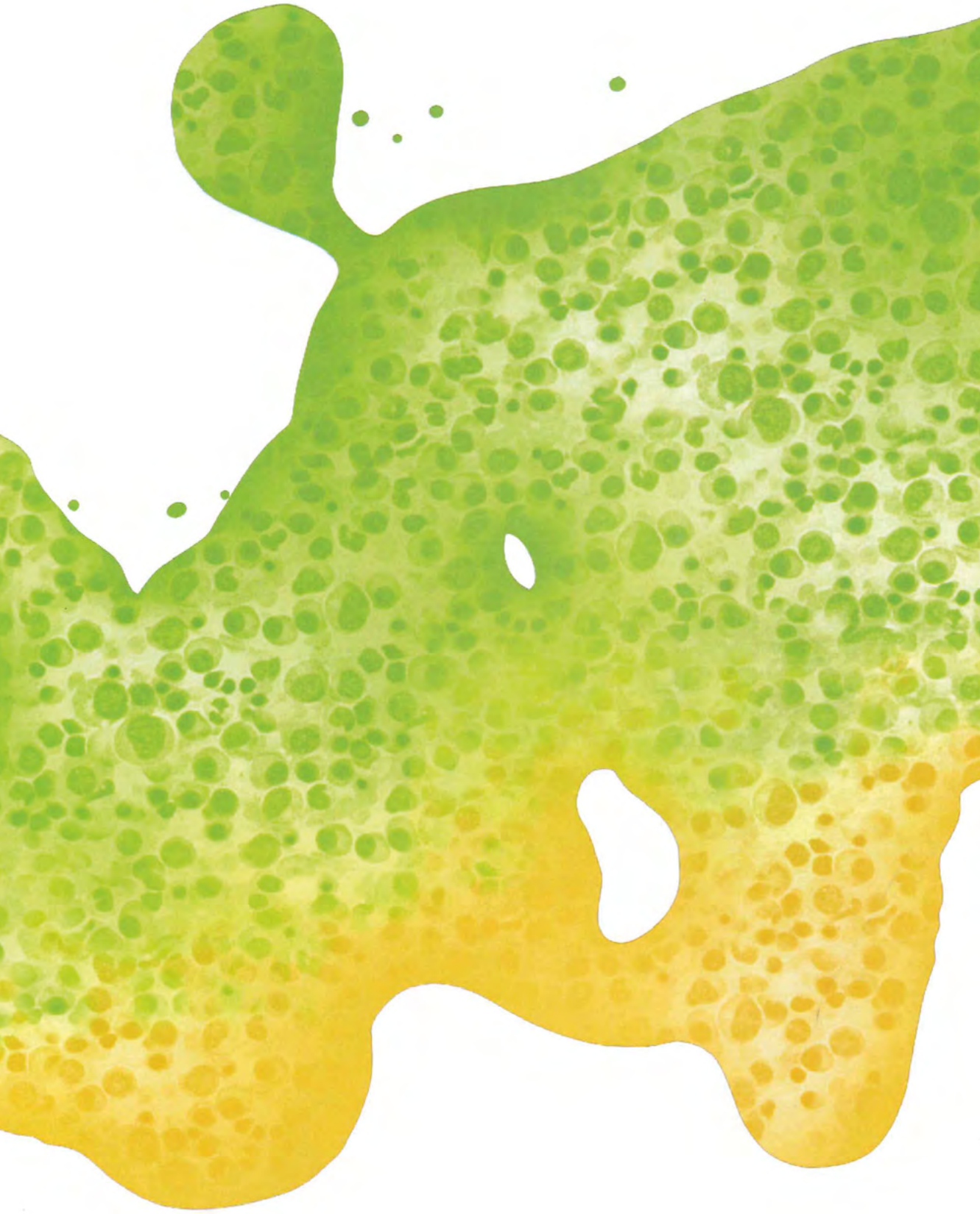
James E. Haber received his PhD in biochemistry at the University of California, Berkeley. During his postdoctoral work at the University of Wisconsin, Madison and at the first Cold Spring Harbor Yeast Genetics course he was introduced to the genetics of the yeast *Saccharomyces cerevisiae*. He joined the Department of Biology at Brandeis University in 1972.

Haber has focused his research on genome instability, especially the repair of chromosome double-strand DNA breaks and the role of DNA damage checkpoints. He has pioneered the real-time monitoring of DNA repair by using Southern blots, PCR and chromatin immuno-precipitations. Using this approach, Haber defined distinct molecular steps in different mechanisms of repair of double-strand breaks and identified the factors influencing them. His lab also investigates the DNA damage response by which cells arrest mitosis when they suffer a single chromosome break. Recently his lab has also used microscopic monitoring of DNA segments to determine how they locate a template to enable repair to take place.

Haber became a Fellow of the American Academy of Microbiology in 1996, a John Simon Guggenheim Fellow in 1999, and a Fellow of the American Association for the Advancement of Science in 2005. He was elected Director of the Genetics Society of America in 2003 and then Secretary in 2006.

In 2009 he became a Fellow of the American Academy of Arts and Sciences and in 2010 a member of the National Academy of Sciences. In 2011 he received the Genetics Society of America's Thomas Hunt Morgan Medal for Lifetime Achievement in Genetics. He is now the Abraham and Etta Goodman Professor of Biology and Director of the Rosenstiel Basic Medical Sciences Research Center at Brandeis University. In 2017 Haber was a Specially Appointed Professor at the Tokyo Institute of Technology. He has published a textbook entitled *Genome Stability*.

Multiple Mechanisms to Repair a Broken Chromosome



Azim Surani

*1945

Gurdon Institute, University of Cambridge, UK

April 28, 2010

Azim Surani, a developmental biologist, was born in Kenya and received his PhD in 1975 at Cambridge University under the supervision of Sir Robert Edwards. He joined the Animal Research Station in 1979 and Babraham Institute in 1986. On election as Marshall-Walton Professor in 1992, he joined the Wellcome Trust/ Cancer Research UK Gurdon Institute, Cambridge University, where he has been Director of Germline and Epigenetics Research since 2013.

Surani co-discovered mammalian genomic imprinting in 1984, and established the underlying epigenetic mechanism for the functional differences between the mammalian parental genomes during development and the roles of individual imprinted genes. He also discovered the genetic basis for mouse and human germ cell specification and the mechanism of epigenetic resetting, including the erasure of DNA methylation, towards a ground state for genomic totipotency. His continuing research focuses on establishing models of human germline development from pluripotent stem cells in culture to explore the properties of the germline and their contributions to human development and disease.

Surani was elected a Fellow of the Royal Society in 1990 and a Fellow of the Academy of Medical Sciences in 2001. He has received several awards for his work, including the Gabor Medal in 2001 and the Rosenstiel Award with Davor Solter and Mary Lyon for "pioneering work on epigenetic gene regulation in mammalian embryos" in 2006.

Azim Surani was awarded a Royal Medal in 2010, received the McEwan Award for Innovation from the International Society for Stem Cell Research in 2014, and the Canada Gairdner International Award in 2018 with Davor Solter for the discovery of mammalian genomic imprinting and epigenetics that causes parent-of-origin specific gene expression and its consequences for development and disease.

Germ Cell Specification in Mice

Kai Simons

*1938

Max-Planck-Institute of Molecular Cell Biology and Genetics, Dresden, Germany

May 13, 2010

Kai Simons is a Finnish professor of biochemistry and cell biology and a physician. He introduced the concept of lipid rafts, as well as coined the term "trans-Golgi network" and proposed its role in protein and lipid sorting.

Kai Simons received his MD degree from the University of Helsinki in 1964, and his doctoral thesis focused on vitamin B12 absorption. After that he began a post-doctoral fellowship at Rockefeller University in New York, where he worked on blood plasma proteins. He returned to Helsinki in 1967, where he became a Fellow of the Finnish Medical Research Council at the University of Helsinki. He was a biochemistry professor in from 1971 to 1979 at the medical faculty of this university. There he started his classical work on Semliki Forest virus. The envelope of the virus became the simplest biomembrane known and was used as a tool for studying membrane structure and assembly. These studies led to the elucidation of the life cycle of the virus and demonstrated how the virus gets into and out of the host cell.

In 1975, he moved to the European Molecular Biology Laboratory (EMBL) in Heidelberg, Germany, where he started the Cell Biology Program. During this time, together with Gerrit van Meer, Simons proposed a new model for membrane organization and coined the term "lipid rafts" for the dynamic nanodomains that support membrane sub-compartmentalization and play an important role in different membrane functions including signal transduction.

In 2001 Kai Simons moved to Dresden to help establish the new Max Planck Institute for Molecular Cell Biology and Genetics. Since 2006 he has been a director emeritus there. In 2007–2008 Simons was co-director of the Shanghai Institute for Advanced Studies of the Chinese Academy of Science.

For his contributions to cell biology, Simons has received the Anders Jahre Prize for Medical Research; the Runeberg Prize, Finland; the Laurens van Deenen Medal, University of Utrecht; the Schleiden Medal of the Academy Leopoldina; and the Äyräpää Prize, Finland, as well as the Robert Koch Gold Medal. Simons is a foreign member of the National Academy of Sciences, USA, and was the President of the European Life Scientist Organization.

In 2012 he started a biotech company called Lipotype GmbH, of which he is the CEO. With Lipotype, Kai Simons is now focusing on translating lipidomics and lipid analysis to clinical and industrial applications.

Cell Membrane Organization and Lipid Rafts


What a privilege it was to talk about my own research in the monastery where Mendel did his work with revolutionary results.

Ueli Schibler

*1947

University of Geneva, Switzerland

May 13, 2010

Ueli Schibler is a Swiss biologist. His research has contributed significantly to the field of chronobiology and the understanding of circadian clocks in the body.

Schibler studied biology at the University of Bern, where he obtained his PhD in 1975. From 1975–78 Schibler worked as a postdoctoral fellow at the Fox Chase Cancer Center in Philadelphia. He then joined the Swiss Institute for Experimental Cancer Research (ISREC) and in 1984 was appointed as a full professor at the University of Geneva.

Schibler was thrust into the world of chronobiology on a single chance discovery. While examining transcription of serum albumin gene in the liver, his research team discovered a DNA Binding Protein (DBP) for the albumin promoter that happened to be rhythmic in its expression. While they initially thought that the underlying mechanism was the rhythmic secretion of hormones, it became clear that the rhythmic expression of DBP was driven instead by self-sustained and cell-autonomous circadian oscillators that are operative in virtually all tissues. In addition, he studied the mechanism by which peripheral oscillators are synchronized, and discovered additional pathways involved in the phase-resetting of peripheral clocks including signalling by hormones, body temperature and actin dynamics.

Schibler is a member of several scientific associations, including the European Molecular Biology Organization, the European Academy of Sciences, the Swiss Academy of Medical Sciences, the Faculty of 1000, and the Union of Swiss Societies in Experimental Biology. Schibler has received the Friedrich Miescher Award of the Swiss Biochemical Society (1983), the Cloëtta Prize of Medicine (1986), the Otto Naegeli Prize of Medicine (1996), and the Louis-Jeantet Prize of Medicine (2000).

Circadian Gene Expression in Mammals: How Does the Brain Talk to the Body?