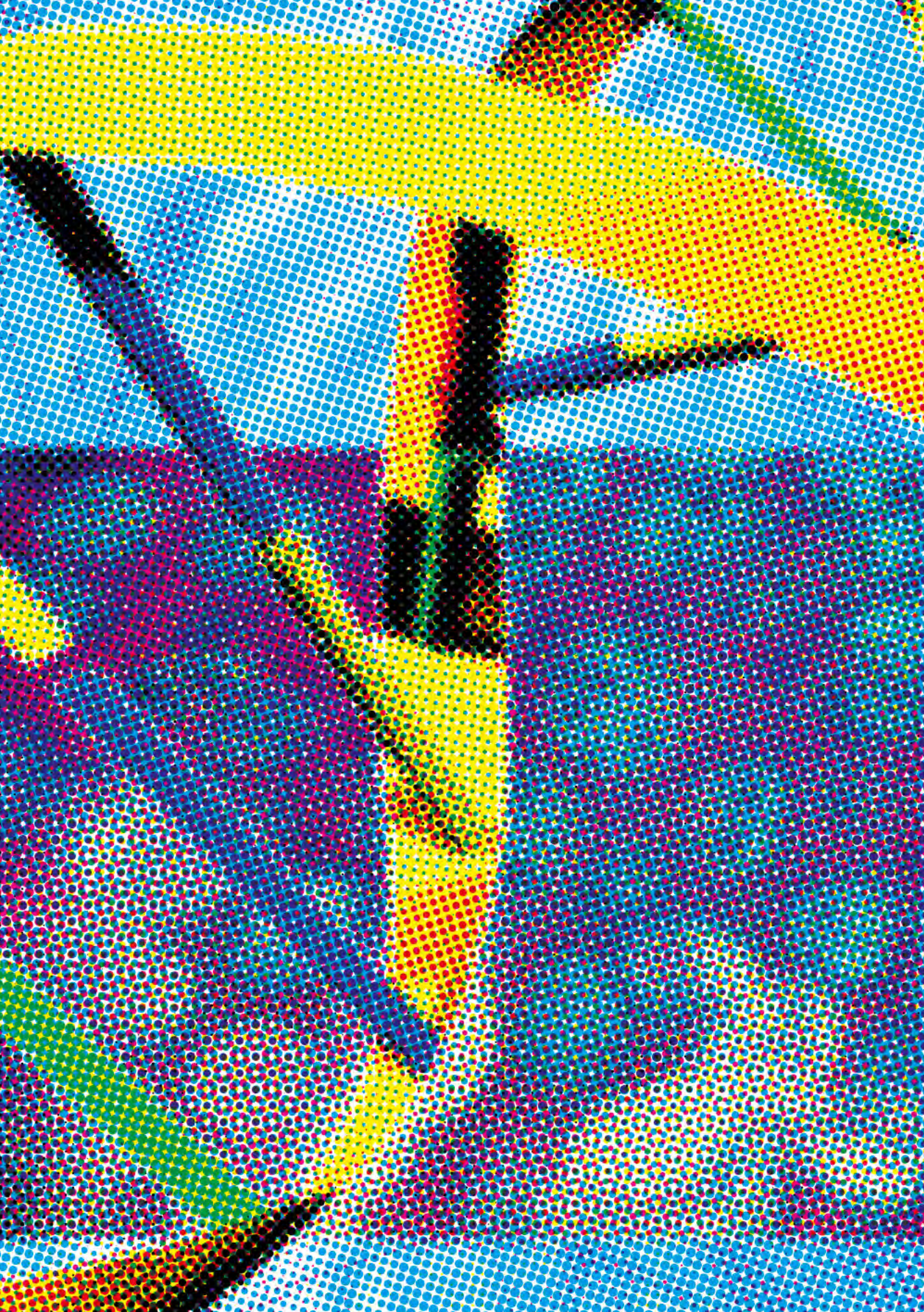


Mendel Lectures

2006—2007



The background is a dense halftone pattern of small dots in various colors, including blue, yellow, red, and green. In the upper left quadrant, there is a large, abstract, multi-colored shape that resembles a stylized letter 'A' or a similar geometric form, composed of many small, overlapping colored dots.

2006 — 2007

Sir John Gurdon

* 1933

The Gurdon Institute, University of Cambridge, UK

📅 October 12, 2006

Sir John Gurdon is British developmental biologist who was the first to demonstrate that egg cells are able to reprogram differentiated (mature) cell nuclei, reverting them to a pluripotent state, in which they regain the capacity to become any type of cell. Gurdon's work ultimately came to form the foundation for major advances in cloning and stem cell research.

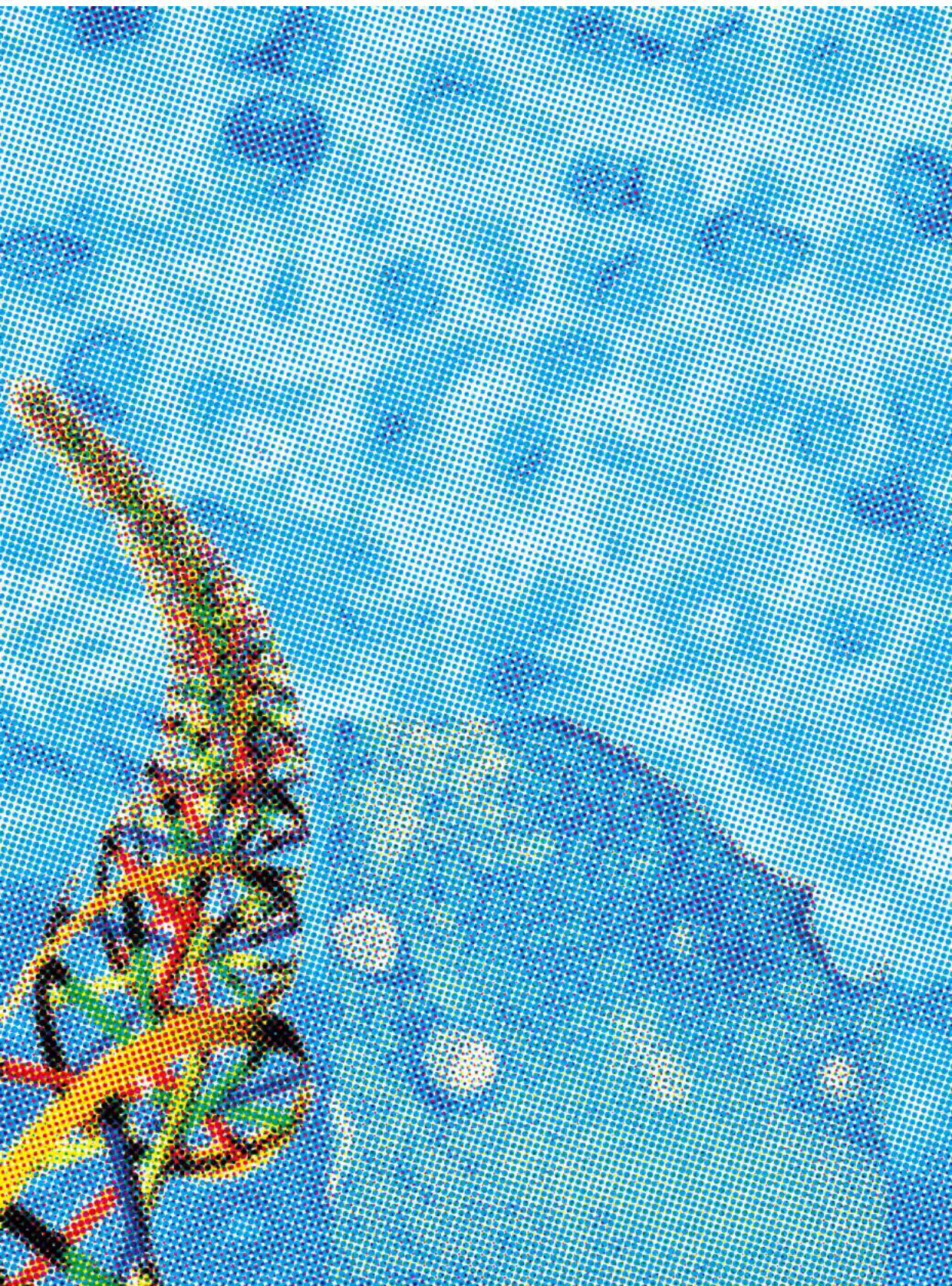
Gurdon studied classics at prestigious Eton College and intended to continue his classics studies at Christ Church, Oxford, but was not accepted. Instead, after being tutored in zoology, he gained acceptance to that department at Oxford, earning a BS in 1956. In that year he began his graduate studies in the laboratory of embryologist Michail Fischberg and initiated a series of experiments on nuclear transfer in the African frog *Xenopus laevis*. He proceeded to generate cloned tadpoles from differentiated *Xenopus* intestinal cell nuclei, demonstrating that egg cells could undifferentiate previously differentiated nuclei and that normal embryos could be produced by this technique. Gurdon's results were at that time greeted with scepticism. After completing a PhD in 1960, Gurdon received a yearlong postdoctoral fellowship to conduct research at the California Institute of Technology in Pasadena, where he investigated the genetics of bacteriophages. He then returned to Oxford, becoming a faculty member in the zoology department and continuing his work to characterize nuclear changes that take place during cell differentiation. He later moved to the Wellcome

Trust/Cancer Research Campaign Institute (later the Wellcome Trust/Cancer Research UK Gurdon Institute), a Cambridge-based institution that he cofounded in 1989 and that in 2004 was named for him. He directed the Institute until 2001, after which he focused on research full time.

Gurdon received numerous awards throughout his career - notably the 1985 Royal Medal of the Royal Society and the 2003 Copley Medal of the Royal Society. He was made a fellow of the Royal Society in 1971 and a foreign associate of the US National Academy of Sciences in 1980. He was knighted in 1995.

Sir John Gurdon was awarded the 2009 Albert Lasker Basic Medical Research Award, and the 2012 Nobel Prize in Physiology or Medicine "for the discovery that mature cells can be reprogrammed to become pluripotent" (shared with Shinya Yamanaka).

Nuclear Reprogramming as a Route to Cell Replacement



Ronald Plasterk

* 1957

Netherlands Institute for Developmental Biology, Utrecht, Netherlands

📅 October 26, 2006

Ronald Plasterk is director of the Hubrecht Laboratory. His research is in the area of genetics and functional genomics. He focuses on the mechanism and regulation of DNA transposition, and on the mechanisms of RNA interference and microRNAs, including the functions of RNAi as a natural defence against the uncontrolled duplication of transposons.

Plasterk studied biology at Leiden University and economics at the University of Amsterdam. In 1981, he obtained both an MSc degree *cum laude* in biology and a propaedeutic diploma in economics. In 1984, he was awarded a PhD degree in Mathematics and the Natural Sciences by Leiden University. His study focused on transposon sequences in DNA. As a doctoral researcher from 1981 to 1984, Plasterk also was a member of the Leiden city council for the Labour Party.

Between 1985 and 1986, he worked as a postdoctoral researcher at the California Institute of Technology in Pasadena. There he studied the transposon sequences in DNA in the parasite *Borrelia hermsii*. Between 1986 and 1987 he was a postdoc at the MRC Laboratory of Molecular Biology in Cambridge, where he studied *Caenorhabditis elegans*, a nematode that is used as a model organism.

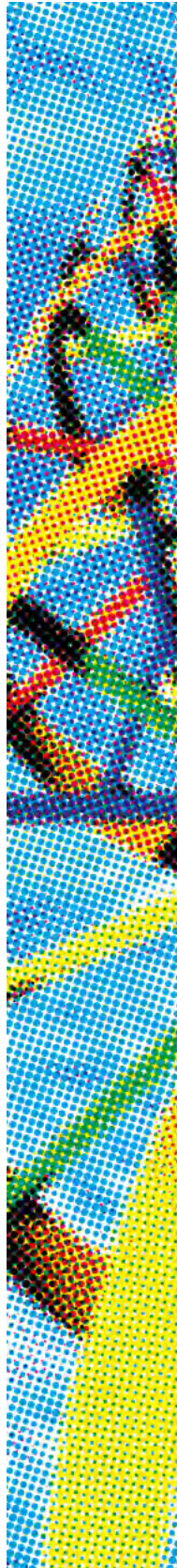
In 1987 he returned to the Netherlands where he became group leader and member of the board of the Netherlands Cancer Institute in Amsterdam. In 1989 he became director of the research school of oncology at the Institute, where he remained until 2000. In February 2000

he became director of the Netherlands Institute for Developmental Biology, also known as the Hubrecht Laboratory, an institute of the Royal Netherlands Academy of Arts and Sciences (KNAW). He combined this with a position as professor in developmental genetics at Utrecht University from May 2000.



Since 2001 Plasterk has been a member of the Royal Netherlands Academy of Arts and Sciences, a member of the Health Council, which advises the Minister of Health, Welfare and Sport, and member of many advisory boards, including the Wellcome Trust and EMBO.

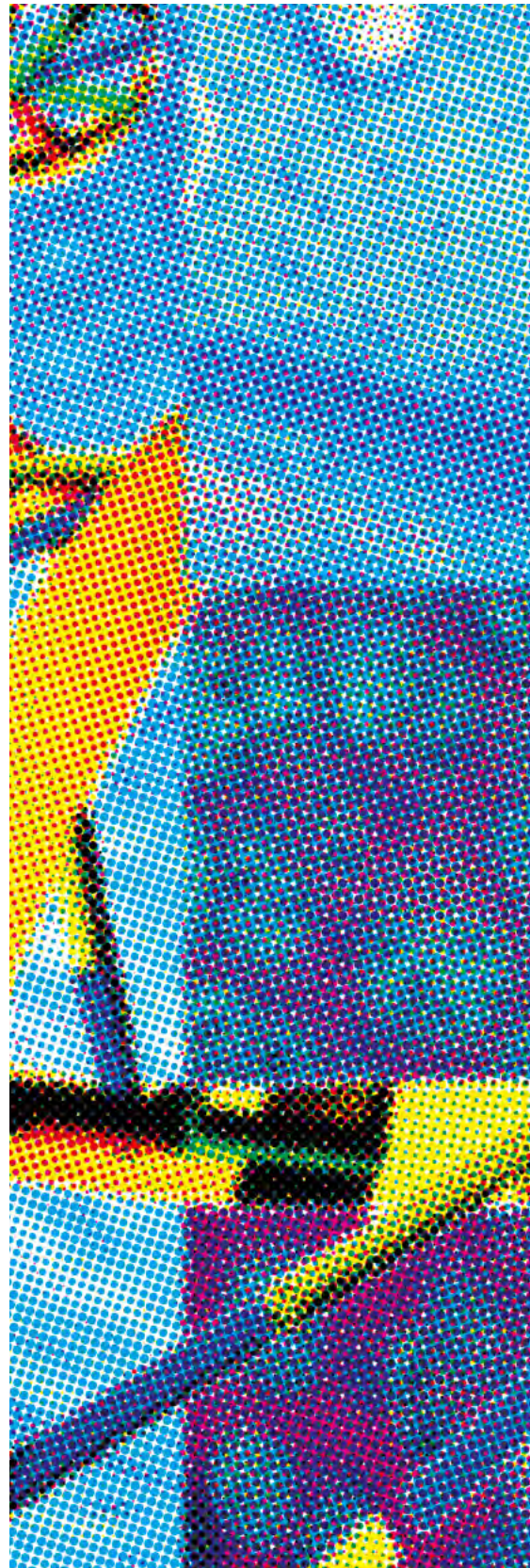
In 2007 Dr. Plasterk was appointed Minister of Education, Culture and Science. After his post as Minister he became a member of the House of Representatives for the Dutch Labour Party (PvdA) and acted as party spokesperson for





finances. In November 2012 Dr. Plasterk was appointed Minister of the Interior and Kingdom Relations. Plasterk retired from national politics in 2017 and in December 2017 was named as Chief Scientific Officer (CSO) for myTomorrows. Plasterk has also served as a professor of Novel Strategies to Access to Therapeutics at the University of Amsterdam since October 2018. In the same year Plasterk founded the startup company Frame Therapeutics, a pharmaceutical company that specializes in Cancer treatment vaccines. Plasterk is also a prolific author, having written more than a dozen books and articles since 1990 about molecular biology, molecular genetics, education and atheism.

miRNAs for Animal Development



Elizabeth Blackburn

* 1948

University of California, San Francisco, USA

 **October 31, 2006**

Elizabeth H. Blackburn is an Australian-born American molecular biologist and biochemist with a focus on telomeres and their maintenance.

In the early 1970s Blackburn earned her bachelor's and master's degrees in biochemistry from the University of Melbourne. She then enrolled as a graduate student in molecular biology at the University of Cambridge in England and received her PhD in 1975. In the same year she began her postdoctoral research in the laboratory of Joseph Gall at Yale University in New Haven, USA. Gall's research was concerned primarily with the structure and replication of chromosomes, and Blackburn brought her training in early DNA sequencing methods to investigate the ends of chromosomes of a protozoan called *Tetrahymena*. She sequenced the DNA of the organism's telomeres and in doing so discovered that telomeres are composed of variable numbers of short repeating segments of DNA.


In 1978 Blackburn became an assistant professor of molecular biology at the University of California, Berkeley, and continued her investigations of the telomeres of *Tetrahymena*. In 1980 she met Jack William Szostak, then studying yeast DNA recombination, and the two collaborated in order to understand telomere function, combining yeast and *Tetrahymena* as model organisms for their investigations. In 1985 Blackburn and Carol W. Greider, who was then a graduate student in Blackburn's laboratory, reported their discovery of telomerase, a novel enzyme that replenishes the ends

of chromosomes, and they continued studies of its fundamental role in maintaining chromosomes.

Blackburn became a professor at the University of California, San Francisco (UCSF) in 1990, and from 1993 to 1999 served as chair of the Department of Microbiology and Immunology. Blackburn's later research involved further investigation of the molecular composition and cellular functions of telomeres and telomerase, as well as studies on the interactions of these cellular components and their roles in cancer and human aging.

Throughout her career Blackburn has received many honorary degrees and awards, including the Gairdner Foundation International Award (1998) and the Albert Lasker Basic Medical Research Award (2006). Blackburn was elected a fellow of the Royal Society of London in 1992 and a Foreign Associate of the American National Academy of Sciences in 1993.

Elizabeth Blackburn was awarded the 2009 Nobel Prize in Physiology or Medicine, together with Carol Greider and Jack Szostak, for their discoveries of the molecular and functional nature of telomeres and of the enzyme telomerase. In 2015 she was appointed President of the Salk Institute, in California, retiring in 2018. Currently, as Professor Emerita at the University of California San Francisco, she continues pursuing her broad interests in science policy and her involvement in collaborative telomere biology studies in humans.



Responses of Cells and Organisms to Altered Telomere Maintenance

*Mendel's foundational insights
began an extraordinary flowering
of our understanding of biology
that only keeps growing.*

Rodney Rothstein

* 1947

Columbia University Irving Medical Center, New York, USA

📅 November 9, 2006

Rodney Rothstein is a professor of genetics and development and systems biology at the Columbia University Irving Medical Center in New York. He is a pioneer in the use of recombination to alter genomes and has employed these methods to isolate novel genes involved in the maintenance of genome stability. He is also an expert in yeast genetics, which he uses as a model system for studying how cells respond to DNA damage.



Rothstein graduated from the University of Illinois, Chicago with a degree in biology in 1969 and from the University of Chicago in 1975 with a PhD in genetics, followed by postdoctoral studies at the University of Rochester and Cornell University in Ithaca, New York. He was a faculty member at UMDNJ in Newark before joining the faculty of Columbia University Medical Center in 1984.

Research in the Rothstein lab has focused on several genes involved in maintaining

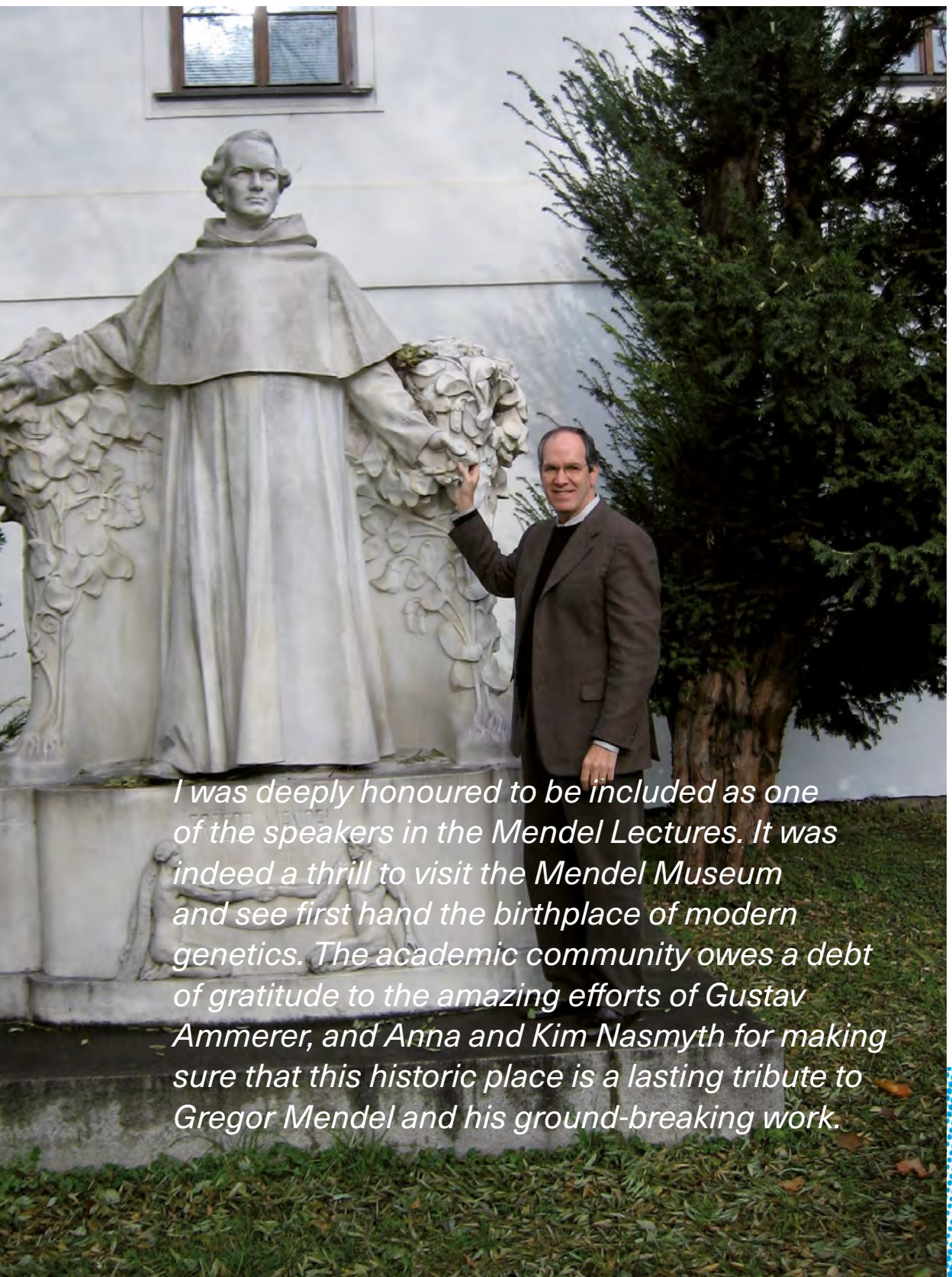
genome stability, including factors that are important in addressing aberrations such as double-strand breaks in DNA and the function of checkpoints for monitoring the progression of cellular processes throughout the cell cycle.

Dr. Rothstein has served as a member of the National Science Foundation Advisory Panel for Eukaryotic Genetic Biology (1984–1988) and of the National Advisory Council for Human Genome Research (1993–1997) and served on many study sections from 2005 to 2019. He received an NIH Merit Award in 2005 and has had continuous funding since starting his lab in 1979.

In 2009, Dr. Rothstein received the Edward Novitski Prize from the Genetics Society of America in recognition of his outstanding creativity in solving genetic problems. He was awarded Doctor Honoris Causa in Medicine from Umeå University, Sweden (2012). He is a fellow of the American Society for Microbiology (2007), the American Association for the Advancement of Science (2008) and the American Academy of Arts and Sciences (2011), and he is a member of the National Academy of Sciences (2015).

Choreography of the DNA Damage Response in Budding Yeast





I was deeply honoured to be included as one of the speakers in the Mendel Lectures. It was indeed a thrill to visit the Mendel Museum and see first hand the birthplace of modern genetics. The academic community owes a debt of gratitude to the amazing efforts of Gustav Ammerer, and Anna and Kim Nasmyth for making sure that this historic place is a lasting tribute to Gregor Mendel and his ground-breaking work.

Wilhelm Ansorge

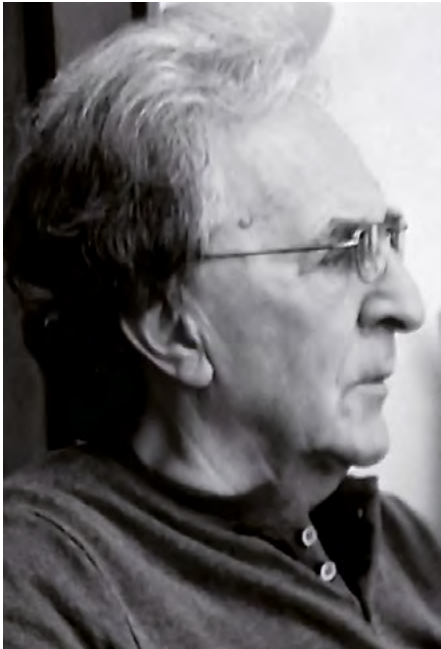
* 1944

ETH Zurich EMBL Heidelberg, and visiting EPFL – ETH Lausanne, Switzerland

📅 April 19, 2007

Wilhelm Jan Ansorge is a German-Czech scientist, born in Czechoslovakia. He developed novel scientific instrumentation and software enabling major advances in analyzing genomes, genes and proteins in cellular and molecular biology, as well as in various medical fields.

Ansorge graduated from the Faculty of Mathematics and Physics at Charles University in Prague. After completing his dissertation in 1968 and serving two years as assistant professor at the Faculty of Mathematics and Physics at Charles University, he joined Texas



Instruments for four years in Dallas, USA (working on the development of semiconductor technology). Then he worked for six years at CERN, the Particle Physics Research Centre in Geneva, in

the development of superconducting magnets for accelerators. Thereafter he worked for 25 years at EMBL, the European Molecular Biology Laboratory in Heidelberg, as the head of the Genomics Technology Department. At EMBL he developed the fluorescence DNA sequencer (1986), the first functional automated system capable of reliably sequencing large genomic DNA. The feasibility of sequencing the human genome with this automated technology was demonstrated by his team on human HPRT (60kb) gene locus (Genomics, 1990). This work for the first time applied the paired-end sequencing approach developed by the team for the project, increasing accuracy and simplifying mapping. This method is now standard in genome sequencing.

In 1991 he revealed a next-generation high throughput planar fluorescence technique for DNA sequencing by synthesis without gels with convertible terminators, and the DNA Chip technique.

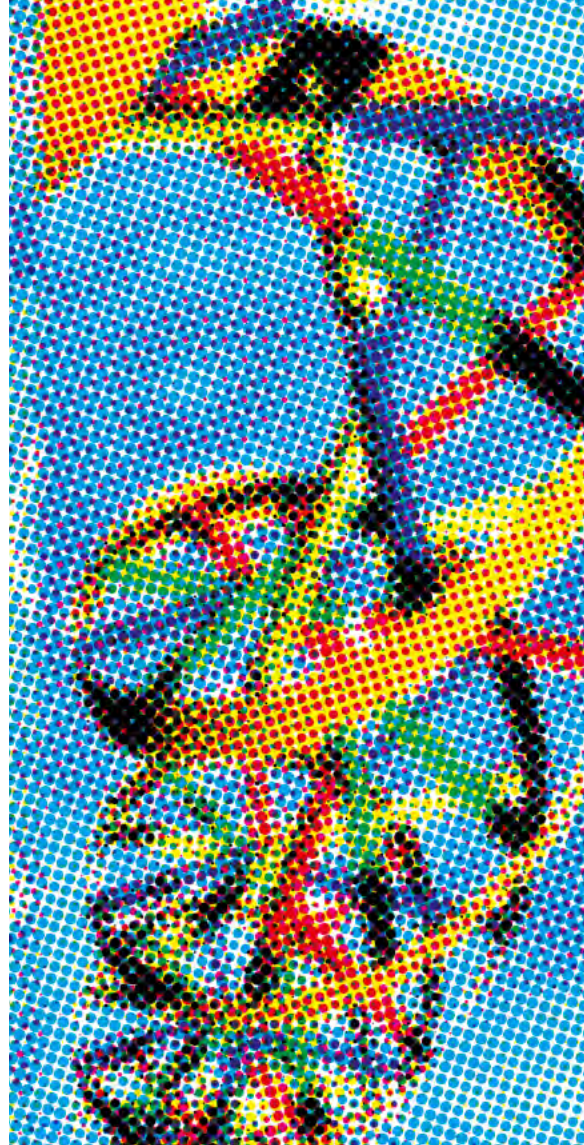
He developed automated systems for microinjection and image analysis in single cells, and the electro-transfection of cells. His team produced the first complete human genome Chip array, and a technique for fast screening of monoclonal antibodies.

In 1999, Dr. Ansorge was elected a member of EMBO, and in 1992 was named Honorary Doctor by Charles University. In 1993, Dr. Ansorge was granted the first European chair, sponsored by the European Union, and in 1994 named visiting professor at Charles University.

In 2009 he was elected a foreign member of the Council of the Czech Academy of Sciences.

During his career he authored over 400 publications, and applied for and was granted more than 30 patents in genomics and technology, leading to license agreements with and commercial products made by leading European companies.

Genomes, Proteomes and Single Cell Analysis



The Mendel Lectures organization, in taking care of the place of Mendel's historical activities, motivates young people to find interest and excitement in science. The visitor is overwhelmed by its cross-disciplinary, quantitative, and systematic work.

Richard Losick

* 1943

Harvard University, Cambridge, Massachusetts, USA

📅 April 26, 2007

Richard Marc Losick is an American molecular biologist. He is the Maria Moors Cabot Professor of Biology at Harvard University and a past Professor at the Howard Hughes Medical Institute.

He received his AB in chemistry at Princeton University in 1965 and his PhD in biochemistry at the Massachusetts



Institute of Technology in 1968. Upon completion of his graduate work, Professor Losick was named a Junior Fellow of the Harvard Society of Fellows when he began his studies on RNA polymerase and the regulation of gene transcription in bacteria. He joined the Harvard faculty in 1972.

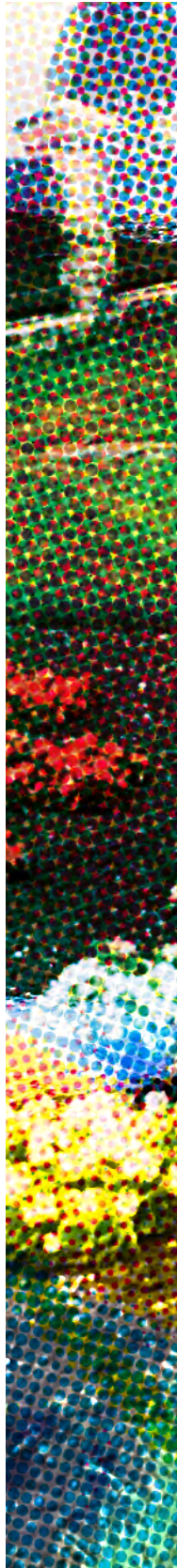
Richard Losick studies gene control in bacteria, including RNA polymerase, gene transcription and its control, and

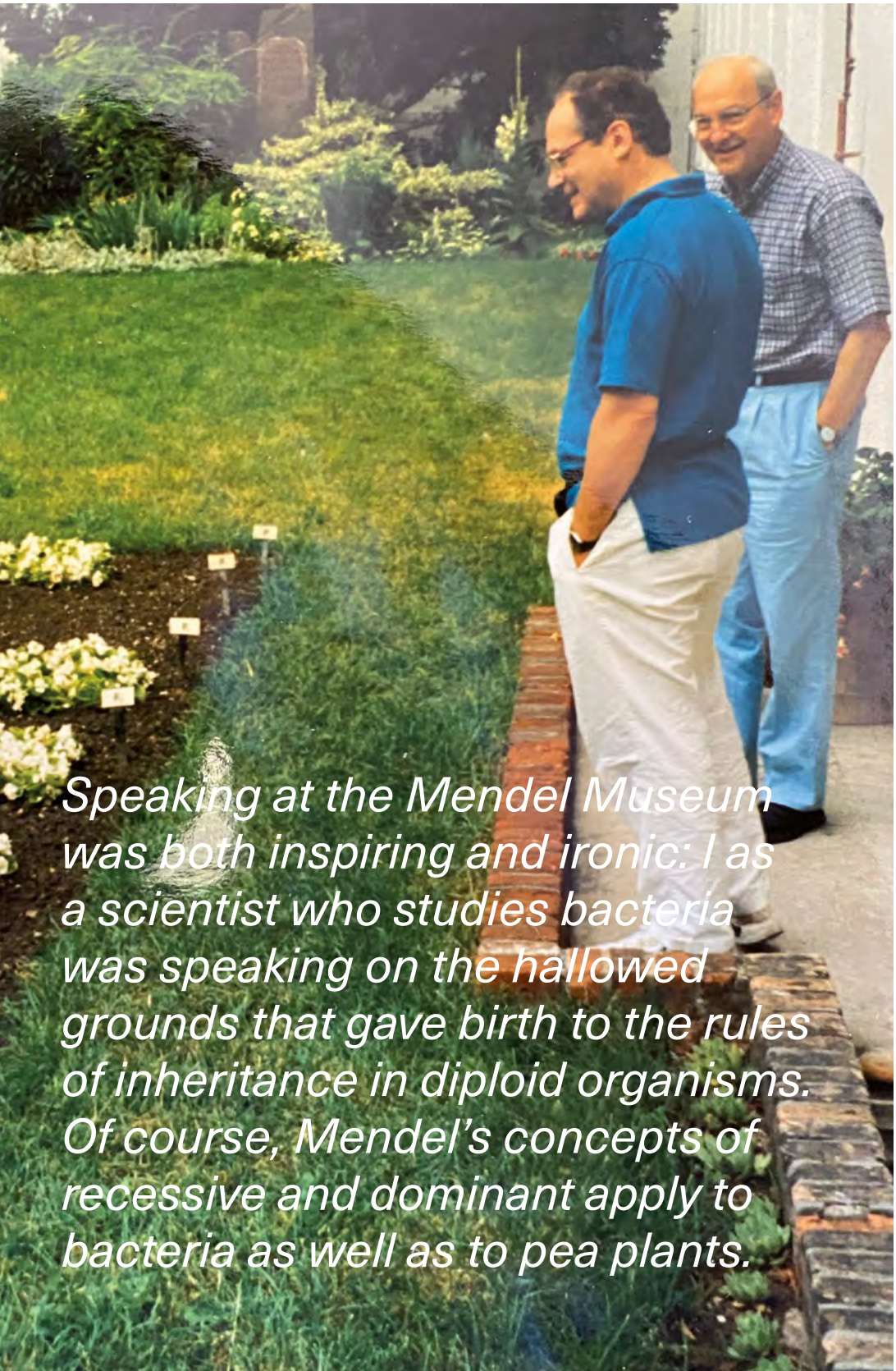
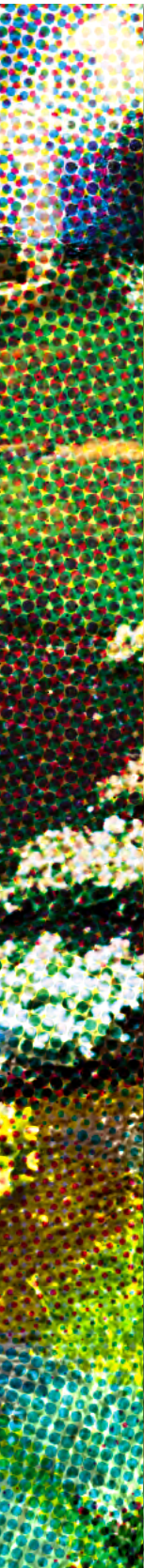
development in microorganisms, with a special interest in the developmental process of spore formation in the soil bacterium *Bacillus subtilis*.

Professor Losick is a past chairman of the Department of Cellular and Developmental Biology and the Department of Molecular and Cellular Biology at Harvard University. He received the Camille and Henry Dreyfuss Teacher-Scholar Award, and he is a member of the National Academy of Sciences, a Fellow of the American Academy of Arts and Sciences, a member of the American Philosophical Society, a Fellow of the American Association for the Advancement of Science, and a Fellow of the American Academy of Microbiology.

Professor Losick is the 2007 recipient of the Selman A. Waksman Award of the National Academy of Sciences. He was awarded the Canada Gairdner International Award in 2009 and the Louisa Gross Horwitz Prize for Biology or Biochemistry by Columbia University in 2012.

Surprises in How Microbes Cope with Uncertainty





Speaking at the Mendel Museum was both inspiring and ironic: I as a scientist who studies bacteria was speaking on the hallowed grounds that gave birth to the rules of inheritance in diploid organisms. Of course, Mendel's concepts of recessive and dominant apply to bacteria as well as to pea plants.

Jan Ellenberg

* 1967

European Molecular Biology Laboratory, Heidelberg, Germany

📅 May 10, 2007

Jan Ellenberg is a German molecular biologist. In 2004 he was the first to receive the Walther Flemming Medal, a prize that is awarded annually by the German Society for Cell Biology to scientists up to 38 years of age.

Ellenberg graduated in biology at the University of Hamburg in 1994. From 1995 to 1998 he worked on his pre-doctoral research at the National Institutes of Health (NIH) in Bethesda, USA. He received his PhD in biochemistry in 1998 at the Free University of Berlin, and then returned to the NIH for another year. In 1999 he became a group leader in the Gene Expression and Cell Biology / Biophysics programmes at the European Molecular Biology Laboratory in Heidelberg. Since 2004 he has been a coordinator of the EMBL Center for Molecular and Cellular Imaging and in 2006 he was appointed a coordinator of the Gene Expression Unit. Ellenberg became a senior scientist at EMBL the same year. In 2010, he became the head of the Cell Biology and Biophysics Unit, and since 2021 he has been the head of the new EMBL Imaging Centre.

The Ellenberg group studies cell division and nuclear organization, focusing on chromatin structure, the formation and segregation of chromosomes, as well as nuclear pore complex structure and assembly in human cells and mammalian pre-implantation embryos. For these purposes, the lab uses and develops advanced quantitative fluorescence microscopy techniques to not only visualize but also understand the underlying molecular mechanisms.

Jan Ellenberg has coordinated European and EMBL efforts to make imaging technologies more accessible to researchers. For his scientific merits within cell biology plus his engagement in the integration of bio-sciences, he was conferred the honorary degree of doctor of philosophy at the Åbo Akademi University in Turku, Finland, in 2016. In 2016 Jan Ellenberg received an ERC Advanced Grant for the study of cell division errors during early mammalian development. In 2017 he became a member of the Academia Europaea and was named Allen Distinguished Investigator of the Paul G. Allen Frontiers Group. In 2018 he was elected a member of the German Academy of Sciences Leopoldina.

Imaging How Living Cells Divide: From Single Proteins to Genome Wide Screening

