

2016 LOUIS-JEANTET PRIZE FOR MEDICINE

The 2016 Louis-Jeantet Prize for Medicine is awarded to **ANDREA BALLABIO**, founder and director of the Telethon Institute of Genetics and Medicine (TIGEM), Italy, and to the biochemist **JOHN DIFFLEY**, associate research director at the Francis Crick Institute, United Kingdom.

The LOUIS-JEANTET FOUNDATION grants the sum of CHF 700'000 for each of the two prizes, of which CHF 625'000 is for the continuation of the prize winner's research and CHF 75'000 for their personal use.

The PRIZE WINNERS are conducting fundamental biological research that is expected to be of considerable significance for medicine.

ANDREA BALLABIO of Italy is awarded the 2016 Louis-Jeantet Prize for Medicine for his contribution to our understanding of the molecular mechanisms controlling the function of lysosomes in health and disease.

Lysosomes are organelles responsible for the degradation of cellular waste. A growing number of diseases are associated to lysosomal dysfunction such as neurodegenerative diseases, cancer, obesity and infections. Andrea Ballabio's group identified a master gene that globally controls lysosomal function and promotes intracellular clearance of accumulating pathological materials. These observations revealed a new biological pathway and provided a tool to modulate lysosomal function to treat human diseases.

Andrea Ballabio will use the prize money to conduct further research on the biological mechanisms that regulate lysosomal function and on methods to modulate the activity of lysosomes in human diseases.

JOHN DIFFLEY, American/British dual national, is awarded the 2016 Louis-Jeantet Prize for Medicine for his contributions to understanding how DNA replication, a process essential to life, initiates.

When a cell in an organism divides to yield two identical daughter cells, its DNA is first duplicated, or "replicated", as two identical copies. John Diffley has become one of the worldwide leaders in the study of the mechanisms governing this process of duplication. His work has allowed us to understand how DNA replication is initiated, and how it is subsequently regulated throughout the cell cycle and in response to DNA damage. Since any mistakes in this process can lead to genetic mutations causing tumours, this research could be significant in the fight against cancer.

John Diffley will use the prize money to conduct further research into the mechanisms involved in the replication of chromosomes in yeast and human cells.

The AWARD CEREMONY will be held in Geneva (Switzerland) on **Wednesday, 20 April 2016**.

ANDREA BALLABIO

Born in 1957 in Naples, Italy, Andrea Ballabio studied Medicine at the Federico II University in Naples and took residency in Pediatrics at the same university. He was a post-doctoral fellow at Guy's Hospital in London, UK, and then at the International Institute of Genetics and Biophysics in Naples, Italy. He spent many years in the US where he became Associate Professor at the Department of Molecular and Human Genetics, Baylor College of Medicine, and Co-Director of the Baylor Human Genome Center, in Houston, Texas. In 1994 he moved back to Italy to become director and founder of the Telethon Institute of Genetics and Medicine (TIGEM), a flagship institute for the study of rare genetic diseases, which is managed by the Italian Telethon Foundation. He is currently also Professor of Medical Genetics at the Federico II University in Naples and Visiting Professor at both Baylor College of Medicine, and at the University of Oxford, UK.

Andrea Ballabio has received many awards and recognitions for his work. He was President of the European Society of Human Genetics, Council member of the European Molecular Biology Organization (EMBO). In 2007, the President of the Italian Republic appointed him Knight of the Order of Merit. He received the European Society of Human Genetics International Award (2007) and the Advanced Investigator Award of the European Research Council (2010). In 2006, he was Torchbearer at the XX Torino Olympic Winter Games.

An “orchestra conductor” for the lysosomes

Lysosomes, cellular organelles discovered by the Noble Prize winner Christian de Duve, are the central core of the machinery that cleans the cell by degrading and recycling materials produced by cell metabolism. Until recently lysosomes have been considered as cellular “waste bags” and the terminal end of cell metabolic pathways. Andrea Ballabio challenged this dogma and demonstrated that lysosomes act as signalling hubs regulating pathways that control fundamental cellular processes in response to environmental cues.

Andrea Ballabio's group discovered a master gene, TFEB, which controls the activity of lysosomes. This gene acts as an “orchestra conductor” regulating the expression of many other genes involved in the clearance of materials derived from cell metabolism. As defects in lysosomal function lead to common neurodegenerative diseases, as well as many rare inherited ones, the discovery of this novel biological pathway provides a promising therapeutic tool for disorders arising from the accumulation of pathological substrates.

JOHN DIFFLEY

John Diffley was born 1958 in New York (USA) and studied in his home town (New York University) where he received his BA and PhD. Following a period as a post-doctoral fellow at Cold Spring Harbor Laboratory in New-York, he left for the UK in 1990. He continued his research at the Clare Hall Laboratories, where he became the director in 2006. In the same year he was made Deputy Director of the London Research Institute, and in 2015 became Associate Research Director at the Francis Crick Institute.

John Diffley was elected as a member of the European Molecular Biology Organization (EMBO) in 1998. He is also a Fellow of the Royal Society, of the American Association for the Advancement of Science, the Academia Europaea, the Academy of Medical Sciences and the European Academy of Cancer Sciences. In 2003 he won the American Paul Marks prize for cancer research.

The start of genome duplication

Cell duplication, in which a cell becomes two daughter cells, is essential for all life, from bacteria to human beings. The first stage of this process involves the copying, or replication, of the DNA of the mother cell in a precisely regulated manner to make exactly two complete copies, one for each of the daughter cells. This “once per cell cycle” genome duplication is crucial for organisms to maintain a stable genetic composition during their lives and through evolution. In human cells, this means the precise duplication of over a billion base pairs each time a cell divides. To do this, replication initiation from 50-100,000 chromosomal sites, known as “replication origins”, must be tightly coordinated to ensure no origin is used more than once in a cell cycle.

John Diffley enjoys worldwide recognition for his work on the mechanism driving the initiation of DNA replication, using yeast, and human cells for his research. He and his team used chromosomal replication origins to characterise and ultimately reconstitute the protein machinery required to initiate DNA replication once in each cell cycle.

Any error in DNA replication or its initiation can result in genome instability that may contribute to the development of cancers. John Diffley's research work could therefore have significant implications for cancer biology.

THE LOUIS-JEANTET PRIZE FOR MEDICINE

Every year, the Louis-Jeantet Prize for Medicine distinguishes leading-edge researchers who are active in the Council of Europe member countries.

Established in 1986, the Louis-Jeantet Prize for medicine has thus so far been awarded to 84 researchers: 26 in the United Kingdom, 15 in Germany, 14 in Switzerland, 14 in France, three in Sweden, three in the Netherlands, two in Austria, two in Belgium, two in Finland, two in Norway and, for the first time this year, one in Italy. Among the 84 prize-winning researchers, 10 subsequently won the Nobel Prize for physiology or medicine, or the Nobel Prize for chemistry.

As one of the best-endowed awards in Europe, the Louis-Jeantet Prize for Medicine fosters scientific excellence. It is not intended as the consecration for work that has been completed, but to finance the continuation of innovative research projects with high added value and of more or less immediate practical significance in the treatment of diseases.

Since 1986, a total sum of approximately CHF 57m has been awarded by the Foundation to the 84 prize winners for the continuation of their work.

THE LOUIS-JEANTET FOUNDATION

The Louis-Jeantet Foundation, set up in 1982, is the legacy of Louis Jeantet, a French businessman and a citizen of Geneva by adoption. Its aim is to move medicine forward and to defend the role and identity of European biomedical research vs. international competition. Established in Geneva, the Foundation is part of an open Europe and devotes its efforts to recognizing and fostering medical progress for the common good.

The Louis-Jeantet Foundation allocates some CHF 4.5m each year to promoting biomedical research. It invests this sum in equal proportions for European and for local research projects. On the local level, the Foundation encourages teaching and the development of research at the Faculty of Medicine of the University of Geneva, and by financing research projects promotes cooperation between this faculty and the graduate schools and university hospitals of the Lake Geneva region.

Since 2010, EMBO and the Louis-Jeantet Foundation jointly promote the leading-edge research work of the winners of the Louis-Jeantet Prize for Medicine. In this context, the journal *EMBO Molecular Medicine* features special contributions by the prize winners and hosts the Louis-Jeantet prize winners' lectures given during the annual EMBO Congress.

For more information, please contact:

Pr Jürg A. SCHIFFERLI

Secretary of the Scientific Committee of the Louis-Jeantet Foundation

Phone: +41 79 771 8515

Email : j.schifferli@unibas.ch

Website: www.jeantet.ch

Andrea BALLABIO

Tél : +39 081 192 306 07

E-mail : ballabio@tigem.it

ufficiostampa.telethon@segrp.it

Site : www.tigem.it/research/faculty/ballabio

John DIFFLEY

Tél. : +44 1707 62 58 69

E-mail : john.diffley@crick.ac.uk

Site : <http://crick.ac.uk/john-diffley>

More information on the prize winners' work is available on our website: www.jeantet.ch