PRESS RELEASE
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2024 LOUIS-JEANTET PRIZES

The 2024 Louis-Jeantet Prizes are awarded to DIRK GÖRLICH, Director at the Max Planck Institute for Multidisciplinary Sciences in Göttingen, Germany, and to CHARLES SWANTON, Deputy Clinical Director at the Francis Crick Institute in London, UK.

2024 Louis-Jeantet Prize for Medicine

DIRK GÖRLICH, of German nationality, is awarded the 2024 Louis-Jeantet Prize for Medicine for elucidating how the directionality of cargo transfer between the cytoplasm and nucleus is achieved and for his discovery of the selective FG phase that governs transport through nuclear pores.

Dirk Görlich has made groundbreaking contributions to our understanding of the processes by which molecules move in and out of the nucleus. He identified key players and discovered mechanisms that lead to the selective import of some molecules and not others. Nucleocytoplasmic transport is fundamental for eukaryotic life, affecting almost every aspect of health and disease.

2024 Jeantet-Collen Prize for Translational Medicine

CHARLES SWANTON, of British nationality, is awarded the 2024 Jeantet-Collen Prize for Translational Medicine for his groundbreaking discoveries in cancer genetics and evolution, leading to insights into how tumours evolve, spread, and develop resistance to drugs.

Charles Swanton's research has yielded unprecedented insights into the driving forces and constraints that act on an evolving cancer. He demonstrated that tumour heterogeneity is driven by branched evolution and shaped by genome instability, therapy and immunity. His work transforms our understanding of cancer and how to treat it more effectively in the future.

The LOUIS-JEANTET FOUNDATION endows each of the two prizes with CHF 500,000, of which CHF 450,000 is intended to finance the continuation of the of the prize-winners' research and CHF 50,000 is for their personal use.

THE AWARD CEREMONY WILL BE HELD IN GENEVA (SWITZERLAND) ON **WEDNESDAY, APRIL 17th, 2024.**

DIRK GÖRLICH

Born in 1966, Dirk Görlich studied biochemistry at the University of Halle and did his doctoral studies with Tom A. Rapoport at the Max Delbrück Center in Berlin. After a two-year postdoctoral stay in the laboratory of Ron Laskey in Cambridge (UK), he joined the ZMBH (University of Heidelberg) where he became an independent group leader in 1996 and Professor of Molecular Biology in 2001. Since 2005, he has been Scientific Member and Director at the Max Planck Institute for Biophysical Chemistry in Göttingen, now the Max Planck Institute for Multidisciplinary Sciences.

Dirk Görlich was elected as a member of the European Molecular Biology Organization (EMBO) in 1997 and of the German National Academy of Sciences Leopoldina in 2005. He received the EMBO Gold Medal in 1997 and the WLA Prize in 2022.

An FG phase governing transport selectivity of nuclear pores

Cell nuclei cannot synthesise proteins and must import all the proteins they need from the cytoplasm. At the same time, they supply the cytoplasmic compartment with tRNA, mRNA, and assembled ribosomes. This nucleocytoplasmic transport proceeds through nuclear pore complexes (NPCs) and plays a fundamental role in eukaryotic cells. Dirk Görlich has made textbook contributions to this field: he discovered the first importins that shuttle between the two compartments, capturing cargoes in the cytoplasm and delivering them into the nucleus; he was instrumental in the discovery and characterisation of exportins; and he developed the RanGTP gradient model to explain the directionality and energetics of nuclear transport.

In transformative work that started in 2001, Görlich showed that the NPC is a quite special transport machine – equipped with a selective barrier that decides which molecules move in and out of the nucleus. It features a mysterious functional duality: for most particles it appears impenetrable. Importins, exportins, and related shuttling transporters, however, are sucked into NPCs and released on the other side. This can happen at a very high rate – up to a thousand times per pore per second. To function as a highly efficient transport machine, NPCs rely on so-called ‘FG repeats’ that are anchored to the pore. Görlich and his team discovered that these intrinsically disordered FG repeats can engage in cohesive interactions and thereby condense into an ‘FG phase’ that functions as a permeability barrier with extreme transport selectivity and capacity. The FG phase can be considered a good 'solvent' and transport medium for importins and exportins, together with their captured cargo. At the same time, it repels macromolecules that are not recognised as valid cargoes. The FG phase discovered by Görlich was the first and remains a fundamentally relevant example of a biomolecular condensate originating from intrinsically disordered protein domains. It can be seen as the starting point of a new field with broad implications throughout biology and medicine.

CHARLES SWANTON

Charles Swanton completed his MD-PhD in 1999 at the Imperial Cancer Research Fund Laboratories and his Cancer Research UK (CRUK) clinician scientist/medical oncology training in 2008. Since 2013 he has been Principal Group Leader at the Francis Crick Institute in London and has recently taken on the role of Deputy Clinical Director. He was appointed Chair in Personalised Medicine at University College London Cancer Institute and Consultant Thoracic Medical Oncologist at University College London Hospitals in 2011. He is the Chief Investigator of the CRUK TRACERx lung cancer evolution study and co-directs the CRUK Lung Cancer Centre of Excellence, and in 2017 – he was appointed CRUK's Chief Clinician.

Charles Swanton was elected as a member of the European Molecular Biology Organization (EMBO) in 2017 and was made a Fellow of the Royal Society in 2018. Throughout his career, he has been honoured with awards and recognitions, including the Memorial Sloan Kettering Paul Marks Prize (2021), the Massachusetts General Hospital Kraft Prize for cancer research (2018) and the San Salvatore Prize for cancer research (2017). He was appointed Napier Professor in Cancer by the Royal Society in 2016.

Order and chaos in cancer evolution and immune surveillance

Cancer is a highly dynamic disease. During its course, cancers respond to selective pressures from their microenvironment, including the immune system, chemotherapy, nutrient deprivation, and geographic barriers. These selective pressures shape the evolutionary trajectory of the tumour leading to an extreme genetic heterogeneity not only within individual tumours, but also across tumour types, primary and secondary. Cancer heterogeneity provides the fuel for resistance and introduces significant challenges in designing effective treatment strategies.

Charles Swanton has changed the way the world understands cancer by careful and impactful demonstrations of cancer as an evolutionary process: cancer proceeds by Darwinian variation and selection of competitive cell clones. He has demonstrated that branched evolution of cancer is ubiquitous; deciphered how it is shaped by genome instability, therapy and immunity, and how this can be exploited for therapy. He has also shown how inflammatory mechanisms can drive cancer initiation. He has discovered functional mechanisms driving cancer chromosomal instability and somatic mutagenesis and developed insights into mechanisms of cancer immune surveillance and evasion.

Charles Swanton is the Chief Investigator of the CRUK TRACERx lung cancer evolution study, a major collaboration integrating clinical, histopathological and genomic data from 842 patients with lung cancer. The study has defined how cancer clonal heterogeneity affects the risk of recurrence and survival, and how cancer subclones compete, adapt and evolve from diagnosis to relapse. His evolutionary insights have led to the identification of biomarkers to recognise minimal residual disease and to clinical trials using adoptive T cell therapeutics targeting clonal neoantigens.

THE LOUIS-JEANTET PRIZES

Every year, the Louis-Jeantet Prizes distinguish leading-edge researchers who are active in the member states of the Council of Europe.

As one of the best-endowed awards in Europe, the Louis-Jeantet Prizes foster scientific excellence. They are not intended solely as the recognition of work that has been completed, but also to encourage the continuation of innovative research projects. When the research being recognised is close to practical applications for combating illnesses affecting humankind, one of the Louis-Jeantet Prizes converts into a Jeantet-Collen Prize for Translational Medicine, supported by generous donations from the Désiré Collen Stichting.

Established in 1986, the Louis-Jeantet Prizes have thus far been awarded to 105 researchers: 30 in the United Kingdom; 22 in Germany; 17 in Switzerland; 15 in France; 4 each in Sweden, Italy and the Netherlands; 2 each in Austria, Belgium, Finland and Norway; and 1 in Hungary. Among the 105 prize-winning researchers, 16 have subsequently won the Nobel Prize in Physiology or Medicine, or the Nobel Prize in Chemistry.

Since 1986, a total sum of more than CHF 65 million has been awarded by the Foundation to the 105 prize-winners for the continuation of their work.

THE LOUIS-JEANTET FOUNDATION

Founded in 1983, the Louis-Jeantet Foundation is the legacy of Louis Jeantet, a French businessman and a citizen of Geneva by adoption. The Foundation's 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 2.5 million each year to promoting biomedical research. It invests this sum for European and for local research projects. At the local level, the Foundation encourages teaching and the development of research at the Faculty of Medicine of the University of Geneva.

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