



Boehringer Ingelheim
Stiftung

2023

HEINRICH WIELAND PRIZE



AWARD SYMPOSIUM OF THE 2023 HEINRICH WIELAND PRIZE

Münchner Künstlerhaus, Munich, Germany
Thursday, 19 October 2023

HEINRICH WIELAND PRIZE

The international Heinrich Wieland Prize honours distinguished scientists for their outstanding research on biologically active molecules and systems in the fields of chemistry, biochemistry, and physiology as well as their clinical importance. The prize is endowed with 100,000 euros by the Boehringer Ingelheim Foundation and named after Heinrich Wieland (1877–1957), Nobel Laureate in Chemistry in 1927.

Every year, the Foundation invites scientists to make nominations in an open call. It entrusts the selection of the awardees to a scientific Board of Trustees, all of whom work in an honorary capacity (see page 7 for current members). Presented annually since 1964, the Heinrich Wieland Prize has five subsequent Nobel Laureates among its awardees.

www.heinrich-wieland-prize.de



AWARD SYMPOSIUM

- 3:30 p.m. **Registration**
- 4:00 p.m. **Welcome and opening remarks**
Professor Dr Franz-Ulrich Hartl, Chair of the Board of Trustees of the Heinrich Wieland Prize,
Max Planck Institute of Biochemistry, Martinsried, Germany
- 4:10 p.m. **Human weight regulation – insights from genetics**
Professor I. Sadaf Farooqi, MBChB (Hons), PhD, FMedSci, FRS,
University of Cambridge, UK
- 4:50 p.m. **Role of the upper gut in insulin resistance and non-alcoholic steatohepatitis**
Professor Geltrude Mingrone, MD, PhD,
Catholic University, Rome, Italy
- 5:30 p.m. **Coffee break and Meet the Speakers**
- 6:10 p.m. **PGC-1 α /Irisin Pathway: Linking exercise to cognition and neurodegeneration**
Professor Bruce M. Spiegelman, PhD,
Dana-Farber Cancer Institute, Boston, MA, USA
- 6:50 p.m. **Award ceremony**
Presented by Dr Stephan Formella, Managing Director Science & Research,
Boehringer Ingelheim Foundation, Mainz, Germany
- Musical introduction**
Wolfgang Amadeus Mozart (1756–1791), Divertimento, KV 138, F major, I. Allegro
- Laudation**
Professor Dr Stefan Bornstein, Vice-Chair of the Board of Trustees of the Heinrich Wieland Prize,
University Hospital Carl Gustav Carus, Dresden, Germany
- Award presentation**
to Professor Dr Dr h.c. Matthias H. Tschöp,
Helmholtz Munich & Technical University of Munich (TUM), Germany
by Christoph Boehringer, Chair of the Executive Committee of the Boehringer Ingelheim
Foundation, Mainz, Germany, and by Professor Dr Franz-Ulrich Hartl
- Musical interlude**
Johannes Brahms (1833–1897), Waltz in A-flat major, op. 39 no. 15
- Award lecture**
Overcoming obesity: The discovery of multi-receptor drugs
Professor Dr Dr h.c. Matthias H. Tschöp
- Musical conclusion**
Luigi Boccherini (1743–1805), op. 33 no. 6, A major, IV. Finale Presto assai
- Closing remarks:** Dr Stephan Formella
- 8:00–10:00 p.m. **Get-together**

Music performed by Schumann Quartet Munich (members of the Bavarian State Orchestra): Barbara Burgdorf (violin), Traudi Pauer (violin), Stephan Finkentey (viola), Oliver Göske (cello)

Professor Dr Dr h.c. Matthias H. Tschöp

Helmholtz Munich & Technical University of Munich (TUM), Germany

Matthias Tschöp receives the 2023 Heinrich Wieland Prize for his seminal discoveries of the first highly effective drugs for human obesity. As a physician-scientist, he embarked on a mission to discover effective therapeutics for obesity and identified the hunger hormone: ghrelin. This breakthrough revealed a fundamental metabolic control signal. Recognizing that one signal would not be sufficient to effectively reverse obesity, Matthias Tschöp then started to combine several hormone action profiles into single hybrid molecules. Together with the chemist Richard DiMarchi, he created dual and triple hormone-like peptides by strategically choosing specific amino acids from a pool of metabolically active gut hormones (e.g. GIP, GLP-1, glucagon) as well as adding modifications to increase half-life, stability, and solubility. The result was a new class of therapeutics, offering unprecedented levels of metabolic benefits and weight loss in obesity. Tschöp and DiMarchi then validated the first types of these poly-agonists in rodent and primate models and led the very first clinical tests. Today, numerous pharmaceutical companies are advancing versions of these co-agonists through clinical trials. The FDA-approved first representative of this drug class, tirzepatide ("Mounjaro", Eli Lilly & Co), already achieves an average weight loss of 22.5 % in human obesity and delivers unprecedented benefits in diabetes. In aggregate, Matthias Tschöp pioneered a new era of metabolic medicine: For the first time, human obesity can be effectively treated, significantly reducing the risk for diabetes and enabling the reversal of a global pandemic.



Photo: © Helmholtz Zentrum München

Matthias Tschöp, MD, trained at Ludwig Maximilians University (LMU) in Munich, Germany. After a research fellowship at Eli Lilly (Indianapolis, USA, 1999–2002), he started his own laboratory at the German Institute of Human Nutrition (Potsdam, 2002–2003). At the University of Cincinnati (USA, 2003–2011), he advanced to Research Director and Endowed Chair of Medicine. He was then jointly recruited back to Germany by Helmholtz Center and Technical University of Munich (TUM), where he holds an Alexander von Humboldt Professorship. Today he is also CEO of the Helmholtz Center Munich and Vice President of the Helmholtz Association of German Research Centers. His multiple awards include the Erwin Schrödinger Prize, Paul Martini Prize, Outstanding Scientific Achievement Awards by the American Diabetes Association and Obesity Society, Carus Medal of the German National Academy (Leopoldina), Ernst Jung Prize in Medicine, and the Banting Medal of the American Diabetes Association. He holds an adjunct professorship at Yale University and an honorary doctorate at Leipzig University. Matthias Tschöp is an elected member of the German, Bavarian, and European Academies of Sciences, the American Society for Clinical Investigation, and the Association of American Physicians.

Professor I. Sadaf Farooqi, MBChB (Hons), PhD, FMedSci, FRS

University of Cambridge, UK

Sadaf Farooqi made seminal contributions to understanding the genetics and physiology of severe obesity, discovering the first single gene defect causing obesity in humans and demonstrating that carriers of a mutated leptin gene respond to leptin treatment. She revealed that mutations in multiple genes involved in the development and function of the leptin-melanocortin pathway also cause severe obesity, mainly by affecting appetite, demonstrating that human eating behaviour is not simply under voluntary control. In addition, she found that sympathetic nervous system tone is modulated by the same neural circuits, explaining a link between obesity and hypertension. Because of her work, severely obese patients can now be diagnosed with the help of genetic testing and new mechanism-based treatments have become possible.

Sadaf Farooqi obtained her Bachelor of Medicine and Surgery from the University of Birmingham, UK, in 1993. After hospital posts in Birmingham and Oxford, she moved to the University of Cambridge, where she earned her PhD in 2001. In 2011, she was appointed Professor of Metabolism and Medicine at the Wellcome Trust-MRC Institute of Metabolic Science, University of Cambridge, UK. She received a number of awards, such as the Andre Mayer Award by the International Society for the Study of Obesity, the Society for Endocrinology Medal, and the European Society for Endocrinology Prize. She is a Fellow of the Royal Society and the Academy of Medical Sciences.

Professor Geltrude Mingrone, MD, PhD

Catholic University, Rome, Italy

Geltrude Mingrone is one of the pioneers studying bariatric surgery and how it leads to remission of type 2 diabetes. She demonstrated that bypassing the duodenum and jejunum reverses diabetes and insulin resistance, unraveled why, and found the key players: The small intestine produces heat shock proteins, mostly glucose regulatory protein 78 (GRP78). If GRP78 enters the blood, it leads to non-alcoholic steatohepatitis in the liver and insulin resistance in muscles. Western Diet leads to a build-up of unfolded protein in the upper gut epithelium by overloading the folding capacity of its cells, which leads to GRP78 release. Surgically bypassing the small intestine prevents this and improves the response to insulin even before weight loss. In addition to explaining why bariatric surgery is so effective, her research uncovered new connections of metabolic regulators in the gut to liver disease.

Geltrude Mingrone studied medicine and did her residency in endocrinology and gastroenterology at the Catholic University & Policlinico A. Gemelli in Rome, Italy, followed by a PhD in clinical pharmacology from the University of Ghent, Belgium. She returned to the Catholic University to join the faculty in 1994. She is now Chief of the Division of Obesity and Related Disorders at the Policlinico A. Gemelli. Since 2015, she also holds a part-time position as Professor of Diabetes and Nutrition at King's College London, UK. Since 2018, she represents the European Association for the Study of Diabetes regarding the joint guidelines with their US counterpart for treating diabetes 2.

Professor Bruce M. Spiegelman, PhD

Dana-Farber Cancer Institute, Boston, MA, USA

Bruce M. Spiegelman is a pioneer in deciphering the transcriptional basis of energy metabolism in mammals. He identified the nuclear receptor PPAR- γ as a key regulator of fat cell differentiation and insulin sensitivity. He revealed how this receptor acts in differentiation and growth of other cell types, including epithelial cells involved in cancer. He found that PPAR- γ interacts with the transcriptional coactivator PGC-1 to stimulate a switch to a more oxidative metabolic state in many tissues, such as thermogenesis in brown fat or gluconeogenesis in the liver. PGC-1 α is now known as the “master regulator” of mitochondrial biogenesis in most, if not all, tissues. Spiegelman also identified beige fat cells, a thermogenic cell type in mice and humans. In addition, his work has identified new targets to treat a variety of metabolic diseases.

Bruce M. Spiegelman received his PhD in biochemistry from Princeton University, USA, in 1978. Following postdoctoral research at MIT in Cambridge, USA, he joined the faculty of Harvard Medical School and the Dana-Farber Cancer Institute (DFCI) in Boston, USA, in 1982. He became director of the Center for Energy Metabolism and Chronic Disease at DFCI in 2006, and since 2008, he has been the Stanley J. Korsmeyer Professor of Cell Biology and Medicine at Harvard Medical School. Among others, he was awarded the Heinrich Wieland Prize, the Manpei Suzuki Prize, the Inbev-Baillet Latour Prize, and the Banting Medal of the American Diabetes Association. He is a member of the AAAS, the NAS, the National Academy of Medicine, and a foreign member of EMBO.

THE PRIZE

Heinrich Otto Wieland was born on 4 July 1877, in Pforzheim, Germany. Wieland studied chemistry at the Ludwig-Maximilians-Universität München (LMU) in Munich, Germany, where he received his doctorate in 1901 and was appointed “außerordentlicher Professor” in 1909. At this time, he was already interested in oxidation processes in the living cell, one of the foundation stones of the field of biochemistry. He worked at the Technische Universität München (TUM), also in Munich, and LMU until 1921 as well as at the Kaiser Wilhelm Institute in Berlin-Dahlem, Germany. Wieland then accepted a call to the University of Freiburg, Germany, but returned to LMU in 1925 to succeed Richard Willstätter as Chair of Chemistry. He retired in 1952 and died in Munich on 5 August 1957.

Heinrich Wieland received numerous awards, among them the 1927 Nobel Prize in Chemistry for his pioneering investigations of bile acids and related substances.

Heinrich Wieland was a cousin of Albert Boehringer, the founder of the Boehringer Ingelheim company. As early as 1903, Wieland worked with the company and, in 1917, his advice led to the company establishing its first scientific department dedicated to innovative research. His scientific findings made it possible, for example, to produce drugs for cardiovascular and respiratory diseases.



The Board of Trustees of the Heinrich Wieland Prize

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BOEHRINGER INGELHEIM FOUNDATION

The Boehringer Ingelheim Foundation is an independent, non-profit organization committed to the promotion of the medical, biological, chemical, and pharmaceutical sciences. It was established in 1977 by Hubertus Liebrecht (1931–1991), a member of the shareholder family of the Boehringer Ingelheim company. Through its funding programmes Plus 3, Exploration Grants, and Rise up!, the Foundation supports excellent scientists during critical stages of their careers. It also endows awards for junior scientists in Germany. In addition, the Foundation funds institutional projects in Germany, such as the Institute of Molecular Biology (IMB) and the European Molecular Biology Laboratory (EMBL) in Heidelberg.



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CONTACT

Boehringer Ingelheim Foundation

Schusterstr. 46–48

55116 Mainz

Germany

Phone +49 (0) 6131 27 508-12

Email hwp@bistiftung.de

www.heinrich-wieland-prize.de

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