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2023 Heinrich Wieland Prize for Munich researcher: Breakthrough in the battle against obesity and diabetes

Mainz, Germany, 19 Oct. 2023: Worldwide, a growing number of people is affected by obesity. This often leads to diabetes, severe cardiovascular diseases, and many other complications. To combat this global health crisis, effective medicines are essential. Prof. Matthias Tschöp from Helmholtz Munich and the Technical University of Munich (TUM), a pioneer in this field, has deciphered the central mechanisms of weight regulation and developed medicines that treat or prevent obesity and its consequences more effectively than ever before. For his groundbreaking work, he will receive the €100,000 Heinrich Wieland Prize from the Boehringer Ingelheim Foundation in Munich on 19 October 2023.

"We are confident that the new multi-receptor drugs have immense potential to stop the pandemic of obesity and Type-2 diabetes," says award-winner Prof. Matthias Tschöp, Scientific Director of Helmholtz Munich and Humboldt Professor at the Technical University of Munich (TUM).

In Europe, overweight and its severe form, obesity, rank among the leading causes of death and disability. A 2022 study by the World Health Organization (WHO) found that around 60% of all adults and nearly 30% of the children in Europe are overweight or even obese. Obesity and one of its most frequent accompanying diseases, Type-2 diabetes, cause suffering for more and more people. The worldwide trend towards unhealthy body weight seems unstoppable. "Estimates suggest that in Europe alone, 1.2 million deaths are attributable to overweight and obesity: that's one in eight deaths. Until now, we've had no therapy that could halt or even reverse these two diseases," says Prof. Franz-Ulrich Hartl, Chairman of the Selection Committee for the Heinrich Wieland Prize, highlighting the significance of the prize winner's work. Christoph Boehringer, Chairman of the Board of the Boehringer Ingelheim Foundation, adds: "We are optimistic that the class of medicines developed by Professor Matthias Tschöp can make a significant contribution to solving an ever-worsening global health problem. We are therefore pleased to award him the Heinrich Wieland Prize 2023."

The scientist and physician Matthias Tschöp has an impressive track record in obesity and diabetes research. Alongside his groundbreaking discovery of the hunger hormone ghrelin in 2000, he worked closely with his long-term research partner, the chemist Richard DiMarchi. Together, they discovered an entirely new class of dual and triple gut hormone drugs known as "Polyagonists."

Discovery of the Polyagonists: Vision of a Sustainable Therapy

As a young doctor, Matthias Tschöp was faced with a frustrating reality: Many patients suffered from obesity, and none of the available medicines led to long term improvement. Despite intensive counselling and support, a healthier lifestyle led to short-term successes for some, but obesity almost always returned – often even stronger than at the outset. Gastric bypass surgery, a highly invasive and irreversible procedure with significant risks, remained the only available option, even for children and adolescents. "Our vision was to discover safe drugs that combat obesity as effectively as

gastric bypass surgery. We wanted to not only improve existing treatment options but also pursue an entirely new approach: finding a successful therapy against the global problem of obesity and thus preventing the onset of Type-2 diabetes wherever possible," says Tschöp.

"Obesity is a Disease of the Brain!"

The first step towards realising this vision was the early insight that the strong urge to eat and the body's mechanism to store calories cannot be treated via a single signalling pathway. Moreover, the scientists identified where the key hormones regulating body weight act: "Obesity is a disease of the brain! This finding was new and pointed us in the right direction," explains Tschöp. The researchers' goal was to identify a substance that could target not just one but several of the brain's signalling pathways at the same time. After years of intense research, they discovered three suitable hormones produced in the gut: glucagon, GLP-1, and GIP. To use these in the human body, the three hormones had to be chemically combined into a single active ingredient molecule. To this end, the researchers deliberately selected specific amino acids from the metabolically active gut hormones and modified the resulting compound until it was durable, stable, and soluble enough for use in the human body. The outcome was a new class of therapeutics with unprecedented effects on the entire metabolism of obese patients and resulting in significant weight loss. Worldwide, these multi-receptor drugs are applauded for their effectiveness.

Last year, the first such polyagonists were approved as medicines in the USA and more than ten others are currently undergoing clinical trials. This indicates the beginning of a new era in metabolic medicine. They demonstrate therapeutic successes similar to gastric bypass surgery – but without the risks of an invasive procedure. For the first time, there's the potential to comprehensively treat widespread diseases like overweight and obesity, thereby significantly reducing the risk of diabetes.

The Next Generation of Personalised Medications

However, for award-winner Tschöp, that's not enough. He wants to explore how patients can stop treatment with multi-receptor drugs after achieving weight loss, while ensuring that patients maintain a healthy metabolism and don't regain weight. And already, he has a new vision in sight: researching the next generation of metabolic medicines. "With the polyagonists, we began developing the next generation of personalised medicines," says Tschöp.

Through his diverse discoveries, he has significantly contributed to advancements in obesity research and the treatment of associated conditions like diabetes. This paved the way for more effective management of this disease and its severe consequences. Tschöp and his team consistently strive for innovative solutions, elevating the fight against diabetes to an entirely new level.

Therefore, Matthias Tschöp fulfils the criteria for the Heinrich Wieland Prize of the Boehringer Ingelheim Foundation in an exemplary manner. The award honours globally distinguished scientists for their pioneering research on the chemistry, biochemistry, and physiology of biologically active molecules and systems and their clinical significance. The festive award ceremony will take place on the evening of 19 October at Munich's Künstlerhaus, following a scientific symposium with high-profile lectures on metabolism and obesity.

"Being awarded the Heinrich Wieland Prize 2023 is a great honour and also a wonderful acknowledgment of the years of hard work by the entire team," says Tschöp. "This award demonstrates that groundbreaking discoveries, preceded by decades of outstanding fundamental research, can sustainably improve both medicine and society. It emphasises the importance of continually pursuing medical innovations, persevering, and proactively shaping the future of healthcare. Only thus can we maintain people's quality of life and meet the significant challenges of the future."

If you have questions or need a higher resolution image, please contact us:

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Professor Matthias Tschöp – the award winner

Matthias Tschöp, MD, trained at Ludwig Maximilians University 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 then was jointly recruited back to Germany by Helmholtz Center and Technical University of Munich, where he holds an Alexander von Humboldt Professorship. Today he is also CEO of Helmholtz Center Munich and Vice President of the Helmholtz Association of German Research Centers. 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.

Heinrich Wieland Prize – the award

This international award honours outstanding research on biologically active molecules and systems in the fields of chemistry, biochemistry, and physiology as well as their clinical importance. The 100,000 euro prize is named after the Nobel Laureate Heinrich Otto Wieland (1877–1957) and has been awarded annually since 1964. Among the awardees – selected by a scientific Board of Trustees – are five subsequent Nobel Laureates. Since 2011, the prize has been endowed by the Boehringer Ingelheim Foundation.

https://www.heinrich-wieland-prize.de

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.

https://www.boehringer-ingelheim-stiftung.de/en

Anhang Prof. Matthias Tschöp receives the 2023 Heinrich Wieland Prize for his seminal discoveries of the first highly effective drugs against human obesity. http://idw-online.de/de/attachment99595

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Helmholtz Munich