

Press release, September 17, 2020

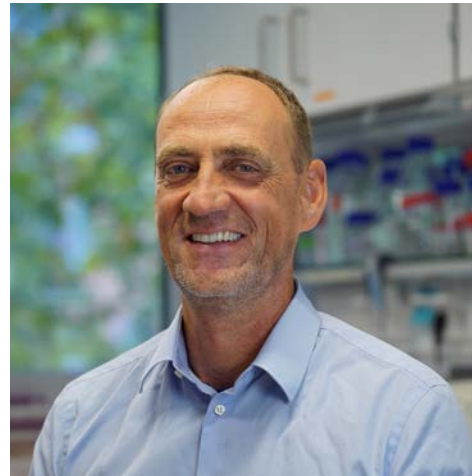
The metabolism HOW OUR BRAIN CONTROLS FOOD INTAKE

The Schering Stiftung honours Jens Claus Brüning with the Ernst Schering Prize 2020. The physician and metabolism researcher receives the prize for his research work on identifying pathological processes in the development of insulin resistance in obesity and diabetes mellitus.

Overweight and obesity have increased greatly in recent years, especially in industrialized countries, and now affect more than 30 percent of the population. At the same time, the incidence of diabetes mellitus type 2 has also risen. Estimates indicate that the number of people suffering from this disease has more than doubled in the last 30 years. This disease, also known as diabetes mellitus in old age, is caused by insulin resistance. The body is then no longer able to break down the glucose in the blood with this hormone produced in the pancreas. In most cases, an altered metabolism is the trigger for diseases such as obesity and diabetes mellitus.

Professor Jens Brüning researches this connection and has been able to show how the central nervous system regulates food intake and influences the availability of energy in the body: Thus creating the basis for new preventive and therapeutic approaches to metabolic diseases.

Jens Brüning is Director of the Max Planck Institute for Metabolic Research in Cologne and heads the Department of Diabetes, Endocrinology and Preventive Medicine at the University Hospital in Cologne. He is working on the signaling mechanism of insulin in the brain. For his outstanding research work, Prof. Dr. Jens Claus Brüning will receive the Ernst Schering Prize 2020: "With Jens Claus Brüning as this year's Ernst Schering Prize winner, we are honoring not only a physician who has succeeded in an impressive way in actively combining clinical and basic research, but who is also an excellent scientist whose research shows solutions to a global health problem," says Dr. Katja Naie, Executive Director of the Schering Stiftung.



A seven-member jury of international scientists has selected Brüning's research work from among 23 nominations. The prize is endowed with 50,000 euros and is one of the most renowned German science prizes. It is awarded annually by the Schering Stiftung and honours scientists worldwide whose groundbreaking research has led to new inspiring models or fundamental changes in knowledge in the field of biomedicine.

Professor Brüning was nominated for the Ernst Schering Prize by **Prof. Dr. Herbert Jäckle**, retired director of the Max Planck Institute for Biophysical Chemistry. Professor Jäckle, who will talk to him about his work at the award ceremony, says: "Jens Brüning is a physician who has made groundbreaking contributions to basic research. He owes this not only to his intellectual brilliance, but also to his social intelligence, which enables him to motivate his staff in achieving top performance while himself remaining humane and modest."

Ernst Schering Prize Award Ceremony

September 30, 2020, 4:30 pm

Livestream from the Komische Oper Berlin, more info: www.scheringstiftung.de/Preisverleihung2020

Student Lecture by Jens Brüning

October 1, 2020: How our brain controls food intake

School farm Insel Scharfenberg, Berlin-Tegel (not public)

Theme partnership with [dasGehirn.info](http://www.dasGehirn.info)

In the thematic partnership "Gestörter Stoffwechsel (disturbed metabolism)" between the internet portal www.dasGehirn.info and the Schering Stiftung, this socially relevant topic is presented to the general public in an expert manner with comprehensible journalistic texts, interviews and animations. "das Gehirn isst mit" (the brain co-eats), for example, sheds light on the interaction of the nervous and digestive systems and explains the functioning of insulin, ghrelin and leptin. The text "zu süßes Blut" (blood that is too sweet) explains the disease of civilization diabetes and shows cause, consequence and prevalence of the disease. The text "Wenn Hunger und Genuss aus dem Gleichgewicht geraten" (when hunger and pleasure are out of balance) gives an overview of the current facts about obesity and also explains why overweight increases the risk of developing type 2 diabetes. In a personal video interview, Ernst Schering Prize winner Jens Brüning explains his research. An animation provides a playful and easily accessible overview of the connections between this complex topic and illustrates the mechanisms of diabetes and the development of pathological obesity. The information portal www.dasGehirn.info is a project of the Klaus Tschira Stiftung and the Neurowissenschaftliche Gesellschaft e.V. in cooperation with the ZKM – Zentrum für Kunst und Medien.

Background information

Diabetes mellitus type 2 is characterized by the fact that the body no longer reacts adequately to the blood sugar-lowering effect of the hormone insulin produced by the pancreas. This is known as insulin resistance. Insulin is released in the blood after food intake and the associated increase in the sugar level. On the one hand, it promotes the absorption of sugar in the muscle and fat cells and, on the other hand, inhibits the formation of new sugar in the liver.

On mice, he was able to show that the lack of insulin action in the brain already leads to a malfunctioning of the sugar balance. This is caused by specific, highly-specialized nerve cells in the brain, the so-called hypothalamus. These nerve cells identified by Jens Brüning and his colleagues mediate the formation of a messenger substance, the neuropeptide agouti-related protein, which is essential for both the control of food intake and the insulin-mediated regulation of the sugar balance. In overweight mice, the regulation of the nerve cells is restricted and leads to obesity and at the same time contributes to the development of diabetes mellitus.

In medicine, for example, it is known that metabolic disorders during pregnancy increase the risk of unborn children developing diabetes or obesity later on. Jens Brüning has identified the nerve-cell networks involved in this control. For the first time, he was able to show in mouse models that a high-fat diet of mouse mothers during lactation leads to a reduction in the development of the nerve cell networks in the offspring and thus promotes the later development of metabolic diseases. This finding in the mouse model allows progress in the diagnosis and therapy of metabolic disorders in pregnant women.

In current studies Jens Claus Brüning has been able to identify further nerve cells in the same brain region, the hypothalamus, which are important for the regulation of food intake. These nerve cells mediate the formation of a further messenger substance, the neuropeptide PNOC. This neuropeptide is specifically activated by the consumption of high-calorie food and contributes to the development of obesity in mice. In summary, the work of Professor Brüning's group has identified new, fundamental regulatory mechanisms of body weight and sugar metabolism by the brain, which may ultimately provide the basis for new prevention and therapy approaches to metabolic diseases.

Jens Brüning was born in Cologne in 1966, studied human medicine there and obtained his PhD in 1993. He completed his clinical training at the University Hospital Cologne in internal medicine and endocrinology, interrupting his studies to take up a postdoctoral fellowship at the Joslin Diabetes Center in the laboratory of Dr. C. Ronald Kahn from 1993 to 1997. In 2002 he completed his habilitation in internal medicine and became a senior physician. Brüning is Director of the Max Planck Institute for Metabolic Research in Cologne and heads the Polyclinic for Diabetes, Endocrinology and Preventive Medicine at the University Hospital in Cologne. Previously, he was Professor of Genetics at the University of Cologne from 2003 to 2011. Brüning has been a member of the Leopoldina since 2017. He has received numerous awards for his research, the Gottfried Wilhelm Leibniz Prize of the Deutsche Forschungsgemeinschaft, for example, the Minkowski Prize of the European Diabetes Association and the Outstanding Scientific Achievement Award as well as the Carl-Friedrich-von-Weizsäcker-Preis of the Stifterverband für die Deutsche Wissenschaft.

Further Information

The press release, the interview with the award winner and the film about Professor Brüning's research work can be found at <https://scheringstiftung.de/en/presse/>.

Jennifer Fielding | press contact

Stiftung | Unter den Linden 32-34 | 10117 Berlin | Tel. 030-20 62 29-60 | fielding@scheringstiftung.de