

## New approach to diabetes research

The Centre for Diabetes Research, Gentofte Hospital, has been instrumental in broadening the approach to both research in and treatment of diabetes. Researchers at the centre have developed a holistic approach to the body's glucose metabolism.

Since a team of Canadian researchers succeeded in isolating insulin in 1921, diabetes treatment and research have focused on this particular hormone and the organ in the body that produces it, namely the pancreas. In recent years, however, international research has started to look at diabetes from different angles, and one of the key proponents of this more holistic approach is the Centre for Diabetes Research, Gentofte Hospital, University of Copenhagen.

"Our research findings have helped to alter our understanding of diabetes and indicate that the intestinal tract and intestinal hormones play a major role in important, hitherto unrecognised, mechanisms of the disease. The intestine is the largest hormone-producing gland in the body and has a significant influence on the body's metabolism – which is why it is interesting in diabetes treatment and research," explains Chief Consultant and Professor Tina Vilsbøll, MD, DMSc, University of Copenhagen, who is one of the directors of the Centre for Diabetes Research.

### Large international network

Diabetes – in particular type 2 diabetes – is a major widespread disease that has grown almost exponentially in many parts of the world. The disease disables millions of people, incurs enormous socio-economic costs and also ultimately costs human lives. Diabetes may not be a direct cause of death, but a large number of various complications affect many people, including life-threatening cardiovascular disease. For this reason, it makes perfect sense for the centre to work together with other specialist fields.

"We have a close, inspiring collaboration with colleagues from a wide range of specialist areas, such as gastroenterologists, psychiatrists, nephrologists, cardiologists and ophthalmologists. We also work closely with universities – in particular the Section of Endocrinology Research, Department of Biomedical Sciences, University of Copenhagen, led by Professor Jens Juul Holst. Furthermore, we have a close-knit international network," explains the other member of the centre's director team, Associate Professor Filip Krag Knop, MD, PhD, University of Copenhagen.

The centre's international research collaborations involve both hospitals and universities in the US, Britain and other European countries, in addition to Australia and Brazil. Consequently, it often has visiting researchers, and younger Danish researchers from the centre regularly take part in international research projects. The pharmaceutical industry is also an important partner for the centre.

### New forms of treatment underway

"The centre's close links with the hospital's major diabetes department are invaluable for our research. It offers us the unique opportunity to involve patients in our research and subsequently to directly apply our research findings to the patients," underlines Professor Vilsbøll.

Researchers at the centre are working on increasing fundamental understanding of the disease by improving and developing completely new prevention strategies and by designing and implementing new therapies. In the field of prevention, they are currently working on a trial involving short-duration but very high-intensity physical training for patients with a high risk of developing type 2 diabetes and on another trial in which high-risk patients are treated using hormones from the intestine.

"Our overall goal is to improve our basic knowledge of how the entire intestinal tract influences the development of diabetes. This could lead to completely new approaches in the treatment of the disease. For example, we have investigated the influence of the gall bladder on the body's glucose metabolism – a project from which we expect big gains. Bile is one of the factors that regulates our appetite and interim findings suggest that bile may be able to be used in a new treatment for diabetes," says Dr. Knop.

### Centre for Diabetes Research in brief

Established in 2007, the centre originally operated under the name Diabetic Research Division, Gentofte Hospital. The centre has about 35 affiliated staff – including five senior researchers and about 20 PhD students. Apart from the medical staff, the centre also employs human biologists, sports physiologists, nurses, laboratory assistants and administrative staff.

The centre is closely linked to the Diabetes Department, Gentofte Hospital, University of Copenhagen, which treats approximately 1,000 patients. Patients are recruited from this pool for many of the centre's projects. The centre is jointly led by Chief Consultant and Professor Tina Vilsbøll, MD, DMSc, University of Copenhagen, and Associate Professor Filip Krag Knop, MD, PhD, University of Copenhagen. The Centre for Diabetes Research won a 2014 Global Excellence – in Health award.



From left to right: Professor Tina Vilsbøll and Associate Professor Filip Krag Knop, Centre for Diabetes Research, Gentofte Hospital, University of Copenhagen

## Facts about Global Excellence – in Health

The Global Excellence programme seeks to recognise and highlight the leading research and therapy environments in the field of healthcare in the hospitals and universities of the Capital Region of Denmark. The programme was established in 2010 in close cooperation with the University of Copenhagen and the Technical University of Denmark (DTU). The purpose of this initiative is to encourage internationalisation of the Region's excellent research and therapy environments with a view to attracting international partners, researchers, talents and both private-sector and public funding for research. The programme comprises the awarding of one or two prizes each year, followed up with focused support in the form of consultancy, tools, website development, conferences, etc.

The Global Excellence award is given to the hospital and university environments in the region that perform first-rate international level research leading to the development and implementation of new, pioneering healthcare services, treatment methods and products for the benefit of patients. The selected Global Excellence environments have been chosen by the executive committee of the Capital Region of Denmark on the basis of evaluations by a specialist review committee of national as well as international experts. The awardees are characterized by unique efforts within one or more areas such as: The extent and quality of their research and development, teaching, examination and treatment of patients, and innovation and dissemination of the new knowledge. In addition to the Global Excellence distinction, which is valid for a period of five years, the awardees each receive a grant of EUR 200,000 to help strengthen and further their international profile.



## Facts about the Capital Region of Denmark

The Capital Region of Denmark is one of five regional administrative units in Denmark. The Capital Region of Denmark, provides healthcare, mental healthcare, carries out research and regional development for 1.7 mio. people or approx. 30% of the population in Denmark. In addition to hosting the largest health care system in Denmark, the region is also home to one of the world's strongest life science clusters, and 70% of Denmark's biotech companies are located in the area.

The Capital Region is home to a number of specialist environments at the nine university hospitals in the region that perform world-class health research and have the ability to translate this new, innovative knowledge into pioneering health care services and treatment of the highest international standard. In order to highlight and acknowledge these environments, in 2010 – 2014 the Global Excellence – in Health award has been presented to a total of 24 hospital and university environments.

Denmark is in fourth place among the OECD countries regarding scientific publications per inhabitant and similarly in third place regarding citations. Accordingly health research in the Capital Region ranks among the best in Europe. In close collaboration with the University of Copenhagen, The Technological University of Denmark, the Capital Region of Denmark represents frontline health science and clinical research, together with research of high quality in other areas with relevans for development of future healthcare. Health research is carried out for approx. EUR 250,000,000 annually at the university hospitals in the region (including internal as well as external funds).

Sources: OECD Territorial Reviews: Copenhagen, Denmark (OECD, 2009); Research Barometer 2012 (Danish Agency for Science, Technology and Innovation, 2012)

