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Up front

Competition for publication in *Diabetologia* continues to grow, and less than 20% of papers are accepted. Of all the high-quality papers that appear in this month's issue I want to draw your attention to five articles that I think are particularly interesting. The articles are summarised here. Our publisher, Springer, has kindly made the full text of each of these papers freely available.
I hope you enjoy reading them!

Sally M. Marshall, Editor

Coming of age: the artificial pancreas for type 1 diabetes

Hood Thabit, Roman Hovorka

The artificial pancreas is a device that monitors blood glucose in people with type 1 diabetes and, in response, automatically adjusts levels of insulin entering the body. In this issue, Thabit and Hovorka review the significant milestones that have been achieved in the past decade, moving the artificial pancreas from the laboratory into free-living, unsupervised home settings. Outpatient clinical studies have shown that the artificial pancreas controls glucose levels to a degree that is equal to or better than existing technologies, as measured by time spent in a target glucose range, with a reduced risk of hypoglycaemia. At present, prolonged 6–24 month multinational closed-loop clinical trials and pivotal studies are under way or in preparation. It is predicted that automated closed-loop systems may appear on the market by the end of 2018. However, to support access to and reimbursement for the closed-loop system, the cost-effectiveness of these devices is yet to be determined. Given the challenges of beta cell transplantation, with continuing innovation closed-loop technologies have the potential to provide a viable alternative for existing insulin pump therapy and multiple daily insulin injections.

Novel phenotypes of prediabetes?

Hans-Ulrich Häring

Prediabetes is characterised by an impaired balance of insulin sensitivity and insulin secretion. In this issue, Häring reviews the phenotypes observed in 3000 prediabetic individuals (those at increased risk of developing type 2 diabetes) using data collected at the Tübingen University Hospital (Tübingen, Germany). Data taken from a subgroup of these participants suggest that the combination of fatty liver, altered plasma hepatokines and possibly fatty pancreas, which is found in people with metabolically unhealthy obesity (MUHO), causes both insulin resistance and low insulin secretion. Interestingly, brain insulin resistance also seems to be associated with these phenotypes and, to some extent, may even be the cause of this condition. It is hypothesised that the chronological development of organ crosstalk is a key feature of the progression from normoglycaemia to the prediabetic and type 2 diabetic states. This speculation may provide a useful roadmap for further studies aimed at understanding the pathophysiology of prediabetes.

Proteomics for prediction of disease progression and response to therapy in diabetic kidney disease

Michelle J. Pena, Harald Mischak, Hiddo J. L. Heerspink

Over the past decade, high-throughput proteomics has revolutionised biomarker discovery, providing new insights into the pathophysiological and biological processes associated with diabetic kidney disease. In this issue, Pena et al review recent advances in proteomics for risk prediction of diabetic kidney disease and describe applications of proteomics for assessing response to therapy. The use of proteomics in clinical practice is promising but many studies stagnate in the discovery phase and do not move through the biomarker pipeline to validation, let alone to clinical use. Enhanced interactions and collaborations between academia, industry and regulatory agencies are needed to implement proteomics in clinical practice, with the ultimate goal of interrupting diabetic kidney disease progression, thus improving patient outcomes.

Neonatal vitamin D status is not associated with later risk of type 1 diabetes: results from two large Danish population-based studies

Ramune Jacobsen, Steffen U. Thorsen, Arieh S. Cohen, Marika Lundqvist, Peder Frederiksen, Christian B. Pipper, Flemming Pociot, Lau C. Thygesen, Alberto Ascherio, Jannet Svensson, Berit L. Heitmann

The role of vitamin D in pregnancy as a risk factor for developing type 1 diabetes has been a hot topic for the last decade. However, results have been conflicting and this field of research has been in need of well-powered studies. In this issue, Jacobsen et al describe results from two large population-based studies. They report that neonatal vitamin D3 levels were not associated with later risk of developing type 1 diabetes in childhood or adolescence. The authors state that they cannot exclude the possibility that higher levels of vitamin D3 during late pregnancy, e.g. gained through high-dose maternal supplementation, could be protective against type 1 diabetes. However, the findings from this study provide evidence to conclude that there is no relation between neonatal vitamin D3 levels and the risk of type 1 diabetes in childhood and adolescence.

CART is overexpressed in human type 2 diabetic islets and inhibits glucagon secretion and increases insulin secretion

Mia Abels, Matteo Riva, Hedvig Bennet, Emma Ahlqvist, Oleg Dyachok, Vini Nagaraj, Liliya Shcherbina, Rikard G. Fred, Wenny Poon, Maria Sörhede-Winzell, Joao Fadista, Andreas Lindqvist, Lena Kask, Ramasri Sathanoori, Marloes Dekker-Nitert, Michael J. Kuhar, Bo Ahrén, Claes B. Wollheim, Ola Hansson, Anders Tengholm, Malin Fex, Erik Renström, Leif Groop, Valeriya Lyssenko, Nils Wierup

Cocaine- and amphetamine-regulated transcript (CART) is mostly known as a hypothalamic regulator of food intake. Based on previous observations in rodents regarding CART expression in islets and the effects of CART on islet hormone secretion in vitro, the role of CART in human islets and on glucose homeostasis in vivo in mice required addressing. In this issue, Abels et al report that in response to hyperglycaemia CART is overexpressed in the islets of diabetic humans and rodent models of diabetes. CART increased insulin secretion in islets from diabetic and healthy individuals and reduced glucagon secretion in human islets and in vivo in mice. The authors suggest that in type 2 diabetes CART is upregulated as part of a defence system that is activated to overcome hyperglycaemia by means of increasing insulin and reducing glucagon secretion. Since CART increases insulin secretion in the islets of diabetic individuals, the findings from this research hold promise for CART-based drugs as a therapy for diabetes. This article is the subject of a commentary in this issue by Patrick Gilon.