



Artificial pancreas to revolutionize diabetes care

In a significant breakthrough for people with diabetes, JDRF has formed a partnership with two international companies to produce an automated diabetes management system to eliminate the need for insulin injections and dramatically reduce the risk of life threatening health complications.

The Juvenile Diabetes Research Foundation has today announced an innovative partnership to develop an automated system to help people with type 1 diabetes better control their disease – the first step on the path to what would be among the most revolutionary advancements in treating type 1 diabetes: the development of an artificial pancreas, a fully automated system to dispense insulin to patients based on real-time changes in blood sugar levels.

JDRF has formed a partnership with Animas, a Johnson & Johnson company and a leading manufacturer and distributor of insulin delivery and glucose management systems.

The objectives of the partnership, a major industry initiative within the JDRF Artificial Pancreas Project, are to not only produce the automated system but to conduct extensive clinical trials for safety and efficacy and submit the product to the regulatory authorities for approval and subsidy.

“If successful, the development of this first-generation system would begin the process of automating how people with diabetes manage their blood sugar,” said Mike Wilson Chief Executive Officer of JDRF Australia.

“Ultimately, an artificial pancreas will deliver insulin as needed, minute-by-minute, throughout the day to maintain blood sugars within a target range. But even this early system could bring dramatic changes in the quality of life for the 140,000 Australians living with type 1 diabetes, beginning to free kids and adults from testing, calculating and treating themselves throughout the day.”

Dr. Alan Lewis, CEO and President of JDRF International noted that “JDRF will provide \$US8 million in funding over the next three years for this project, with a target of having a first-generation system ready within four years.”

Currently, type 1 diabetes is managed with insulin injected from a needle or an insulin pump and regular fingerprick blood tests. Unfortunately, blood glucose levels can change rapidly in response to hundreds of different triggers making it extremely difficult to accurately predict the amount of insulin required.

This first-generation system will be partially automated, utilising an insulin pump connected wirelessly with a continuous glucose monitor (CGM). The CGM continuously reads glucose levels through a sensor with a hair-thin sensor wire inserted just below the skin, typically on the abdomen. The sensor would transmit those readings to the insulin pump, which delivers insulin through a small tube or patch on the body. The pump would house a sophisticated computer program that will address safety concerns during the day and night, by helping prevent hypoglycemia and extreme hyperglycemia. It would slow or stop insulin delivery if it detected blood sugar was going too low and would increase insulin delivery if blood sugar was too high.

For example, the system would automatically discontinue insulin delivery to help prevent hypoglycemia, and then automatically resume insulin delivery based on a specific time interval (i.e., 2 hours) and/or glucose concentration. It will also automatically increase insulin delivery to reduce the amount of time spent in the hyperglycemic range and return to a pre-set basal rate once glucose concentrations have returned to acceptable levels.

In this early version of an automated diabetes management system, the patient would still need to manually instruct the pump to deliver insulin at times, (i.e. around meals). But this “hypoglycemia-hyperglycemia minimiser” system would represent a significant step forward in diabetes management, and could provide immediate benefits in terms of blood sugar control, by minimising dangerous highs and lows.

The Diabetes Research Foundation is very excited by these developments and the benefits this may bring to those with diabetes. Advances in research have made a huge contribution to the quality of life for people with diabetes. We are thankful to those that give generously to us an enable research to continue in Australia. More information is available at www.diabetesresearchfoundation.asn.au