Type 1 Diabetes Research at UC San Diego Gets $5 Million Boost

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Maike Sander, MD, associate professor of pediatrics and cellular & molecular medicine at the University of California, San Diego School of Medicine has been awarded nearly $5 million by the Beta Cell Biology Consortium (BCBC) to lead an interdisciplinary team in cell therapy research for type 1 diabetes. Sander will lead a team of domestic and international collaborators, with the aim of generating replacement insulin-producing beta cells from patient-derived induced pluripotent stem cells.

The $4,950,000 grant is shared with Karl Willert, PhD, director of the UCSD Human Stem Cell Core Facility, who will apply a screening platform for cellular microenvironments to beta cell differentiation (the process by which cells become progressively more specialized.) Additional participants include labs at the University of Pennsylvania and in Barcelona, Spain, as well as a San Diego-based biotech company.

Sander is a physician-scientist with UCSD's Pediatric Diabetes Research Center (PDRC). Launched the summer of 2008, the PDRC brings together top-ranked physicians and research scientists to investigate the causes and cure of type 1 diabetes.

Type 1 diabetes can occur at any age; however, half of the patients are diagnosed before the age of 20. Though the exact cause is unknown, genetics, viruses, and environmental factors are thought to play a role in causing the autoimmune response that eventually leads to beta cell destruction.

The major focus of Sander's current research is to understand the molecular mechanisms underlying the ability of pluripotent stem cells, or progenitor cells, to produce the different cell types of the pancreas. Specifically, she and her team want to be able to instruct patient-derived pluripotent stem cells to become beta cells.

Since the first pioneering work on islet transplantation, it has become clear that a cell-based approach for the treatment of type 1 diabetes can have significant benefits in terms of insulin independence and a reduced risk of hypoglycemia.

"Right now, scientists can create pancreatic progenitor cells from human embryonic stem cells. However, our goal is to take it a step further and make replacement beta cells from the patient's own tissue," Sander said. "This grant is a perfect example of collaboration and translational medicine for a greater cause. It's not about who discovers the cure first. It's about finding a cure - fast."

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