

University of Miami Miller School of Medicine

News

DRI Scientists Receive Grant to Increase Insulin-Producing Cells for Transplant

11.01.2016

Scientists at the Diabetes Research Institute at the University of Miami Miller School of Medicine, along with UM start-up Ophysio, Inc., have been awarded a \$1.4 million National Institutes of Health grant to advance their work turning leftover pancreatic tissues that are typically discarded after transplantation into insulin-producing cells that could be transplanted into type 1 diabetes patients.

Combined with a UM-developed oxygen modulation technology that improves the survival and function of pancreatic islet cells before transplantation, the new technology may lead to the generation of enough insulin-producing cells to transplant several patients from a single donor organ.

Juan Dominguez-Bendala, Ph.D., Director of Stem Cell Development for Translational Research at the DRI, and Ricardo L. Pastori, Ph.D., Director of the DRI's Molecular Biology Laboratory, are leading the research made possible by the Phase II Small Business Innovation Research grant – the team's fourth in six years. These studies will build on UM technologies on exocrine-to-endocrine conversion and the use of enhanced oxygenation platforms for beta cell differentiation.

"This grant is yet another example of the fruitful interaction between industry and academia, and opens the door to potentially transformative therapies for diabetes," Dominguez-Bendala said.

Other DRI researchers involved in this work are Luca A. Inverardi, M.D., Co-Director of the DRI's Cell Transplant Center, Camillo Ricordi, M.D., Director of the DRI, Dagmar Klein, Ph.D., Silvia Alvarez-Cubela, and Chris Fraker, Ph.D.

The team is working to develop alternative and renewable sources of insulin-producing cells because there is a gap between the availability of donor organs and the clinical demand for them for islet transplantation. A steady supply of islets is also needed for research and drug discovery purposes.

"Our proprietary technology for oxygen modulation has proven key at improving the survival and function of pancreatic islets prior to transplantation, as well as the differentiation and maturation of insulin-producing cells from stem cells," Dominguez-Bendala said.

"Ophysio, a spin-off company created to commercially develop this technology, is partnering again with UM scientists on research aimed at combining the oxygen-modulation techniques with this exciting new finding from our team – that the leftover pancreatic tissues that are typically discarded after islet isolation can be converted into



Clockwise from top left, Juan Dominguez-Bendala, Ph.D., Luca A. Inverardi, M.D., and Ricardo L. Pastori, Ph.D.

islets by exposure to BMP-7, an FDA-approved agent. We show that by carefully adapting oxygenation of these leftovers of islet isolation, BMP-7-mediated conversion is greatly enhanced.”