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Decellularized pancreas bioscaffold generation aiming at Type 1 Diabetes therapeutics

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Type 1 Diabetes Mellitus (T1DM) is a condition resulting from the autoimmune destruction of pancreatic β cells, leading patients to require lifelong insulin therapy, however, often, this therapy does not avoid the most common complications of this disease. Transplantation of isolated pancreatic islets from heart-beating organ donors is a promising alternative treatment for T1DM, however, this approach is severely limited by the pancreas shortage. Recently, pancreatic bioengineering in Regenerative Medicine has been proposed as a potential alternative therapy. Human pancreas may be decellularized and the remaining bioscaffold, a skeleton of extracellular matrix (ECM), can provide the optimal microstructure and microenvironment for *in vitro* islets formation, maintenance and transplantation. Our group designed a new protocol for pancreas decellularization which may be used for both rat and human pancreas. The pancreatic tissue is submitted to a series of water and detergent-enzymatic solutions wash cycles. Complete decellularization of the rat pancreas was obtained after only one cycle of this treatment (approximately 31h), as compared to another protocols in literature. Apparently, complete decellularization of human pancreas was obtained only after approximately seven days under this protocol. Our next steps consist in evaluating and characterizing the extracellular matrix integrity. Therefore, instead of discarding, cadaveric pancreas may be decellularized to generate a very useful and powerful bioscaffold, which may be reconstituted to generate a partially or fully functional organ. This study intends to improve the islet transplantation outcome and to develop alternative treatments for T1DM.

Biography

Marluce da Cunha Mantovani has a Master's degree in Biological Sciences (Biochemistry) from the Chemistry Institute of the University of Sao Paulo (2007) and an MBA in Health Management and Infection Control from the National Institute of Higher Education and Research (2011). Currently, she is a Laboratory Specialist at the University of Sao Paulo Medical School - Department of Internal Medicine, working as a Senior Lab Manager and a pre-doctoral student at the Cell and Molecular Therapy Center (NUCEL - www.usp.br/nucel). She has experience in Biochemistry with emphasis in Cell and Molecular Biology, Biotechnology and Cell Therapy.

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