

Generation of artificial pancreas by using MIN-6 cell line culture seeded in decellularized testis's rat scaffold



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Abstract

Objective: Type 1 diabetes is an autoimmune disease which is due to lack of β cells. Regenerative medicine offers the opportunity for curing diabetes. Native extracellular matrix (ECM) creates a reconstruction platform to replace the organs. A decellularized rat's testis was used as a natural 3D scaffold in this experiment. MIN_6 β cells were seeded in the scaffold.

Methods: The decellularized testes were prepared for in vitro analyses.

Results: The decellularized testes were analyzed by histological studies such as H&E and DAPI staining. SEM showed that the 3D ultra structure of the testis remained intact. In vitro studies point out that the decellularized scaffold was nontoxic and performed a good platform for MIN_6 β cells. The DTZ staining showed β cells in recellularized testis. Expression of genes (PDX1, Glut2, insulin) with RT_PCR and (PDX1, NSE, nestin) with western blotting in recellularized testis were upregulated compare with MIN_6 β cells in media culture. Insulin release from recellularized showed increasing ($P < 0.05$) when exposed a high glucose media.

Conclusion: The decellularized testis can be considered as an artificial pancreas and may help to cure type 1 diabetic patients.

Keywords: Testis, Decellularization, Scaffold, Insulin-Secreting Cells, diabetes

Biography

Samaneh karimi has completed her PhD at the age of 32 years from Ahvaz Jundi Shpour University of medical science, Iran. She is the professor of Abadan faculty of medical science, Iran.



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