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Improving the viability of pseudo-islet for efficient insulin production

Khalid Alwsaidi
Imam Muhammad Bin Saud Islamic University, Saudi Arabia

A novelsolution for Type 1 diabetes mellitus (T1DM) is the formation of pseudo-isletcell, which are beta cellsaggregationsthatmimic the basicfunction of beta cells. Central necrosis of pseudo-isletcell due to the shortage of the oxygen and nutrienttransportationhasbeen an obstacle to introduce thissolution for the patient with T1DM. This study aims to overcome this issue by removingthe central area of the pseudo-isletsand replacingit with the cell-friendlyalginate hydrogel"gelatinbeads" type B(GBs), whichischaracterized byproviding a high diffusion rate, and capable to functionasa drugcarrier. In order to maximizethediffusion rate and avoid the dissolutionof the beads in the water solution, itisimportant to control the right size, shape of GBs and the cross-linkage time. Increased in viability and morphology is seen in the 30μm GBs cross-linked for six hours. The ratpancreatic β cell line BRIN-BD11 cellsweregrown in RPMI 1640 media and showedsimilarmorphology to the native human isletcellsafter the GBsincorporation. Alexafluor 568 conjugatedusedas a secondaryantibody in the fluorescence test to examine the drugreleasingcapabilityof the GBs. The effect of the anti-inflammatory cytokine IL-10 on pseudo-islets can be determinant using dose response which reveals the best response at 10 ng/ml concentration. Improving our understanding of the methods used to remodel pseudo-islets should widen the gaze of possible strategies obtainable for developing de novo islets for therapeutic applications.

Biography

Khalid M Alwsaidi is currently a medicalstudentat the college of Medicine,Imam Muhammad Bin SaudIslamicUniversityUniversity and he hascompleted a laboratory-basedresearchsummerprogramme at Keeleuniversity, Manchester, UK.

Abu3zah@gmail.com

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