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Abstract

Development of bioartificial pancreatic scaffold using goat pancreas

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Abstract:
A bioscaffold is nothing but an organ taken from an animal and later decellularized, giving us the final scaffold, an artificial intricacy which can mimic the microenvironment of cells. Our study aims at producing a natural pancreatic scaffold by decellularizing goat pancreas. We harvested goat pancreas from a local butcher and decellularized the same with various detergents (SDS) and ionic solutions Triton X-100) by immersing the pancreas in these solutions for a particular period of time so as to obtain a ghostly white organ at the end. The cycle consists of washing pancreas in 1X PBS for 1 hour followed by immersion in 1% SDS for 2 hours and finally immersed in 0.01% Triton X-100. As the colour of pancreas turned white after 24 hours, so this cycle was repeated till then. The organ turning white was the sign of complete decellularization. But a scaffold is of no use if it has remnant native cells and/or its vasculature has been compromised after being subjected to detergent for decellularization. So we have also assessed the situation of cell population and vasculature. After microtomy, the native and decellularized pancreatic tissue samples were subjected to various assessment such as hematoxylin and Eosin staining, trichrome staining, immunohistochemical staining and DNA estimation. H&E staining and DNA quantification predicted that pancreas was devoid of any native cell population. While trichrome and immunohistochemical staining proved the existence of extracellular matrix proteins such as collagen, fibronectin and laminin, which make up the vasculature, even after decellularization. These results reveal a unique, rapid mechanoresponsiveness and community behavior of hESCs to integrin-targeted cyclic forces.

Biography:
Garima Singh is currently pursuing her PhD from National Institute of Technology Rourkela, Orissa, India. The presented work is a part of her doctoral thesis.

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