P-53

Development and Characterization of Decellularized Myocardial Tissue Slices

Khalil M. (1), Adelmann R. (1), Köster A. (2), Pfannkuche K. (2), Haustein M. (1), Hannes T. (1), Rubach M.(1), Hescheler J. (2), Pillekamp F. (3), Brockmeier K. (1)
Department of Pediatric Cardiology, University of Cologne, Cologne, Germany (1)
Institute of Neurophysiology, University of Cologne, Cologne, Germany (2)
Department of Pediatric Cardiology, University of Duesseldorf, Duesseldorf, Germany (3)

Background: In the last years Tissue Engineering (TE) focused increasingly on the development of cardiovascular scaffolds. Besides artificial scaffolds there is an increasing demand for native matrices, which are generated by decellularization (DZ). DZ is intended to include the removal of cellular membranes, nucleic acids, lipids, cytoplasmic components and retaining an extracellular matrix (ECM) having as major components collagens and elastins. The aim of this study was to decellularize murine myocardial tissue and thereby to preserve the extracellular matrix. Methods: Murine ventricles were embedded in low-melting agarose and sectioned into 300-µm thick slices along the short axis with a microtome. Afterwards the tissue was treated over 3 days with hypotonic Tris-buffer and SDS as well with DNA and RNA nucleases. Results: RNA and DNA could not be detected by PCR-screening. HE staining showed a honeycomb structure. Nuclei could not be detected. Both western blot as well as immunohistochemistry were negative for alpha actinin. Positive staining for fibronectin, collagen IV, nidogen I and laminin I indicated a widely preserved ECM. Conclusion: We could show that the decellularization of myocardial tissue with a vast conservation of the ECM is possible. The decellularized tissue slices could serve as scaffold for the recellularization with adequate cells and are therefore another step in the development of TE techniques in the cardiovascular field.