

Experimental study in obtaining of a vascularised composite bone extracellular matrix.

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Introduction. One of the final products of tissue engineering is the extracellular matrix (ECM), a non-cellular component of tissues that can be obtained using different methods of decellularization. Most decellularization protocols are divided into those for soft tissues and those for hard tissues [1-4]. Our study aims to develop and test the universal protocol for decellularization of the composite vascularized bone graft (soft and hard tissue) in order to obtain the vascularized extracellular bone matrix that can be used in reconstruction of the massive bone defects.

Material and Methods. The same protocol was used for the decellularization of different diameters vascular grafts, and different structures of bone tissue (soft and hard tissue) porcine origin. Like large diameter vessel, was taken from the tibial bone. The efficacy of the protocol was demonstrated by histological examinations, DNA quantification and the biocompatibility test.

Results. The used protocol has been effective even for small diameter vascular grafts and on cortical and spongy bone blocks. Histological examination (H&E staining) showed cell death after processing. DNA quantification has shown a decrease in the amount of DNA, especially for spongy bone grafts and the biocompatibility test has demonstrated the biocompatibility of vascular and bone grafts after processing.

Conclusions: We can obtain an effective decellularization for both soft and hard tissues using the same protocol.

Keywords: extracellular bone matrix, decellularization, composite graft.

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