

COMPARISON OF THE BIOLOGICAL SCAFFOLDS DESIGNED FOR CELL GROWING

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Abstract. Fabrication of the scaffolds for tissue engineering has come a long way since they were came into use. However, even today there are very few products relevant for construction of artificial tissue. Going back, manufacturing of the scaffolds from biological tissue is the way which can resolve a lot of technical, biocompatibility and immunological problems.

The aim of this study was to compare different biological xenogenic extracellular matrix (ECM) relevance for cell growing as well as for xenograft construction, implantation and biocompatibility in the organism.

In our experiments, samples of rabbit's blood vessel, diaphragm, esophagus and intestine were used. All biological tissues were decellularized, the efficiency of host-cell exclusion was proved by scanning electron microscope. In this way, ECM for foreign cell growing was prepared. For artificial tissue fabrication, primary endothelial stem cell line was derived from Wistar rat's pulmonary trunk. Rat cell growing on the rabbits'-origin ECM was verified using MTT test and microscopic analysis. Therefore, artificial tissue was constructed from rabbit's ECM and rat's endothelial cells. Such tissue as implant was inserted under the rat skin to evaluate their biocompatibility. After 2 and 4 weeks, histological examination of the implant and surrounding tissues confirmed biocompatibility of fabricated tissue as well as implanted cell spreading in the host tissue.

According to our studies, the investigated xenogenic ECM were different in structure, but they all were relevant for the cell growing. However, in our experiments, rabbit's blood vessel-nature ECM was the most suitable for rat's endothelial cell growing. After implantation, xenografts with the autologous stem cells were adopted by the organism well.

Keywords: extracellular matrix (ECM), biological matrix, stem cells, tissue engineering