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Antigenic and Biodegradable Characteristics of the Extracellular Matrices from the Pig Dermis

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Abstract

The present work demonstrates the possibility for fabrication of extracellular matrices from the pig dermis. The obtained matrices were characterized from the point of view of antigenic, biodegradability and the ability to absorb the fluid from the environment, making them prospective for fabrication of intelligent dressings. Five parallel groups of extracellular matrices were established and the mean value was calculated. The size of the grafts was $10 \times 10 \times 2$ mm and the weight of 87.9 ± 3 mg for all the study groups. Histological examination revealed the presence of fewer number of cells. As a result, we were able to remove around 80.5% of the genetic material from the porcine dermal structures, demonstrated by spectrophotometric DNA quantification. In the in vitro graft degradation study in 0.01 M of phosphate buffer solution with the pH 7.4 combined with collagenase, we determined a significant ($p < 0.05$) loss of graft mass by 91.3% during 35 h. In the absorption test, we obtained a variable depending on the exposure time, respectively the soaked samples ended up exceeding four times the initial mass of 87.9 ± 3 mg at the 4th hour of immersion in the liquid. Acellular grafts from the porcine dermis can play a key role in the wound care and facilitating tissue engineering strategies by the acting as an acellular and immunologically inert scaffold, as a source of the bioactive molecules with the hydrophilic and biodegradable properties.

Keywords: porcine dermis, extracellular matrices, acellular grafts, tissue engineering, acellular scaffolds, immunologically inert scaffolds



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