

цинской ассоциации о гуманном обращении с животными, 1996 г.).

### КОНФЛИКТ ИНТЕРЕСОВ

Авторы заявляют, что у них нет конфликта интересов.

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## Evaluation of Tissue-Engineered Vascular Grafts Based on the Biodegradable Scaffold and Mesenchymal Stem Cells in the Long-Term *in vivo* Experiment

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In order to create a tissue-engineered vascular graft, the bioresorbable tubular scaffold from poly(L-lactide) and the method for mesenchymal stem cells seeding and culturing were developed. In group 1, scaffolds without pre-seeded cells were implanted into the abdominal rat aorta; in group 2 scaffolds with pre-cultured rat adipose-derived mesenchymal cells were used. Follow-up in the group 1 was from 2 days to 64 weeks ( $n = 36$ ), in the group 2 up to 72 weeks ( $n = 42$ ). Patency in the group 1 – 86% (31/36), in the group 2 – 97% (41/42). Histology revealed gradual polymer biodegradation and replacement with connective tissue, however, after 64 weeks a total polymer resorption was achieved and an aneurysm formation was noted in all cases in the group 1. Cells amount and neoadventitia thickness were above in the group 2, however the graft morphology did not fundamentally differ from the group 1. Aneurysm formation was noted only in 45% of grafts at the later stages of follow-up in the group 2. Thus, the preliminary cultivation of mesenchymal stem cells on the scaffold led to a pronounced host cellular reaction, which probably made it possible to reduce the incidence of aneurysm formation, but did not ensure the formation of a natural vessel structure.

**Keywords:** tissue engineering, artificial vessel, bioresorbable scaffold, poly(L-lactide), adipose-derived mesenchymal stem cells