

**CELL BASES OF BIORESORPTION OF POROUS 3D-MATRIX  
BASED ON CHITOSAN****P. V. Popryadukhin<sup>a, c, \*</sup>, G. Y. Yukina<sup>b</sup>, I. P. Dobrovolskaya<sup>a, c</sup>, E. M. Ivankova<sup>a, c</sup>, and V. E. Yudin<sup>a, c</sup>**<sup>a</sup>*Institute of Macromolecular Compounds RAS, Saint Petersburg, 194064 Russia*<sup>b</sup>*Pavlov First Saint Petersburg State Medical University, Saint Petersburg, 197376 Russia*<sup>c</sup>*Peter the Great Saint Petersburg Polytechnic University, Saint Petersburg, 195251 Russia**\*E-mail: pavelpnru@gmail.com*

High-porous cylindrical 3D-matrix with a diameter of 1.3 mm were obtained by the method of lyophilization of chitosan solution. 12 months after implantation into muscle tissue in rats, full resorption of the matrix occurred. On the terms of 1, 2, 6, 12, 24, 36, 48 weeks *in vivo*, the cellular mechanisms of matrix bioresorption are examined by histological and immunohistochemical methods. The leading role of CD68 + cells, mainly giant multinuclear cells of foreign bodies, in the processes of matrix biodegradation is shown. At the same time, chronic aseptic inflammation is not accompanied by the activation of mast cells, which indicates the bioinertness of the matrix material and makes it possible to recommend the developed matrices for use in regenerative medicine, tissue engineering, and cell transplantation.

**Keywords:** 3D-porous matrix, chitosan, bioresorption, tissue engineering, cell transplantation, regenerative medicine, CD68<sup>+</sup> cells, mast cells