

Cover letter

Submission Invitation: [Polymers, Q1, IF 4.967] Special Issue "Chitosan-Based Coatings for Food, Pharmaceutical and Medical Applications"

Dear editor Ogadimma Okagu

The authors of a scientific article (N.N. Patlataya, I.N. Bolshakov, A.A. Levenets, N.N. Medvedeva, M.A. Cherkashina) send summary of the work to your editorial office for examination and publication – “**EXPERIMENTAL EARLY STIMULATION OF BONE TISSUE NEO-FORMATION FOR CRITICAL SIZE ELIMINATION DEFECTS IN THE MAXILLOFACIAL REGION**”

Summary

Rationale. A biomaterial is proposed for closing extensive bone defects in the maxillofacial region. The composition of the biomaterial includes high molecular weight chitosan, chondroitin sulfate, hyaluronate, heparin, alginate and inorganic nanostructured hydroxyapatite. **The purpose** of the study is to demonstrate morphological and histological early signs of reconstruction of a bone cavity of a critical size. **Materials and methods.** The studies were carried out on 84 white female rats weighing 200 g. The control group of animals consisted of 44 individuals, the study group - 40. In all animals, three-walled bone defects 0.5 cm in size were applied subperiosteally in the region of the angle of the lower jaw and filled in the experimental group with a gel mass of chitosan -alginate-hydroxyapatite (CH-SA-HA). In control animals, the bone cavities were filled with an auto-blood clot. The follow-up periods were 3.5.7 days, 2.3.4.6.8 and 10 weeks. **Results.** The chitosan construct after implantation actively replaced defects early with the formation of a full-fledged new bone tissue compared to control animals. Morphological analysis of the walls of the bone defect on the 7th day showed signs of the formation of spongy bone tissue, after two weeks - a pronounced increase in bone volume ($P < 0.01$), after 6 weeks after surgery, the closure of the defect was 70-80%, after 8 weeks - 100% without disturbing bone morphology with a high degree of mineralization. **Conclusion** The use of modified chitosan after filling eliminates bone defects of critical size in the maxillofacial region, reveals early signs of bone neoformation, and serves as a promising material in reconstructive dentistry.

We confirm that neither the manuscript nor any parts of its content are currently under consideration or published in another journal. All authors have approved the manuscript and agree with its submission to Polymers: "Chitosan-Based Coatings for Food, Pharmaceutical and Medical Applications".

University: Professor V.F. Voino-Yasenetsky Krasnoyarsk State Medical University, Russia Address: Russia, Krasnoyarsk Territory, Krasnoyarsk, 660022 st. Partisan Zheleznyak, 1 Tel No: +7 (391) 228-08-76 - Department of Affairs; +7 (391) 220-13-95 - Rector's office E-mail id: Fax: +7 (391) 2280860 Official website: krasgmu.ru E-mail: rector@krasgmu.ru

Autor: Bolshakov Igor Nikolaevich, Professor of the Department Operative Surgery and Topographic Anatomy Professor V F Voino-Yasenetsky Krasnoyarsk State Medical University, bol.bol@mail.ru; +7 913 511 0933, Russia



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