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Editors

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## Bioceramics based on resorbable calcium magnesium phosphates by stereolithographic 3D printing

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Poster

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The implants are important for regeneration of bone tissue in modern reconstructive and corrective surgery and orthopedics. At the same time the ideal material has not been created up to now. Solubility of calcium phosphate materials increases with a decrease in the ratio of Ca/P. Increased bioactivity and strength of calcium-phosphate ceramics can be due to the addition of magnesium phosphates, since magnesium is integrated into the trellis of bone tissue hydroxyapatite and takes part in cellular metabolism processes. An ideal material needs to be porous in order to be allow for the growth of blood vessels, nerve tissue and bone cells proliferation. Such materials compensating for the lost area of bone tissue should create necessary conditions for its regeneration. The aim of the work was to obtain porous resorbable ceramic materials in the system  $\text{Ca}_3(\text{PO}_4)_2\text{-Mg}_2\text{P}_2\text{O}_7$  based on fine dispersed powders of calcium and magnesium phosphates. According to the laser granulometry of calcium and magnesium phosphates, the nanoparticle are suitable for 3D printing. Almost all of them had a dark gray color, due to the presence of decomposition products of ammonium acetate. The resulting composite (monomers / powder) structures in the form of a Kelvin structure were exposed to a temperature of up to  $1200^\circ\text{C}$ . The study of the metabolic activity of cells in the presence of extracts from the material showed that the materials are able to support the adhesion, spreading and proliferative activity of human mesenchymal stem cells. In this regard, these samples of biomaterials are biocompatible and do not have a cytotoxic effect on mammalian cells. Thus, the resulting ceramic materials are suitable for the creation of resorbable bone implants, including individually designed inorganics bases for the treatment of bone defects. This work was supported by the Russian Foundation for Basic Research, grant nos. 16-08-01172, 16-38-60203, 18-08-01473.