
Scientists to Develop the Coatings for Titanium Implants to Fasten Osseointegration

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Researchers from Peter the Great St. Petersburg Polytechnic University (SPbPU) in collaboration with colleagues from St. Petersburg State University developed the coatings for titanium implants, which accelerate the implantation of the implant material into the bone tissue.

"We have developed a method for applying a thin (nanometer size) and uniform titanium oxide coating on titanium carcass structures, which can be used as an implant. The experiments demonstrated that the coatings fasten the implants osseointegration notes Dr. MAXIMOV of High School of Materials Physics and Technologies, Institute of Mechanical Engineering, Materials and Transport [SPbPU](#)."

He explained that the researchers tested the properties of a range of titanium implant coatings, differing in composition, thickness, and structure. The coatings were applied by atomic layer deposition (ALD) in special vacuum equipment. After the modification of the implants, the successful [studies](#) were carried out on cells in vitro, and then in vivo (on experimental animals).



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"Currently we started applying silver nanoparticles on the surface of titanium since this chemical element obtains useful antibacterial properties and should reduce the risk of implant rejection. However, to use the silver coatings freely, it is necessary to adjust the conditions and the general method of obtaining the material, said Dr. NAZAROV of the

Research Park, [St. Petersburg State University](#)."

According to scientists, an important part of the study is to select the size and morphology of nanoparticles thus not causing toxic effects of silver on living cells and at the same time preserving the beneficial properties of the previously developed coating. The research and development of new materials are carried out within the framework of the SPbPU State Assignment No. 0784-2020-0022 and Russian Science Foundation (RSF) Grant No. 20-73-00067.

Read the [original article](#) on Peter the Great St. Petersburg Polytechnic University (SPbPU).