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ASKLEPIOS, Poland

**Surface nanocoatings inside pores of metallic skeletons improving nesting and proliferation human living cells**

The lecture concerns the newly developed category of nanostructured biological-engineering materials. The hybrid technology using selective laser sintering SLS with the nanocoatings by atomic layers deposition ALD method inside the micropores of the skeletons improving the nesting and proliferation of living cells were applied. As input material alternatively powders of both pure titanium and Ti6Al4V alloy were used. The TiO<sub>2</sub> and Al<sub>2</sub>O<sub>3</sub> coatings were deposited inside micropores using the ALD method and hydroxyapatite with the sol-gel submersion coating method. The properties and structure were investigated using advanced HRTEM

research. Due to the presence of deposited TiO<sub>2</sub> and Al<sub>2</sub>O<sub>3</sub> nanostructured coatings, conditions of nesting and proliferation of live cells of the hFOB 1.19 (Human ATCC - CRL - 11372) osteoblasts on the surface of micropores are significantly improved. The nanostructured hydroxyapatite coatings after a relatively short time will biodegrade and living cells will be in contact with a metal skeleton that is not covered by any coating. Therefore it is inapplicable for long-term implants. The performed research fully confirmed the original idea of the microporous implant-scaffolds production as a new type of medical devices.

**Biography**

Leszek Adam Dobrzanski has completed the degrees of DSc, MSc and PhD in engineering. He is a Full Professor and the Director of the Science Centre of the Medical and Dental Engineering Centre for Research, Design and Production ASKLEPIOS in Gliwice, Poland. In 1971-2017 he worked at the Silesian University of Technology in Gliwice, Poland as Full Professor, Vice Rector, Dean of the Faculty, Director of the Institute and Head of Division. He was conferred abroad a title Honorary Professor in Lviv, Ukraine and 3 times titles of Doctor Honoris Causa in, Bulgaria, Ukraine and Hungary. His scientific output includes about 2500 scientific publications, including about 50 books and monographs and 50 chapters in books and monographs. He has 55 positions in ranking most cited Polish scientists of all scientific disciplines and is included to the group of 5% most read Authors by the Academia Platform.

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