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## Biocompatibility and electrochemical behavior of chemical deposited hydroxyapatite coating on titanium based alloy

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In this paper, a nano-crystalline hydroxyapatite (HA) coating was applied on the surface of the new Ti-20Nb-10Zr-5Ta alloy by method of the chemical deposition in a solution supersaturated with Ca<sup>2+</sup> and PO<sub>4</sub><sup>3-</sup> ions; X-ray diffraction, micro-Raman, infrared and energy dispersive X-ray spectroscopies detected the deposition of HA on the Ti-20Nb-10Zr-5Ta alloy surface after 6 soaking hours. Scanning electron microscopy ascertained the complete coverage of the alloy surface and the typical features of the HA coating acicular nano-crystallites. The coating long-term electrochemical behaviour for 3000 soaking hours in simulated human fluids (Ringer's solutions of different pH values) was studied by cyclic potentiodynamic and linear polarization, electrochemical impedance spectroscopy and monitoring of the open circuit potentials and corresponding open circuit potential gradients due to the pH non-uniformity of the biofluid. All the main electrochemical and corrosion parameters had more favorable values for the HA coated alloy than those of the bare alloy due to the protective effects of the nano-coating that acts as a barrier against the dissolution of the metallic substrate. The initial HA nano-coating promoted the deposition of new HA layers, thickening itself and showing its ability to induce the formation of this main inorganic component of the human bone, therefore denoting bioactivity of the HA nano-coated alloy. Also, the coating biocompatibility was performed by cells adhesion and proliferation testing in the HA coated bioalloy extract compared to the un-coated bioalloy extract. HA coated bioalloy is better tolerated by human osteoblast cells.

### Biography

E Vasilescu has completed his PhD at the age of 30 years from Institute of Physical Chemistry "Ilie Murgulescu" of Romanian Academy and postdoctoral studies from University of Bucharest. She is Senior Researcher at Institute of Physical Chemistry "Ilie Murgulescu", Bucharest, Romania. She has published more than 115 papers in reputed journals regarding the passive film formation and reactivity, technical and functional characteristics and corrosion behavior of new biomaterials for orthopedic and dental implants.

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## Laser ablation process for thin film deposition and material processing on nano/micrometer scales

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Pulsed-laser radiation can be absorbed through various energy transfer mechanisms, leading to thermal and non-thermal heating, melting, and finally ablation of the target. Laser ablation has become one of the most efficient physical methods for micro and nanofabrication of materials due to the high resolution capability, low heat deposition in the target and high level of flexibility. Laser ablation of the target in vacuum or in a residual gas produces an ejection of its constituents and to the formation of nanostructured thin films on the PLD process. The properties of synthesized nanostructured thin films can be efficiently controlled by parameters of laser ablation (fluence, pulse duration, wavelength) and properties of the environment. The laser ablation process for thin film deposition and material processing on micro/nanometer scales session will address all aspects of the interaction of pulsed lasers with condensed matter, from fundamental theory and simulations to material processing. It will provide a unique forum for exchange of ideas on the physics and application of pulsed laser-materials interaction, including advances in thin film deposition and nano/micromachining.

### Biography

Dongfang Yang received his PhD in Physical Chemistry from University of Guelph in 1995. Now he is a Senior Research Officer at National Research Council Canada. His research interests include laser material processing; pulsed laser and sputtering deposition of thin films; materials development for energy devices, chemical and optical sensors. In his career, he has authored 3 book chapters, 1 patent, and 60 scientific articles. He is currently serving as Member of Editorial Board for 5 scientific journals. He also held the Adjunct Professorship both at Western University and Lakehead University in Canada.

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