BIOACTIVE GLASS COATINGS SYNTHESIZED BY "MAPLE" FOR ENHANCED PERFORMANCE OF MEDICAL IMPLANTS

Ungureanu (Negut) I.[1], Ristoscu C.[1], Tozar T.[1,2], Grumezescu V.[1], Dinu M.[3], Parau A.C.[3], Popa M.[4], Stan M.S.[5]

[1] National Institute for Lasers, Plasma and Radiation Physics, Romania,
[2]Extreme Light Infrastructure-Nuclear Physics, Horia Hulubei National Institute for R&D in Physics and Nuclear Engineering, Romania;
[3]National Institute of Research and Development for Optoelectronics, Romania;
[4]Faculty of Biology, Microbiology Immunology Department, University of Bucharest, Romania;
[5]Faculty of Biology, Department of Biochemistry and Molecular Biology, University of Bucharest, Romania
e-mail: negut.irina@inflpr.ro

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We deposited thin films from bioglass/antibiotic by the matrix-assisted pulsed laser evaporation (MAPLE) technique onto metallic substrates which mimic the surfaces of medical implants. The deposition was made in a two-step procedure: i) a thin layer of the polymeric material was deposited by MAPLE onto Ti substrates, ii) a second layer consisting of bioglass+antibiotic was applied by MAPLE onto the prior deposited polymeric film.

The surface morphology of samples was examined by SEM and the surface topography was assessed by AFM. The wettability of the obtained thin films was studied by means of the sessile drop method, whereas the chemical functions integrity of thin films was studied FT-IR. To simulate the insertion of implants into the physiological media of the human body and the phenomena happening at the tissue-implant interface, samples were immersed in SBF and investigated by FT-IR, after different times. The SBF solutions containing the released products from thin films were analysed by UV-Vis. The electrochemical behaviour of the investigated samples was analysed by potentiodynamic polarization and electrochemical impedance spectroscopy. The antimicrobial action of the antibiotic-containing thin films was evaluated on *Staphylococcus aureus*, *Enterococcus faecalis*, *Escherichia coli*, *Pseudomonas aeruginosa* standard strains. The biocompatibility of obtained thin films was assessed on mouse osteoblast-like cells.

The laser-deposited coatings were biocompatible and resistant to microbial colonization and biofilm formation and can be taken into consideration as novel and viable candidates for implantable surfaces.

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