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Silica based nanostructured biomaterials/biofluids interface processes

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The surface structure of biomaterials is critical for the processes that took place at the interface between biomaterials and simulated body fluids, whether or not enriched with proteins. In order to tune the surface properties of silica based biomaterials prepared by sol-gel or by spray drying methods the as prepared samples were subjected to different heat treatments resulting in development of nanocrystals in the amorphous matrices. Nanostructured hollow microspheres and porous microparticles with TiO_2, Fe_2O_3, gold or silver nanocrystals were immersed in simulated body fluids, with or without proteins. The way in which the type and morphology of the nanostructures from the biomaterials surface are influencing the processes at their interface with biofluids was characterized by various microscopic (SEM, TEM, AFM) and spectroscopic (NMR, EPR, IR, Raman, XPS) methods. Beside dissolution and inorganic layered reconstruction on nanostructured surface the conformation and dynamics of the attached biomolecules are well evidenced.

Biography

Simion Simon is Professor of Physics at Babes Bolyai University, Romania. He finished his PhD studies in 1986, in the field of magnetic resonance on oxide materials and has a two years (1993, 1994) postdoc stage at Nijmegen University, The Netherlands. He is the director of Interdisciplinary Research Institute in Bio- Nano- Sciences and of National Centre of Magnetic Resonance. He has published more than 100 papers in reputed journals.

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