17:30 INFLUENCE OF Au ON ANTIBACTERIAL ACTIVITY OF Ag-TiCN COATINGS

Authors : I. Carvalho1, F. Oliveira1, M. Henriques2, A.P. Piedade3, S. Carvalho1 1GRF-CFUM, University of Minho, Campus de Azur? 4800-058 Guimar?, Portugal 2 IBB-Institute for Biotechnology and Bioengineering Centre for Biological Engineering Universidade do Minho Campus de Gualtar, 4700-057, Portugal 3CEMUC - Mechanical Engineering Department, University of Coimbra, 3030-788 Coimbra

Resume : The increasing demand for sustainable products requires the development of new knowledge-based materials with advanced properties. These products are then expected to: last longer, have a better performance, be safe, and be more efficient. These requirements, gain particular importance when dealing with applications involving the human body: the so-called biomaterials. Thus, the main aim of these investigations is to contribute to the development of new biomaterials that are able to prevent biofilm formation, since those complex microbial communities are responsible for the undesired reactions such as inflammation and infection, and consequently medical devices rejection. This work reports the development of Ag-TiCN coatings doped with gold. One series of samples was prepared by DC reactive magnetron sputtering using two targets, Ti and Ti+Ag, in an Ar + C2H2 + N2 atmosphere. Silver pellets were placed in the

Extended physical, chemical and structural characterization such as the study of composition, grain size and texture phase evolution, phase composition, film surface topography and morphology, will be achieved resorting to surface analysis techniques, such as, Electron Probe Microanalysis (EPMA), X-ray diffraction (XRD), Atomic Force Microscopy (AFM), scanning electron microscopy (SEM-EDS). The galvanic couple formed between gold and silver, accelerates silver ion release and should provide more pronounced antibacterial activity. Staphylococcus epidermidis was selected to study coatings' antibacterial activity, and fibroblasts were used to test the cytotoxicity. Bacteria adhesion and biofilm formation on coatings were assessed by crystal violet staining, which quantifies total amount of biomass. Animal cell (fibroblasts) death was determined by MTS assay.