

Abstract thesis – english

INTERFACES IN THE DEVELOPMENT AND CHARACTERIZATION OF BIODEGRADABLE AND NON BIODEGRADABLE METAL ALLOY

The doctoral thesis entitled "*Interfaces in the Development and Characterization of Biodegradable and Non biodegradable Metal Alloys*" comprises three chapters of literature research representing the state of the art about materials used for medical implants and methods used to characterize these materials, and six chapters representing original research on the AZ31 biodegradable alloy and TiZr non-biodegradable alloy.

The doctoral thesis research comprises surface modifications of forementioned alloys by electrospinning, dip-coating, and electropolymerization.

The obtained coatings, as well as the metallic substrates, were characterized morphologically, structurally, and functionally using SEM, EDX, AFM, FT-IR analysis, contact angle measurements, and electrochemical studies such as electrochemical impedance spectroscopy and Tafel potentiodynamic curves. Furthermore, a drug (gentamicin sulfate) was encapsulated in the deposited polymer coatings and its release kinetics were performed. Uncoated and coated alloy samples with or without the drug were tested for antibacterial effect against *Escherichia coli* and *Staphylococcus aureus*.

At the end of this work a conclusions chapter includes the original contributions, the bibliography, and the list of publications.