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MEETING POINT OF THE SCIENCE AND PRACTICE IN THE FIELDS OF  
CORROSION, MATERIALS AND ENVIRONMENTAL PROTECTION

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*STECIŠTE NAUKE I PRAKSE U OBLASTIMA KOROZIJE,  
ZAŠTITE MATERIJALA I ŽIVOTNE SREDINE*

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# PROCEEDINGS

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## Novel Calcium Phosphate Coatings with Selenium on Titanium

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### Abstract

*This paper deals with the deposition of calcium phosphate and hybrid coatings based on calcium phosphate ceramics on titanium with improved properties by in situ anodization/anaphoretic deposition process. Hybrid coatings consisted of chitosan oligolactate (ChOL) and ChOL with Se as immunomodulatory oligoelement. The paper contributes to solving the problem of multi-stage pre-treatment and post-treatment of titanium and oxidized titanium surface to obtain a coating on the substrate, adhesion of the coating, antimicrobial and cytotoxic properties that occur in biomaterials, as well as reduced immune inflammatory response of the organism. The in situ method results in improved adhesion bioactive coating, increased bioactivity and biocompatibility with increased antimicrobial properties and absence of cytotoxicity. The studied biomaterials have improved properties such as: corrosion resistance, absence of toxicity to the human body and adequate strength, which enables their potential use in medicine and dentistry. The innovation is reflected in combining calcium phosphate coating synthesis and surface modification by partially incorporating a ceramic coating into the crystalline structure of the substrate. The characterization of the coatings obtained in this manner was performed by various physico-chemical, biochemical and biological methods. These characterization techniques included: FE-SEM, XRD, FTIR, cytotoxicity and in vivo testing.*

**Keywords:** selenium; chitosan oligolactate; immunomodulation; hybrid coating