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Affinity of bacteria *Desulfovibrio desulfuricans* to various titanium alloys

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Titanium alloys are widely used for many medical and technical applications. Sulphate-reducing bacteria (SRB) such as these belonging to *Desulfovibrio desulfuricans* species may cause corrosion of various metals including titanium and its alloys. These bacteria can form biofilm on the metal surface. Titanium and its alloys may be colonized by microorganisms including SRB and corrosion under their metabolic activity may occur. Up today, there are no satisfactory results of removal already developed mature biofilms. There is a need for research on the possibility to control biofilm formation on titanium. High surface energy connected with the alloy composition, negative charge and high surface roughness of titanium alloys may promote the adhesion of bacteria. In order to prevent biofilm formation, modifications to the titanium alloys composition and surface character must be carried out for elimination the effects of these properties. In this study, the influence of the titanium alloy type on the biofilm formation by *D. desulfuricans* bacteria has been studied. The biofilms formation by *D. desulfuricans* bacteria on grinded, electropolished and anodized surfaces of three titanium alloys: NiTi, Ti6Al4V and Ti6Al7Nb have been investigated during the metal samples immersion in various simulated physiological solutions (artificial saliva, artificial saliva under inflammatory conditions). Based on results of microscopic and biochemical investigations, the influence of the alloy type (with different chemical composition) on the biofilm formation by *D. desulfuricans* bacteria has been detected.

Biography

Beata Cwalina has almost 40 years of research experience in studying the fundamental and applied aspects of metals bioleaching from various materials, biocorrosion of metals and biodeterioration of non-metallic materials as well as the modification possibilities of connective tissues for implantology. She has published over 270 papers, many in reputed journals and has been serving as a Reviewer. She had been a member of scientific councils of four universities. She has supervised 5 PhD students and has reviewed many PhD, Associate Professor and Professorship thesis.

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