

Formation and Development of Polyspecies Biofilm on the Surface of Ti-7.5Mo Nanotubes Growth

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Abstract : In the present work, a susceptibility and efficacy of the Ti-7.5Mo alloy nanotube and Ti-7.5Mo alloy to bacterial biofilm formation after surface treatment was evaluated. The Ti-7.5Mo alloy was obtained in arc furnace under an argon atmosphere. Ingots were then homogenized under vacuum at 1100 °C for 86.4 ks to eliminate chemical segregation and after cold worked discs were cutting. Nanotubes were processed using anodic oxidation in 0.25% NH₄F electrolyte solution. Biofilms were grown in discs immersed in sterile brain heart infusion broth (BHI) containing 5% sucrose, inoculated with microbial suspension (10⁶ cells/ml) and incubated for 5 days. Next, the discs were placed in tubes with sterile physiological solution 0.9% sodium chloride (NaCl) and sonicated for to disperse the biofilms. Tenfold serial dilutions were carried and aliquots seeded in selective agar, which were then incubated for 48 h. Then, the numbers CFU/ml (log 10) were counted and analyzed statistically. Scanning electron microscopy (SEM) on discs with biofilms groups was performed, atomic force microscope (AFM) and contact angle. The results show that there is no difference in bacterial adhesion between Ti-7.5Mo alloy nanotube pure titanium and Ti-7.5Mo alloy.

Keywords : biofilm, titanium alloy, brain heart infusion, scanning electron microscopy

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