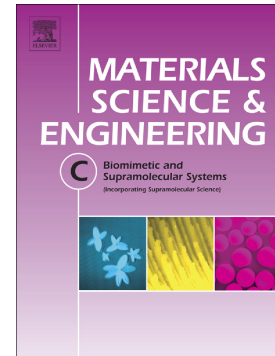


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Cellular response to nano-structured Zr and ZrO₂ alloyed layers on Ti-6Al-4V

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Abstract

The surface topography of biomaterials is known to influence cellular response such as adhesion, spreading and differentiation. In this work, the behavior of osteoblasts and endothelial cells on nano-structured Zr and micro/nano-structured ZrO₂ alloyed layers of Ti-6Al-4V (TC4) was investigated. Zr alloyed layer (Zr@TC4) decreases the hydrophilicity whereas ZrO₂ alloyed layers (ZrO₂@TC4) is more hydrophilic than TC4 and more proteins adsorb on ZrO₂@TC4 followed by Zr@TC4. The cells proliferate steadily on the smooth TC4 and nano-structured Zr@TC4 surfaces and the osteoblast activity is more pronounced on Zr@TC4 than TC4. The micro/nano-structured surface on ZrO₂@TC4 restricts cellular adhesion and spreading independent of the surface

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