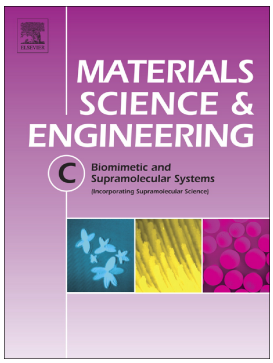

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Cellular response to nano-structured Zr and ZrO_2 alloyed layers on Ti-6Al-4V

Xiangyu Zhang [a,b] *, Guannan Zhang [a], Jianfang Li [a], Xiaojing He [a], Yueyue Wang [a], Ruiqiang Hang [a], Xiaobo Huang [a], Bin Tang [a], Paul K. Chu [b] **

[a] College of Materials Science and Engineering, Taiyuan University of Technology, Taiyuan, China

[b] Department of Physics and Materials Science, City University of Hong Kong, Tat Chee Avenue, Kowloon, Hong Kong, China

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 ZrO_2 alloyed layers of Ti-6Al-4V (TC4) was investigated. Zr alloyed layer (Zr@TC4) decreases the hydrophilicity whereas ZrO_2 alloyed layers (ZrO_2@TC4) is more hydrophilic than TC4 and more proteins adsorb on ZrO_2@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 ZrO_2@TC4 restricts cellular adhesion and spreading independent of the surface

* Corresponding author.
** Corresponding author.
E-mail address: zhangxiangyu@tyut.edu.cn (X. Zhang), paul.chu@cityu.edu.hk (P.K. Chu).