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Hongqing Feng, Guomin Wang, Guosong Wu, Weihong Jin, Hao Wu, Paul K. Chu

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Plasma and ion-beam modification of metallic biomaterials for improved anti-bacterial properties

Hongqing Feng, Guomin Wang, Guosong Wu, Weihong Jin, Hao Wu, Paul K Chu*

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

* Corresponding author: Email: paul.chu@cityu.edu.hk; Tel: +852-34427724; Fax: +852-34420538; Postal address: Department of Physics and Materials Science, City University of Hong Kong, Tat Chee Avenue, Kowloon, Hong Kong, China

Abstract

Plasma-based technology is effective in improving the performance of titanium and magnesium-based biomaterials with regard to bacteria prevention and osteogenetic induction. For titanium and titania, silver ion implantation can endow them with good bactericidal ability without compromising the compatibility with osteoblast cells and sometimes even improve the biological functions. In Ag-implanted titanium, micro-galvanic effects occur between the Ag nanoparticles and titanium substratum forming a proton-depleted region which may cause bacteria death due to the disturbance of their energy production process. In ion-implanted

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