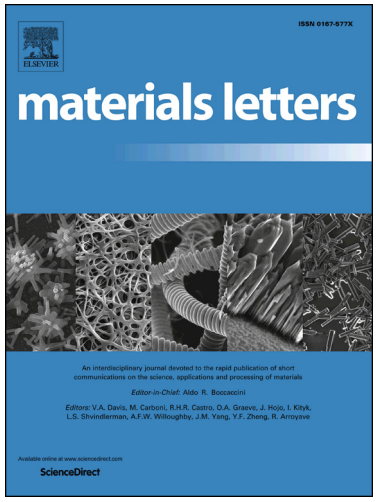

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Evaluation of strategically-designed bifunctional peptide coating by QCM-D and osteoblast behaviors on titanium

Jing Mao [a, #], Min Zhao [a, #], Fan Xia [b], Tianchi Zhang [b], Dan Wang [a,*]

[a] Department of Stamotology, Tongji Hospital, Tongji Medical College, Huazhong University of Science and Technology, Wuhan, 430030, PR China

[b] Key Laboratory for Large-Format Battery Materials and System, Ministry of Education, School of Chemistry and Chemical Engineering, Huazhong University of Science and Technology, Wuhan, 430074, PR China

[*] Corresponding author.

Email address: danwangtongji@hust.edu.cn (D. Wang)

[#] These two authors contributed equally to this article.

Abstract

Arginine-glycine-aspartic acid (RGD) peptide is the most widely employed motif as biomimetic coating on titanium (Ti) surface to accelerate osseointegration between Ti implant and bone tissue. Ti binding motif (TBP) has the ability of specifically recognizing and binding onto Ti surface via electrostatically interaction with TiO_2 layer. Here, TBP was introduced to connect RGD with different design strategies to form three chimeric dual-targeting peptides. Quartz crystal microbalance with dissipation monitoring (QCM-D) was used to monitor the real-time absorbance of these peptides on Ti plates in molecular level as well as to estimate the properties of peptide films. In addition, MC3T3-E1 cell behaviors on Ti plates coated with these peptides were evaluated in adhesion, spreading and proliferation under mechanical loading condition which simulated the Ti implant load carrying in oral cavity.