

研究论文

非胶原蛋白模拟多肽E8DS促进I型胶原仿生矿化

王秀梅, 王琼, 程振江, 崔福斋

清华大学材料科学与工程系新型陶瓷与精细工艺国家重点实验室 北京 100084

摘要: 通过分析骨涎蛋白和牙本质基质蛋白的功能域, 设计合成了一种非胶原蛋白模拟多肽E8DS (EEEEEEEDSESSEEDR), 引入胶原蛋白仿生矿化体系, 共同调控磷酸钙晶体的矿化过程。圆二色谱和红外光谱分析结果表明, 多肽E8DS可与钙离子和胶原分子通过静电作用相结合。使用稳态凝胶系统对多肽E8DS的分析结果表明, E8DS具有很强的调控钙磷盐矿化的能力。多肽的加入有助于胶原纤维的分子组装, 增加了形核位点, 促进了磷酸钙在胶原纤维表面矿化, 使胶原纤维的矿化程度明显提高。

关键词: 有机高分子材料 生物矿化 非胶原蛋白 胶原纤维 多肽

Biom mineralization of type I collagen promoted by an engineered non-collagen protein - derived peptide E8DS

WANG Xiumei, WANG Qiong, CHENG Zhenjiang, CUI Fuzhai

State Key Laboratory of New Ceramics and Fine Processing, Department of Materials Science & Engineering, Tsinghua University, Beijing 100084

Abstract: Peptides with sequence (EEEEEEEDSpESpSp\$EEDR) were synthesized to mimic the biom mineralization function of non-collagenous protein over the type I collagens. The results show that the peptide can be bound to Ca^{2+} and type I collagen by electrostatic interactions. Moreover, synthetic peptide is conducive to calcium ions binding and promotes the nucleation and formation of minerals on the surface of collagen fibrils. Designed peptides also presented a function of accelerating type I collagen fibrillogenesis and the formation of fibrils bundle or network.

Keywords: organic polymer materials biom mineralization non-collagenous protein collagen peptide

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通讯作者: 王秀梅

作者简介:

通讯作者E-mail: wxm@mail.tsinghua.edu.cn

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