

第192回 IBBセミナー

学際・国際的高度人材育成ライフイノベーションマテリアル創製
共同研究プロジェクト 第2回生体医療・福祉材料分野研究会

Biocompatible and Biodegradable Coatings by Physicochemical methods for Implants

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日時: 平成29年9月27日(水) 15:00~16:30

場所: 22号館1階 マルチタスクルーム

Abstract

Surface modification is an important and predominant technique for obtaining biofunctionality in metals for biomedical use. It changes the surface composition, structure, and morphology of the material, leaving the bulk mechanical properties intact. Amorphous metallic alloys or metallic glasses are lucrative engineering materials owing to their superior mechanical properties such as high strength and large elastic strain. In order to identify new biologically safe glass forming Ti-based compositions for biomedical applications, quaternary Ti-Nb-Zr-Si metallic glasses in thin film forms were fabricated by sputtering on Ti substrates. A suitability evaluation concerning glass forming ability, thermal stability, mechanical and biocompatibility were performed and the results will be discussed. Biodegradable PCL with different weight percentage were electrospun to form nanofibrous scaffold. In order to enhance the bioactivity, magnesium metallic glasses were sputtered over the PCL scaffold and the results will be discussed. A serious problem in implant materials, namely assimilation, whereby calcium phosphate precipitates from body fluids over Ti metal implants might result in bone re-facture during removal operation of the implanted devices after healing. To control such assimilation, physical vapor deposition of Zr metallic glass (MG) and ZrO₂ on Ti substrate was carried out and these results will also be discussed in the IBB seminar.

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