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SURFACE MODIFICATION OF MAGNESIUM ALLOYS FOR HARD TISSUE APPLICATIONS

Preeti Makkar

Soonchunhyang University, Cheonan, South Korea

Biodegradable implants have been extensively studied for hard tissue regeneration. Magnesium seems as a potential candidate due to its unique combination of bone-like mechanical properties and being degradable in vivo. However, the rapid corrosion of magnesium and its alloys in physiological environment limits their clinical applications. Alloying and Surface coatings are the reliable ways to improve corrosion resistance by preventing its contact with the environment. The present paper details the state of the art in coating and surface modification technologies, applied to magnesium alloys for improved corrosion resistance and biocompatibility. The efficiency of single layered bioactive ceramic based coatings and dual layered ceramic-polymer based coatings are studied in this regard. The morphology, phase, chemical composition, wettability and performance in terms of in-vitro corrosion and biocompatibility using pre-osteoblast MC3T3 cells were discussed and compared with uncoated samples. In-vivo performance using rabbit model was also evaluated for the coatings with respect to magnesium substrate.

BIOGRAPHY

An experienced researcher, an avid learner, team worker with project management skills. Currently working as Assistant Research Professor at Institute for Tissue Regeneration (ITR), Soonchunhyang University, cheonan-city, South Korea since April 2018. Prior to this position, worked as a post-doctoral research fellow (Biomaterials) at ITR from March 2016-2018. The prime project is based on surface coatings of magnesium based alloys for hard tissue applications. Earlier, worked as a Women Scientist under WOS-A, Department of Science and Technology (DST) scheme, at Department of Metallurgical and Materials Engineering (MMED), Indian Institute of Technology Roorkee (IITR), INDIA. Handled research project as Principal Investigator. PhD (Material Science) from MMED, IITR, M.Tech (Materials Science) from Thapar University, INDIA.

preeti.materials@gmail.com



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