OMICS International
conferenceseries.com

Noura Alom et al., J Tissue Sci Eng 2015, 6:2
http://dx.doi.org/10.4172/2157-7552.S1.022

Hydrogel scaffolds derived from decellularized extracellular matrices for tendon-to-bone tissue engineering

Noura Alom, Kevin M Shakesheff and **Lisa J White**
University of Nottingham, UK

Hydrogel scaffolds derived from the extracellular matrix (ECM) of mammalian tissues have been used to promote constructive remodeling *in vivo*. Such scaffolds have the advantage of being delivered in a minimally invasive manner have the bioinductive properties of the native matrix and may be used to fill an irregular shaped space. The objective of this study were: To determine the biological composition and osteoinductive properties of ECM hydrogels prepared from demineralized and decellularized bovine bone and to prepare hydrogel scaffold from decellularized equine tendon and determine their structure and mechanics properties. Bovine bone was demineralized and decellularized as previously described; the resultant bone granules were solubilized and gelation was induced by neutralizing the pH and salt concentration. Mouse primary calvarial cells (mPCs) and C2C12 mouse myoblast cells were cultured on the surface of hydrogels, osteogenic differentiation was analyzed by qPCR, immunohistochemistry, alkaline phosphatase (ALP) activity and alkaline phosphatase staining in both basal and osteogenic media. Equine flexor digitorum superficial is tendon ECM was decellularized and subsequently pepsin digested and solubilized. Decellularized tendon matrix (tECM) and coll type I hydrogels was seeded with NIH 3T3 fibroblasts to determine cell viability and proliferation using Alamar Blue assay. Culture of C2C12 and mPCs on bECM and bDBM gels resulted in significant increases in expression of osteogenic markers ALP, osteopontin (OPN) and osteocalcin (OC) compared to cells cultured on collagen type I for both basal and osteogenic media. tECM hydrogel showed to have distinct structural, mechanical and biologic properties.

Biography

Noura Alom has graduated in 2008 with BSc in pharmacy from Jordan University of Science and Technology, Jordan. In 2011, she achieved her Master Degree in Pharmaceutical Sciences at Aston University. In 2013 she started a 4 year PhD at the University of Nottingham in the Tissue Engineering Group within the Wolfson Centre for Stem Cells, Tissue Engineering and Modelling (STEM). Her research is mainly addressed in developing biologically derived biomaterials from natural resources for tissue regeneration.

Paxna2@nottingham.ac.uk

Notes: