

O.S.E.B.2.

Polymer/Ceramic Composite Scaffold for the Regeneration of Bone Defect After Cancer Treatment in Dog Distal Radius

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The aim of the study was to reconstruct a radius bone loss after cancer treatment in a 8 year-old, male Labrador (69.2 kg) presented for progressive lameness of 3 weeks duration. A polymer/ceramic composite (PCL/TCP, 10%wt.) was used to fabricate scaffold by using rapid prototyping technique. Radiographs of the affected limb revealed proliferative changes and lysis of the radial metaphysical cortex with an irregular periosteal reaction in the distal radius. Limb-sparing surgery was offered because the owner refused limb amputation. In this study a 10cm of radius bone region was removed and the defect was reconstructed with the composite scaffold. For scaffold fixation a titanium locking plate was used. After scaffold implantation a significant improvement of the dog movement have been obtained. Every month implanted scaffold using radiographs was evaluated. After 3 months of implantation, we observed that sufficient tissue formation can be induced in segmental bone defect in combination with a well-designed composite scaffold was used.

O.S.E.B.3.

Magnetic Chitosan-g-acrylate/styrene Composites for Hybrid Coatings with Nanostructured Morphology

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This study aims to evaluate novel hybrid materials as potential candidates for producing coatings with hierarchical roughness and controlled wetting behaviour.

Magnetite (Fe₃O₄) nanoparticles obtained by co-precipitation were embedded in matrices synthesized by solution radical co-polymerization of butyl acrylate (BA), butyl methacrylate (BMA), hexyl acrylate (HA) or styrene (ST) with ethylene glycol di-methacrylate (EGDMA) onto previously modified chitosan bearing surface vinyl groups. The resulting composite particles were characterized regarding their average size (dynamic light scattering), composition (FTIR) and magnetic properties.

Hybrid thin films containing ethanolic suspension of composite particles and pre-hydrolysed alkoxysilane as a coupling/crosslinking agent were deposited by spin coating. The films were cured by heating and subsequently characterized regarding their morphology (scanning electron microscopy) and contact angle with water. The structure-property relationship is discussed. Acknowledgement: This work was supported by a grant of the Ministry of National Education, CNCS-UEFISCDI, project number PN-II-ID-PCE-2012-4-0433.