during the initial stage of implantation. To fabricate SPcl composite with a ratio of 30/70, Starch and polycaprolactone were mixed with Chloroform and cast in moulds. After characterization of composites using FTIR spectroscopy, degradation studies were performed in PBS. The UV-visible spectroscopy's result used to evaluate starch degradation rate as an index for composite degradation. Furthermore the cross-sections morphology, before and after degradation, was observed by scanning electron microscopy. SEM images showed that a porous structure is formed. These results suggest that SPcl composite, with potential to form porous scaffold in situ, is promising for bone tissue engineering applications.

29.P13
Impact of different formulation variables on the biodegradability, surface area and porosity of biopolymeric microparticles

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The influence of different formulation variables including the biopolymer M.W. and concentration, crosslinking density, time and pH in addition to co-crosslinker concentration on the functional properties such as surface area, porosity, chemical and bio-degradability of chitosan microparticles (CS MPs) prepared by ionic gelation technique was studied. The microparticle yield ranged from 8.92 to 38.02% with a particle size of 0.83-1.22 mm. SEM micrographs revealed a spherical shape of microparticles with some cracks and pores. CS MPs showed higher swelling degree in simulated gastric than in simulated intestinal fluid and disintegrated after 6 hr at pH 1.2. Glutaraldehyde co-crosslinked microparticles showed a lower swelling in both media and maintained their integrity for 3-4 days. These microparticles exhibited a surface area of 19.33 - 56.25 m2/g with a pore volume of 28.37 - 77.67 e-3ml/g. They were found to be a susceptible substrate for the hydrolytic action of lysozyme while remained almost structurally stable in HCl and PBS. Conclusively, proper modification of formulation variables can affect the physicochemical properties of these microgel carriers and suggest their usefulness for controlled release of drugs and bioactive substances.

29.P14
Cell adhesion in free-standing multilayer films made of chitosan and alginate

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The method for preparing multilayer ultrathin films by the consecutive deposition of oppositely charged polyelectrolytes has gained tremendous recognition due the user friendly preparation, capability of incorporating high loads of different types of biomolecules in the films, fine control over the materials' structure, and robustness of the products under ambient and physiological conditions. However the preparation of such films needs the assembly on a substrate and, sometimes, cannot be detached from it, which has limited the application of such films in areas as tissue engineering and regenerative medicine (TERM).Thus, the production of free-standing films is of extreme importance once it allows the direct experimental determination of many physical properties of fundamental significance such as ion permeation and mechanical properties that can be tuned for real-world applications. In this work, we investigated the elaboration of free-standing multilayer films made of chitosan (CHI) and alginate (ALG), by detaching a polyelectrolyte multilayer film from its underlying substrate without any postprocessing step. The conditions for optimized film growth were investigated. The adhesion of C2C12 myoblast cells on the CHI/ALG membrane was assessed by cytoskeletal and nuclear staining. A good cell adhesion and spreading was observed all over the surface. The results demonstrate the potential of such biocompatible free standing membranes made of CHI and ALG for applications in TERM.

29.P15
Chitosan/silica homogenous hybrid hydrogels for tissue engineering applications

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The objective of this study was to fabricate a homogenous organic/inorganic biohybrid hydrogel from chitosan and bioglass. Chitosan is a natural polymer with favourable properties of non-toxicity and ability to promote wound healing. Hydrogels of chitosan are considered as a potential candidate for bone replacements; however, lack of bioactivity limits its application. Bioceramics such as bioglass are combined with chitosan hydrogels to address this issue. Bioglass exhibits high bioactivity and capability to bond with living bone in the body without forming fibrous tissues. Addition of bioglass to chitosan improves its bioactivity and cell adhesion properties; however, lack of homogeneity is a major challenge for the development of this composite matrix. Formation of hydrogen bonding promotes the compatibility between organic and inorganic phases in their physical mixtures; however, this bonding was not efficient for the production of homogeneous hybrids. The results of our study demonstrated the feasibility of fabricating a homogenous mixture between chitosan and bioglass by chemical conjugation. FTIR analysis confirmed that functionalization of chitosan with silica-containing molecules resulted in the formation of Si-O-Si bonds between silica groups of bioglass and functionalized chitosan. The physiochemical properties of hybrids such as degradability, swelling and mechanical strength were a function of the degree of covalent bondings of bioglass and chitosan.

29.P16
Evaluation of the effect of addition of wollastonite on the mechanical strength, porosity and cell compatibility of different molecular weight chitosan

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Chitosan is a cationic biodegradable polymer which possesses very good cellular compatibility and tissue growth, but lacks mechanical strength for bone tissue regeneration. The present work describes the effect of wollastonite on various molecular weight of chitosan scaffold. Different composite scaffolds with varying molecular weight of chitosan (109,513, 41,707, 27,175) and % of wollastonite (20%,30%,40%) have been prepared by freeze drying method. The scaffolds were evaluated to find any improvement in mechanical strength, porosity and biocompatibility. The highest mechanical strength was achieved with scaffold containing chitosan of mol. wt. 27,175Da and 30% wollastonite (particle size<5μm). The compressive stress and compressive modulus were found to be 140.9 and 1201 kPa and porosity 77.5%. This study demonstrated that the low molecular weight chitosan produces composite scaffold with higher mechanical strength compared to the chitosan with high molecular weight. Further there is no significant