DEVELOPMENT OF CHITOSAN PARTICLES WITH RADIOPAQUE PROPERTIES

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Tissue engineering is concerned about the rejuvenation and restoration of diseased and damages tissues/organs using manufactured structures that mimic the native environment. Although these structures manufacture technology has so many perspectives, at present, have not yet been developed appropriate techniques and methodologies for particles production. Chitosan, a positively charged polysaccharide, has applications in several medicinal areas because it has biocompatibility and a degradation profile. However, once as a polymer, its visualization by imaging techniques are not workable, since it cannot detected by x-rays and ultrasound characterizations. Thus, by adding a contrast agent, could be add radiopaque properties to the polymers, thereby allowing the particles going monitored when their implantation takes place. The objective of the present work was to produce and characterize chitosan and chitosan/barium particles produced by a particle aggregation method. Chitosan and chitosan/barium sulfate particles were prepared using the ionotropic gelation. Chitosan solution (2%wt) was dropped into a Sodium Tripolyphosphate Solution (5%wt), using a compressed air compressor to form particles. Then, the obtained particles were rinsed with PBS until neutral pH and frozen at -20 °C for 24h. After freezing, the samples were lyophilized for 72h. The chitosan and chitosan/barium sulfate particles were characterized by Optical Microscopy (OM), Size Particle Distribution and Fourier Transformed Infrared (FTIR). Chitosan particles were obtained with ranges of sizes ranging from 1 to 2.5mm, where the particles presented, in the majority, sizes in the range of 1.5 to 2mm. Through FTIR results, was observed ionic interactions between the negatively charged phosphate groups (PO$_{-}$) chains of the TPP and the protonated amino groups (NH$_{3}^{+}$) of chitosan chains. With this results, was possible conclude that the particle aggregation method was efficient to obtain chitosan particles.