

(P 223) Injectable Hydrogels Based on ChitosanL. F. Boesel¹, R. L. Reis^{2,3}, J. San Román¹¹ICTP-CSIC, Dept. of Biomaterials, Madrid, Spain.²3Bs Research Group, Univ. of Minho, Braga, Portugal.³IBB—Institute for Biotechnology and Bioengineering, Braga, Portugal.

Oligo-D-glucosamine (“oligomer” of chitosan) seems well suited for injectable, biodegradable systems (IBS), due to their solubility in water, easier functionalization and the possibility of working at high concentrations.

Chitosan was enzymatically degraded with a commercial enzyme (Multifect Pectinase FE) at 50°C and pH 5.5 during 17h, adapting a previous procedure. The oligomers were precipitated in ethanol and analysed by MALDI-TOF/MS and FTIR. They were then functionalized by reaction with methacrylic anhydride (MethA), varying ratio of amount of substance of MethA : amount of substance of -NH₂ groups in the oligomer. The obtained methacrylamide-oligomers were polymerized with a potassium persulfate/vitamin C initiation system. Both the modified oligomers and the polymerized product were analysed by FTIR and NMR.

In FTIR, there was the appearance, on the spectrum of the acrylic ester oligomer, of bands attributed to =CH₂ stretching (~3100 cm⁻¹) and the strengthening and splitting in two of the bands of amide I (~1650 cm⁻¹), due to the reaction of carbonyl from the anhydride with amine of chitosan. After polymerization with the above mentioned system, the methacrylamide oligomers became insoluble due to the crosslinking at the double bonds of the acrylic side groups, and the spectrum shows notable changes.

We have shown that injectable systems based on chitosan oligomers may be easily prepared. These materials have varying properties depending on the amount of methacrylamide groups incorporated in the oligomer chains.

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