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Chitosan Polymeric Derivatives as Smart Human Genome Carriers

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Chitosan is one of the natural materials used for gene delivery; this is why the current study focused on getting Chitosan from Chitin extracted from shrimp shells by known and modified chemical methods to obtain chitosan with a high Degree of Deacetylation to increase its solubility. It was characterized by FTIR and intrinsic viscosity measurement in order to determine the degree of deacetylation and viscosity average molecular weight of purified Chitosan. Some Chitosan derivatives were prepared by reaction of chitosan with (maleic-, adipic- and sebacic-) anhydride to prepare N-malenoyl, - N-adiboyl, and N-sebacoyl-) chitosan respectively. Polymerase chain reaction (PCR) was used as a technique for amplification and obtaining of target gene within the human genetic material (DNA); the heat shock protein gene (hsp-70) with about 590 bp. in its length, was used as a model of a specific human gene to study the effect of all Chitosan derivative by the possibility of wrapping mechanism of the human genes, which may use them in several gene therapy, biomedical applications in the future.

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