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Blood Compatibility and Biodegradability of N-acyl Chitosan Derivatives

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Chitosan was selectively N-acylated with various carboxylic anhydrides, e.g., acetic, propionic, *n*-butyric, *n*-valeric, and *n*-hexanoic anhydrides. The degree of N-acylation of about 20 - 50% was obtainable by using carboxylic anhydride of 0.3 - 1.2 mole per glucosamine residue. *In vitro* blood compatibility tests were performed by rheological measurement, blood clotting test, and SEM observation for human blood and plasma protein. N-acyl chitosan showed more blood compatible properties than N-acetyl chitosan and in particular, N-hexanoyl chitosan was the most blood compatible. Enzymatic degradation was also investigated by adding a lysozyme solution to N-acyl chitosan solution and film, incubating at 37℃. The N-acyl chitosan had a susceptibility to lysozyme and molecular weight (M_w) of the material liberated from the film was $2x10^4$ - $10x10^4$.