

**TITLE**

**Elaboration of nano-scaled chitosan carriers for protein delivery**

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National Nano-sized protein carriers from polysaccharides bear a lot of potential because they are made of non toxic materials from biomass, via energy efficient and environment friendly processes. Particularly attractive for the production of safe delivery systems is the formation of colloidal polyelectrolyte complexes by charge neutralization between oppositely charged polysaccharides, which takes place in water at room temperature, under moderate stirring, in the absence of any chemical cross-linker and solvent.

But more criteria are to be met to produce nano-sized delivery systems for in vivo use: these carriers should maintain their colloidal properties at physiological pH and salt concentration have a long shelf life and be lyophilized and sterilized.

Our strategy towards colloids meeting the above specifications was based on the use of chitosan, a copolymer of N-acetyl glucosamine and glucosamine, obtained from partial deacetylation of chitin. Chitosan is known for its biocompatibility. Dextran sulfate was selected as polyanion.

We will address some formulation issues like the mode and the order of addition of the reactants and more fundamental aspects such as the impact of chitosan intrinsic parameters (molar mass and the degree of acetylation i.e. the molar fraction of N-acetyl groups in the polymer chain) on the particle size, size distribution, the colloidal stability in physiological media and the capacity of lyophilisation.

Results on the association with proteins or fluorescent markers and preliminary results on the effective delivery of vaccine in vivo will be reported.

**Biography**

Thierry Delair has been a full professor at Lyon University, since November 2008. Before he spent twenty years in different R&D departments in bioMérieux, a major French biotech company, where he developed polymers for medical diagnostics and vaccine delivery. He co-authored 121 articles, 17 patents, 8 book chapters, and gave 60 oral conferences. His areas of expertise are the physico-chemistry of dispersed media, natural polymer formulation, polymers / biological molecules interactions. His current research subjects are focused on the elaboration and the characterization of nano-structured physical hydrogels based on polysaccharides originated from biomass, for tissue engineering, drug and vaccine delivery.