

4th International Conference on **Vaccines & Vaccination**

September 24-26, 2014 Valencia Convention Centre, Spain

Nasal administration of antigens using maltodextrin nanoparticles: A mechanistic study

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Nanoparticles can be used to deliver antigens to immune cells, therefore increasing their immunogenicity. A better knowledge of their mechanisms of interaction with cells and the biological fluids is necessary to fully understand their potential as delivery systems of antigens. Most of nanotechnologies-antigens complex to formulate proteins implies surfactant, organic solvents, temperature conditions; all these parameters are generally considered to be deleterious from proteins and are limitations for further medical applications. To overcome these inconveniences, we developed a new concept based on porous nanoparticles to obtain protein loading in water without requiring any organic solvent or surfactant. These nanoparticles made from starch hydrolysate (maltodextrin) can be used alone or associated with lipids. Proteins loaded are efficiently protected from proteolysis and antigens are highly delivered within cells and when administered intra-nasally or sub-lingually this delivery vehicle was capable of eliciting humoral, cellular and mucosal immunity without the use of adjuvant. This lecture will give an overview of the mechanisms implied using nanoparticles to deliver antigens to the immune cells using the nasal route of administration.

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