Novochizol
First-in-class polysaccharide materials technology

BREAKTHROUGH CHITOSAN FORMULATION FOR MUCOSAL VACCINES

Building mucosal immunity against COVID-19: a better scenario to eradicate the pandemic

Chitosan, a derivative of chitin, is the second most abundant polysaccharide on earth. It has numerous applications in healthcare and other fields, but its inherent characteristics limit its use.

Novochizol™ technology quantitatively transforms single linear chitosan molecules into uniformly sized nanoparticles that can be used alone, as excipients, emulsifiers or carriers of countless active ingredients.

Novochizol™ overcomes the limitations of chitosan, enhances its existing beneficial properties and displays new characteristics, **offering first-in-class solutions for intranasal, intrapulmonary and oral vaccine development.**

Watch a 5-minute video presentation of Novochizol™

NOVOCHIZOL™ vs CHITOSAN

Chitosan

- Solubility only at acid pH
- High viscosity
- Rapid biodegradation
- Low physical and chemical stability
- Limited physical states
- Limited carrier possibilities

NOVOCHIZOL™

- Solubility/dispersibility under all conditions
- Low viscosity
- Slow biodegradation
- High physical and chemical stability
- Aqueous suspensions, aerosols, hydrogels, solid states
- Sustained release of small molecules, peptides, nucleic acids, and proteins, including recalcitrant , hydrophobic compounds.

THE CASE FOR BUILDING MUCOSAL IMMUNITY AGAINST COVID-19 (AND OTHER RESPIRATORY VIRUSES)

Mucosal immunity vs systemic immunity: efficacy

- Systemic immunity only aims to prevent disease, **not viral replication** in the mucosa and its transmission.
- Mucosal immunity prevents viral replication in the mucosa: exactly what is needed to stop the pandemic.
- Only mucosal immunity attacks viruses outside the body, by secreting IgA antibodies in the mucus (SIgAs).
- Injectable vaccines only generate serum IgG antibodies: they do little or nothing to build up mucosal immunity.
- Mucosal vaccines are all-encompassing: they generate SIgAs (blocking infection) and IgGs (preventing disease).
- Only mucosal vaccines can provide sterile, lifelong immunity.

Mucosal immunity vs systemic immunity: safety

- Systemic immunity is pro-inflammatory: its imbalance is the cause of severe Covid-19, a host response disease.
- Mucosal immunity is non-inflammatory: SIgAs act without activating complement or triggering inflammatory signals.
- Injectable vaccines may cause antibody-dependent enhanced disease (ADE), with IgGs promoting viral replication.
- Mucosal vaccines carry no risk of ADE: mucosal immunity is , with a more balanced T cell response.
- Intranasal vaccines avoid issues associated with needlestick injuries and resulting trauma and inflammation.
- Safe and effective mucosal vaccines against the flu and other viral diseases have been on the market for decades.

NOVOCHIZOL™ FORMULATIONS FOR INTRANASAL VACCINES

- **Versatility**: RNAs, peptides, proteins and viruses can all be formulated for intranasal or intrapulmonary delivery.
- **Nasal clearance:** Novochizol™-formulations adhere to epithelia, minimizing vaccine loss in mucus secretions.
- **Intracellular transport:** Novochizol™ can bring any active vaccine ingredient inside cells that the vaccine targets.
- **Stability:** Novochizol™ would protect vaccine antigens from proteases and nucleases present in the mucus.
- **Stability:** Novochizol™ vaccine formulations would be inherently more stable, facilitating transport and storage.
- **Adjuvant properties:** Novochizol™ particles have the right size and shape to enhance vaccine immunogenicity.
- **Prior art:** chitosan, Novochizol™ parent molecule, has been successfully tested as an Influenza vaccine carrier.
- **Safety:** A preclinical package is available, demonstrating lack of toxicity in a variety of Novochizol™ formulations.

FURTHER INFORMATION: www.novochizol.ch info@novochizol.ch Tel +41 76 370 73 25