



BREAKTHROUGH NANOPARTICLE DRUG FORMULATIONS IN ONCOLOGY TARGETED ADMINISTRATION AND INTRACELLULAR DELIVERY OF ALL CLASSES OF ANTI-CANCER DRUGS

Chitosan, a derivative of chitin, is the second most abundant polysaccharide on earth. Its tissue adhesiveness and permeation and biodegradability make it an attractive polymer to derive drug carriers, in particular in oncology. However, chitosan presents major limitations: it is inherently fragile, heterogeneous and insoluble at physiological pH. Novochizol™ technology overcomes these limitations by quantitatively transforming single linear chitosan molecules into uniformly sized nanoparticles that can be used alone, as excipients, emulsifiers or carriers of countless active ingredients.

Novochizol™ retains chitosan's beneficial properties and displays new characteristics, offering first-in-class solutions for sustained, tissue-targeted drug delivery with intracellular targeting, a unique added value proposition in oncology.

[Watch a short 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
- Batch-to-batch heterogeneity
- Limited carrier possibilities

NOVOCHIZOL™

- Solubility/dispersibility under all conditions
- Low viscosity
- Slow biodegradation
- High physical and chemical stability
- Aqueous suspensions, aerosols, hydrogels, solid states
- Batch-to-batch standardization.
- Sustained release of virtually any API

NOVOCHIZOL™: INTRACELLULAR DRUG DELIVERIES FOR ALL SOLID TUMORS. Because Novochizol™ technology can deliver all classes of APIs – small molecules, peptides, nucleic acids and proteins – inside different cells, only at the site of its administration, it offers an unprecedented potential to formulate virtually any anti-cancer drug, dramatically increasing its efficacy (high ED₅₀) and safety (minimizing systemic effects).

NOVOCHIZOL™- BOTULINUM TOXIN A (BoNT/A) FORMULATIONS. Investigating Novochizol™- BoNT/A in oncology is of particular interest, considering our extensive R&D experience with this formulation in in vitro and in vivo settings, with a full preclinical safety package:

- **Immunotherapy: enabling checkpoint inhibitors.** Checkpoint inhibitors offer the promise of curative medicine in many cancers. But they fail to benefit the majority of patients, because of tumor cells that start secreting immunosuppressive checkpoints in exosomes that travel outside tumors. Novochizol™-mediated delivery of BoNT/A inside tumor cells is poised to inhibit this phenomenon, redeploying checkpoint inhibition effectiveness
- **Inhibition of tumorigenesis through SNARE cleavage.** SNARE proteins, cleaved by BoNT/A, are employed by cancer cells in multiple processes that drive tumorigenesis and promote chemo-resistance. Novochizol™-mediated intracellular BoNT/A is expected to act as a Pan-SNARE inhibitor within tumors, without concerns for toxicity.

INTRATUMORAL CYTOKINE SPIKING. Anti-tumor immunity can be activated by exogenous addition of key cytokines to the tumor environment, providing sufficient doses of the right cytokines remain within the tumor. Novochizol™ technology expedites this task, allowing multiple combinations without any risk of systemic effects.

INTRANASAL AEROSOL FORMULATIONS AGAINST BRAIN CANCER. Brain tumors present a unique challenge due to the inability of most drugs to cross the blood-brain barrier. A Novochizol™-based intranasal route of administration offers an alternative for directly targeting the CNS, without systemic side effects. Novochizol™ aerosols have been formulated for a number of APIs in other areas, exhibiting all key characteristics for effective delivery.

TARGETING CHEMOTHERAPIES TO THE TUMOR MICROENVIRONMENT. The effectiveness of traditional chemotherapies is always limited due to their systemic toxicities. Novochizol™ formulations would allow administration of high doses of even highly cytotoxic compounds intratumorally (injections or aerosols), without systemic distribution.

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