

Manganese Ion Coated Nanoparticles for Delivery of Compositions into the Central Nervous System by Nasal Insufflation

Researchers at the University of South Florida have developed a novel method which delivers genes or small interfering RNA into the brain by nasal insufflations using nanoparticles.

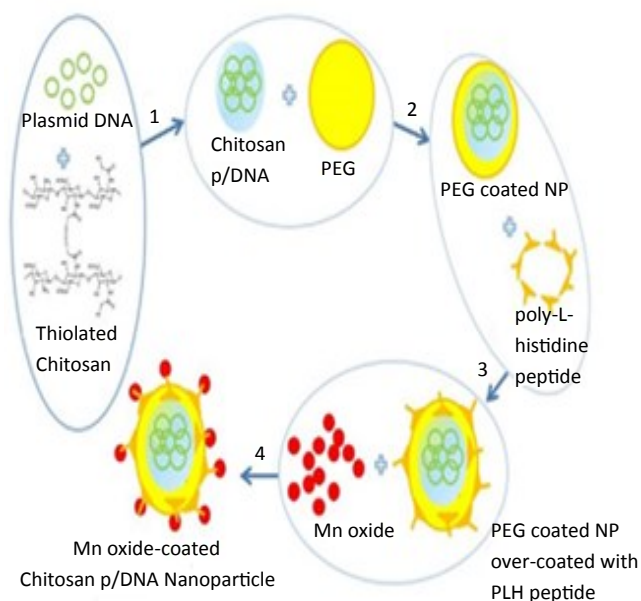
The current method of delivering therapeutic genes or viral vectors into the brain is by minimally invasive neurosurgical injection. For diseases like Huntington’s Disease that involve the entire brain, injection of a viral vector into multiple brain regions over time is not feasible. Furthermore, an additional problem with current methods is the reliance on viral vectors to deliver the gene of interest. Applying these vectors to humans carries a certain amount of risk that can be obviated by using other vehicles for gene delivery such as nanoparticles designed to target specific tissues.

USF researchers have developed novel nanoparticles which can be safely delivered to the brain in a non-invasive manner. These manganese (Mn) oxide-coated nanoparticles are taken up through the nose and then transported to the brain. This allows for more effective therapeutic delivery without the need for invasive neurosurgical injection. Furthermore, these nanoparticles can be visualized by MRI and other similar techniques, allowing clinicians and researchers to visualize the uptake of the nanoparticles and the distribution of the therapeutic. This invention provides an innovative method for delivery of therapeutics to the brain.

ADVANTAGES:

- Direct therapeutic delivery to the brain
- Novel method for delivering short DNA or RNA molecules
- Allows MRI imaging of drug delivery

Nasal Drug Delivery into the Brain Using Nanoparticles



Composition of the Mn Oxide-Coated Chitosan/pDNA Nanoparticle

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