NEW NANOPARTICLES WITH TARGETED EXPRESSION VECTOR AS A THERAPEUTIC APPROACH FOR IDIOPATHIC NEPHROTIC SYNDROME

Production of nanoparticles as vector carriers for RNAi targeting to podocytes for the treatment of idiopathic nephrotic syndrome.

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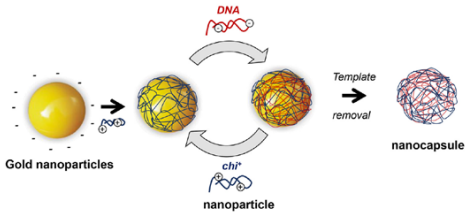
PRESENTATION

Idiopathic Nephrotic Syndrome (INS) accounts for 85% of glomerular nephropathies in children and 25-30% of those in adults. Pathogenesis of this syndrome is based on an immune disorder whose mechanism remains incompletely understood. The team has identified a promising protein target to develop gene therapy for INS. However, no simple technique compatible with a gene therapy treatment has shown efficiency to target the podocyte so far. Vectors classically used in gene therapy (adenovirus, retrovirus, etc.) do not allow for proper targeting of the podocyte due to the presence of a glomerular barrier. Thus, the inventors have developed nanocapsules consisting of multilayers of chitosan/DNA assembly as a vector carrier allowing specific expression of miRNA in podocytes. This therapeutic approach has been validated in vitro and optimized for in vivo use, making it possible to envisage new therapeutic perspectives for INS in humans. This new innovative expression nanocapsule can be optimized for other therapeutic uses.



Nanoparticules - DNA delivery - Non-viral carrier
Nephrotic syndrome - miRNA

APPLICATIONS

- Targeting of miRNA as a new therapeutic approach for Nephrotic syndrome
- Specific DNA expression vector targeted to the podocytes
- miRNA therapeutic approaches

COMPETITIVE ADVANTAGES

- Adaptable physico-chemical properties of nanocapsules
- Protection of miRNA against nucleases
- Production of active miRNA specifically in podocytes

PUBLICATIONS

- Oniszczuk et al. 2020 Chemical Engineering Journal

INTELLECTUAL PROPERTY

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DEVELOPMENT PHASE

- Nanoparticle optimization and characterization
- In vitro validation on podocyte cells
- In vivo validation on a mice model of INS through LPS-induction of proteinuria

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