Aromatic self-assembling polyethylenimines as effective siRNA delivery reagents

- **New class of cationic self-assembling polymers exhibiting a pH-sensitive dissolution switch for the formation of stable siRNA polyplexes outside the cell and the release of oligonucleotides in the endosome.**
- **High potential agent for systemic *in vivo* delivery**

KEYWORDS

siRNA
Delivery vector
Transfection
Gene silencing
Systemic *in vivo* delivery
Nucléic acids
Protein
Oncology

PATENTS

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Granted in the US

INVENTOR

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TECHNOLOGY

- Self-assembling polyplexes with efficient endosomal escape
- Polyplex can be made stable with 70 nm diameter, Zeta = + 35 mV, compatible for iv injection
- No aggregation in serum, low hemolytic and cytotoxic profile
- Stability after incubation in 100 % serum and at various N/P ratio
- Greater than 90% reduction in target mRNA levels by target siRNA at concentrations <10 nM in media containing 10% serum
- Less than 10% reduction in target mRNA levels by control siRNA at concentrations <10 nM in media containing 10% serum
- >15-fold window between target gene silencing IC50 and IC50 for reduction in viability
- Demontrated activity in multiple cell lines (i.e. U87, A549, HeLa, HuH7, BHK-21) and different target genes

APPLICATIONS

- Versatile siRNA delivery reagent extensible to miRNA, protein and antibodies
- *in vitro*, *ex-vivo* and *in vivo* application

INNOVATION ADVANTAGES

- Self-aggregating PEI derivatives with pH-sensitive disassembly switch
- Versatile delivery reagent for bioactive molecules as siRNA, miRNA and proteins
- Efficient *in vitro* and *in vivo*
- An easy procedure (« mix and go ») and stable formulations
- Low hemolytic and low toxicity profile
- Low production cost and ease of synthetic scale-up

DEVELOPEMENT STATUS

- POC following IT and IP administration (subcutaneous glioblastoma model)
- Accumulation in liver and lung following IV administration
- Antitumoral activity in an orthotopic hepatocarcinoma model ongoing

Partnership: *available for licensing*

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