

Co-Transcriptional Assembly of Modified RNA Nanoparticles

Summary

The National Cancer Institute seeks parties interested to license a method to generate RNA molecules suitable for nanoparticle and biomedical applications.

NIH Reference Number

E-223-2012

Product Type

- Therapeutics
- Diagnostics

Keywords

- Drug Delivery
- RNA
- Nanoparticle

Collaboration Opportunity

This invention is available for licensing.

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Description of Technology

The National Cancer Institute seeks parties interested in collaborative research to co-develop a method to generate RNA molecules suitable for nanoparticle and biomedical applications.

The development of nanoparticles as a method of drug delivery is paving the way for precise targeted therapy making it a more attractive and effective method for treating cancer. However, the current methods of designing RNA nanoparticles are limited by three factors: 1) the cost and size limitations associated with chemical synthesis of RNA; 2) the complexity of RNA nanoparticle production; and 3) low retention time of RNA nanoparticles in the patient bloodstream due to their susceptibility to nuclease degradation.

NCI scientists have developed a method to overcome these challenges in RNA nanoparticle design. The method entails generating RNA nanoparticles having modified nucleotides and/or having increased nuclease resistance where the RNA nanoparticles are formed co-transcriptionally by T7 RNA polymerase in the presence of manganese ions. In essence, the technology results in high-yield production of chemically modified RNA nanoparticles functionalized with siRNAs that are resistant to nucleases from human blood serum

Potential Commercial Applications

- Inexpensive and efficient method of producing chemically modified RNA nanoparticles for diagnostic or therapeutic applications.

Competitive Advantages

- Reduces the cost and size limitations of solid-phase RNA synthesis.
- Simplifies production of complex RNA nanoparticles.
- Increases retention time of RNA nanoparticles.

Inventor(s)

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Development Stage

- Discovery (Lead Identification)

Patent Status

- **Research Material:** NIH will not pursue patent prosecution for this technology

Related Technologies

- [E-059-2009 - In silico design of RNA nanoparticles](#)
- [E-039-2012 - Nanoparticles for the targeted treatment of infected cells](#)

Therapeutic Area

- Cancer/Neoplasm

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