

# SYNTHESIS OF NEW CATIONIC AND IONIZABLE LIPID NANOPARTICLES (LNPS) VIA SOLID PHASE PEPTIDE SYNTHESIS

Tech ID: 33013 / UC Case 2023-063-0

## BRIEF DESCRIPTION

Cationic, ionizable lipids are a type of lipid that can switch between neutral and positive charges depending on the pH of their environment. They're crucial in lipid nanoparticle (LNP) formulations, particularly for RNA delivery, where they play a key role in encapsulating and releasing the RNA payload. Unfortunately, conventional chemical de novo synthesis of cationic and ionizable lipids is slow, expensive and inefficient.

UC Berkeley researchers have developed compositions and methods of synthesizing cationic, ionizable lipids via standard solid phase peptide synthesis protocols, and integration of (i) the solid phase lipid synthesis, (ii) initial cell screening, and (iii) animal organ or cell targeting in an automated robotic system (ARS).

## SUGGESTED USES

- » efficient synthesis of peptide-lipid conjugates and lipid nanoparticle formulations
- » research tool for cell and animal studies for mRNA delivery
- » drug delivery

## ADVANTAGES

- » expands the types of cationic/ionizable lipids and lipid libraries that can be synthesized.
- » does not require a trained organic chemist
- » can be performed automatically and robotically
- » lower cost, time and chemical space that can be accessed, typically by a factor of at least 10 or 100

## ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- [Small Molecule Endosomal Disruptor for Biotherapeutic Delivery](#)
- [Compositions and Methods for Identifying Functional Nucleic Acid Delivery Vehicles](#)
- [Aromatic 2-nitrosulfonyl fluoride antibiotics](#)
- [New Acid Degradable Lipids Based On Self Assembling Peptides](#)
- [Lipid Nanoparticles with non-immunogenic Poly \(ethylene glycol\)](#)
- [Acid Degradable Solid Lipid Nanoparticles](#)

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## INVENTORS

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## OTHER INFORMATION

### CATEGORIZED AS

- » **Materials & Chemicals**
- » Chemicals
- » **Medical**
- » Delivery Systems
- » Research Tools
- » Therapeutics
- » Vaccines

### RELATED CASES

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