

NOVEL SOLID LIPID NANOPARTICLE TO IMPROVE HEART CARDIO PROTECTION

Tech ID: 33315 / UC Case 2024-029-0

PATENT STATUS

Patent Pending

BRIEF DESCRIPTION

A primary reason behind the lack of progress in heart therapeutics is the inability to use phenotypic human tissue-level approaches to discover novel therapies. In recent years, there have been significant advances in the development microphysiological systems (MPS), which recapitulate organ-level and even organism-level functions. MPS are quickly becoming representative of the future of disease modeling and drug screening, therefore paving the way for complex in vitro models to dominate the preclinical drug discovery landscape. However, there has yet to be an effective LNP formulation for therapeutic mRNA delivery to the heart. Therefore, despite progress in this area, one of the remaining challenges is to develop a LNP formulation capable of diffusing within human cardiac muscle, transfecting cardiomyocytes, and escaping the endo-lysosome before degradation more efficiently than current strategies.

UC Berkeley researchers and others have developed compositions and methods using lipid nanoparticles for delivery of a payload (e.g., messenger RNA (mRNA)) to the heart, for delivery of mRNA for transfection of cells and methods of treatment.

SUGGESTED USES

- » Therapeutic applications to treat the heart acutely post-myocardial infarction
- » Therapeutic treatment of cardiac genetic diseases

ADVANTAGES

- » Delivery of mRNA to dense 3D tissues, such as cardiac tissue
- » High levels of mRNA delivery into the heart and low off-target levels compared to standard LNP formulations

CONTACT

Terri Sale
terri.sale@berkeley.edu
tel: 510-643-4219.



INVENTORS

- » Healy, Kevin E.

OTHER INFORMATION

CATEGORIZED AS

- » **Medical**
 - » Delivery Systems
 - » Disease: Cardiovascular and Circulatory System
 - » Gene Therapy

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