IMMUNE CELL-MEDIATED INTERCELLULAR DELIVERY OF BIOMOLECULES

Tech ID: 33991 / UC Case 2025-115-0

PATENT STATUS

Patent Pending

BRIEF DESCRIPTION

Tissue targeting and cargo packaging limitations are two of the most challenging barriers to in-vivo therapeutic delivery. Overcoming both of these issues, UC Berkeley researchers have developed engineered immune cells that produce enveloped delivery vehicles (EDVs) capable of encapsulating protein and/or RNA therapeutics that can be delivered to a target cell with a predetermined trigger. Triggers can either be the presence of a small molecule, or recognition of a specific antigen on the target cell. The researchers showed that delivery can be achieved in a co-cultured system using various strategies and that the system is compatible with multiple cargo proteins of interest including Cre recombinase and RNA-complexed Cas proteins. This technology opens possibilities for broader and safer in-vivo therapeutic delivery.

SUGGESTED USES

» Gene therapy: Cell therapies with intracellular delivery of nucleic acids and/or protein for in-vivo gene editing

» Drug Delivery: Allowing for more targeted delivery of protein and nucleic acid therapies

» Immunotherapies: Reprogramming immune cells to target therapies to diseased cells

ADVANTAGES

» In-vivo: EDVs can be used inside the body, rather than extracting cells and applying the therapy ex-vivo

» More cargo: EDVs are not limited by cargo size, unlike other delivery methods such as AAV capsids

» Versatility: EDVs can be programmed to target a wide variety of cells and package a broad set of protein and nucleic acid therapies

» Control: EDVs target specific immune cell types

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Next-Generation Lipid Nanoparticles for Precision Nucleic Acid Delivery
- COMPOSITIONS AND METHODS FOR IDENTIFYING HOST CELL TARGET PROTEINS FOR TREATING RNA VIRUS INFECTIONS
- Genome Editing via LNP-Based Delivery of Efficient and Stable CRISPR-Cas Editors
- Tissue-Specific Genome Engineering Using CRISPR-Cas9
- Type III CRISPR-Cas System for Robust RNA Knockdown and Imaging in Eukaryotes
- Targeted Nucleic Acid Editing via Cas9-Deaminase Fusion Proteins
- Cas9 Variants With Altered DNA Cleaving Activity
- Cas12-mediated DNA Detection Reporter Molecules
- Improved guide RNA and Protein Design for CasX-based Gene Editing Platform

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INVENTORS

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OTHER INFORMATION

CATEGORIZED AS

» **Medical**

» Disease: Cancer

» Gene Therapy

» Research Tools

» Therapeutics

» **Research Tools**

» Nucleic Acids/DNA/RNA

RELATED CASES

2025-115-0

- Compositions and Methods for Delivering Molecular Cargo to Cells
- Cas13a/C2c2 - A Dual Function Programmable RNA Endoribonuclease
- Miniature Type VI CRISPR-Cas Systems and Methods of Use
- RNA-directed Cleavage and Modification of DNA using CasY (CRISPR-CasY)
- Generation of Chimeric RNA with Type III CRISPR-Cas
- CasX Nickase Designs, Tans Cleavage Designs & Structure
- Methods and Compositions for Modifying a single stranded Target Nucleic Acid
- Genetically Encoded, Biologically Responsive, And Programmable Bispecific Aptames As Therapeutic Protein Degraders
- A Dual-RNA Guided CasZ Gene Editing Technology
- A Protein Inhibitor Of Cas9
- RNA-directed Cleavage and Modification of DNA using CasX (CRISPR-CasX)
- Compositions and Methods for Genome Editing
- IS110 and IS1111 Family RNA-Guided Transposons
- Variant Cas12a Protein Compositions and Methods of Use
- In Vitro and In Vivo Genome Editing by LNP Delivery of CRISPR Ribonucleoprotein
- CRISPR CASY COMPOSITIONS AND METHODS OF USE
- Single Conjugative Vector for Genome Editing by RNA-guided Transposition
- CRISPR-CAS EFFECTOR POLYPEPTIDES AND METHODS OF USE THEREOF
- Compositions and Methods for VIPR-Based Nucleic Acid Targeting
- Precision-Engineered Cas12a: Eliminating Collateral DNA Cleavage for Next-Generation Genome Editing
- Selective Cell Elimination using RNA-guided Chromatin Shredding
- Methods Of Use Of Cas12L/CasLambda In Plants
- Type V CRISPR/CAS Effector Proteins for Cleaving ssDNA and Detecting Target DNA
- THERMOSTABLE RNA-GUIDED ENDONUCLEASES AND METHODS OF USE THEREOF (GeoCas9)
- Variant TnpB and wRNA Proteins
- Efficient Site-Specific Integration Of New Genetic Information Into Human Cells
- Class 2 CRISPR/Cas COMPOSITIONS AND METHODS OF USE
- Compositions and Methods of Use for Variant Csy4 Endoribonucleases
- Methods and Compositions for Controlling Gene Expression by RNA Processing

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