

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

- ▶ 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
- ▶ 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
- ▶ Compositions and Methods for Delivering Molecular Cargo to Cells
- ▶ Cas13a/C2c2 - A Dual Function Programmable RNA Endoribonuclease

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INVENTORS

- » Doudna, Jennifer A.

OTHER INFORMATION

CATEGORIZED AS

- » **Medical**
 - » Disease: Cancer
 - » Gene Therapy
 - » Research Tools
 - » Therapeutics
- » **Research Tools**
 - » Nucleic Acids/DNA/RNA

RELATED CASES

2025-115-0

- ▶ 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
- ▶ In Vivo Gene Editing Of Tau Locus Via Liponanoparticle Delivery
- ▶ Methods and Compositions for Modifying a single stranded Target Nucleic Acid
- ▶ 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
- ▶ Improved Cas12a Proteins for Accurate and Efficient Genome Editing
- ▶ CRISPR-CAS EFFECTOR POLYPEPTIDES AND METHODS OF USE THEREOF
- ▶ Compositions and Methods for VIPR-Based Nucleic Acid Targeting
- ▶ 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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