

COMPOSITIONS AND METHODS FOR VIPR-BASED NUCLEIC ACID TARGETING

Tech ID: 34692 / UC Case 2026-140-0

PATENT STATUS

Patent Pending

BRIEF DESCRIPTION

RNA-guided systems mediate diverse functions ranging from mobile genetic element propagation to adaptive immunity. These systems comprise proteins that use guide RNAs bearing sequence complementarity to nucleic acid substrates, facilitating programmable recognition of different substrates by the same protein or enzyme. In RNA-guided systems known to date, one or two continuous segments in the guide

RNA determines target specificity and can be altered to direct the system to a new target, including genomic DNA in eukaryotic cells. However, there are constraints to such systems, e.g., protein size and the need for a protospacer adjacent motif (PAM) in target DNA. However, there is a need for nucleic acid guided systems that overcome constraints of known systems, such as protein size or protospacer adjacent motif.

UC Berkeley researchers have developed a programmable RNA-guided nucleic acid targeting platform termed the Viral Interference Programmable Repeat (VIPR) system. The system employs a repeat-based guide RNA architecture and an associated targeting protein to direct sequence-specific recognition of nucleic acid substrates. Target specificity is programmable through modification of selected guide regions, enabling adaptable targeting of DNA or RNA substrates across different biological contexts, including cellular and viral genetic material.

SUGGESTED USES

- » Gene editing
- » Programmable targeting of nucleic acids in vitro and in vivo
- » Antiviral and phage-interference applications
- » Next-gen RNA-guided systems with tunable targeting properties

ADVANTAGES

- » Highly programmable targeting specificity
- » Modular repeat-based guide system enabling customizable target recognition
- » Variable guide length allows adjustable targeting footprint and coverage
- » Broad adaptability for DNA and RNA recognition
- » Compact and versatile RNA-guided targeting mechanism

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

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INVENTORS

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OTHER INFORMATION

CATEGORIZED AS

- » **Biotechnology**
- » Genomics
- » **Medical**
- » Gene Therapy
- » Research Tools
- » Therapeutics
- » **Research Tools**
- » Nucleic Acids/DNA/RNA

RELATED CASES

2026-140-0

- ▶ 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
- ▶ 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
- ▶ 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
- ▶ Immune Cell-Mediated Intercellular Delivery Of Biomolecules
- ▶ Methods and Compositions for Controlling Gene Expression by RNA Processing



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