VARIANT TNPB AND WRNA PROTEINS

Tech ID: 33492 / UC Case 2024-091-0

PATENT STATUS

Patent Pending

BRIEF DESCRIPTION

TnpB protein has generated interest as a potential compact genome-editing tool, due to the short amino acid sequence (408 AAs for ISDra2 TnpB), which overlaps with the wRNA sequence in their genomes of origin. There is a need for compositions and methods that provide more efficient TnpB systems.

UC Berkeley researchers have created variant TnpB proteins and variant wRNAs that increase cleavage activity and/or DNA binding activity (e.g., revealed as endonuclease activity such as on-target endonuclease activity). These variant TnpB proteins include an amino acid sequence having one or more amino acid substitutions relative to a corresponding wild type TnpB protein. Also provided are variant TnpB wRNAs that can form a complex with a TnpB protein and a second nucleotide sequence that can hybridize to a target sequence of a target nucleic acid, thereby guiding the complex to the target sequence.

SUGGESTED USES

- highly active, compact genome editors
- delivery in both mammalian cells and plants

ADVANTAGES

- significantly smaller than the adeno-associated viral delivery (AAV) packaging limit of ~4.7 kilobases.

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

CONTACT

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INVENTORS

- Doudna, Jennifer A.

OTHER INFORMATION

CATEGORIZED AS

- **Agriculture & Animal Science**
  - Transgenics
- **Biotechnology**
  - Proteomics
- **Materials & Chemicals**
  - Biological
- **Medical**
  - Gene Therapy
  - Research Tools
  - Therapeutics
- **Research Tools**
  - Nucleic Acids/DNA/RNA
- **Veterinary**
  - Therapeutics

RELATED CASES

2024-091-0

- Type III CRISPR-Cas System for Robust RNA Knockdown and Imaging in Eukaryotes
- Cas12-mediated DNA Detection Reporter Molecules
- Improved guide RNA and Protein Design for CasX-based Gene Editing Platform
- 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)
- 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
- CRISPR-CAS EFFECTOR POLYPEPTIDES AND METHODS OF USE THEREOF (“Cas-VariPhi”)
- A Protein Inhibitor Of Cas9
- RNA-directed Cleavage and Modification of DNA using CasX (CRISPR-CasX)
- Compositions and Methods for Genome Editing
- Methods to Interfere with Prokaryotic and Phage Translation and Noncoding RNA
- 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
- Engineered/Variant Hyperactive CRISPR CasPhi Enzymes 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)
- Structure-Guided Methods Of Cas9-Mediated Genome Engineering
- 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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