

## 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.

### 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

#### 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
- ▶ Type III CRISPR-Cas System for Robust RNA Knockdown and Imaging in Eukaryotes

- ▶ Cas12-mediated DNA Detection Reporter Molecules
- ▶ Highly Multiplexed Tagging Methods for RNA Imaging and Other Applications
- ▶ 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
- ▶ Single-Stranded Nucleic Acid Detection And Imaging System Using Cas9
- ▶ 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
- ▶ Split-Cas9 For Regulatable Genome Engineering
- ▶ Methods to Interfere with Prokaryotic and Phage Translation and Noncoding RNA
- ▶ Minimal RNA Targeting CRISPR Cas Systems
- ▶ Variant Cas12a Protein Compositions and Methods of Use
- ▶ 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
- ▶ CRISPR-Cas Effector Polypeptides and Methods of Use Thereof
- ▶ Virus-encoded DNA-binding Proteins
- ▶ 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