

VARIANT TNPB AND WRNA PROTEINS

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

PATENT STATUS

Country	Type	Number	Dated	Case
Patent Cooperation Treaty	Published Application	WO 2025/259791	12/18/2025	2024-091

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
- ▶ 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
- ▶ 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)
- ▶ 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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