A DUAL-RNA GUIDED CASZ GENE EDITING TECHNOLOGY

Tech ID: 28913 / UC Case 2018-045-0

PATENT STATUS

Country	Type	Number	Dated	Case
China	Issued Patent	ZL201880084919.X	05/02/2025	2018-045
Australia	Issued Patent	2018358051	04/24/2025	2018-045
Japan	Issued Patent	7672445	04/24/2025	2018-045
United States Of America	Issued Patent	12,264,314	04/01/2025	2018-045
United Kingdom	Issued Patent	2582482	05/17/2023	2018-045
United States Of America	Issued Patent	11,453,866	09/27/2022	2018-045
United States Of America	Issued Patent	11,441,137	09/13/2022	2018-045
United States Of America	Issued Patent	11,371,031	06/28/2022	2018-045
United States Of America	Issued Patent	11,180,743	11/23/2021	2018-045
United States Of America	Published Application	20250179470	06/05/2025	2018-045
China	Published Application	CN117487776A	02/02/2024	2018-045
Japan	Published Application	2021-503278	02/12/2021	2018-045
European Patent Office	Published Application	3704239 A0	09/09/2020	2018-045
Canada	Published Application	3080493	05/09/2019	2018-045
Singapore	Published Application	WO 2019/089820	05/09/2019	2018-045

BRIEF DESCRIPTION

The CRISPR-Cas system is now understood to confer bacteria and archaea with acquired immunity against phage and viruses. CRISPR-Cas systems consist of Cas proteins, which are involved in acquisition, targeting and cleavage of foreign DNA or RNA, and a CRISPR array, which includes direct repeats flanking short spacer sequences that guide Cas proteins to their targets. Class 2 CRISPR-Cas systems are streamlined versions in which a single Cas protein bound to RNA is responsible for binding to and cleavage of a targeted sequence. The programmable nature of these minimal systems has facilitated their use as a versatile technology that is revolutionizing the field of genome manipulation, so there is a need in the art for additional Class 2 CRISPR/Cas systems (e.g., Cas protein plus guide RNA combinations).

UC Berkeley researchers discovered a new type of Cas protein, CasZ. (CasZ) is short compared to previously identified CRISPR-Cas endonucleases, and thus use of this protein as an alternative provides the advantage that the nucleotide sequence encoding the protein is relatively short. The researchers have shown that the CRISPR CasZ protein and its variants can be used in a complex for specific binding and cleavage of DNA. The CRISPR CasZ complex utilizes a novel RNA and a guide RNA to perform double stranded cleavage of DNA and the complex is expected to have a wide variety of applications in genome editing and nucleic acid manipulation.

SUGGESTED USES

- Genome editing
- Genetic engineering

CONTACT

Ellen S. Kats
ellenkats@berkeley.edu
tel: .

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INVENTORS

- Doudna, Jennifer A.

OTHER INFORMATION

KEYWORDS

CRISPR, gene editing, gene therapy, therapeutics,

CATEGORIZED AS

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

RELATED CASES

2018-045-0

- Gene therapy
- Research tools (e.g., high-throughput screening of gene functions in cell lines and in vivo)
- Creation of transgenic animal models

ADVANTAGES

- Adds additional versatility because of small size
- Variant PAM

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Next-Generation Lipid Nanoparticles for Precision Nucleic Acid Delivery
- 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
- Targeted Nucleic Acid Editing via Cas9-Deaminase Fusion Proteins
- 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
- Methods and Compositions for Modifying a single stranded Target Nucleic Acid
- Genetically Encoded, Biologically Responsive, And Programmable Bispecific Aptames As Therapeutic Protein Degraders
- 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
- CRISPR-CAS EFFECTOR POLYPEPTIDES AND METHODS OF USE THEREOF
- Compositions and Methods for VIPR-Based Nucleic Acid Targeting
- Precision-Engineered Cas12a: Eliminating Collateral DNA Cleavage for Next-Generation Genome Editing
- Selective Cell Elimination using RNA-guided Chromatin Shredding
- 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

University of California, Berkeley Office of Technology Licensing
2150 Shattuck Avenue, Suite 510, Berkeley,CA 94704
Tel: 510.643.7201 | Fax: 510.642.4566
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