RNA-DIRECTED CLEAVAGE AND MODIFICATION OF DNA USING CASY (CRISPR-CASY)

Tech ID: 26043 / UC Case 2017-017-0

PATENT STATUS

Country	Type	Number	Dated	Case
Eurasian Patent Office	Issued Patent	045278	11/10/2023	2017-017
Japan	Issued Patent	7306696	07/03/2023	2017-017
United Kingdom	Issued Patent	2569734	09/07/2022	2017-017
United States Of America	Issued Patent	11,371,062	06/28/2022	2017-017
United States Of America	Published Application	20220396812	12/15/2022	2017-017
Mexico	Published Application	WO 2018/064352	09/25/2020	2017-017
Hong Kong	Published Application	40014082	08/14/2020	2017-017
Hong Kong	Published Application	40013668A	08/07/2020	2017-017
European Patent Office	Published Application	3532089 A0	09/04/2019	2017-017
India	Published Application	28/2019	07/12/2019	2017-017
Brazil	Published Application	2529	06/25/2019	2017-017
Australia	Published Application	WO 2018/064352	04/05/2018	2017-017
Canada	Published Application	WO 2018/064352	04/05/2018	2017-017
China	Published Application	WO 2018/064352	04/05/2018	2017-017
Israel	Published Application	WO 2018/064352	04/05/2018	2017-017
Rep Of Korea	Published Application	WO 2018/064352	04/05/2018	2017-017
New Zealand	Published Application	WO 2018/064352	04/05/2018	2017-017
Saudi Arabia	Published Application	WO 2018/064352	04/05/2018	2017-017
Singapore	Published Application	WO 2018/064352	04/05/2018	2017-017
South Africa	Published Application	WO 2018/064352	04/05/2018	2017-017

Additional Patent Pending

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 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. Current CRISPR Cas technologies are based on systems from cultured bacteria, leaving untapped the vast majority of organisms that have not been isolated. 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, CasY. CasY 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. CasY utilizes a guide RNA to perform double stranded cleavage of DNA. The researchers introduced

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OTHER INFORMATION

KEYWORDS

CRISPR, gene editing, genome, gene therapy, cell biology, CasY, Cas12d

CATEGORIZED AS

» **Biotechnology**
» Genomics
» **Imaging**
» Medical
» **Medical**
» Gene Therapy
» Research Tools
» Screening
» Therapeutics
» **Research Tools**
» Nucleic Acids/DNA/RNA
» **Veterinary**
» Therapeutics

RELATED CASES

2017-017-0

CRISPR-CasY into E. coli, finding that they could block genetic material introduced into the cell. Further research results indicated that CRISPR-CasY operates in a manner analogous to CRISPR-Cas9, but utilizing an entirely distinct protein architecture containing different catalytic domains. CasY is also expected to function under different conditions (e.g., temperature) given the environment of the organisms that CasY was expressed in. Similar to CRISPR Cas9, CasY enzymes are expected to have a wide variety of applications in genome editing and nucleic acid manipulation.

SUGGESTED USES

- Diagnostics

ADVANTAGES

- Functions under different conditions than current CRISPR-Cas proteins (e.g., lower temperatures)
- Nucleotide sequence encoding the CasY protein is short

PUBLICATION

New CRISPR–Cas systems from uncultivated microbes

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
- Improved guide RNA and Protein Design for CasX-based Gene Editing Platform
- Cas13a/C2c2 - A Dual Function Programmable RNA Endoribonuclease
- CasX Nickase Designs, Tans Cleavage Designs & Structure
- In Vivo Gene Editing Of Tau Locus Via Liponanoparticle Delivery
- A Dual-RNA Guided CasZ Gene Editing Technology
- CRISPR-CAS EFFECTOR POLYPEPTIDES AND METHODS OF USE THEREOF (“Cas-VariPhi”)
- Modifications To Cas9 For Passive-Delivery Into Cells
- 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
- NANOPORE MEMBRANE DEVICE AND METHODS OF USE THEREOF
- Methods to Interfere with Prokaryotic and Phage Translation and Noncoding RNA
- 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
- Engineering Cas12a Genome Editors with Minimized Trans-Activity
- 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

- Endoribonucleases For Rna Detection And Analysis
- Efficient Site-Specific Integration Of New Genetic Information Into Human Cells
- CRISPR-Cas Effector Polypeptides and Methods of Use Thereof
- Class 2 CRISPR/Cas COMPOSITIONS AND METHODS OF USE
- Compositions and Methods of Use for Variant Csy4 Endoribonucleases
- Identification Of Sites For Internal Insertions Into Cas9
- Methods and Compositions for Controlling Gene Expression by RNA Processing

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