

CLASS 2 CRISPR/CAS COMPOSITIONS AND METHODS OF USE

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PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	11,970,719	04/30/2024	2018-048
United States Of America	Published Application	20240301376	09/12/2024	2018-048

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).

Researchers have shown that Class 2 CRISPR Cas protein and their variants can be used in a complex for specific binding and cleavage of DNA. The Class 2 CRISPR Cas 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
- » Gene therapy
- » Research tools (e.g., high-throughput screening of gene functions in cell lines and in vivo)
- » Creation of transgenic animal models
- » Genomic imaging

ADVANTAGES

- » Adds additional versatility
- » Variant PAM

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INVENTORS

- » Doudna, Jennifer A.

OTHER INFORMATION

KEYWORDS

CRISPR, gene editing, genome, gene therapy, cell biology, Class 2

CATEGORIZED AS

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

RELATED CASES

2018-048-0

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
- ▶ Compositions and Methods of Use for Variant Csy4 Endoribonucleases
- ▶ Methods and Compositions for Controlling Gene Expression by RNA Processing



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