STRUCTURE-GUIDED METHODS OF CAS9-MEDIATED GENOME ENGINEERING

Tech ID: 23719 / UC Case 2014-078-0

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	9,963,689	05/08/2018	2014-078

BRIEF DESCRIPTION

The ability to program Cas9 for DNA cleavage at sites defined by guide RNAs has led to its adoption as a robust and versatile platform for genome engineering. Whereas there are a number of ongoing successes with using the CRISPR-Cas9 system for genome engineering, there is a need for understanding the structural basis for guide RNA recognition and DNA targeting by Cas9.

UC Berkeley researchers have developed software and methods for providing the structures of Cas9 with and without the polynucleotides bound thereto, and have developed the crystals comprising the Cas9 polypeptides. Using the atomic coordinates, the software can be used to computationally identify a site for amino acid residue substitution, insertion, or deletion to alter a function or chemical property of a Cas9 polypeptide.

SUGGESTED USES

- Genetic engineering or editing of Cas9 polypeptides
- Controlling of site-specific gene regulation

PUBLICATION

Structures of Cas9 endonucleases reveal RNA-mediated conformational activation

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INVENTORS

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OTHER INFORMATION

KEYWORDS

genome, genetic engineering, Cas9, CRISPR

CATEGORIZED AS

- **Biotechnology**
  - Genomics
- **Medical**
  - Gene Therapy
  - Research Tools
  - Software
- **Research Tools**
  - Nucleic Acids/DNA/RNA

RELATED CASES

2014-078-0

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
- 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)
- 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
- 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
- IS110 and IS1111 Family RNA-Guided Transposons
- Methods to Interfere with Prokaryotic and Phage Translation and Noncoding RNA
- 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
- 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)
- 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
- Methods and Compositions for Controlling Gene Expression by RNA Processing

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