

ENDORIBONUCLEASES FOR RNA DETECTION AND ANALYSIS

Tech ID: 29125 / UC Case 2012-124-0

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	9,688,971	06/27/2017	2012-124

BRIEF DESCRIPTION

Bacteria and archaea possess adaptive immune systems that rely on small RNAs for defense against invasive genetic elements. CRISPR (clustered regularly interspaced short palindromic repeats) genomic loci are transcribed as long precursor RNAs, which must be enzymatically cleaved to generate mature CRISPR-derived RNAs (crRNAs) that serve as guides for foreign nucleic acid targeting and degradation. This processing occurs within the repetitive sequence and is catalyzed by a dedicated CRISPR-associated (Cas) family member in many CRISPR systems. Endoribonucleases that process CRISPR transcripts are bacterial or archaeal enzymes capable of catalyzing sequence- and structure-specific cleavage of a single-stranded RNA. These enzymes cleave a specific phosphodiester bond within a specific RNA sequence.

UC Berkeley researchers discovered variant Cas endoribonucleases, nucleic acids encoding the variant Cas endoribonucleases, and host cells genetically modified with the nucleic acids that can be used, potentially in conjunction with Cas9, to detect a specific sequence in a target polyribonucleotide and of regulating production of a target RNA in a eukaryotic cell. For example, it was found that the variant Cas endoribonuclease has an amino acid substitution at a histidine residue such that it is enzymatically inactive in the absence of imidazole and is activatable in the presence of imidazole.

SUGGESTED USES

- » Purifying a target RNA in a mixed population of nucleic acids
- » Detection of specific sequences in a target polyribonucleotide
- » Regulating expression of a target RNA in a eukaryotic cell

RELATED MATERIALS

- » [Mechanism of substrate selection by a highly specific CRISPR endoribonuclease - 02/16/2012](#)

PUBLICATION

[RNA-protein analysis using a conditional CRISPR nuclease](#)

RELATED TECHNOLOGIES

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INVENTORS

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OTHER INFORMATION

KEYWORDS

CRISPR, Cas6, Csy4, Gene editing

CATEGORIZED AS

- » **Biotechnology**
- » Genomics
- » **Materials & Chemicals**
- » Biological
- » **Medical**
- » Research Tools
- » **Research Tools**
- » Nucleic Acids/DNA/RNA

RELATED CASES

2012-124-0

- ▶ Compositions and Methods of Use for Variant Csy4 Endoribonucleases

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- ▶ COMPOSITIONS AND METHODS FOR IDENTIFYING HOST CELL TARGET PROTEINS FOR TREATING RNA VIRUS INFECTIONS
- ▶ Lentivirus-like Particle Delivery of CRISPR-Cas9 & Guide RNA for Gene Editing
- ▶ 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
- ▶ RNA-directed Cleavage and Modification of DNA using CasY (CRISPR-CasY)
- ▶ CasX Nickase Designs, Tans Cleavage Designs & Structure
- ▶ 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
- ▶ 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
- ▶ 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
- ▶ Small Molecule Assisted Cell Penetrating Cas9 RNP Delivery
- ▶ Methods and Compositions for Controlling Gene Expression by RNA Processing



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