**ENDORIBONUCLEASES FOR RNA DETECTION AND ANALYSIS**

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

**PATENT STATUS**

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<th>Country</th>
<th>Type</th>
<th>Number</th>
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<td>United States Of America</td>
<td>Issued Patent</td>
<td>9,688,971</td>
<td>06/27/2017</td>
<td>2012-124</td>
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**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 endonuclease has an amino acid substitution at a histidine residue such that is 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**

- Compositions and Methods of Use for Variant Csy4 Endoribonuclease
- Methods and Compositions for Using Argonaute to Modify a Single-Stranded Target Nucleic Acid
- 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
- 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 Endonuclease
- Miniature Type VI CRISPR-Cas Systems and Methods of Use
- 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

**INVENTORS**

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**OTHER INFORMATION**

**KEYWORDS**

CRISPR, Csy6, Csy4, Gene editing

**CATEGORIZED AS**

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

**RELATED CASES**

2012-124-0
▶ A Protein Inhibitor Of Cas9
▶ Split-Cas9 For Regulatable Genome Engineering
▶ NANOPORE MEMBRANE DEVICE AND METHODS OF USE THEREOF
▶ Optimized Virus-like Particles for Cas9 RNPs & Transgene/HDR Template Delivery
▶ Protein Inhibitor of Type VI-B CRISPR-Cas System
▶ COMPOSITIONS AND METHODS FOR INCREASING HOMOLOGY-DIRECTED REPAIR
▶ 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
▶ Protein Inhibitor of Type II-A CRISPR-Cas System
▶ 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
▶ 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
▶ Chimeric Cas9 Variants With Novel Engineered Enzymatic Activities
▶ Small Molecule Assisted Cell Penetrating Cas9 RNP Delivery
▶ Methods and Compositions for Controlling Gene Expression by RNA Processing