ENDORIBONUCLEASES FOR RNA DETECTION AND ANALYSIS

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

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 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 Endoribonucleases

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

» 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
» Cas9 Variants With Altered DNA Cleaving Activity
» 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
» Methods For High Signal-To-Noise Imaging Of Chromosomal Loci In Cells Using Fluorescent Cas9
» A Dual-RNA Guided Cas2 Gene Editing Technology
» MODULATORS OF TYPE VI-D CRISPR-CAS EFFECTOR POLYPEPTIDES AND METHODS OF USE THEREOF
» CRISPR-CAS EFFECTOR POLYPEPTIDES AND METHODS OF USE THEREOF ("Cas-VariPhi")
» A Protein Inhibitor Of Cas9

INVENTORS

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OTHER INFORMATION

KEYWORDS
CRISPR, Cas6, Csy4, Gene editing

CATEGORIZED AS
» Biotechnology
» Genomics
» Materials & Chemicals
» Biological
» Medical
» Research Tools
» Nucleic Acids/DNA/RNA

RELATED CASES
2012-124-0

30x2275
30x2245
30x2193
- Small Cas9 Protein Inhibitor
- Split-Cas9 For Regulatable Genome Engineering
- Decorating Chromatin for Precise Genome Editing Using CRISPR
- Optimized Virus-like Particles for Cas9 RNPs & Transgene/HDR Template Delivery
- CRISPR-CAS EFFECCTOR POLYPEPTIDES AND METHODS OF USE THEREOF (“Cas-Theta”)
- COMPOSITIONS AND METHODS FOR INCREASING HOMOLOGY-DIRECTED REPAIR
- CRISPR CASY COMPOSITIONS AND METHODS OF USE
- Single Conjugal Vector for Genome Editing by RNA-guided Transposition
- CRISPR-CAS EFFECCTOR POLYPEPTIDES AND METHODS OF USE THEREOF (“Cas-Omega”)
- CRISPR-CAS EFFECCTOR POLYPEPTIDES AND METHODS OF USE THEREOF
- Engineered/Variant Hyperactive CRISPR CasPhi Enzymes And Methods Of Use Thereof
- 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 EFFECCTOR POLYPEPTIDES AND METHODS OF USE THEREOF (CasGamma)
- 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