METHODS AND COMPOSITIONS FOR CONTROLLING GENE EXPRESSION BY RNA PROCESSING

Tech ID: 22273 / UC Case 2012-055-0

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	9,745,610	08/29/2017	2012-055

BRIEF DESCRIPTION

Genetic systems often behave unpredictably due to structural interactions between DNA, RNA and protein components as well as functional interactions with host factors and metabolites. Due to these complexities, the ability to program gene expression quantitatively based on the characteristics of individual components is very limited. In nature, the control of the activity of an RNA transcript is crucial to its function. For example, the transcription, translation, and degradation of an mRNA is crucial to any gene expression event, and all three processes are controlled by a combination of elements including promoters, ribosome binding sites (RBSs), and cis -regulatory signals encoded in untranslated regions (UTRs). Methods and/or tools to facilitate the combination of various regulatory elements originating from various different sources to predictably control the activity of any desired RNA would be beneficial for numerous biotechnology applications. However, regulatory elements can unpredictably interact with each other through the formation of RNA structures and the recruitment of factors that affect global transcript accessibility and stability.

UC Berkeley researchers have developed methods and compositions for identifying appropriate combinations of regulatory elements simply and quickly. The invention allows for the combination of multiple regulatory elements in a fashion that predictably affects RNA activity.

SUGGESTED USES

» A synthetic RNA-processing platform (e.g., assembly of promoters, ribosome binding sites, cis-regulatory elements and riboregulators into single- and multigene operons)

PUBLICATION

RNA processing enables predictable programming of gene expression

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

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INVENTORS

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OTHER INFORMATION

KEYWORDS

Genome engineering, gene editing, CRISPR-Cas, Cys4, RNA

CATEGORIZED AS

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

RELATED CASES

2012-055-0

- Next-Generation Lipid Nanoparticles for Precision Nucleic Acid Delivery
- 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
- Targeted Nucleic Acid Editing via Cas9-Deaminase Fusion Proteins
- 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
- 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)
- Generation of Chimeric RNA with Type III CRISPR-Cas
- CasX Nickase Designs, Tans Cleavage Designs & Structure
- Methods and Compositions for Modifying a single stranded Target Nucleic Acid
- Genetically Encoded, Biologically Responsive, And Programmable Bispecific Aptames As Therapeutic Protein Degraders
- A Dual-RNA Guided CasZ Gene Editing Technology
- 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
- 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
- CRISPR-CAS EFFECTOR POLYPEPTIDES AND METHODS OF USE THEREOF
- Compositions and Methods for VIPR-Based Nucleic Acid Targeting
- Precision-Engineered Cas12a: Eliminating Collateral DNA Cleavage for Next-Generation Genome Editing
- Selective Cell Elimination using RNA-guided Chromatin Shredding
- 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
- Immune Cell-Mediated Intercellular Delivery Of Biomolecules

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