METHODS AND COMPOSITIONS FOR CONTROLLING GENE EXPRESSION BY RNA PROCESSING

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

PATENT STATUS

<table>
<thead>
<tr>
<th>Country</th>
<th>Type</th>
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<td>United States Of America</td>
<td>Issued Patent</td>
<td>9,745,610</td>
<td>08/29/2017</td>
<td>2012-055</td>
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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

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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

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
Endoribonucleases For Rna Detection And Analysis
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