SPLIT-CAS9 FOR REGULATABLE GENOME ENGINEERING

Tech ID: 24519 / UC Case 2015-060-0

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OTHER INFORMATION
CATEGORIZED AS
» Biotechnology
» Genomics
» Medical
» Gene Therapy
» Research Tools
» Research Tools
» Nucleic Acids/DNA/RNA

RELATED CASES
2015-060-0
### BRIEF DESCRIPTION

The CRISPR-Cas9 system can be used to quickly and specifically target and cleave DNA at sites defined by engineered single-guide RNAs (sgRNAs) and has led to its adoption as a robust and versatile platform for genome engineering. Cas9 contains two nuclease active sites that function together to generate DNA double-strand breaks (DSBs) at sites complementary to the guide RNA sequence and adjacent to a protospacer adjacent motif.

Structural studies of the Streptococcus pyogenes Cas9 showed that the protein exhibits a bilobed architecture comprising the catalytic nuclease lobe and the α-helical lobe of the enzyme and interactions between the two lobes seem to be mediated primarily through contacts with the bound nucleic acid rather than direct protein-protein contacts.

UC Berkeley researchers have developed a heterodimeric Cas9 system whose assembly and function is regulatable by the sgRNAs. The enzymatic activity of the split-Cas9 also closely mimics that of WT Cas9. Such a system enables analysis of the functionally distinct properties of each Cas9 structural region and offers a unique mechanism for controlling active protein assembly.

### SUGGESTED USES

- Controlled use of Cas9 for genome engineering applications in cells
- Research of the functionally distinct properties of each Cas9 structural region

### ADVANTAGES

- The split-Cas9 is highly stable and pure
- Enzymatic activity mimics WT Cas9

### PUBLICATION

Rational design of a split-Cas9 enzyme complex

### 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
NANOPORE MEMBRANE DEVICE AND METHODS OF USE THEREOF
CRISPR CASY COMPOSITIONS AND METHODS OF USE
Single Conjugal 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
Methods and Compositions for Controlling Gene Expression by RNA Processing