SPLIT-CAS9 FOR REGULATABLE GENOME ENGINEERING
Tech ID: 24519 / UC Case 2015-060-0

PATENT STATUS

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<th>Type</th>
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<td>Issued Patent</td>
<td>11,208,638</td>
<td>12/28/2021</td>
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<td>3245232</td>
<td>04/21/2021</td>
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<td>11/22/2017</td>
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<td>11/22/2017</td>
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<td>WO2016114972</td>
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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

» 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-VarPhi")
- Modifications To Cas9 For Passive-Delivery Into Cells
- A Protein Inhibitor Of Cas9
- 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 CasPn 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
- Endonuclease For Rna Detection And Analysis
- 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 Casy4 Endonuclease
- 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