

SPLIT-CAS9 FOR REGULATABLE GENOME ENGINEERING

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CONTACT

Terri Sale
terri.sale@berkeley.edu
tel: 510-643-4219.



INVENTORS

» Doudna, Jennifer A.

OTHER INFORMATION

CATEGORIZED AS

- » **Biotechnology**
- » Genomics
- » **Medical**
- » Gene Therapy
- » Research Tools
- » **Research Tools**
- » Nucleic Acids/DNA/RNA

RELATED CASES

2015-060-0

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	11,208,638	12/28/2021	2015-060

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 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
- ▶ Methods and Compositions for Controlling Gene Expression by RNA Processing



University of California, Berkeley Office of Technology Licensing

2150 Shattuck Avenue, Suite 510, Berkeley, CA 94704

Tel: 510.643.7201 | Fax: 510.642.4566

ipira.berkeley.edu/ | otl-feedback@lists.berkeley.edu

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