METHODS FOR HIGH SIGNAL-TO-NOISE IMAGING OF CHROMOSOMAL LOCI IN CELLS USING FLUORESCENT CAS9

Tech ID: 24759 / UC Case 2015-098-0

PATENT STATUS

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<td>United States Of America</td>
<td>Published Application</td>
<td>20180142222</td>
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<td>European Patent Office</td>
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<td>04/18/2018</td>
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BRIEF DESCRIPTION

Cas9 is an endonuclease that binds complementary target DNA and generates site-specific breaks using two conserved nuclease domains. By inactivating both nuclease domains, dCas9 is produced, which functions as a programmable DNA binding protein. Current methods use dCas9-GFP fusions to image chromosomal loci, but have insufficient signal-to-noise ratio and often misidentify loci.

UC Berkeley researchers have engineered a Cas9 variant that can be labeled with small molecule fluorescent dyes. This variant utilizes a conformational change in Cas9 to provide highly specific identification of chromosomal loci, and has been shown to work in a proof-of-principle experiment using Förster resonance energy transfer (FRET) pairs.

SUGGESTED USES

- Diagnostic tool to detect large-scale chromosomal alterations in vivo
- Identification of target sequence presence and copy number
- Research tool to screen candidate libraries

ADVANTAGES

- High signal-to-noise imaging of chromosomal loci
- Can be used in vivo or in vitro
- Compatible with a variety of standard molecules used in imaging

RELATED MATERIALS

SUGGESTED USES

INVENTORS

Doudna, Jennifer A.

OTHER INFORMATION

CATEGORIZED AS

- Agriculture & Animal Science
- Devices
- Transgenics
- Biotechnology
- Genomics
- Medical
- Diagnostics
- Gene Therapy
- Research Tools
- Screening
- Research Tools
- Nucleic Acids/DNA/RNA

RELATED CASES

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
- Cas9 Variants With Altered DNA Cleaving Activity
- Cas12-mediated DNA Detection Reporter Molecules
- Cas13a/C2c2 - A Dual Function Programmable RNA Endoribonuclease
- A Dual-RNA Guided Cas2 Gene Editing Technology
- CRISPR-CAS EFFECTOR POLYPEPTIDES AND METHODS OF USE THEREOF ("Cas-VarPhi")
- A Protein Inhibitor Of Cas9
- Small Cas9 Protein Inhibitor
- Split-Cas9 For Regulatable Genome Engineering
- Decorating Chromatin for Precise Genome Editing Using CRISPR
- CRISPR-CAS EFFECTOR POLYPEPTIDES AND METHODS OF USE THEREOF ("Cas-Theta")
- COMPOSITIONS AND METHODS FOR INCREASING HOMOLOGY-DIRECTED REPAIR
- CRISPR CAS9 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 (Cas-Omega)
- 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 (CasGamma)
- Improved gRNA and Protein Design for CasX-based Gene Editing Platform
- 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
- 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