CASX NICKASE DESIGNS, TANS CLEAVAGE DESIGNS & STRUCTURE

Tech ID: 29659 / UC Case 2019-011-0

PATENT STATUS

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<td>United States Of America</td>
<td>Published Application</td>
<td>20210309981</td>
<td>10/07/2021</td>
<td>2019-011</td>
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<td>European Patent Office</td>
<td>Published Application</td>
<td>3841205 A0</td>
<td>06/30/2021</td>
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BRIEF DESCRIPTION

Metagenomic analysis of microbial DNA from groundwater samples revealed a new protein, CasX, that prevented bacterial transformation by plasmid DNA when expressed with cognate crRNAs targeting the plasmids. Sequence analysis of CasX revealed no similarity to other CRISPR-Cas enzymes, except for the presence of a RuvC nuclease domain similar to that found in both Cas9 and Cas12a enzyme families as well as transposases and recombinases. The evolutionary ambiguity of CasX hinted at a distinct structure and mechanism for DNA targeting, but without reconstitution of a functional CasX enzyme it was not possible to determine its mechanism of plasmid interference.

UC Berkeley inventors found variant CasX polypeptides that induce programmable, site-specific genome repression in E. coli and genome editing in human cells, distinct from Cas9 and Cas12a, which establishes this enzyme family as a third CRISPR-Cas system for genetic manipulation.

SUGGESTED USES

- Genome editing
- Gene therapy
- Research tools
- Genomic imaging

ADVANTAGES

- Functions under different conditions than currently used CRISPR-Cas proteins
- Nucleotide sequence encoding the CasX is short, therefore especially useful when using a viral vector for deliver to cell

RELATED CASES

2019-011-0

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 Endoribonuclease
- Miniature Type VI CRISPR-Cas Systems and Methods of Use
- A Dual-RNA Guided CasZ Gene Editing Technology