RECOMBINASES FOR INTEGRATING DNA & RECOMBINASE FUSIONS

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PATENT STATUS

Country	Type	Number	Dated	Case
European Patent Office	Published Application	EP4612297	09/10/2025	2023-022
Japan	Published Application	WO 2024/097747	06/20/2024	2023-022

Additional Patent Pending

BRIEF DESCRIPTION

Manipulation of eukaryotic genomes, particularly the integration of multi-kilobase DNA sequences, remains challenging and limits the rapidly growing fields of synthetic biology and cell engineering. Large serine recombinases (LSRs) are enzymes that recognize specific target sequences on a DNA donor sequence and DNA target sequence to catalyze a recombination reaction that results in the insertion of a DNA donor in a sequence-specific manner. Genome editing can be carried out using an LSR system and a DNA donor nucleic acid, such as a plasmid or double-stranded DNA. However, in a human genome, these systems can exhibit variable efficiency and specificity.

In this invention, UC Berkeley researchers and others have developed optimized compositions to significantly increase the efficiency and specificity of LSRs to target a specific genomic locus in human cells. Via fusion to additional protein systems, this engineered composition retains the simplicity of a single protein for gene delivery. The invention also encompasses use in in vivo or ex vivo gene therapy and the creation of modified cell lines or transgenic animals.

SUGGESTED USES

» Genome editing

ADVANTAGES

» Enables improved gene editing without DNA double-sranded breaks

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- RNA Writing: Programmable Splicing for Transcriptome Engineering
- Compositions and Methods of Isothermal Nucleic Acid Detection

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OTHER INFORMATION

CATEGORIZED AS

» **Medical**

» Gene Therapy

» Therapeutics

» **Research Tools**

» Nucleic Acids/DNA/RNA

RELATED CASES

2023-022-0

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