

# RECOMBINASES FOR INTEGRATING DNA & RECOMBINASE FUSIONS

Tech ID: 32932 / UC Case 2023-022-0

## PATENT STATUS

Country	Type	Number	Dated	Case
Patent Cooperation Treaty	Published Application	WO 2024/097747	06/20/2024	2023-022

## 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 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-stranded breaks

## ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

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

## CONTACT

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



## INVENTORS

- » Hsu, Patrick David

## OTHER INFORMATION

### CATEGORIZED AS

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

### RELATED CASES

2023-022-0

