

COMPOSITIONS AND METHODS FOR GENOME EDITING IN PLANTS

Tech ID: 34192 / UC Case 2025-191-0

PATENT STATUS

Patent Pending

BRIEF DESCRIPTION

CRISPR-derived nucleases offer unprecedented precision and ease of use for targeting specific genomic sites. However, the efficient delivery of gene editing tools into plant cells remains a significant hurdle. Current methods rely on a laborious and time-consuming tissue culture pipeline and can induce undesirable changes to the genome and epigenome. To circumvent these limitations, one alternative is to use plant viral vectors for the delivery of compact gene editors and their guide RNA (gRNA).

UC Berkeley and UC Davis inventors found that the use of tobacco rattle virus (TRV) vectors to deliver reRNA and variant TnpB proteins to plants results in surprisingly high efficiencies of genome editing not only in the infiltrated cells, but also systemically (e.g., seeds and non-infiltrated leaves). Delivery via TRV caused systemic viral spread into the shoot apical and floral meristematic regions, leading to unexpectedly high efficiencies of genome editing in non-infiltrated cells (i.e., spread of genome editing), for example, surprisingly high efficiencies of genome editing in non-infiltrated systemic leaves as well as in the germline (e.g., seeds).

SUGGESTED USES

» genome editing in plants, particularly dicots

ADVANTAGES

- » highly efficient
- » relative quick and specific compared to current gene editing methods in plants

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- ▶ Rubisco Selection System
- ▶ Compression of Genetic Information in Multiple Reading Frames
- ▶ Improving Photosynthetic Performance of Plants
- ▶ 2'-fluoro RNA Activators for Enhanced Activation of Csm6 in RNA Detection Assays
- ▶ Composition and Methods of a Nuclease Chain Reaction for Nucleic Acid Detection

CONTACT

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



INVENTORS

» Savage, David Frank

OTHER INFORMATION

CATEGORIZED AS

- » **Agriculture & Animal Science**
 - » Transgenics
- » **Biotechnology**
 - » Genomics
- » **Research Tools**
 - » Nucleic Acids/DNA/RNA
- » **Materials & Chemicals**
 - » Agricultural

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