

Resource Summary Report

Generated by [RRID](#) on Aug 26, 2026

[pDIRECT_22C](#)

RRID:Addgene_91135

Type: Plasmid

Proper Citation

RRID:Addgene_91135

Plasmid Information

URL: <http://www.addgene.org/91135>

Proper Citation: RRID:Addgene_91135

Insert Name: Engineering Reagent: 35S:Csy4-P2A-AtCas9 + CmYLCV:gRNAs with Csy4 spacers

Organism: Synthetic

Bacterial Resistance: Kanamycin

Defining Citation: [PMID:28522548](#)

Vector Backbone Description: Vector Backbone:pTRANS_220d; Vector Types:Plant Expression, CRISPR; Bacterial Resistance:Kanamycin

Plasmid Name: pDIRECT_22C

Record Creation Time: 20220422T222617+0000

Record Last Update: 20260815T082215+0000

Ratings and Alerts

No rating or validation information has been found for pDIRECT_22C.

No alerts have been found for pDIRECT_22C.

Data and Source Information

Source: [Addgene](#)

Usage and Citation Metrics

We found 10 mentions in open access literature.

Listed below are recent publications. The full list is available at [RRID](#) .

Wu R, et al. (2025) A visual monitoring DNA-free multi-gene editing system excised via LoxP::FRT/FLP in poplar. *Plant biotechnology journal*, 23(9), 4017.

Aalders TR, et al. (2024) Specific members of the TOPLESS family are susceptibility genes for Fusarium wilt in tomato and Arabidopsis. *Plant biotechnology journal*, 22(1), 248.

Wang Y, et al. (2024) Harnessing clonal gametes in hybrid crops to engineer polyploid genomes. *Nature genetics*, 56(6), 1075.

Laura M, et al. (2023) Highly Efficient CRISPR/Cas9 Mediated Gene Editing in *Ocimum basilicum* 'FT Italiko' to Induce Resistance to *Peronospora belbahrii*. *Plants* (Basel, Switzerland), 12(13).

Liu L, et al. (2023) Developing a UV-visible reporter-assisted CRISPR/Cas9 gene editing system to alter flowering time in *Chrysanthemum indicum*. *Plant biotechnology journal*, 21(8), 1519.

Ruiz-Ramón F, et al. (2023) The tomato calcium-permeable channel 4.1 (SIOSCA4.1) is a susceptibility factor for pepino mosaic virus. *Plant biotechnology journal*, 21(10), 2140.

Barrera-Rojas CH, et al. (2023) Tomato miR156-targeted SISBP15 represses shoot branching by modulating hormone dynamics and interacting with GOBLET and BRANCHED1b. *Journal of experimental botany*, 74(17), 5124.

Miller SS, et al. (2022) Alfalfa (*Medicago sativa* L.) *pho2* mutant plants hyperaccumulate phosphate. *G3* (Bethesda, Md.), 12(6).

Termák T, et al. (2021) Genome Editing to Achieve the Crop Ideotype in Tomato. *Methods in molecular biology* (Clifton, N.J.), 2264, 219.

Zsögön A, et al. (2018) De novo domestication of wild tomato using genome editing. *Nature biotechnology*.