



Genome editing

Complete cell engineering solutions

CRISPR genome editing tools

invitrogen

Invitrogen™ products set a new standard in CRISPR genome editing

Genome editing combines molecular biology and engineering principles to generate modified genotypes, enabling researchers to study how the genome influences phenotypes. We have developed tools and solutions for every step in the genome editing workflow. This combined toolset comprises a collection of optimized and validated systems, designed to work together to help answer your important scientific questions faster and with less effort. Our comprehensive portfolio of products and services is built on 30 years of cutting-edge innovation and can be scaled up to meet your research needs.



Design and build

Design your experiment and assemble the optimal set of tools

- Invitrogen™ TrueDesign™ Genome Editor software
- Invitrogen™ TrueCut™ Cas9 Protein v2
- Invitrogen™ TrueCut™ HiFi Cas9 Protein
- Invitrogen™ GeneArt™ CRISPR Nuclease mRNA
- Invitrogen™ TrueGuide™ Synthetic gRNA
- Invitrogen™ LentiArray™ CRISPR gRNA
- Invitrogen™ LentiArray™ Cas9 Lentivirus
- Invitrogen™ TrueTag™ Donor DNA Kits
- Invitrogen™ Precision gRNA Synthesis Kit



Deliver

Highly efficient delivery of editing tools to the cells

- Invitrogen™ Lipofectamine™ CRISPRMAX™ Cas9 Transfection Reagent
- Invitrogen™ Lipofectamine™ MessengerMAX™ Transfection Reagent
- Invitrogen™ Lipofectamine™ RNAiMAX™ Transfection Reagent
- Invitrogen™ Neon™ Transfection System



Screen and validate

Confirm gene editing by sequencing, protein knockout, and functional assays

- Invitrogen™ GeneArt™ Genomic Cleavage Detection Kit
- Targeted sequence analysis by Ion Torrent™ next-generation sequencing
- Sanger sequencing of edited genomic region

Invitrogen products and services empower genome editing

We aim to bring you top-performing tools to help you achieve your research goals faster and with fewer challenges. Here's how:

1

More choices, better results

Whether you need an economical solution for routine CRISPR-Cas9 editing tasks in standard cell lines or need to drive maximum editing efficiency in primary cells or iPSC lines, the Invitrogen genome editing suite has a solution to meet your needs.

2

Superior support

From local technical specialists to our technical support center and dedicated genome editing R&D team—if you have questions about genome editing, we've got people who have the answers.

3

Focused innovation

Our R&D team is dedicated to pushing the boundaries of genome editing and is focused on developing innovative solutions to increase the performance, precision, and ease of use of our editing reagents.

4

Proven quality

All of our genome editing reagents are manufactured to meet the rigorous quality standards that you expect and rely on from Invitrogen products.

5

Trust

We leverage 30 years of experience as an industry leader in cell and molecular biology to provide effective solutions that help you make new discoveries faster.

6

Validated solutions

Our extensive line of products includes a complete collection of genome editing tools, each backed by validated protocols for a variety of cell lines and readily available customer service support.

Additional resources

New to genome editing? Access our 24/7 learning center at thermofisher.com/genomeeditingresources

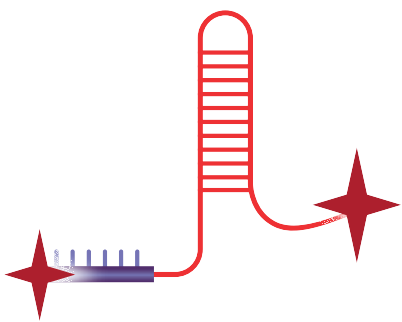


TrueCut Cas9 proteins

Our next-generation Cas9 wild-type and high-fidelity proteins are engineered to deliver maximum editing efficiency.

- Consistently higher editing efficiency with TrueCut Cas9 Protein v2 in tested cell lines, including immune, primary, and stem, compared to other suppliers' products
- Significantly reduce off-target effects with TrueCut HiFi Cas9 Protein in a broad range of cell types
- Validated protocols help you achieve success faster

Learn more at thermofisher.com/tru-cut



TrueGuide Synthetic sgRNAs

Ready-to-transfect single guide RNAs (sgRNAs) that are chemically modified for additional stability and potency.

- Predesigned gRNAs selected for maximum knockout efficiency without compromising specificity
- Easy ordering of custom gRNA designs
- Free software available for design and ordering sgRNA for precise genome editing experiments

Learn more at thermofisher.com/trueguide

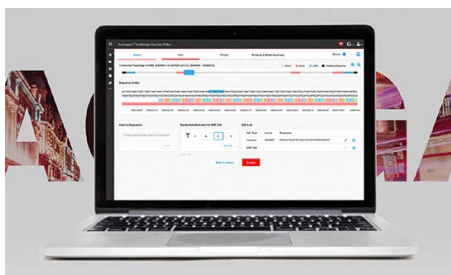


TrueTag Donor DNA Kit

The fast and easy way to generate transfection-ready donor DNA to fluorescently tag a gene.

- Obtain up to 100% edited cells with selection markers
- No cloning required—create donor templates with one-step PCR in hours, not days
- Tag your gene with GFP or RFP

Learn more at thermofisher.com/true-tag



TrueDesign Genome Editor software

Easy-to-use software for precise gene editing and gene tagging experiments.

- Design gRNA and DNA donors for SNP changes, insertions, deletions, and replacements at any location for any transcript
- Generate gene-specific reagents needed for tagging experiments using the TrueTag Donor DNA Kit
- Create and order products for knockout or knock-in studies across five different species

Learn more at thermofisher.com/true-design

Truly stunning performance, reliable results, and more choices—your research demands nothing less

TrueCut Cas9 Protein v2 consistently outperforms products from other suppliers

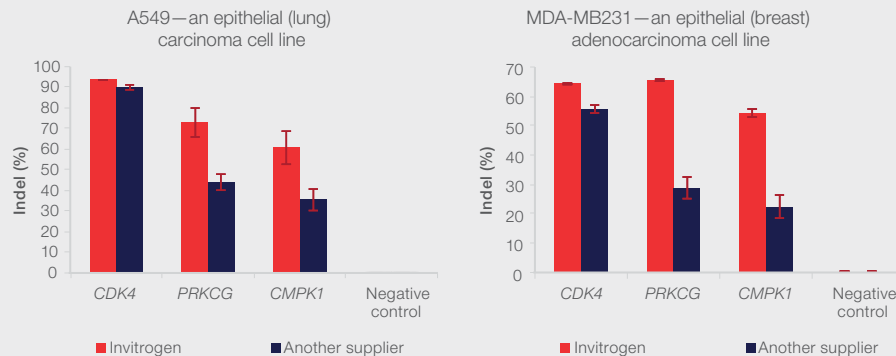


Figure 1. Genome editing of multiple gene targets was performed with TrueCut Cas9 Protein v2 and corresponding TrueGuide sgRNAs. Delivery was achieved using optimized transfection protocols and Lipofectamine CRISPRMAX transfection reagent in two cell lines: A549, a human lung carcinoma cell line; and MDA-MB231, a human breast cancer cell line. The graphs also compare the same experiments using products and recommended protocols from another supplier. With Invitrogen products, cleavage efficiency is improved for low-efficient loci (*PRKCG* and *CMPK1*) and shows consistently superior efficiency, up to a two-fold increase, when compared to products and protocols from other suppliers.

Achieve functional knockout in up to 90% of human primary T cells



Figure 2. High-efficiency functional knockout in T cells. Human T cells were isolated and activated using Invitrogen™ Dynabeads™ magnetic beads and then transfected with TrueCut Cas9 Protein v2 and TrueGuide sgRNAs for T cell receptor alpha (TCRα) or beta (TRCβ) regions using the Neon Transfection System. Following transfection, editing efficiency was measured by **(A)** the Invitrogen™ GeneArt™ cleavage detection assay, or by **(B)** measuring the percentage of TCR-negative (TCR⁻) cells using the Invitrogen™ Attune™ NxT Flow Cytometer. Cells analyzed by flow cytometry were stained with a TCR-specific antibody conjugated to PE.

Ordering information

Product	Quantity	Cat. No.
Cas9 nuclease		
TrueCut Cas9 Protein v2	10 µg	A36496
	25 µg	A36497
	100 µg	A36498
	500 µg	A36499
TrueCut HiFi Cas9 Protein	10 µg	A50574
	25 µg	A50575
	100 µg	A50576
	500 µg	A50577
LentiArray Cas9 Lentivirus	100 µL	A32064
	1 mL	A32069
GeneArt CRISPR Nuclease mRNA	15 µg	A29378
CRISPR sgRNAs		
TrueGuide sgRNA, custom, unmodified	3 nmol	A35513
TrueGuide sgRNA, custom, modified	1.5 nmol	A35534
	3 nmol	A35514
TrueGuide sgRNA, predefined, modified	1.5 nmol	A35533
LentiArray lentiviral gRNA	200 µL, 1 x 10 ⁸ TU/mL	A32042
Precision gRNA Synthesis Kit	25 reactions	A29377
CRISPR controls		
TrueGuide sgRNA Positive Control, AAVS1 (Human)	3 nmol	A35522
TrueGuide sgRNA Positive Control, CDK4 (Human)	3 nmol	A35523
TrueGuide sgRNA Positive Control, HPRT1 (Human)	3 nmol	A35524
TrueGuide sgRNA Positive Control, Rosa26 (Mouse)	3 nmol	A35525
TrueGuide sgRNA Negative Control, non-targeting 1 (Human and Mouse)	3 nmol	A35526
LentiArray CRISPR Positive Control Lentivirus, human HPRT	100 µL	A32056
LentiArray CRISPR Positive Control Lentivirus, human HPRT with GFP	100 µL	A32060
	100 µL	A32062
LentiArray CRISPR Negative Control Lentivirus, human, non-targeting	1 mL	A32327
	100 µL	A32063
CRISPR knock-in tools		
TrueTag Donor DNA Kit, GFP	10 reactions	A42992
TrueTag Donor DNA Kit, RFP	10 reactions	A42993

Commonly purchased products listed above; see a complete list of product offerings at thermofisher.com/crispr.

For custom volumes of TrueCut Cas9 Protein v2, guide RNAs in 96-well plates, or stable Cas9 cell lines, contact us at GEMServices@thermofisher.com

To learn more about our custom genome engineering services, visit thermofisher.com/engineeringservices

 Get started today at thermofisher.com/crispr

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