Cas9 Gene Editing Products

CRISPR

Simple, Fast, Precise

fisher scientific
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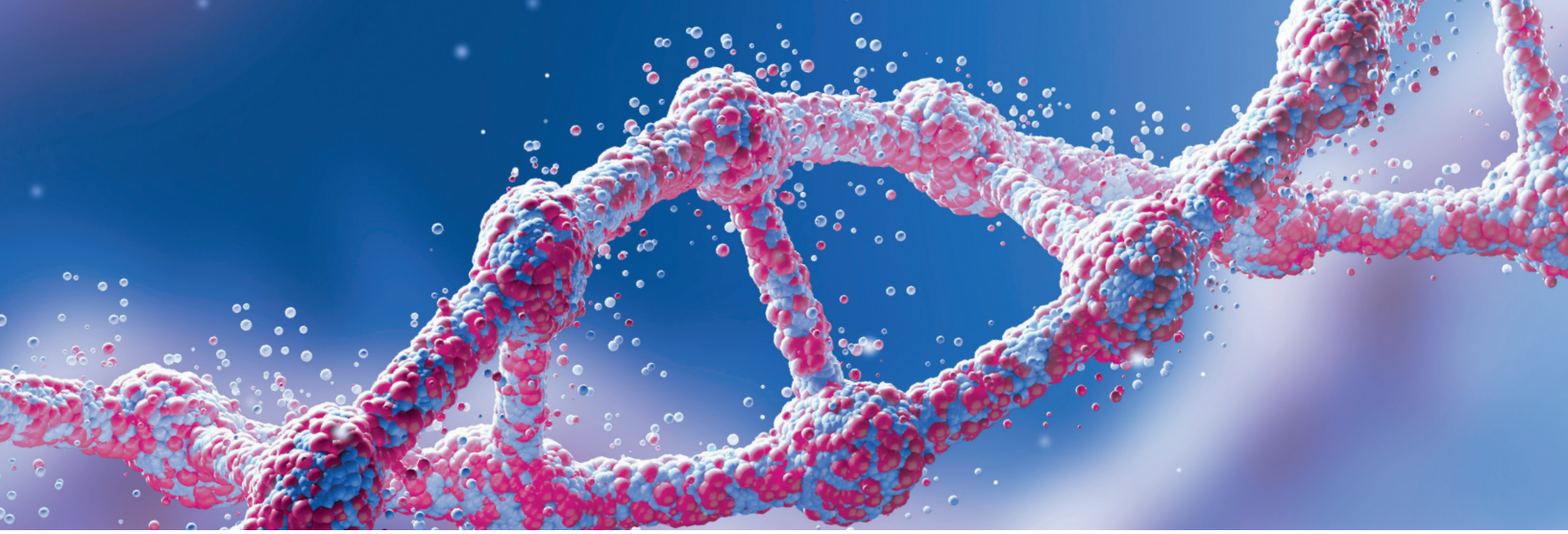


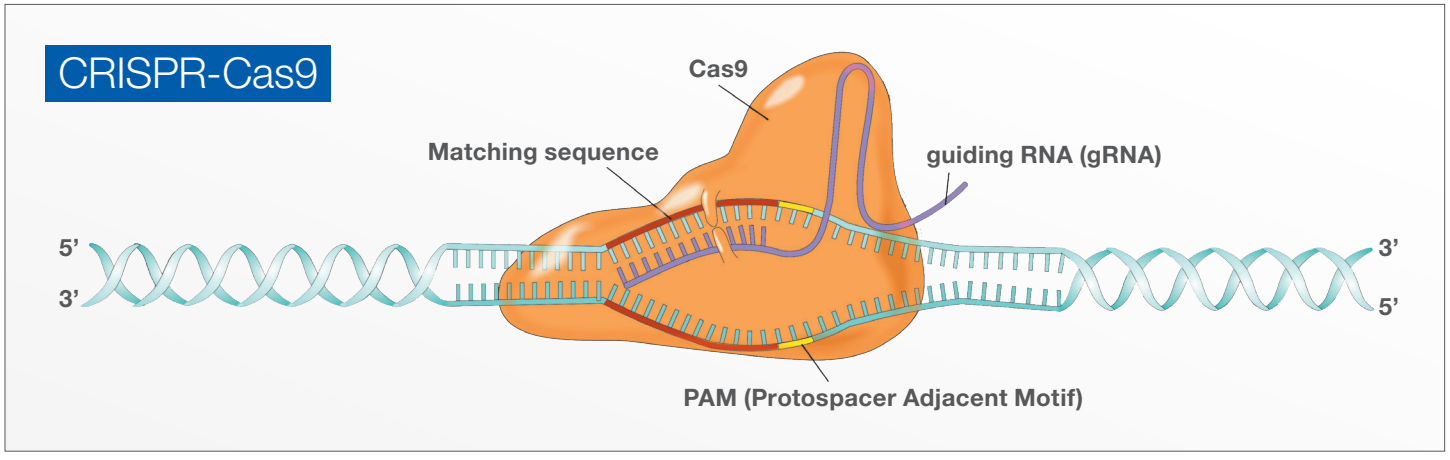
Find Tools to Design, Transfect, and Detect

The Fisher Scientific channel delivers a range of products to help you transform your CRISPR-Cas9 genome editing workflows, from gene design to transfection and detection.

Design: Use the Invitrogen™ TrueDesign™ Genome Editor at **thermofisher.com/crisprdesign** to easily design, select, and order reagents for accurate and successful gene editing experiments.

Transfect: Target a specific genomic locus, induce a double-strand break, and insert new DNA with the gRNA, mRNA, proteins, and reagents featured throughout this brochure.

Detect: Confirm successful, on-target cleavage and transfection with the detection kits featured in this brochure.



invitrogen

Mirus

Invitrogen

GeneArt Genomic Cleavage Detection Kit

For Detecting DS Break Formation

The Invitrogen™ GeneArt™ Genomic Cleavage Detection Kit provides a simple, reliable, and rapid method for detecting locus-specific double-strand break formation.

When editing a genome for targeted mutations, the efficiency of the nucleases to cleave the target sequence is critical, especially before proceeding to downstream processes of cloning and sequencing.

The GeneArt Kit contains all the reagents required prior to gel analysis. A sample of the edited cell population is used as template for amplification. The PCR product is then denatured and re-annealed to produce heteroduplex mismatches where double-strand breaks have occurred and resulted in indel introduction. The mismatches are then recognized and cleaved by the detection enzyme and the cleavage is easily detectable and quantifiable.

- **Easy:** No genomic DNA isolation, direct PCR amplification
- **Rapid:** Four-hour total processing time
- **Quantitative:** Gel band density directly correlates to target indel introduction

Description	Quantity	Cat. No.
GeneArt Genomic Cleavage Detection Kit, Includes Cell Lysis Buffer, Proteinase K, PCR Supermix, Water, Detection Enzyme, Detection Reaction Buffer, Control Template, and Primers	20 rxns	A24372

Description	Quantity	Cat. No.
Precision gRNA Synthesis Kit • Box 1 Includes RNase-Free Reaction Buffer, Nuclease-Free Water, NTP Mix, and Control gRNA Forward and Reverse Primers • Box 2 Includes Binding Buffer, Concentrated Wash Buffers 1 & 2, Nuclease-Free Water, Gene JETTM RNA Purification Micro Column and Collection Tubes, and Elution Tubes	25 rxns	A29377

Invitrogen

Precision gRNA Synthesis Kit

Expression Vector System for CRISPR-Cas9

The Invitrogen™ Precision gRNA Synthesis Kit is a complete system for rapidly synthesizing guide RNA (gRNA) for complexing.

Starting with two short single-stranded oligos, the gRNA template is assembled with a T7 promoter in a short “one-pot” PCR reaction. The assembled product is then used as a template for in vitro transcription (IVT), followed by rapid purification to yield transfection-ready gRNA in as little as four hours.

The resulting gRNA can also be co-transfected with GeneArt Platinum Cas9 Nuclease or GeneArt CRISPR Nuclease mRNA. Both protein and mRNA Cas9 formats require no plasmid manipulation and can be used for high-throughput and multiplex genome-wide cell engineering approaches.

Invitrogen

TrueGuide sgRNA Positive and Negative Controls

Invitrogen™ TrueGuide™ Synthetic gRNAs are ready-to-transfect CRISPR sgRNAs designed and validated to provide specific and high-efficiency target gene knockout.

Description	Quantity	Cat. No.
TrueGuide sgRNA Negative Control, Non-Targeting 1, 24-Well Array Plate	Each	A35526
TrueGuide sgRNA Positive Control, AAVS1 (Human), 24-Well Array Plate	Each	A35522
TrueGuide sgRNA Positive Control, CDK4 (Human), 24-Well Array Plate	Each	A35523
TrueGuide sgRNA Positive Control, Rosa26 (Mouse), 24-Well Array Plate	Each	A35525
TrueGuide sgRNA Positive Control, HPRT1 (Human), 24-Well Array Plate	Each	A35524

Invitrogen

TrueCut Cas9 Protein v2

Engineered for Editing Efficiency

Invitrogen™ TrueCut™ Cas9 Protein v2 is a next-generation recombinant Streptococcus pyogenes Cas9 (wt) protein purified from E. coli for genome editing with CRISPR technology. Cas9 protein forms a very stable ribonucleoprotein (RNP) complex with the guide RNA (gRNA) component of the CRISPR/Cas9 system. Incorporation of nuclear localization signals (NLS) aids delivery to the nucleus, increasing the rate of genomic DNA cleavage.

- Tested for consistent editing efficiency in standard, immune, primary, and stem cell lines
- Delivers up to two times higher editing efficiency with difficult targets than similar products
- Manufactured in an ISO 13485 facility
- Validated protocols for multiple cell types
- Transfection-ready using electroporation or lipid-mediated transfection reagents
- Eliminates cloning steps

Available in two concentrations*: 1 µg/µL for standard editing scenarios and 5 µg/µL for optimizing editing conditions or for primary or embryonic cells, microinjection, or screening multiple gRNA sequences simultaneously.

To obtain CRISPR gRNA for use with TrueCut Cas9 Protein v2:

1. Order transfection-ready Invitrogen TrueGuide synthetic gRNAs
2. Generate transfection-ready gRNA (including template assembly) with the GeneArt Precision gRNA Synthesis Kit
3. Request design, synthesis, and in vitro purification (IVT) of gRNA sequences from our Custom Services team

Description	Quantity	Cat. No.
TrueCut Cas9 Protein v2, 1 µg/µL	10 µL	A36496
	25 µL	A36497
TrueCut Cas9 Protein v2, 5 µg/µL	20 µL	A36498
	100 µL	A36599

**Contact your Fisher Scientific representative about custom sizes or concentrations.*

Description	Quantity	Cat. No.
GeneArt CRISPR Nuclease mRNA	15 µg	A29378

Invitrogen

GeneArt CRISPR Nuclease mRNA

Ready-to-Transfect mRNA Format

Invitrogen™ GeneArt™ CRISPR Nuclease mRNA has two nuclear localization signals (NLSs) to increase efficiency in targeting the Cas9 protein to the nucleus.

The mRNA format is ready to transfect and eliminates the cloning required with CRISPR vector systems. Cas9 mRNA is co-transfected with a target-specific guide RNA (gRNA) to direct the Cas9 protein to the intended genome locus and create a double-stranded break.

This produces a smaller payload than plasmid-based Cas9 systems and can be used in multiplex approaches with more than one gRNA. Use this approach to determine which gRNA sequence works best for a particular target or to edit multiple genomic loci with one transfection. Then target your specific RNA with the GeneArt Precision gRNA Synthesis Kit or GeneArt CRISPR Strings.

Invitrogen

GeneArt CRISPR Nuclease Vector with CD4 Enrichment Kits

With and without Competent Cells

Invitrogen™ GeneArt™ CRISPR Nuclease Vector with CD4 Enrichment Kit is a vector system for expressing the functional components needed for CRISPR-Cas9 genome editing in mammalian cells with a CD4 reporter.

The CD4 reporter enables sorting and enrichment of Cas9 and CRISPR expressing cells using Invitrogen™ Dynabeads™ CD4 Magnetic Beads or anti-CD4 fluorescent antibodies to track transfection efficiency. The linearized GeneArt CRISPR Nuclease Vectors help produce double-stranded oligonucleotides that encode a crRNA target into an expression cassette for sequence-specific targeting of the Cas9 nuclease. (A version with competent cells is also available.)

The complete RNA format is a smaller payload than plasmid-based Cas9 systems for improved delivery into the cell and better genome editing efficiency. Additionally, the Cas9 mRNA can be used in multiplex approaches with more than one gRNA. Use this approach to determine which gRNA sequence works best for a particular target or to edit multiple genomic loci with one transfection. Use the GeneArt Precision gRNA Synthesis Kit or GeneArt CRISPR Strings to make your target-specific gRNA.

Description	Includes Competent Cells*	Quantity	Cat. No.
GeneArt CRISPR Nuclease Vector with CD4 Enrichment Kit, Includes CRISPR CD4 Nuclease Vector, 10X Annealing Buffer, DNase/ RNase-Free Water, 5X Ligation Buffer, T4 DNA Ligase, U6 Forward Sequencing Primer, and Control Double-Stranded Oligonucleotide	No	10 rxns	A21175
	Yes	10 rxns	A21177

**Invitrogen™ OneShot™ TOP10 Chemically Competent Cells*

Invitrogen

GeneArt CRISPR Nuclease Vector with OFP Reporter Kit

With and without Competent Cells

A ready-to-use expression vector system for CRISPR-Cas9 genome editing in mammalian cells using an orange fluorescent protein (OFP) reporter. The OFP reporter allows for fluorescence-based tracking of transfection efficiency, as well as FACS-based sorting and enrichment of Cas9 and CRISPR expressing cells.

Linearized GeneArt CRISPR Nuclease Vectors offer rapid and efficient cloning of double-stranded oligonucleotides that encode crRNA for a desired target. This creates an expression cassette for sequence-specific targeting of the Cas9 nuclease.

Description	Includes Competent Cells*	Quantity	Cat. No.
GeneArt CRISPR Nuclease Vector with OFP Reporter Kit, Includes CRISPR OFP Nuclease Vector, 10X Annealing Buffer, DNase/RNase-Free Water, 5X Ligation Buffer, T4 DNA Ligase, U6 Forward Sequencing Primer, and Double-Stranded Oligonucleotide Control	No	10 rxns	A21174
GeneArt CRISPR Nuclease Vector with CD4 Enrichment Kit, Includes CRISPR CD4 Nuclease Vector, 10X Annealing Buffer, DNase/RNase-Free Water, 5X Ligation Buffer, T4 DNA Ligase, U6 Forward Sequencing Primer, and Control Double-Stranded Oligonucleotide	Yes	10 rxns	A21178

Invitrogen

Lipofectamine CRISPRMAX Cas9 Transfection Reagent

Optimized Lipid Nanoparticle Transfection Reagent

Invitrogen™ Lipofectamine™ CRISPRMAX™ Transfection Reagent increases the likelihood of successful cleavage and recombination, especially when combined with our Invitrogen™ TrueCut™ Cas9 Protein v2 and TrueGuide™ Synthetic gRNA.

Unlike CRISPR plasmid or Cas9 mRNA, using Cas9 protein provides superior cleavage efficiency in primary and stem cells. It eliminates the need for transcription or translation of the payload, removes the risk of genomic integration, and is cell cycle independent.

- Tested for cleavage efficiency in iPSC, mESC, N2A, CHO, A549, HCT116, HeLa, HEK293, and other cell types
- Low cell toxicity
- High-throughput friendly using 96-well format

Description	Quantity	Cat. No.
CRISPRMAX Cas9 Transfection Reagent	0.1 mL	CMAX00001
	0.3 mL	CMAX00003
	0.75 mL	CMAX00008

**Invitrogen™ OneShot™ TOP10 Chemically Competent Cells*

Invitrogen

Lipofectamine Stem Transfection Reagent

Optimized for Efficiency

Invitrogen™ Lipofectamine™ Stem Transfection Reagent helps achieve efficiency with minimal early differentiation in a wide range of stem cells. It can co-deliver DNA, RNA, and Cas9 ribonucleoprotein (RNP) complexes.

Lipofectamine Stem Reagent is compatible with feeder-free and other media systems to support and simplify your stem cell culture workflow. Researchers have reported up to 80% or better transfection efficiency in pluripotent (PSCs) and neural stem cells (NSCs) and up to 45% in mesenchymal stem cells (MSCs).

Description	Quantity	Cat. No.
Lipofectamine Stem Transfection Reagent	0.1 mL	STEM00015
	0.3 mL	STEM00003
	0.75 mL	STEM00008
	1.5 mL	STEM00001

Mirus Bio

*Trans*IT-mRNA Transfection Kits

For Large RNA and CRISPR Guide RNA

Each kit includes Mirus Bio™ *Trans*IT™-mRNA Transfection Reagent and mRNA Boost Reagent.

- Low cellular toxicity to maintain cell density and reduce experimental bias
- Achieve RNA delivery in a large cell population
- Perform transfections in the presence of serum — no need to change media
- For virus production, protein expression, CRISPR genome editing, and other specialized applications

Description	Quantity		Cat. No.
	Transfection Reagent	Boost Reagent	
Trans IT-mRNA Transfection Kit	0.4 mL	0.4 mL	MIR-2225
	1 mL	1 mL	MIR-2250
	5 x 1 mL	5 x 1 mL	MIR-2255
	10 x 1 mL	10 x 1 mL	MIR-2256

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