

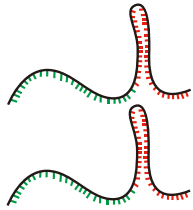
# CRISPR/Cas9

Products and kits

# from GenScript

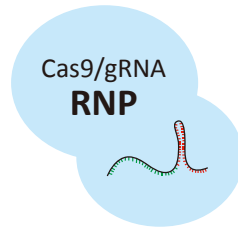
# The workflow of CRISPR gene editing

## gRNA design, synthesis and screening



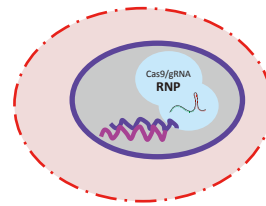
- online database for gRNA design
- gRNA synthesis kit
- gRNA screening kit

## gRNA + Cas9 construction



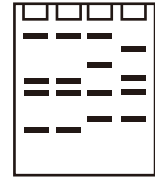
- Cas9 proteins
- crRNA:tracrRNA
- gRNA-Cas9 assembling kit

## Cas9/gRNA delivery in cells



- RNP (Cas9 + gRNA)
- Plasmids

## Genomic cleavage detection



- T7E1
- Genomic cleavage detection kit

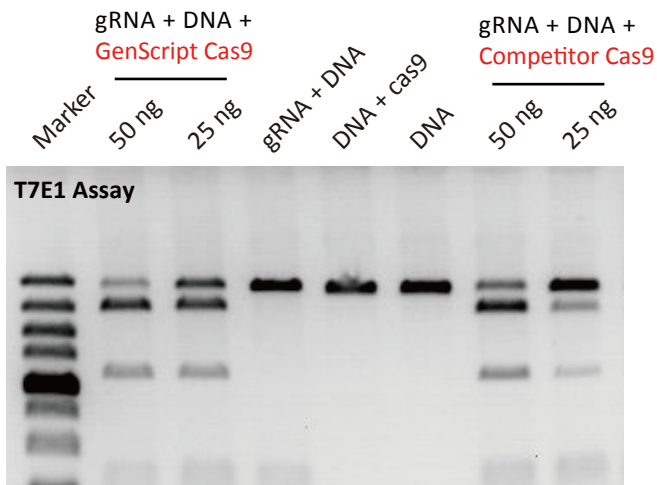


[www.genscript.com](http://www.genscript.com)

# GenScript offers a variety of Cas9 proteins for various applications

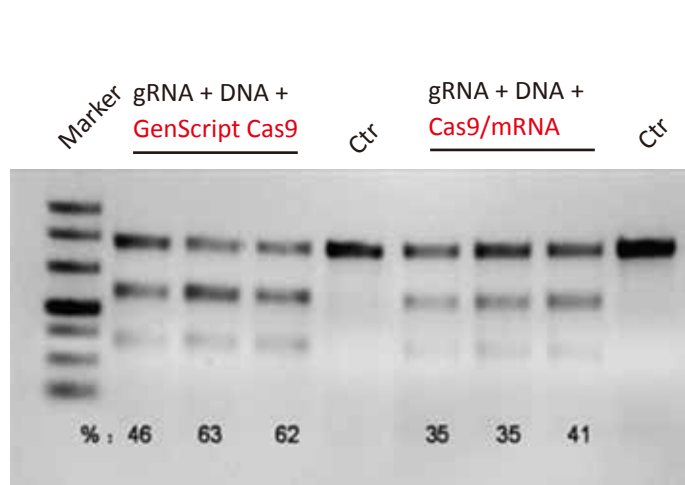
Cat	Name	Applications
Z03386-10	GenCrispr Cas9 Nuclease	For <i>in vitro</i> gRNA cleavage
Z03386-50	GenCrispr Cas9 Nuclease	
Z03385-100	GenCrispr Cas9-C-NLS Nuclease	
Z03385-50	GenCrispr Cas9-C-NLS Nuclease	For <i>in vivo</i> gene editing; NLS ensure nuclear localization
Z03388-100	GenCrispr Cas9-N-NLS Nuclease	
Z03388-50	GenCrispr Cas9-N-NLS Nuclease	
Z03389-100	GenCrispr NLS-Cas9-NLS Nuclease	
Z03389-50	GenCrispr NLS-Cas9-NLS Nuclease	Lower off-target effect
Z03390-10	GenCrispr NLS-Cas9-D10A Nickase	
Z03390-100	GenCrispr NLS-Cas9-D10A Nickase	
Z03390-50	GenCrispr NLS-Cas9-D10A Nickase	For sorting and enrichment by FACS
Z03393-100	GenCrispr NLS-Cas9-EGFP Nuclease	
Z03393-50	GenCrispr NLS-Cas9-EGFP Nuclease	

## Higher cleavage activity than competitors

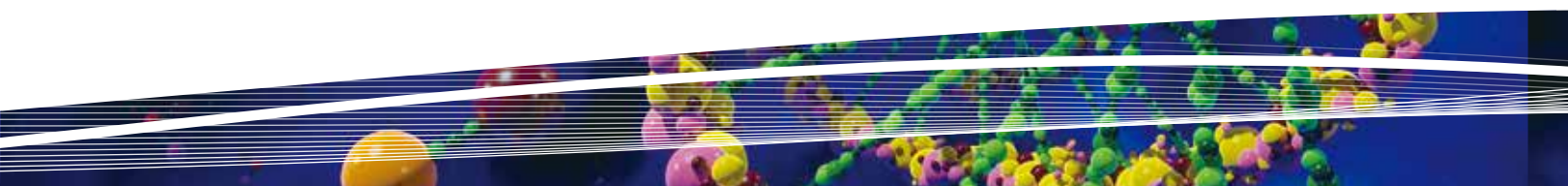


gRNA target DNA substrate is incubated with gRNA and different concentration of cas9 protein for 2h, the final cleavage efficiency was analyzed by agarose electrophoresis. Compared with competitor's cas9 protein, more substrate is cleaved by GenCrispr Cas9 under the same concentration treatment.

## Higher gene editing efficiency than mRNA in embryos



Three different zebrafish embryos were injected with gRNA and cas9 protein or cas9 mRNA, after 48h the embryos were lysed for T7E1 assay shown in the above figure. The cleavage efficiency of gRNA+GenScript Cas9 protein is much higher than that of gRNA+Cas9 mRNA.

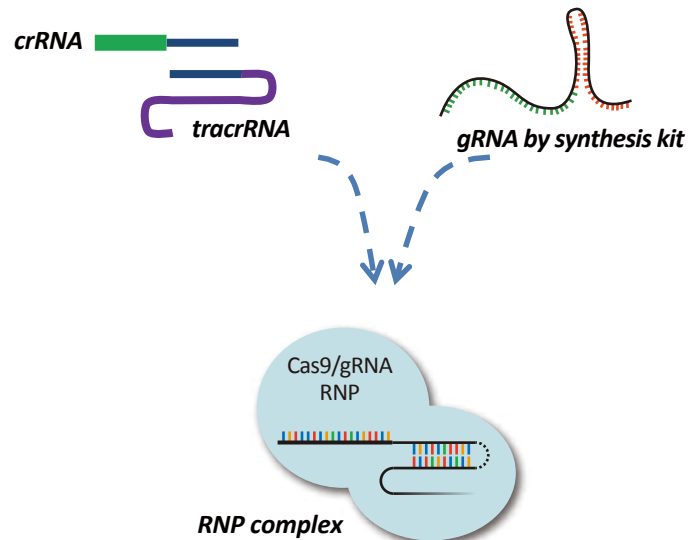


# gRNA preparation

How to get your gRNA fast by GenCrispr Tools

## Synthesized crRNA and tracrRNA

Customer can order the RNA oligos directly from GenScript. We optimize the length of both the crRNA and tracrRNA for the highest editing efficiency. We also provide HPRT crRNA/ tracrRNA as a positive control.



## GenCrispr gRNA synthesis kit

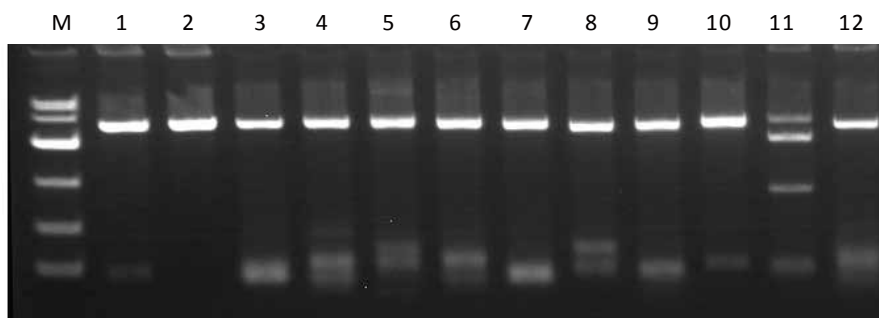
(Cat.No: L00694)

Synthesize your own gRNA by using our GenCrispr gRNA synthesis kit. This kit includes the template DNA and T7 RNP. Only a pair of DNA oligos is needed to prepare a specific gRNA.

## GenCrispr gRNA screening kit

(Cat.No: L00689)

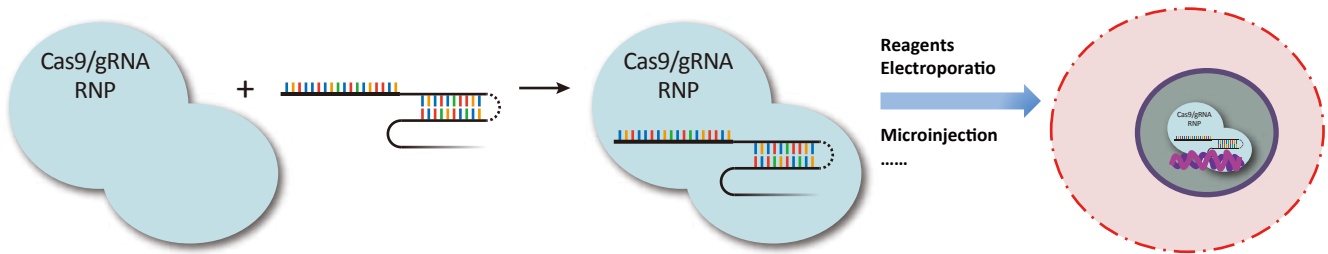
Save time and labor by choosing the most efficient target gRNA before introducing it into cells. GenScript offers the GenCrispr gRNA screening kit to quickly identify the most efficient target gRNA using *in vitro* cleavage assays.



The screening of high efficient target gRNA. 12 synthesized gRNA were incubated with Cas9 nuclease for 1 h at 37°C, then detected by DNA argose gel.

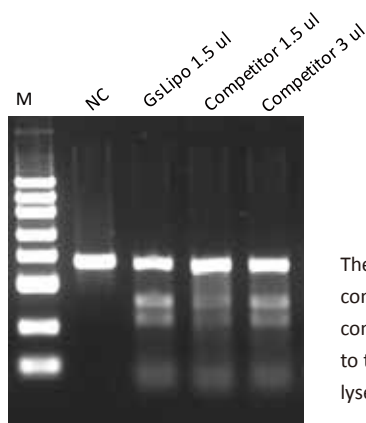
# Delivery of Cas9 protein and gRNA

Traditional cellular delivery approaches focus on DNA/ plasmid transfection, but this is not usually applicable to protein or protein/ RNA transfection methods. As the use of Cas9 protein has increased in the gene editing field, more reagents and methods have been developed to facilitate the introduction of the RNP complex (Cas9 protein and gRNA).



## GsLipo reagent-dependent transfection

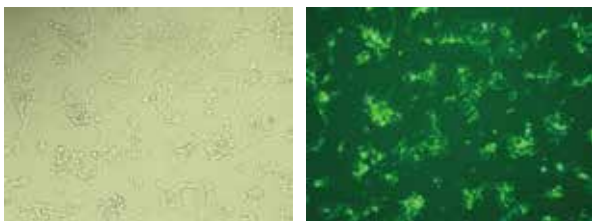
- High efficiency
- Low toxicity
- Competitive



The gene editing efficiency of GsLipo is higher than competitor's. HPRT gRNA and Cas9 protein complex were transfected into 293T cells according to the suggested protocols. After 48 h, cells were lysed for T7E1 assay.

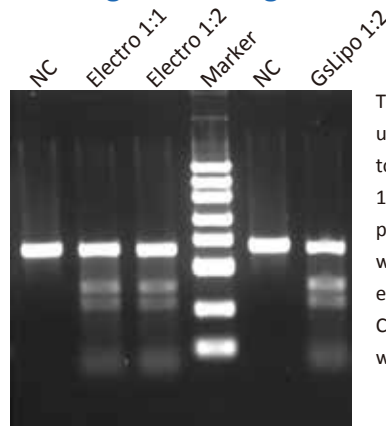
## Electroporation-dependent transfection

### High transfection efficiency



GenCrispr NLS-Cas9-EGFP nuclease was transfected into 293T cells by using Bio-rad electroporation machine. 6 h later, cells were observed by fluorescence microscope.

### Similar gene editing efficiency with GsLipo



The gene editing efficiency using electroporation is similar to that observed with GsLipo. 150 pmol Cas9 protein and 150 pmol or 300 pmol HPRT gRNA was introduced into 293T by electroporation. 12.5 pmol Cas9 protein and 25 pmol gRNA was introduced by GsLipo.

## Microinjection-dependent

For clients needing gene editing in embryos, microinjection is the best approach (faster and highest efficiency) for introducing the RNP complex.

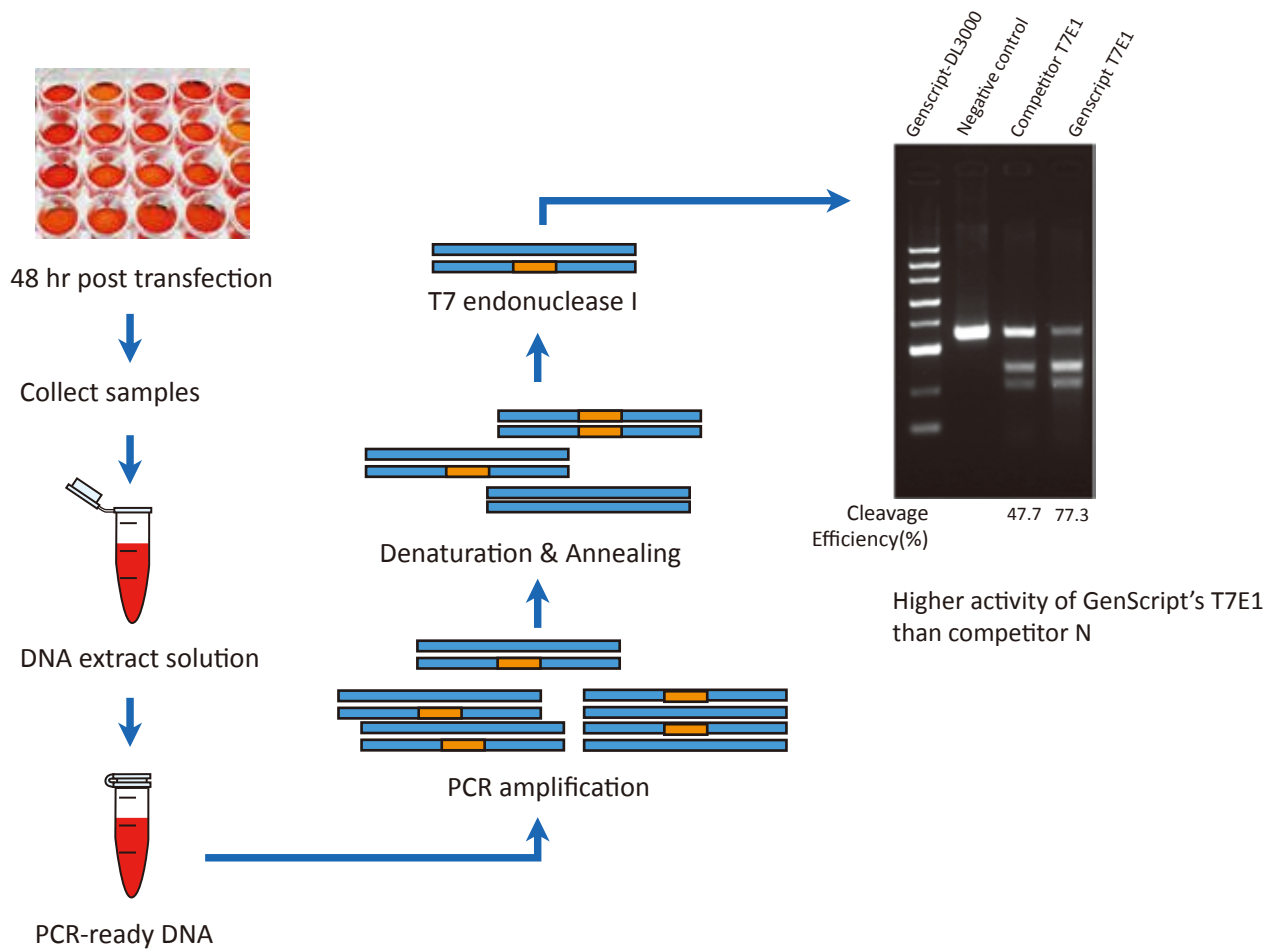


# Detection and analysis of genome editing efficiency

## Genome cleavage detection products

GenScript provides reliable detection tools to verify the genome cleavage efficiency easily.

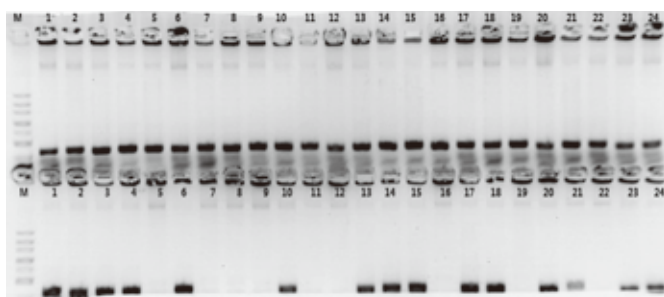
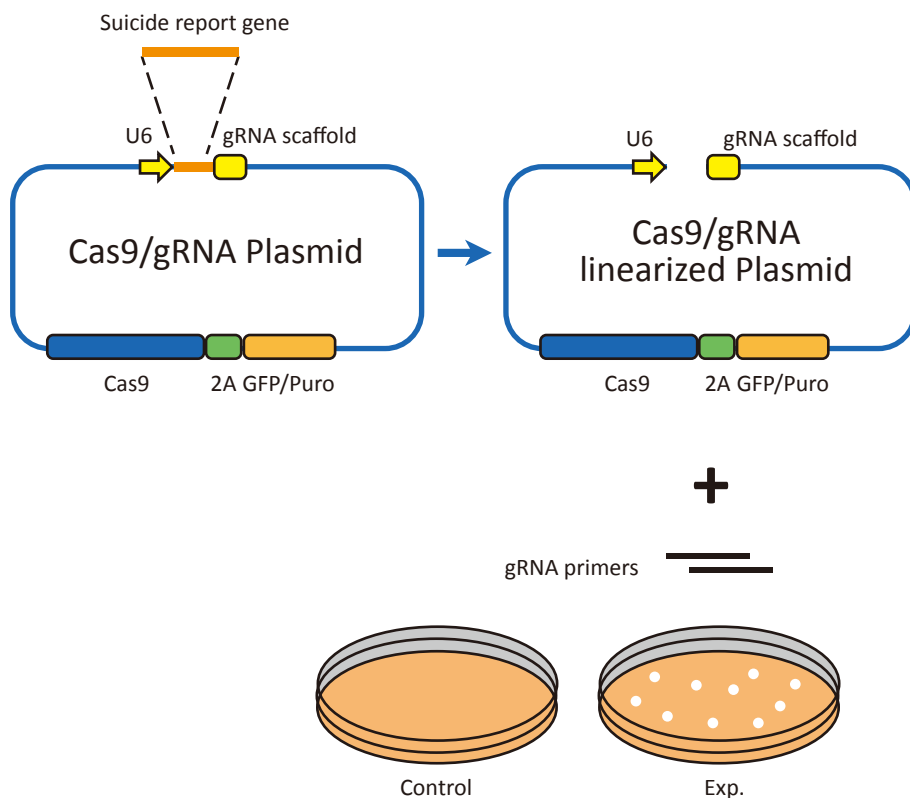
- T7E1 (T7 Endonuclease I) (Cat.No: Z03396)
- Genomic cleavage detection kit (Cat.No: L00688)
  - Easier – with DNA polymerase for direct PCR amplification
  - Higher efficiency – with competitive enzyme cleavage activity
  - Faster – with straight forward workflow



# Highly efficient gRNA-Cas9 plasmid assembling kit

(Cat.No: L00690, L00692, L00693)

In addition to offering Cas9 proteins, GenScript has also developed a highly efficient Cas9-gRNA plasmid assembly kit. This includes a vector that contains a suicide reporter gene at the gRNA insert site. Under the selection of the suicide reporter, nearly 100% of clones are positive. GenScript offers both a circular or linear format. The linear format allows you to skip the digestion and purification process, saving time and labor, while the circular format allows you to propagate the vector for future use.



- Positive clone rate increased from 62% (lower panel) to 100% (upper panel using L00692)
- Easy to use, no need for plasmid digestion and fragment purification, nor colony screening
- Save time and labor

# Ordering information

Cat.No	Name	Size
Z03385-50	GenCrispr Cas9-C-NLS Nuclease	50 µg (1 mg/ml)
Z03385-100		100 µg (4 mg/ml)
Z03386-10	GenCrispr Cas9 Nuclease	10 µg (0.2 mg/ml)
Z03386-50		50 µg (5×10 µg)(0.2 mg/ml)
Z03388-50	GenCrispr Cas9-N-NLS Nuclease	50 µg (1 mg/ml)
Z03388-100		100 µg (4 mg/ml)
Z03389-50	GenCrispr NLS-Cas9-NLS Nuclease	50 µg (1 mg/ml)
Z03389-100		100 µg (4 mg/ml)
Z03390-10	GenCrispr NLS-Cas9-D10A Nickase	10 µg (1 mg/ml)
Z03390-50		50 µg (1 mg/ml)
Z03390-100		100 µg (4 mg/ml)
Z03393-50	GenCrispr NLS-Cas9-EGFP Nuclease	50 µg (1 mg/ml)
Z03393-100		100 µg (3 mg/ml)
Z03396-250	GenCrispr T7 Endonuclease I	250 U (10000 U/ml)
Z03396-1250		1250 U (10000 U/ml)
L00688-25	GenCrispr Mutation Detection Kit	25 reactions
L00688-100		100 reactions
L00689-30	GenCrispr sgRNA Screening Kit	30 reactions
L00689-100		100 reactions
L00690-10	High-Efficiency gRNA-Cas9-GFP Plasmid (linear) Assembly Kit	10 reactions
L00690-25		25 reactions
L00691-10	High-Efficiency gRNA-Cas9-Puro Plasmid (linear) Assembly Kit	10 reactions
L00691-25		25 reactions
L00692-10	High-Efficiency gRNA-Cas9-GFP Plasmid Assembly Kit	10 reactions
L00692-25		25 reactions
L00693-10	High-Efficiency gRNA-Cas9-Puro Plasmid Assembly Kit	10 reactions
L00693-25		25 reactions



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