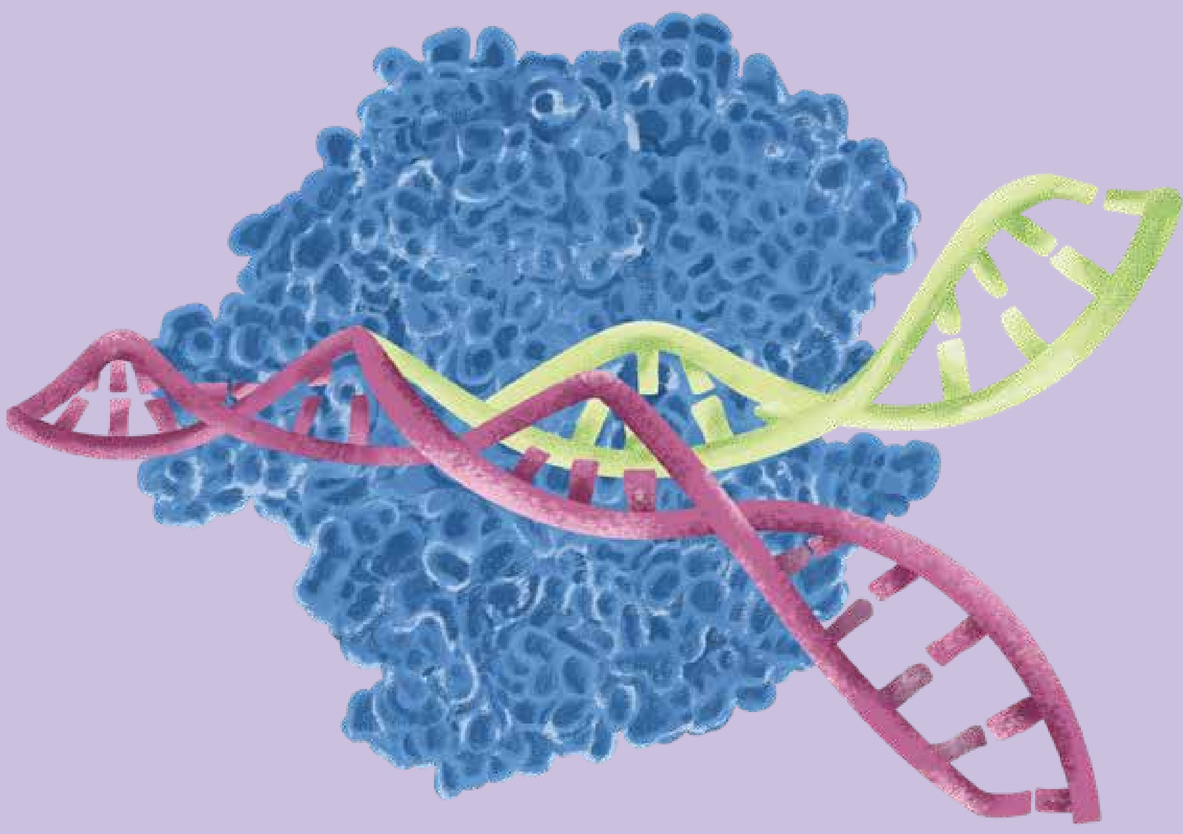
Enzymes for CRISPR Gene Editing

GMP-Grade, GMP-Ready, & Research-Grade



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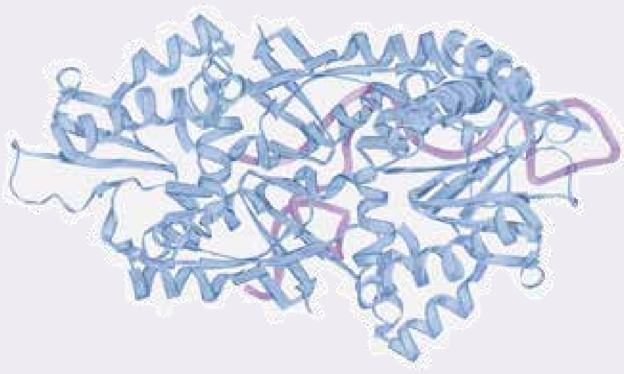
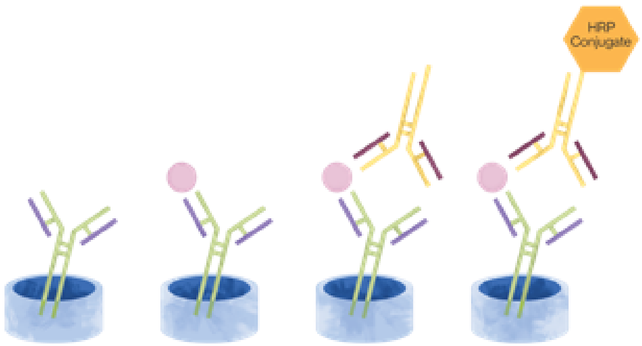
Due to the convenience of its design and operation, the CRISPR-Cas system has become the most widely used gene editing technology at present. In light of market demand, KACTUS has successfully engineered highly-active Cas9 and Cas12a nucleases. Our CRISPR enzymes offer high editing activity, high purity, and low endotoxin.
To meet the demands of our CMC customers, we offer small- and large-scale production with consistent quality control throughout so you can have a smooth transition scaling up from development to manufacturing.



CRISPR Cas9 Nuclease ELISA Kit

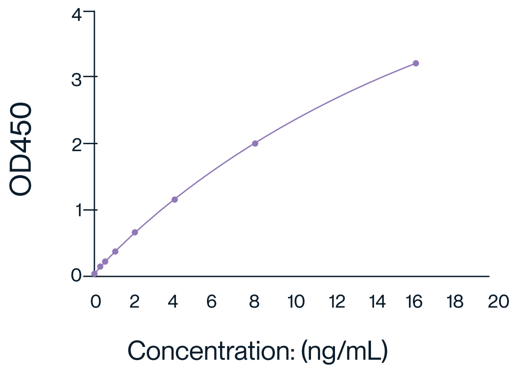


In *ex vivo* gene therapy, after the cells are modified by the CRISPR Cas9 system, the residual Cas9 nuclease in the cells needs to be quantified before the cells can be transfused back into the human body. To this end, KACTUS has carefully developed a highly sensitive and specific Cas9 residue detection kit, with a sensitivity of up to 0.125ng/mL.

This kit uses sandwich ELISA to quantify the Cas9 nuclease in the sample. Our 8-point standard curve has high sensitivity.

Assay Performance:
(1) Detection range: 0.25ng/mL - 16ng/mL
(2) Sensitivity: 0.125ng/mL
(3) Precision: CV < 10%

Example Standard Curve

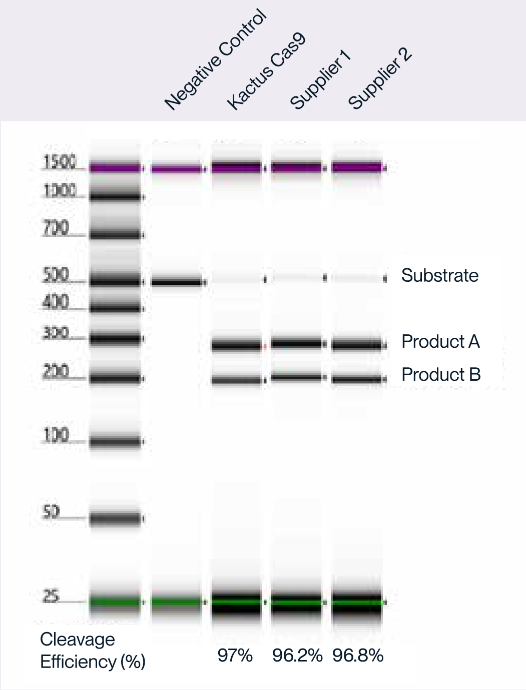


GMP-Grade Cas9 Nuclease

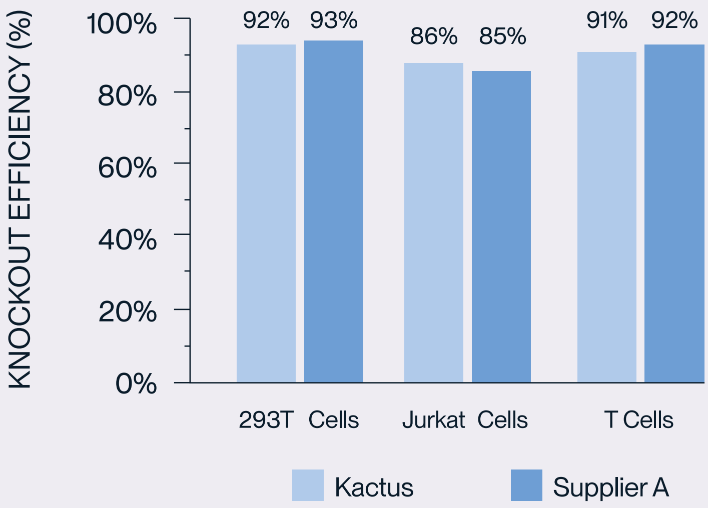
KACTUS has successfully designed a highly-active CRISPR Cas9 nuclease. Using our protein engineering platform, our Cas9 has undergone codon optimization, nuclear localization signal (NLS) design, and optimization of *E. coli* expression and purification.

Our Cas9 nuclease is manufactured GMP-Grade and has completed the U.S. FDA DMF filing (DMF #036578). This means you can directly quote our DMF submission in your regulatory documentation for new drug applications, thereby expediting drug review.

Catalog Number	Product Description	Grade
GMP-CAS-EE110	CRISPR Cas9	GMP-Grade (DMF #036578)
CAS-MM00B	CRISPR Cas9 Nuclease ELISA Kit	Research - Grade



High Editing Efficacy in Multiple Cell Types



In vitro Cleavage

Cas9 cleaves substrate DNA standard via *in vitro* cleavage experiment. Results show the cleavage activity of KACTUS Cas9 is equivalent to that of leading suppliers.

Ex vivo Gene Knockout

Gene knockout efficiency analyzed in nucelofected 293T, Jurkat, and T cells using TIDE analysis. Results show greater than 85% editing efficacy across all three cell types, comparable to a leading supplier.

GMP-Ready AsCas12a Nuclease

CRISPR-associated nuclease Acidaminococcus sp. Cas12a, also known as AsCpf1, can recognize and cleave DNA sequences with a T-rich protospacer adjacent motif (T-PAM), making it a useful tool for genome editing in regions where the NGG PAM sequence is not present. Different from Cas9, AsCas12a leaves sticky ends with 5' overhangs after the cleavage of both DNA strands, which provides a powerful tool for genetic engineering and other applications that require precise and specific DNA cleavage and editing. Additionally, Cas12a has been shown to have a lower off-target activity than Cas9, making it a promising tool for precision genome editing.

Catalog Number	CAS-EE121
Product Description	AsCas12a Nuclease
Purity (SEC-HPLC)	≥ 95%
Purity (RP-HPLC)	≥ 95%
Endotoxin	≤ 10 EU/mg
Source	*E. coli*
Species	*Acidaminococcus sp. BV3L6*

Quality Control

Example QC Specifications: Cas9 Nuclease	
Assay	**Specification**
Activity (*In Vitro* Cleavage Activity)	> 85%
Endotoxin (Chromogenic)	≤ 10EU/mg
Purity (Bis-Tris, RP-HPLC, & SEC-HPLC)	≥ 95%
Concentration (Non-interfering protein quantification)	9.5-12.5mg/mL
Residual DNase (Qubit Fluorometer)	≤ LOD
Residual RNase (Qubit Fluorometer)	≤ LOD
Residual Host Protein (ELISA)	≤100mg/mL
Residual Host Cell DNA (qPCR)	≤ 200ng/mL
Sterility (Membrane filtration)	Negative
Mycoplasma (qPCR)	Negative

Adhering strictly to cGMP guidelines, our comprehensive quality management system and quality controls ensure the provision of high-quality raw materials from development to manufacturing. Our protein engineering team also offers custom GMP-grade protein production and protein engineering services.

GMP-Grade Manufacturing

→ Produced and quality control tested in adherence with cGMP standards
→ Manufacturing Execution System (MES) digital production management system
→ Process and analytical method validation
→ Testing for stability & batch-to-batch consistency
→ Free from antibiotic residues
→ Free from raw materials of animal origin
→ Comprehensive records for batch production and control
→ Supporting regulatory documentation reviewed & approved by Quality Assurance

Learn more