

## CRISPR-Cas9 Protein, *S. pyogenes* (NLS)

Cat. No.:	HY-P701235
Synonyms:	CRISPR-associated endonuclease Cas9/Csn1; cas9; SpCas9; SpyCas9
Species:	Others
Source:	<i>E. coli</i>
Accession:	Q99ZW2 (M1-D1368)
Gene ID:	/
Molecular Weight:	Approximately 160 kDa

### PROPERTIES

Biological Activity	≥ 90% as analyzed by in vitro assay.
Appearance	Solution.
Formulation	Supplied as 0.22 μm filtered solution in 25 mM Tris, 300 mM NaCl, 0.1 mM EDTA, 50% glycerol, pH 8.0.
Endotoxin Level	<0.1 EU/μg, determined by LAL method.
Reconstitution	N/A.
Storage & Stability	Stored at -80°C for 1 year. It is stable at -20°C for 3 months after opening. It is recommended to freeze aliquots at -80°C for extended storage. Avoid repeated freeze-thaw cycles.
Shipping	Shipping with dry ice

### DESCRIPTION

#### Background

CRISPR-Cas9, a revolutionary molecular tool, constitutes an adaptive immune system that defends against mobile genetic elements like viruses, transposable elements, and conjugative plasmids. In this system, CRISPR clusters contain spacers, which are sequences complementary to preceding mobile elements, serving as a memory bank of past encounters. The process involves transcription and processing of CRISPR RNA (crRNA), wherein, for type II CRISPR systems, the proper processing of pre-crRNA requires a trans-encoded small RNA (tracrRNA), endogenous ribonuclease 3 (rnc), and the pivotal Cas9 protein. The tracrRNA guides ribonuclease 3 in processing pre-crRNA, with Cas9 stabilizing the pre-crRNA:tracrRNA interaction. In subsequent steps, Cas9/crRNA/tracrRNA complex acts as an endonuclease, cleaving the target DNA with complementary spacer sequences. Cas9 is inactive without the guidance of two specific guide RNAs (gRNA), emphasizing the necessity of both gRNAs for DNA binding and nuclease activity. Cas9's recognition of the protospacer adjacent motif (PAM) within CRISPR repeats is crucial for distinguishing self from nonself, ensuring accurate target identification. This sophisticated system confers immunity against invading genetic elements through a mechanism known as CRISPR interference.

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**Caution: Product has not been fully validated for medical applications. For research use only.**

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