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# CRISPR/Cas Genome Editing




## From New England Biolabs

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Cas nucleases are central components of CRISPR-based immunity, a mechanism used to protect a bacterial or archaeal cell from invading viral and foreign DNA. CRISPRs (clustered regularly interspaced short palindromic repeats) are DNA loci that contain multiple, short, repeated sequences, separated by unique “spacer DNA”. The CRISPR locus is transcribed and processed into short guide RNAs (gRNAs) that are incorporated into Cas nuclease. The RNA corresponding to the spacer DNA guides the Cas nuclease to its target by complementary base pairing; double-stranded DNA cleavage results.

Cas nucleases have been adapted for use in genome engineering, because they can be easily programmed for target specificity by supplying gRNAs of any sequence. In cells and animals, genome targeting is performed by expressing nucleases and gRNA from DNA constructs (plasmid or virus), supplying RNA encoding Cas nuclease and gRNA, or by introducing RNA-programmed Cas nuclease directly.

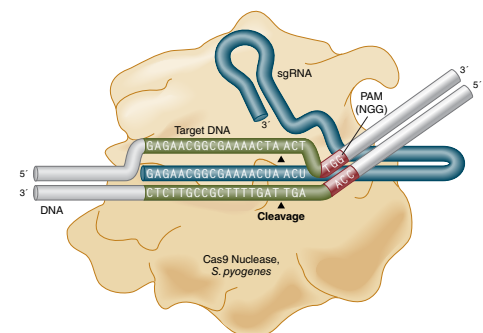
### Featured NEB Products Supporting CRISPR Workflows

NEB#	PRODUCT NAME	FEATURES	LIST PRICE	DISCOUNTED PRICE
M0646T/M	EnGen Cas9 Nuclease NLS, <i>S. pyogenes</i>	<i>In vitro</i> cleavage of dsDNA. Genome engineering by direct introduction of active nuclease complexes.	<del>\$213/\$852</del>	<b>\$159.75/\$639</b>
M0386S/T/M	Cas9 Nuclease, <i>S. pyogenes</i>	<i>In vitro</i> cleavage of dsDNA. Genome engineering by direct introduction of active nuclease complexes.	<del>\$71/\$192/\$767</del>	<b>\$53.24/\$144/\$575.25</b>
 M0650S/T	EnGen Spy Cas9 Nickase	<i>In vitro</i> nicking of dsDNA. Genome engineering by direct introduction of active nuclease complexes.	<del>\$85/\$213</del>	<b>\$63.75/\$159.75</b>
 M0652S/T	EnGen Spy dCas9	<i>In vitro</i> binding of DNA. Compatible with SNAP-tag substrates for visualization and enrichment.	<del>\$85/\$213</del>	<b>\$63.75/\$159.75</b>
 M0653S/T	EnGen Lba Cas12a (Cpf1)	<i>In vitro</i> cleavage of dsDNA. Genome engineering by direct introduction of active nuclease complexes. Recognizes 5'-TTTN PAM.	<del>\$99/\$355</del>	<b>\$74.24/\$266.25</b>
E3322S	EnGen sgRNA Synthesis Kit, <i>S. pyogenes</i>	Generation of microgram quantities of custom sgRNA in less than 1 hr.	<del>\$568</del>	<b>\$426</b>
E3321S	EnGen Mutation Detection Kit	Determination of the targeting efficiency of genome editing protocols.	<del>\$284</del>	<b>\$213</b>
M0302S/L	T7 Endonuclease I	Determination of the targeting efficiency of genome editing protocols by surveyor assay.	<del>\$98/\$392</del>	<b>\$73.49/\$294</b>

There are a number of differences between EnGen Lba Cas12a (Cpf1) and EnGen Cas9 NLS, *S. pyogenes*. These differences are summarized in the table below.

	EnGen Cas9 NLS, <i>S. pyogenes</i>	EnGen Lba Cas12a (Cpf1)
<b>Classification</b>	Class II Type II	Class II Type V
<b>Nuclease Domains</b>	RuvC and HNH	RuvC only
<b>Size</b>	161.3 kDa	150.9 kDa
<b>Guide RNA Length</b>	~100 nt	~41-44 nt
<b>PAM Sequence</b>	NGG	TTTN
<b>Cleavage Site</b>	3 bases 5' of the PAM	~18 bases 3' of the PAM
<b>Termini of Cleaved Product</b>	Blunt ends	5' overhang

Schematic representation of Cas9 Nuclease, *S. pyogenes* sequence recognition and DNA cleavage



\*TERMS & CONDITIONS: Offer valid in Canada only. Expires September 30<sup>th</sup>, 2018. Discount is eligible for products listed on this flyer. Promotion not valid for cash or cash equivalent towards purchase(s). No substitutions. Offer may not be applied to existing, pending or prior orders. Cannot be combined with any other promotion or discount. One or more of these products are covered by patents, trademarks and/or copyrights owned or controlled by New England Biolabs, Inc. For more information, please email us at [orders.ca@neb.com](mailto:orders.ca@neb.com)

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