

# Alt-R™ A.s. Cas12a (Cpf1) *ULTRA* NUCLEASE

Enhanced performance and high editing efficiency even at low temperatures



**Achieve higher on-target potency** with editing as efficient as Cas9



**Simplify your workflow** with Cas12a guided by a short, single guide RNA



**Target organisms with AT-rich genomes**



**High activity at temperatures optimal for ectothermic organisms**

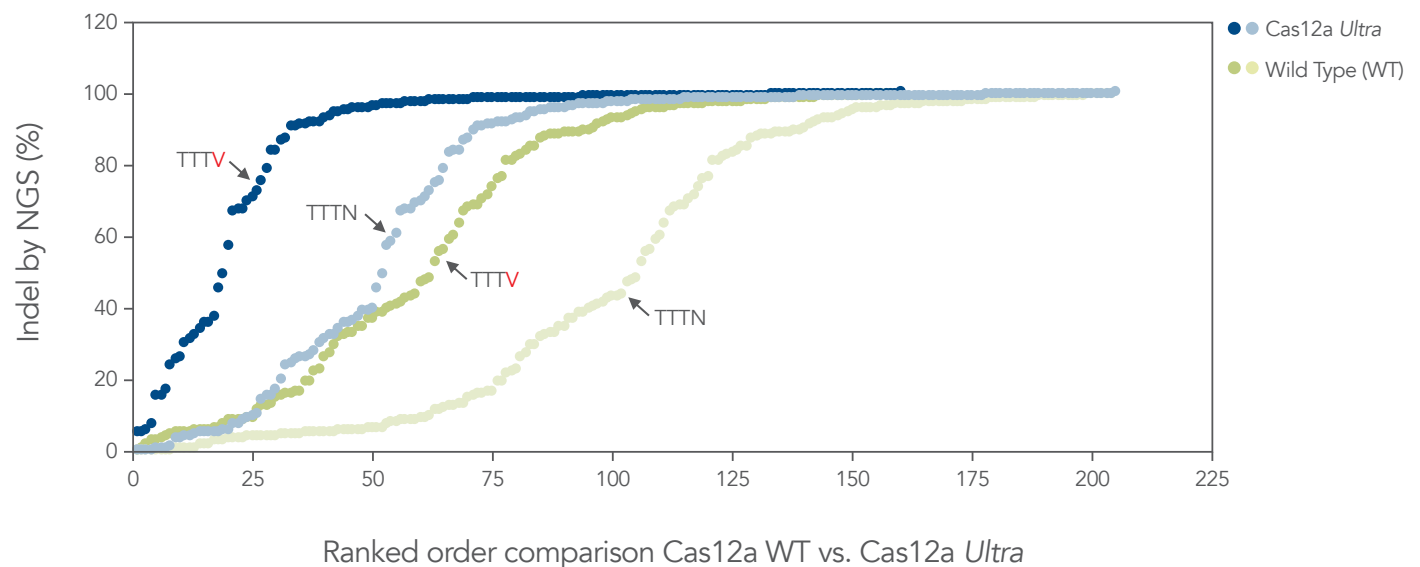


**Maximize precision edits** with vastly improved rates of HDR using Cas12a *Ultra*

Alt-R A.s. Cas12a (Cpf1) *Ultra* enzyme is a high purity, recombinant *Acidaminococcus* sp. Cas12a protein that is the result of protein engineering and directed evolution. The improvements to the Alt-R A.s. Cas12a *Ultra* enzyme now make it as reliable as the Cas9 nuclease.

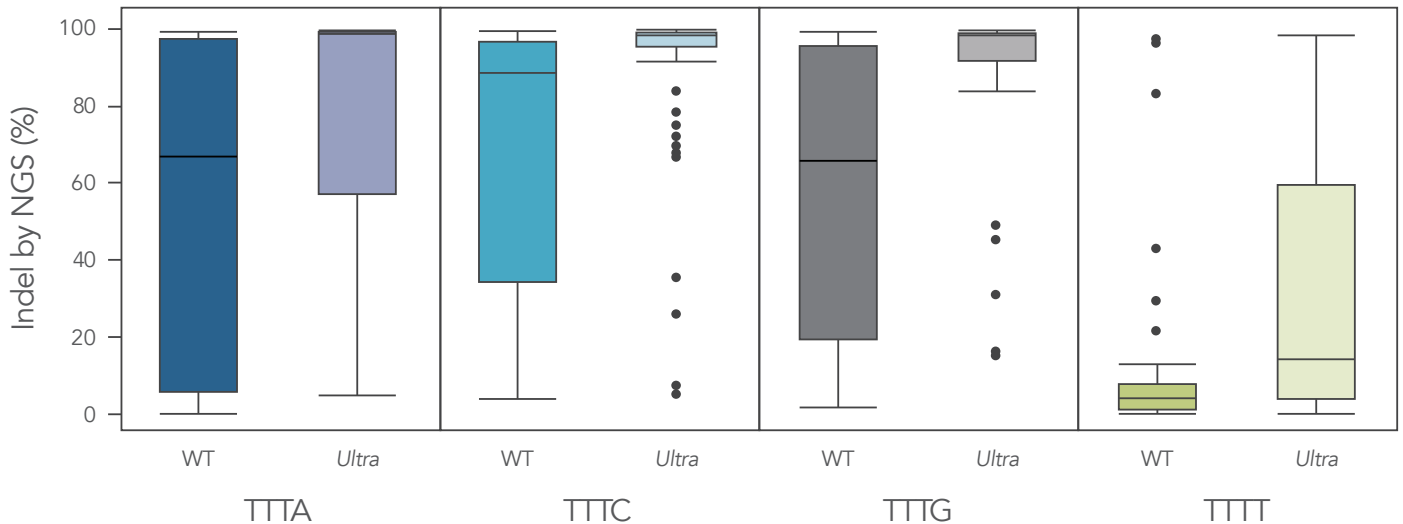
The new Alt-R A.s. Cas12a *Ultra* nuclease can recognize many TTTT PAM sites in addition to TTTV motifs, expanding the target range for genome editing studies (Figures 1 and 2). Alt-R A.s. Cas12a *Ultra* is also active at room temperature, making it a powerful tool for applications requiring delivery at lower temperatures. The Alt-R A.s. Cas12a *Ultra* enzyme easily replaces existing A.s. Cas12a (Cpf1) nuclease in related applications, with no need for protocol changes (Figure 3). The enzyme is compatible with other components of the Alt-R CRISPR-Cas12a system to enable precise genome editing through the same advantageous ribonucleoprotein (RNP)-based workflow.

## Alt-R A.s. Cas12a *Ultra* protein demonstrates superior performance with TTTV target site selection

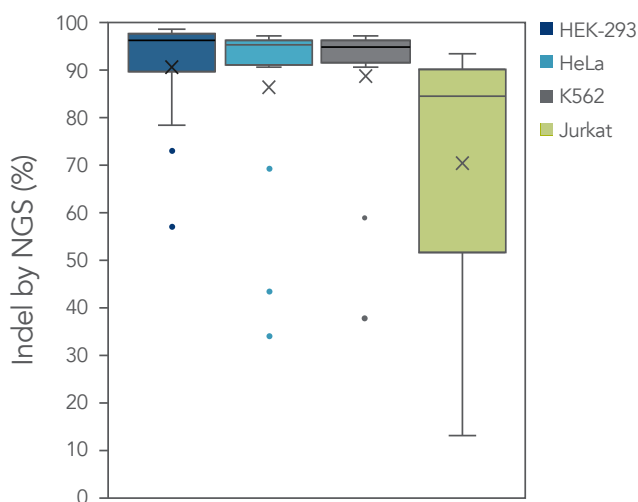


**Figure 1. Alt-R A.s. Cas12a *Ultra* protein demonstrates superior performance with TTTV target site selection.** Dots represent rank-ordered editing efficiency of 216 guides that target TTTV (dark shading) or TTTN (light shading) PAM sites and that were complexed to wild-type Cas12a V3 (green) or Cas12a *Ultra* (blue) before delivery into HEK-293 cells (96 sites) and Jurkat cells (120 sites). Human cells were transfected with RNP as instructed in the user guide for Alt-R CRISPR-Cas12a—RNP electroporation with a 4D-Nucleofector™ system (Lonza). Editing efficiency was determined 48 hr after electroporation using NGS (rhAmpSeq amplicon sequencing).

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Alt-R A.s. Cas12a *Ultra* demonstrates increased editing efficiency at TTTN PAM sites

**Figure 2. Alt-R A.s. Cas12a *Ultra* demonstrates increased editing efficiency at TTTA, TTTC, TTTG, and TTTT PAM sites.** RNPs were formed with wild-type A.s. Cas12a V3 or A.s. Cas12a *Ultra*, complexed to 216 individual crRNAs targeting distinct loci on the human genome. RNP complexes (4  $\mu$ M) were delivered into Jurkat cells (120 sites) or HEK-293 cells (96 sites) using a 4D-Nucleofector System (Lonza) in the presence of Alt-R Cas12a (Cpf1) Electroporation Enhancer. Editing efficiency was determined 48 hr after electroporation using NGS (rhAmpSeq amplicon sequencing).



**Figure 3. Alt-R A.s. Cas12a *Ultra* demonstrates high performance in multiple human cell types.** RNPs were formed with A.s. Cas12a *Ultra*, complexed to 16 individual crRNAs that target distinct loci on the human genome. RNP complexes (4  $\mu$ M) were delivered into the indicated cell types using a 4D-Nucleofector™ system (Lonza) in the presence of Alt-R Cas12a (Cpf1) Electroporation Enhancer. Editing efficiency was determined 48 hr after electroporation using NGS (rhAmpSeq amplicon sequencing).

## ORDERING INFORMATION

## CRISPR guide RNAs

Product	Size	Catalog#
Alt-R CRISPR-Cpf1 crRNA	2, 10 nmol tubes or plates	Order at <a href="http://www.idtdna.com/CRISPR-Cpf1">www.idtdna.com/CRISPR-Cpf1</a>

## Cas12a (Cpf1) nuclease

Product	Size	Catalog#
Alt-R A.s. Cas12a (Cpf1) <i>Ultra</i>	100 $\mu$ g	10001272
	500 $\mu$ g	10001273

> FOR MORE INFORMATION, VISIT [WWW.IDTDNA.COM/CRISPR-CPF1](http://WWW.IDTDNA.COM/CRISPR-CPF1).

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