

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 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 editing 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 enhanced activity with TTTV target site selection

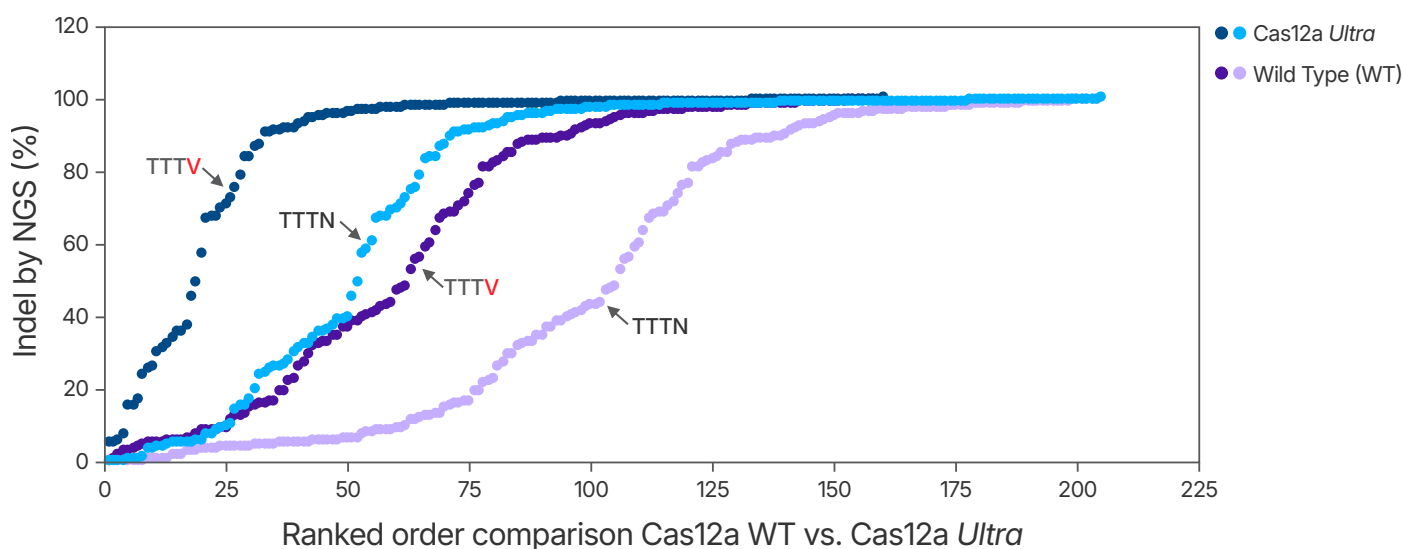


Figure 1. Alt-R A.s. Cas12a *Ultra* protein demonstrates enhanced activity with TTTV target site selection. Dots represent rank-ordered editing efficiency of 216 guides ($n = 1$ per guide) that target TTTV (dark shading) or TTTN (light shading) PAM sites and that were complexed to wild-type Cas12a V3 (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).

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

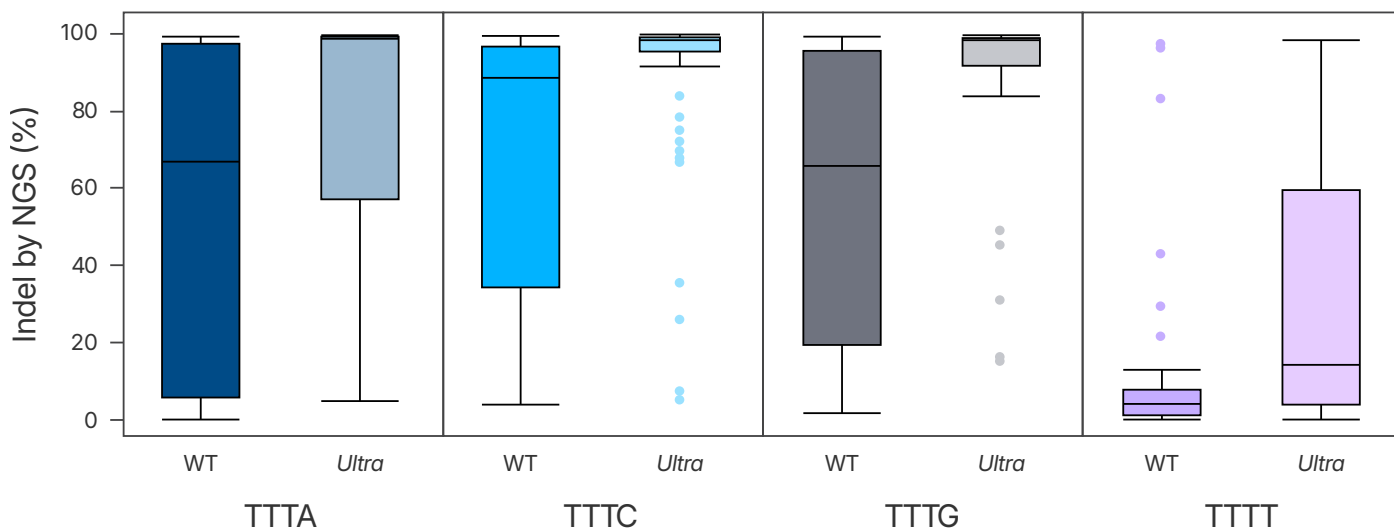


Figure 2. Alt-R A.s. Cas12a Ultra demonstrates increased editing efficiency at TTTA, TTTC, TTTG, and TTTT PAM sites. RNPs were formed with wild-type A.s. Cas12a V3 or A.s. Cas12a Ultra, complexed to 216 individual crRNAs targeting distinct loci on the human genome. RNP complexes (4 μ M) were delivered into Jurkat cells (n = 120 sites) or HEK-293 cells (n = 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).

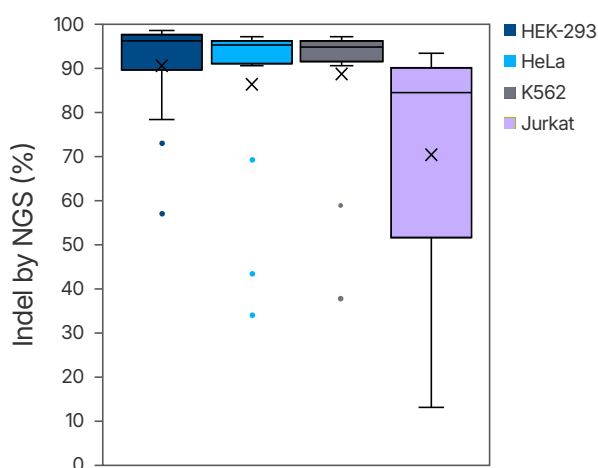


Figure 3. Alt-R A.s. Cas12a Ultra demonstrates high activity in multiple human cell types. RNPs were formed with A.s. Cas12a Ultra, complexed to 16 individual crRNAs (n = 16) that target distinct loci on the human genome. RNP complexes (4 μ M) were delivered into the indicated cell types using a 4D-Nucleofector™ 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 www.idtdna.com/CRISPR-Cpf1

Cas12a (Cpf1) nuclease

Product	Size	Catalog#
Alt-R A.s. Cas12a (Cpf1) Ultra	100 μ g	10001272
	500 μ g	10001273

For more information, visit idtdna.com/CRISPR-Cpf1



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