

CUTANA™ SsDddA Deaminase

Catalog No	15-1037	Type	Cytidine deaminase
Lot No	26229001-61	Source	<i>E. coli</i>
Pack Size	50 µL	Epitope Tag	N-terminal 6xHis
Concentration	100 µM	MW	15.1 kDa

DESCRIPTION

Products in EpiCypher's IDEA Toolbox (Innovation and Discovery of Epigenetic Applications) offer access to reagents without known or fully defined uses, enabling researchers to explore cutting-edge applications. Due to their novelty and unexplored potential, EpiCypher will engage in limited technical support.

SsDddA is a double-stranded DNA (dsDNA) cytidine deaminase from the bacterial species *Simiaoa sunii* that converts accessible cytosine to uracil [1]. These uracil residues can then be detected as C-to-T mutations following PCR amplification and sequencing. SsDddA has been used to label chromatin accessibility in two recently published methods, DAF-seq [1] and ACCESS-ATAC [2].

Double-stranded DNA deaminases are key enabling enzymes in emerging deaminase-based chromatin accessibility mapping methods. In general, cytosines that are bound by proteins or wrapped within nucleosomes are protected from deamination. After sequencing, stretches of DNA without C-to-T mutations are inferred to be protein-occupied. Because the resulting C-to-T marks are non-destructive to DNA and are preserved through PCR amplification, these methods are compatible with both long-read and short-read sequencing. When paired with long-read sequencing, deaminase-mediated labeling enables chromatin accessibility mapping and protein footprinting from lower sample inputs than other long-read accessibility assays that are not PCR-compatible. When paired with short-read sequencing, deamination provides more precise protein footprinting than standard ATAC-seq. Users interested in learning more about deaminase-based methods are encouraged to consult a recent review by Krebs et al. describing deaminase-based single-molecule genomics methods [3].

Key Advantages

- **Ready to Use** | Commercially available SsDddA eliminates the need to express, purify, and validate your own dsDNA deaminase so you can focus on experimenting with the actual assay instead.
- **Quality Assured** | SsDddA comes with a Certificate of Analysis verifying both purity and activity, reducing sources of experiment-to-experiment variability that can come with homebrewed reagents.
- **Exclusivity** | EpiCypher is the only commercial provider of SsDddA, so your lab has reliable, ongoing access to reagents that cannot be sourced reliably elsewhere.

RECOMMENDED ACCESSORY PRODUCTS

<u>Item</u>	<u>Cat No</u>
CUTANA SsDddA Inhibitor Protein, SsDddl	15-1038

TECHNICAL INFORMATION

Storage	Store at -20°C. Refer to product label for expiration date.
Formulation	50 mM Tris pH 7.8, 500 mM NaCl, 0.1 mM EDTA, 10 µM ZnCl ₂ , 50% glycerol

APPLICATION NOTES

For use in general deamination reactions, EpiCypher has verified that SsDddA is compatible with the following buffer conditions. Users are encouraged to validate buffer compatibility with their desired application, as the ideal buffer may vary depending on application:

15 mM Tris pH 8.0, 15 mM NaCl, 60 mM KCl, 1 mM EDTA pH 8.0, 0.5 mM EGTA pH 8.0, 10 nM ZnCl₂ (as reported in ref [1])

15 mM Tris pH 8.0, 15 mM NaCl, 60 mM KCl, 1 mM EDTA pH 8.0, 0.5 mM EGTA pH 8.0 (as reported in the Stergachis Lab DAF-seq protocol page, ref [4])

REFERENCES

[1] Swanson et al. Nat. Biotechnol. (2025). PMID: 41339527

[2] Yu et al. bioRxiv (2024). PMID: 39763859

[3] Krebs et al. Nat. Rev. Mol. Cell Biol. (2026). PMID: 42736336

[4] Stergachis Lab. The Guide for DAF-seq: Protocol. <https://fiberseq.github.io/The-Guide-for-DAF-seq/protocol/protocol.html>.

Accessed 24 September 2026

CERTIFICATE OF ANALYSIS

Quality Control Metrics

Result

Protein Purity Assay (SDS-PAGE)

Pass

SsDddA is >90% pure as determined by SDS-PAGE analysis using Coomassie Blue detection.

Functional Testing (Cytosine deaminase enzyme activity)

Pass

Each lot of CUTANA™ SsDddA Deaminase is validated for cytosine deaminating activity. A cytosine-containing double-stranded DNA (dsDNA) template is incubated with varied concentration of SsDddA. The enzyme-generated uracil-containing dsDNA is then incubated with USER® enzyme in the corresponding 1X rCutSmart™ Buffer (NEB, M5505) to cleave the phosphodiester backbone at uracil sites. The integrity of the resulting product is measured using a fluorescence-based assay, where a decrease in fluorescence is observed with increased nicking by USER. USER-mediated nicking is observed in reactions containing SsDddA and is proportional to increasing quantities of SsDddA.

PUBLISH DATE

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APPROVED BY



ANDREA JOHNSTONE, PHD

SENIOR DIRECTOR OF PRODUCT MANAGEMENT

This product ("Product") is warranted to operate or perform substantially in conformance with published Product specifications in effect at the time of sale, as set forth in the Product documentation, specifications, and/or accompanying package inserts ("Documentation") and to be free from defects in material and workmanship. Unless otherwise expressly authorized in writing, Products are supplied for research use only. No claim of suitability for use in applications regulated by FDA is made. The warranty provided herein is valid only when used by properly trained individuals. Unless otherwise stated in the Documentation, this warranty is limited to one year from date of shipment when the Product is subjected to normal, proper, and intended usage. This warranty does not extend to anyone other than the original purchase of the Product ("Buyer"). No other warranties, express or implied, are granted, including without limitation, implied warranties of merchantability, fitness for any particular purpose, or non infringement. Buyer's exclusive remedy for non-conforming Products during the warranty period is limited to replacement of or refund for the non-conforming Product(s). There is no obligation to replace Products as the result of (i) accident, disaster or event of force majeure, (ii) misuse, fault or negligence of or by Buyer, (iii) use of the Products in a manner for which they were not designed, or (iv) improper storage and handling of the Products.