

Product Information

Ten Eleven Translocase 1 catalytic domain

TET1CD, mouse recombinant, expressed in HEK 293 cells

S9797

Product Description

Ten-eleven translocase 1 (TET1) is a dioxygenase that catalyzes the conversion of 5-methylcytosine (5mC) to 5-hydroxymethylcytosine (5hmC), and plays a key role in active DNA demethylation.¹ TET1 also causes the sequential oxidation of 5-formylcytosine (5fC) and of 5-carboxylcytosine (5caC).² TET1-mediated cytosine methylation on C5 is a mammalian genome epigenetic modification, which is involved in transcriptional regulation.³ The full structure of TET1 includes a double-stranded β -helix (DSBH) domain, a cysteine-rich domain, and a CXXC domain.³ The dioxygenase activity of DSBH is dependent on Fe²⁺ and 2-oxoglutarate.³

TET1 is utilized in TET-assisted bisulfite sequencing (TAB-seq), a method for the identification of 5hmC at single-base resolution, and the determination of its abundance at each modification site.⁴ TAB-seq is an improvement over traditional bisulfite sequencing, which has been widely used to detect 5mC at single-base resolution, but cannot differentiate 5mC from 5hmC, as both resist deamination during the treatment of DNA with sodium bisulfite.^{4,5} The TAB-seq method uses TET1 to selectively convert 5mC to 5caC in two steps:

- Protection of 5hmC through glucosylation
- TET1-mediated oxidation of 5mC to 5caC.⁴

This recombinant TET1 product may potentially be used in bisulfite-free sequencing methodology to investigate mapping of 5mc and 5hmC,⁶ although we ourselves have not tested this application.

This recombinant TET1 product consists of the catalytic domain (CD) of mouse TET1 (amino acids 1366-2039) and includes an N-terminal polyhistidine tag. The product has a calculated molecular mass of 75.8 kDa. This protein is produced in mammalian cells (HEK 293), without the use of serum. The mammalian cells expression system allows proper post-translational modifications and folding, and often supports higher specific activity of the protein.

The specific activity of this recombinant mTET1CD is measured by its ability to catalyze the conversion of the modified DNA base 5-methylcytosine (5mC) to 5-hydroxymethylcytosine (5hmC).

Reagent

This product is supplied as a 0.22 μ m-filtered solution, containing phosphate-buffered saline (PBS), pH 7.4, and supplemented with glycerol.

Storage/Stability

Store the product at -70 °C. The product retains its activity for at least 2 years as supplied. After initial thawing, it is recommended to store the protein in working aliquots at -70 °C.

Precautions and Disclaimer

For R&D use only. Not for drug, household, or other uses. Please consult the Safety Data Sheet for information regarding hazards and safe handling practices.

References

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5. Huang, Y. *et al.*, *PLoS One*, **5(1)**, e8888 (2010).
6. Liu, Y. *et al.*, *Nat. Biotechnol.*, **37(4)**, 424-429 (2019).

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