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Catalog #	Aliquot Size
S342-381G-05	5 µg
S342-381G-10	10 µg

SETD1A (KMT2F), Active

Recombinant human protein expressed in Sf9 cells

Catalog # S342-381G
Lot # L2041-9

Product Description

Recombinant human SETD1A (1418-end) was expressed by baculovirus in Sf9 insect cells using an N-terminal GST tag. The SETD1A protein accession number is NM_014712.

Gene Aliases

SETD1A; KMT2F; Set1; Set1A

Formulation

Recombinant protein stored in 50mM Tris-HCl, pH 7.5, 150mM NaCl, 10mM glutathione, 0.1mM EDTA, 0.25mM DTT, 0.1mM PMSF, 25% glycerol.

Storage and Stability

Store product at –70°C. For optimal storage, aliquot target into smaller quantities after centrifugation and store at recommended temperature. For most favorable performance, avoid repeated handling and multiple freeze/thaw cycles.

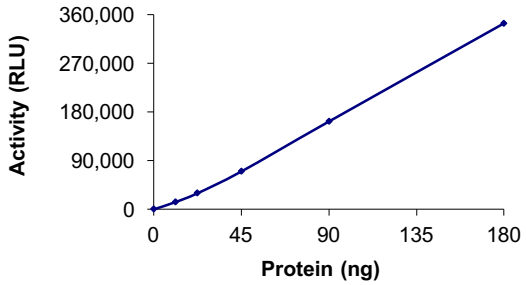
Scientific Background

As a member of the mixed lineage leukemia (MLL) family of histone methyltransferase, it specifically methylates 'Lys-4' of histone H3, when part of the SET1 histone methyltransferase (HMT) complex, but not if the neighboring 'Lys-9' residue is already methylated. H3 'Lys-4' methylation represents a specific tag for epigenetic transcriptional activation.

References

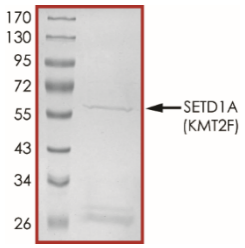
1. Li Y, et al: Structural basis for activity regulation of MLL family methyltransferases. Nature. 530(7591):447-52. 2016
2. http://www.uniprot.org/uniprot/O15047

Specific Activity



The specific activity of SETD1A (KMT2F) was determined to be **500 pmol /min/mg** as per activity assay protocol.

Purity



The purity of SETD1A (KMT2F) was determined to be **>70%** by densitometry, approx. MW **61 kDa**.

SETD1A (KMT2F), Active

Recombinant human protein expressed in Sf9 cells

Catalog #	S342-381G
Specific Activity	500 pmol/min/mg
Lot #	L2041-9
Purity	>70%
Concentration	0.05 µg/µl
Stability	1yr at –70°C from date of shipment
Storage & Shipping	Store product at –70°C. For optimal storage, aliquot target into smaller quantities after centrifugation and store at recommended temperature. For most favorable performance, avoid repeated handling and multiple freeze/thaw cycles. Product shipped on dry ice.

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Activity Assay Protocol

Reaction Components

Active Methyltransferase (Catalog #: S342-381G)

Active SETD1A (KMT2F) (0.05μg/μl) diluted with Methyltransferase Reaction Buffer and assayed as outlined in sample activity plot. (Note: these are suggested working dilutions and it is recommended that the researcher perform a serial dilution of Active SETD1A (KMT2F) for optimal results).

Methyltransferase Reaction Buffer

Buffer components: 20mM Tris-HCl, pH 8.0, 50 mM NaCl, 1 mM EDTA, 3 mM $MgCl_2$, 0.1 mg/ml BSA. Add 1mM DTT prior to use.

Components of SETD1A (KMT2F) Complex

WDR5 Protein: Catalog #: W325-30H

RbBP7 Protein: Catalog #: R317-30G

ASH2L Protein: Catalog #: A372-30BG

MTase-Glo™ Methyltransferase Assay (Promega, Catalog #: V7601)

S-Adenosyl-Methionine (SAM), 1mM
S-Adenosyl-Homocysteine (SAH), 15 μM
Methyltransferase-Glo™ Reagent, 10X
MTase-Glo™ Detection Solution, 1 bottle

Substrate (Catalog #: H12-58)

Histone H3 Peptide (1-21) diluted in Reaction Buffer to a final concentration of 20 μM.

Assay Protocol

The SETD1A (KMT2F) assay is performed using the Methyltransferase-Glo™ Assays kit (Promega, Catalog #: V7601).

Step 1. Thaw each active SETD1A (KMT2F) complex component and all Methyltransferase-Glo™ Assays kit reagents on ice.

Step 2. Prepare the following working solutions with Methyltransferase Reaction Buffer on ice:

- 2X final concentration of Active SETD1A (KMT2F) (Catalog # S342-381G) with complex proteins
- 2X Substrate Cocktail: 40 μM of SAM and 20 μM of Histone H3 Peptide (1-21) in Reaction Buffer

Step 3. In a polystyrene 96-well plate, add the following components to bring the initial reaction volume to 20 μl:

Component 1. 10 μl of 2X Substrate Cocktail

Component 2. 10 μl of 2X Active SETD1A (KMT2F) complex

Note: A blank control can be set up as outlined in step 3 by replacing the substrate working solution with an equal volume of Reaction Buffer.

Step 4. Mix the reaction on an orbital shaker for 2 minutes. Seal the plate with a plate seal and incubate at 37°C for 60 minutes

Step 5. Dilute 10X Methyltransferase-Glo™ Reagent with equal volume of nanopure water, and add 5 μl of the 5X Methyltransferase-Glo™ Reagent to all reaction wells

Step 6. Mix on an orbital shaker for 2 minutes and then incubate at room temperature for 30 minutes.

Step 7. Add 25 μl of MTase-GloTM Detection Solution to all reaction wells. Mix for 2 minutes and then incubate at room temperature for 30 minutes

Step 8. Read the plate using the KinaseGlo Luminescence Protocol on a GloMax plate reader (Promega; Cat# E7031)

Step 9. Using the SAH standard curve, determine the concentration of SAH produced (nM) and calculate the methyltransferase specific activity as outlined below. For a detailed protocol of how to determine SAH amount from RLUs, see MTase-Glo™ Methyltransferase Assay protocol at Promega's website: www.promega.com/protocols

Methyltransferase Specific Activity (SA) (nmol/min/mg)

$$= \frac{[SAH](nM) \times Reaction\ Volume(ul)}{Reaction\ Time\ (min) \times Enzyme\ Amount\ (mg)} \times 10^{-6}$$