Recombinant KMT2A (MLL1) complex

Catalog No: 31423, 31823
Expressed In: *E. coli*

Quantity: 20, 1000 µg
Concentration: 0.75 µg/µl
Source: Human

Buffer Contents: Full length Recombinant KMT2A (MLL1) complex is supplied in 25 mM Tris pH 8.0, 300 mM NaCl, 5% Glycerol and 0.04% Triton X-100. Please refer to product insert upon arrival for lot-specific concentration.

Background: Recombinant KMT2A (MLL1) complex (myeloid/lymphoid or mixed-lineage leukemia (trithorax homolog 1, Drosophila)), also known as Histone-lysine N-methyltransferase HRX, is a histone methyltransferase that plays an essential role in early development and hematopoiesis. Catalytic subunit of the MLL1 /MLL complex, a multiprotein complex that mediates both methylation of 'Lys-4' of histone H3 (H3K4me) complex and acetylation of 'Lys-16' of histone H4 (H4K16ac). In the MLL1/MLL complex, it specifically mediates H3K4me, a specific tag for epigenetic transcriptional activation. Has weak methyltransferase activity by itself, and requires other component of the MLL1/MLL complex to obtain full methyltransferase activity. Has no activity toward histone H3 phosphorylated on 'Thr -3', less activity toward H3 dimethylated on 'Arg-8' or 'Lys-9', while it has higher activity toward H3 acetylated on 'Lys -9'. Required for transcriptional activation of HOXA9. Promotes PPP1R15A-induced apoptosis.

Protein Details: Recombinant KMT2A (MLL1) complex contains amino acids 3735 - 3973 of the human MLL1 protein (accession number NP_001184033.1) with N-terminal GST-Tag and MW = 53.7 kDa; full length human WDR5 (GenBank Accession No.NM_017588), with N-terminal 6×His-Tag and MW = 35 kDa; full length human ASH2L (GenBank Accession No. NM_001105214), N-terminal 6×His-Tag and MW = 61 kDa; full length human RbBP5 (GenBank Accession No. NM_005057), N-terminal 6×His-Tag and MW = 60kDa, and full length human DPY30 (GenBank Accession No. NM_032574), N-terminal 6×His-Tag and MW =12 kDa, all individually expressed in *E.coli* cells. The recombinant protein is >95% pure by SDS-PAGE.

Application Notes: Recombinant KMT2A (MLL1) complex is suitable for use in enzyme kinetics, inhibitor screening, and selectivity profiling.

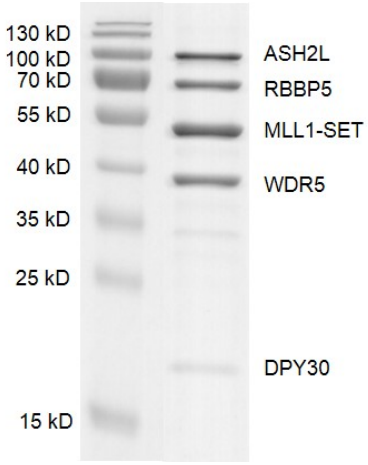
Specific Activity: H3K4 methyltransferase

Catalytic Ability: ~300 turnovers/ enzyme molecule

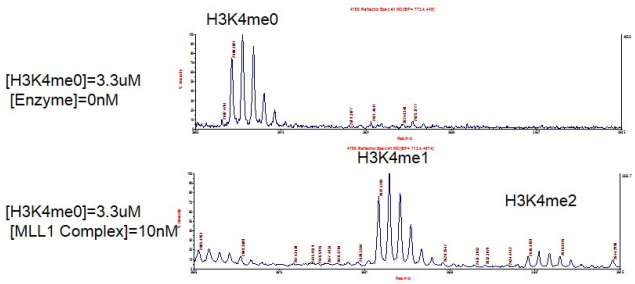
HMT Assay Conditions: 3.3 µM H3K4me0 (1-21aa) peptide was incubated with different concentration of Recombinant KMT2A (MLL1) complex in reaction buffer containing 50 mM TrisCl pH 8.6, 0.02% Triton X-100, 2 mM MgCl2, 1 mM TCEP, 100 µM SAM for 3 hours at room temperature. Activity was detected by HTRF and MALDI-TOF.

References:
This product was used in the following publications:
Nature (2019). 567(7749):535-539. PMID: 30867594. (Histone Methyltransferase Assay (HMT)

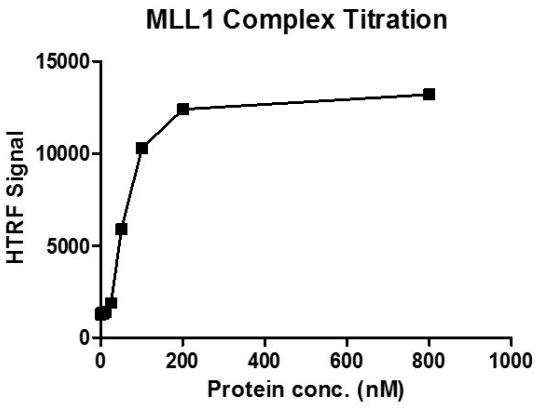
Storage and Guarantee: Recombinant proteins in solution are temperature sensitive and must be stored at -80°C to prevent degradation. Avoid repeated freeze/thaw cycles and keep on ice when not in storage. This product is guaranteed for 6 months from date of receipt.



Recombinant KMT2A (MLL1) complex gel.
Recombinant MLL1 complex was run on an 12% SDS-PAGE gel and stained with Coomassie blue.



Recombinant KMT2A (MLL1) complex activity assay.
3.3 uM H3K4me0 peptide was incubated with 10 nM MLL1 complex in reaction buffer for 3 hours at room temperature. The reaction product was detected by MALDI-TOF. Single 3.3 uM H3K4me0 peptide was used as negative control.



Recombinant KMT2A (MLL1) complex activity assay.
3.3 µM H3K4me0 (1-21aa) peptide was incubated with MLL1 complex in reaction buffer for 3 hour at room temperature. MLL1 complex was used in a HTRF assay to determine enzyme linearity. Methylated peptide (H3K4me2) was measured using H3K4me2-specific antibody.