PRODUCT INFORMATION

METTL3/14 Complex (human, recombinant)

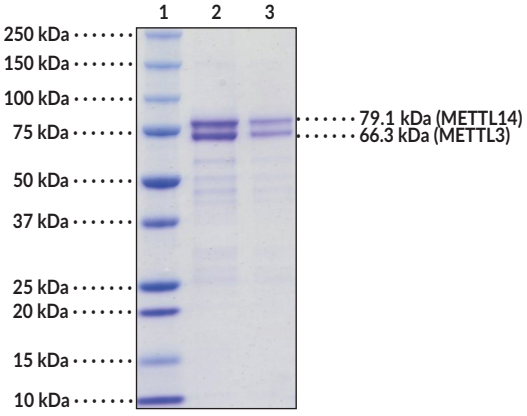
Item No. 26342

Overview and Properties

Synonyms:	hMETTL3/hMETTL14, Methyltransferase-like Protein 3/Methyltransferase-like Protein 14, N^6-Adenosine-Methyltransferase Catalytic Subunit/N^6-Adenosine-Methyltransferase Non-catalytic Subunit
Source:	Recombinant human N-terminal histidine-tagged METTL3 and recombinant human N-terminal GST-histidine-tagged METTL14 expressed in insect cells
Amino Acids:	2-580 and 2-456 for METTL3 and METTL14, respectively
Uniprot No.:	Q86U44 and Q9HCE5
Molecular Weight:	66.3 and 79.1 kDa for METTL3 and METTL14, respectively
Storage:	-80°C (as supplied)
Stability:	≥1 years
Purity:	***batch specific*** (≥80% estimated by SDS-PAGE)
Supplied in:	10 mM Tris, with 500 mM sodium chloride, 1 mM DTT, and 5% glycerol
Protein Concentration:	***batch specific*** mg/ml

Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

Image



Lane 1: MW Markers
Lane 2: METTL3 and METTL14 (4 µg)
Lane 3: METTL3 and METTL14 (2 µg)

CAYMAN CHEMICAL
1180 EAST ELLSWORTH RD
ANN ARBOR, MI 48108 · USA
PHONE: [800] 364-9897
[734] 971-3335
FAX: [734] 971-3640
CUSTSERV@CAYMANCHEM.COM
WWW.CAYMANCHEM.COM

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Description

Methyltransferase-like protein 3 (METTL3) and METTL14 are m^{6}A RNA methyltransferases encoded by the *METTL3* and *METTL14* genes, respectively, in humans.[1] METTL3 and METTL14 form a stable complex in the cytoplasm then localize to the nucleus *via* a METTL3 nuclear localization sequence. METTL3 contains an N-terminal leader helix domain that interacts with Wilms' tumor 1-associated protein (WTAP) in the nucleus, which confers localization of the complex to nuclear speckles. METTL14 contains a C-terminal arginine-glycine-glycine (RGG) sequence that contributes to the catalytic activity of the complex. METTL3 and METTL14 each contain methyltransferase domains but the METTL3 domain alone binds S-adenosylmethionine (SAM) or S-adenosylhomocysteine (SAH) while METTL14 interacts with RNA.[2] The METTL3/14 complex primarily binds to regions of RNA that correspond to intergenic and intron regions of DNA, and it preferentially methylates RNA substrates that contain the sequence GGACU, with little preference for secondary structural features of the substrates.[3] METTL3 and METTL14 are involved in hematopoietic stem cell differentiation *in vitro* and are necessary for self-renewal and reconstitution of hematopoietic stem cells following bone marrow transplantation in mice.[4] *Mettl3* knockdown or *Mettl14* knockout increases radial glia cell cycle length in embryonic mouse brain, and *Mettl14* knockout extends cortical neurogenesis into the postnatal period.[5] Knockdown of METTL3 or METTL14 also increases proliferation of glioblastoma stem cells (GSCs) *in vitro* and increases tumor size in a mouse orthotopic model using GSCs.[6] The expression of METTL3 and METTL14 is reduced in juvenile patients with *ETV6/RUNX1(E/R)*-positive acute lymphoblastic leukemia (ALL).[7]

References

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2. Wang, P., Doxtader, K.A., and Nam, Y. Structural basis for cooperative function of Mettl3 and Mettl14 methyltransferases. *Mol. Cell* **63(2),** 306-317 (2016).
3. Liu, J., Yue, Y., Han, D., *et al.* A METTL3-METTL14 complex mediates mammalian nuclear RNA N^6-adenosine methylation. *Nat. Chem. Biol.* **10(2),** 93-95 (2014).
4. Yao, Q.J., Sang, L., Lin, M., *et al.* Mettl3-Mettl14 methyltransferase complex regulates the quiescence of adult hematopoietic stem cells. *Cell Res.* **28(9),** 952-954 (2018).
5. Yoon, K.J., Ringeling, F.R., Vissers, C., *et al.* Temporal control of mammalian cortical neurogenesis by m^{6}A methylation. *Cell* **171(4),** 877-889 (2017).
6. Cui, Q., Shi, H., Ye, P., *et al.* m^{6}A RNA methylation regulates the self-renewal and tumorigenesis of glioblastoma stem cells. *Cell Rep.* **18(11),** 2622-2634 (2017).
7. Sun, C., Chang, L., Liu, C., *et al.* The study of *METTL3* and *METTL14* expressions in childhood *ETV6/RUNX1*-positive acute lymphoblastic leukemia. *Mol. Genet. Genomic Med.* **7(10),** e00933 (2019).

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