

Store at
-20°C

#93140

DNMT3A Antibody Sampler Kit



Support: +1-978-867-2388 (U.S.)
www.cellsignal.com/support

Orders: 877-616-2355 (U.S.)
orders@cellsignal.com

New 11/19

For Research Use Only. Not For Use In Diagnostic Procedures.

Product Includes	Quantity	MW (kDa)	Isotype/Source
DNMT3A (E9P2F) Rabbit mAb 49768	20 µl	85, 95, 130	Rabbit IgG
DNMT3A (D23G1) Rabbit mAb 3598	20 µl	130	Rabbit IgG
DNMT3A Isoform 2 (E1Y50) Rabbit mAb 44807	20 µl	95	Rabbit IgG
Anti-rabbit IgG, HRP-linked Antibody 7074	100 µl		Goat

See www.cellsignal.com for individual component applications, species cross-reactivity, dilutions, and additional application protocols.

Description: The DNMT3A Antibody Sampler Kit provides an economical means of detecting various isoforms of DNMT3A, including isoform 1 (DNMT3A1) and isoform 2 (DNMT3A2). The kit includes enough antibodies to perform two western blot experiments with each primary antibody.

Background: Methylation of DNA at cytosine residues in mammalian cells is a heritable, epigenetic modification that is critical for proper regulation of gene expression, genomic imprinting and development (1,2). Three families of mammalian DNA methyltransferases have been identified: DNMT1, DNMT2 and DNMT3 (1,2). DNMT1 is constitutively expressed in proliferating cells and functions as a maintenance methyltransferase, transferring proper methylation patterns to newly synthesized DNA during replication. DNMT3A and DNMT3B are strongly expressed in embryonic stem cells with reduced expression in adult somatic tissues. DNMT3A and DNMT3B function as *de novo* methyltransferases that methylate previously unmethylated regions of DNA. DNMT2 is expressed at low levels in adult somatic tissues and its inactivation affects neither *de novo* nor maintenance DNA methylation. DNMT1, DNMT3A and DNMT3B together form a protein complex that interacts with histone deacetylases (HDAC1, HDAC2, Sin3A), transcriptional repressor proteins (RB, TAZ-1) and heterochromatin proteins (HP1, SUV39H1), to maintain proper levels of DNA methylation and facilitate gene silencing (3-8). Improper DNA methylation contributes to diseased states such as cancer (1,2). Hypermethylation of promoter CpG islands within tumor suppressor genes correlates with gene silencing and the development of cancer. In addition, hypomethylation of bulk genomic DNA correlates with and may contribute to the onset of cancer. DNMT1, DNMT3A and DNMT3B are over-expressed in many cancers, including acute and chronic myelogenous leukemias, in addition to colon, breast and stomach carcinomas (9-12).

There are at least two protein isoforms expressed from the DNMT3A locus, DNMT3A isoform 1 (DNMT3A1) and DNMT3A isoform 2 (DNMT3A2). DNMT3A2 is expressed from an intronic promoter that is downstream from the DNMT3A1 promoter

(13,14). As a result, the N-terminal 223 amino acids found in DNMT3A1 are replaced by a different 24 amino acid found in DNMT3A2. Although they have distinct N-termini, both isoforms contain the PWWP domain required for binding to tri-methylated histone H3 lysine 36 (H3K36me3) and the ADD domain required for histone binding and transcriptional regulation. DNMT3A1 is lowly expressed in most cell and tissue types and is localized to heterochromatic regions. DNMT3A2 expression appears to be developmentally regulated and limited to embryonic stem cells, where it is localized to euchromatic regions of the genome, suggesting distinct functions for DNMT3A1 and DNMT3A2. DNMT3A2 is the predominant isoform responsible for *de novo* DNA methylation in embryonic stem cells. In addition, DNMT3A2 is mutated and/or highly expressed in a number of different cancers, including acute myeloid leukemia (AML), teratocarcinoma, neuroblastoma, and lung, testicular, gastric, and breast cancer (13-17).

Specificity/Sensitivity: Each antibody in the DNMT3A Antibody Sampler Kit detects endogenous levels of its target protein. DNMT3A (E9P2F) Rabbit mAb detects endogenous levels of total DNMT3A protein, including isoform 1 (DNMT3A1) at 130 kDa and isoform 2 (DNMT3A2) at 95 kDa. This antibody also detects an additional isoform of DNMT3A protein at 85 kDa. DNMT3A (D23G1) Rabbit mAb only detects endogenous levels of DNMT3A1 at 130 kDa. DNMT3A Isoform 2 (E1Y50) Rabbit mAb only detects endogenous levels of DNMT3A2 at 95 kDa. These antibodies do not cross-react with other DNMT proteins, including DNMT1 and DNMT3B.

Source/Purification: DNMT3A (E9P2F) Rabbit mAb is produced by immunizing animals with recombinant protein specific to the carboxy terminus of human DNMT3A isoform 1 (DNMT3A1). DNMT3A (D23G1) Rabbit mAb is produced by immunizing animals with a synthetic peptide corresponding to residue Gly91 of human DNMT3A1. DNMT3A Isoform 2 (E1Y50) Rabbit mAb is produced by immunizing animals with a synthetic peptide corresponding to residues near the amino terminus of human DNMT3A isoform 2 (DNMT3A2) protein.

Storage: Supplied in 10 mM sodium HEPES (pH 7.5), 150 mM NaCl, 100 µg/ml BSA, 50% glycerol and less than 0.02% sodium azide. Store at -20°C. Do not aliquot the antibodies.

Recommended Antibody Dilutions:

Western blotting 1:1000

Please visit www.cellsignal.com for validation data and a complete listing of recommended companion products.

Background References:

- (1) Hermann, A. et al. (2004) *Cell. Mol. Life Sci.* 61, 2571-87.
- (2) Turek-Plewa, J. and Jagodzinski, P.P. (2005) *Cell. Mol. Biol. Lett.* 10, 631-47.
- (3) Kim, G.D. et al. (2002) *EMBO J.* 21, 4183-95.
- (4) Fuks, F. et al. (2001) *EMBO J.* 20, 2536-44.
- (5) Geiman, T.M. et al. (2004) *Biochem. Biophys. Res. Commun.* 318, 544-55.
- (6) Rountree, M.R. et al. (2000) *Nat. Genet.* 25, 269-77.
- (7) Pradhan, S. and Kim, G.D. (2002) *EMBO J.* 21, 779-88.
- (8) Fuks, F. et al. (2003) *Nucleic Acids Res.* 31, 2305-12.
- (9) Mizuno, S. et al. (2001) *Blood* 97, 1172-9.
- (10) Robertson, K.D. et al. (1999) *Nucleic Acids Res.* 27, 2291-8.
- (11) Xie, S. et al. (1999) *Gene* 236, 87-95.
- (12) Kanai, Y. et al. (2001) *Int. J. Cancer* 91, 205-12.
- (13) Gujar, H. et al. (2019) *Genes (Basel)* 10, pii: E172. doi: 10.3390/genes10020172.
- (14) Chen, B.F. and Chan, W.Y. (2014) *Epigenetics* 9, 669-77.
- (15) Chen, B.F. et al. (2014) *Epigenetics* 9, 119-28.
- (16) Gao, J. et al. (2013) *J Exp Clin Cancer Res* 32, 86.
- (17) Yu, Z. et al. (2015) *Mol Carcinog* 54, 707-19.

Thank you for your recent purchase. If you would like to provide a review visit cellsignal.com/comments.

www.cellsignal.com

© 2019 Cell Signaling Technology, Inc.

Cell Signaling Technology is a trademark of Cell Signaling Technology, Inc.

Applications: W—Western IP—Immunoprecipitation IHC—Immunohistochemistry ChIP—Chromatin Immunoprecipitation IF—Immunofluorescence F—Flow cytometry E-P—ELISA-Peptide Species Cross-Reactivity: H—human M—mouse R—rat Hm—hamster Mk—monkey Mi—mink C—chicken Dm—D. melanogaster X—Xenopus Z—zebrafish B—bovine Dg—dog Pg—pig Sc—S. cerevisiae Ce—C. elegans Hr—Horse All—all species expected Species enclosed in parentheses are predicted to react based on 100% homology.