Revision 1

Store at -20C

#14680

# Tri-Methyl Lysine Motif [tme-K] (D1L1X) Rabbit mAb

Cell Signaling TECHNOLOGY®

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**For Research Use Only. Not for Use in Diagnostic Procedures.**

| Applications: | Reactivity: | Sensitivity: | Source/Isotype: |
|---|---|---|---|
| W | All | Endogenous | Rabbit IgG |

## Product Usage Information

| Application | Dilution |
|---|---|
| Western Blotting | 1:1000 |

## Storage

Supplied in 10 mM sodium HEPES (pH 7.5), 150 mM NaCl, 100 µg/ml BSA, 50% glycerol. Store at –20°C. Do not aliquot the antibody.

## Specificity/Sensitivity

Tri-Methyl Lysine Motif [tme-K] (D1L1X) Rabbit mAb recognizes endogenous levels of proteins only when tri-methylated at a lysine residue. This antibody does not cross-react with endogenous levels of proteins with mono- or di-methylated lysine or arginine residues.

## Source / Purification

Monoclonal antibody is produced by immunizing animals with a synthetic peptide library containing tri-methyl lysine.

## Background

Methylation of lysine residues is a common regulatory post-translational modification (PTM) that results in the mono-, di-, or tri-methylation of lysine at ε-amine groups by protein lysine methyltransferases (PKMTs). Two PKMT groups are recognized based on structure and catalytic mechanism: class I methyltransferases or seven β strand enzymes, and SET domain-containing class V methyltransferases. Both use the methyl donor S-adenosyl-L-methionine to methylate histone and non-histone proteins. Class I methyltransferases methylate amino acids, DNA, and RNA (1,2). Six methyl-lysine-interacting protein families are distinguished based on binding domains: MBT, PHD finger, Tudor, PWWP, WD40 repeat, and chromodomains. Many of these display differential binding preferences based on lysine methylation state (3). KDM1 subfamily lysine demethylases catalyze demethylation of mono- and di-methyl lysines, while 2-oxoglutarate-dependent JmjC (KDM2-7) subfamily enzymes also modify tri-methyl lysine residues (4).Most PKMT substrates are histone proteins and transcription factors, emphasizing the importance of lysine methylation in regulating chromatin structure and gene expression. Lys9 of histone H3 is mono- or di-methylated by G9A/GLP and tri-methylated by SETDB1 to activate transcription. JHDM3A-mediated demethylation of the same residue creates mono-methyl Lys9 and inhibits gene transcription (5). Tumor suppressor p53 is regulated by methylation of at least four sites. p53-mediated transcription is repressed following mono-methylation of p53 at Lys370 by SMYD2; di-methylation at the same residue further inhibits p53 by preventing association with 53BP1. Concomitant di-methylation at Lys382 inhibits p53 ubiquitination following DNA damage. Mono-methylation at Lys382 by SET8 suppresses p53 transcriptional activity, while SET7/9 mono-methylation at Lys372 inhibits SMYD2 methylation at Lys370 and stabilizes the p53 protein. Di-methylation at Lys373 by G9A/GLP inhibits p53-mediated apoptosis and correlates with tri-methylation of histone H3 Lys9 at the p21 promoter (1,6). Overexpression of PKMTs is associated with multiple forms of human cancer, which has generated tremendous interest in targeting protein lysine methyltransferases in drug discovery research.

## Background References

1. Lanouette, S. et al. (2014) *Mol Syst Biol* 10, 724.
2. Clarke, S.G. (2013) *Trends Biochem Sci* 38, 243-52.
3. Herold, J.M. et al. (2011) *Curr Chem Genomics* 5, 51-61.
4. Thinnes, C.C. et al. (2014) *Biochim Biophys Acta* 1839, 1416-32.
5. Klose, R.J. et al. (2006) *Nature* 442, 312-6.
6. Yost, J.M. et al. (2011) *Curr Chem Genomics* 5, 72-84.

## Species Reactivity

Species reactivity is determined by testing in at least one approved application (e.g., western blot).

## Western Blot Buffer

IMPORTANT: For western blots, incubate membrane with diluted primary antibody in 5% w/v BSA, 1X TBS, 0.1% Tween® 20 at 4°C with gentle shaking, overnight.

## Applications Key

**W:** Western Blotting

## Cross-Reactivity Key

**All:** All Species Expected

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