

Tri-Methyl Histone H3 (Lys4) Antibody

✓ 100 µl
(10 western blots)

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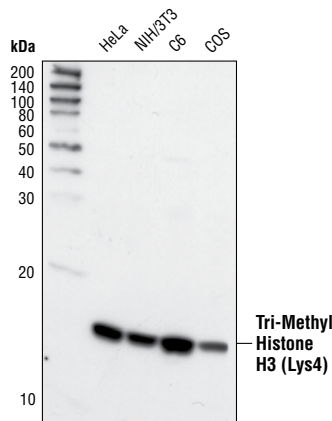
This product is intended for research purposes only. This product is not intended to be used for therapeutic or diagnostic purposes in humans or animals.

Applications	Species Cross-Reactivity*	Molecular Wt.	Source
W, IP, IHC-P, IF-IC, ChIP Endogenous	H, M, R, Mk, (Z, X)	17 kDa	Rabbit**

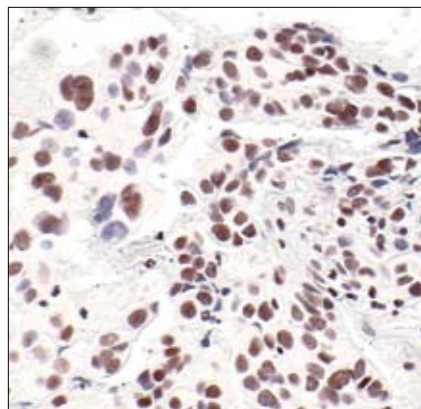
Background: The nucleosome, made up of four core histone proteins (H2A, H2B, H3, and H4), is the primary building block of chromatin. Originally thought to function as a static scaffold for DNA packaging, histones have now been shown to be dynamic proteins, undergoing multiple types of post-translational modifications, including acetylation, phosphorylation, methylation and ubiquitination (1). Histone methylation is a major determinant for formation of active and inactive regions of the genome and is crucial for proper programming of the genome during development (2,3). Arginine methylation of histones H3 (Arg2, 17, 26) and H4 (Arg3) promotes transcriptional activation and is mediated by a family of protein arginine methyltransferases (PRMTs), including the co-activators PRMT1 and CARM1 (PRMT4) (4). In contrast, a more diverse set of histone lysine methyltransferases have been identified, all but one of which contain a conserved catalytic SET domain originally identified in the *Drosophila* Su[var]3-9, Enhancer of zeste, and Trithorax proteins. Lysine methylation occurs primarily on histones H3 (Lys4, 9, 27, 36, 79) and H4 (Lys20) and has been implicated in both transcriptional activation and silencing (4). Methylation of these lysine residues coordinates the recruitment of chromatin modifying enzymes containing methyl-lysine binding modules such as chromodomains (HP1, PRC1), PHD fingers (BPTF, ING2), tudor domains (53BP1), and WD-40 domains (WDR5) (5,6,7,8). The recent discovery of histone demethylases such as PADI4, LSD1, JMJD1, JMJD2 and JHDM1 has shown that methylation is a reversible epigenetic mark (9).

Specificity/Sensitivity: Tri-Methyl-Histone H3 (Lys4) Antibody detects endogenous levels of histone H3 when tri-methylated on Lys4. This antibody shows some cross-reactivity with histone H3 that is di-methylated on Lys4, but does not cross-react with non-methylated or mono-methylated histone H3 Lys4. In addition, the antibody does not cross-react with methylated histone H3 Lys9, Lys27, Lys36 or methylated histone H4 Lys20.

Source/Purification: Polyclonal antibodies are produced by immunizing animals with a synthetic peptide corresponding to the amino terminus of histone H3 in which lysine 4 is tri-methylated. Antibodies are purified by protein A and peptide affinity chromatography.



Western blot analysis of lysates from HeLa, NIH/3T3, C6 and COS cells, using Tri-Methyl Histone H3 (Lys4) Antibody.



Immunohistochemical analysis of paraffin-embedded human breast carcinoma, using Tri-Methyl Histone H3 (Lys4) Antibody.

Swiss-Prot Acc. # P68431

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

*Species cross-reactivity is determined by western blot.

**Anti-rabbit secondary antibodies must be used to detect this antibody.

Recommended Antibody Dilutions:

Western blotting	1:1000
Immunoprecipitation	1:50
Immunohistochemistry (Paraffin)	1:200
Unmasking buffer:	Citrate
Antibody diluent:	SignalStain® Antibody Diluent #8112
Immunofluorescence (IF-IC)	1:4000
Chromatin IP	1:100

For application specific protocols please see the web page for this product at www.cellsignal.com.

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

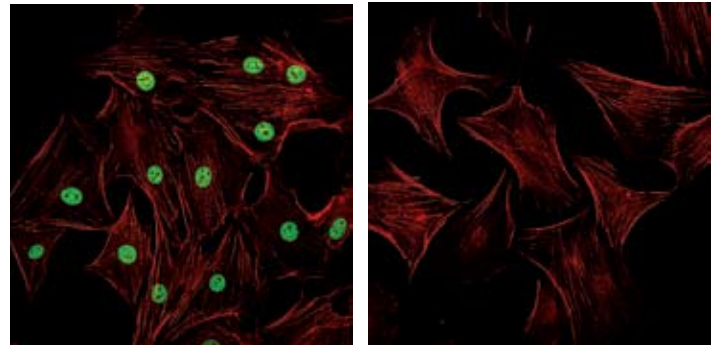
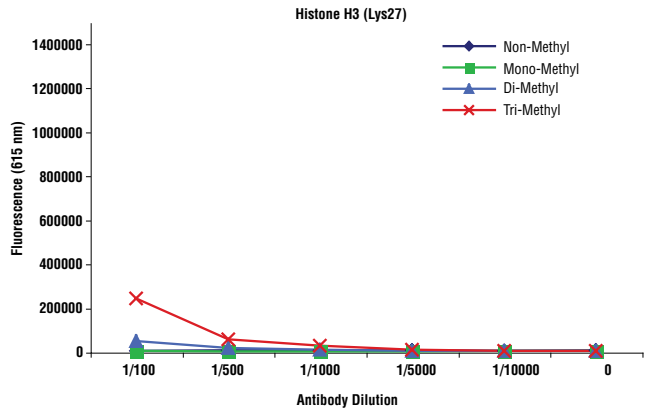
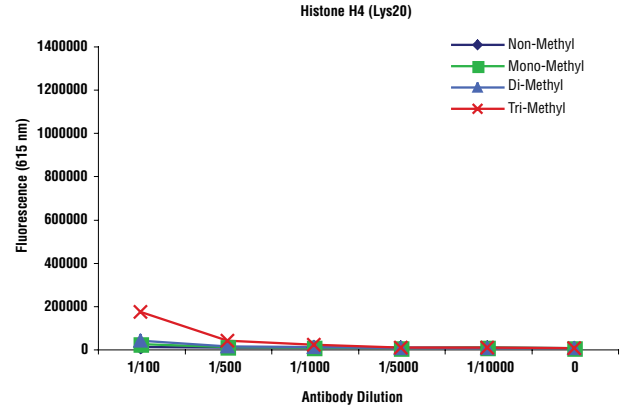
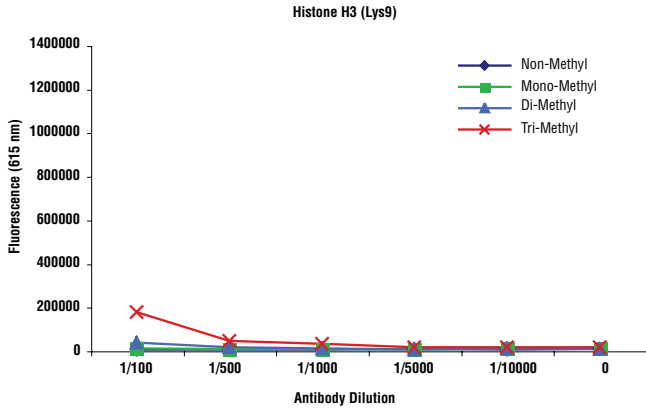
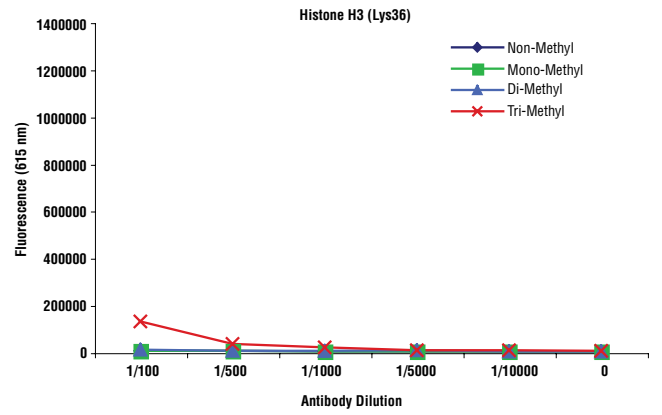
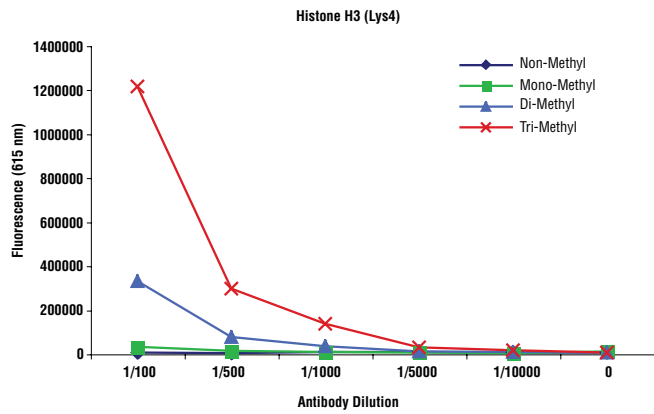
Background References:

- (1) Peterson, C.L. and Laniel, M.A. (2004) *Curr. Biol.* 14, R546–551.
- (2) Kubicek, S. et al. (2006) *Ernst Schering Res. Found Workshop*, 1–27.
- (3) Lin, W. and Dent, S.Y. (2006) *Curr. Opin. Genet. Dev.* 16, 137–142.
- (4) Lee, D.Y. et al. (2005) *Endocr. Rev.* 26, 147–170.
- (5) Daniel, J.A. et al. (2005) *Cell Cycle* 4, 919–926.
- (6) Shi, X. et al. (2006) *Nature*, Epub ahead of print.
- (7) Wysocka, J. et al. (2006) *Nature*, Epub ahead of print.
- (8) Wysocka, J. et al. (2005) *Cell* 121, 859–872.
- (9) Trojer, P. and Reinberg, D. (2006) *Cell* 125, 213–217.

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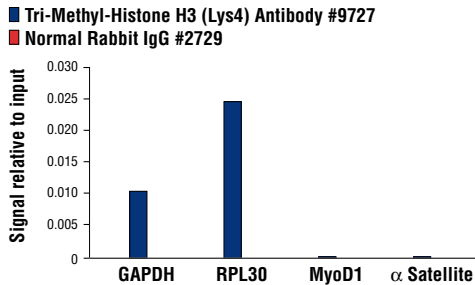
IMPORTANT: For western blots, incubate membrane with diluted antibody in 5% w/v BSA, 1X TBS, 0.1% Tween-20 at 4°C with gentle shaking, overnight.

Applications Key: W—Western IP—Immunoprecipitation IHC—Immunohistochemistry ChIP—Chromatin Immunoprecipitation IF—Immunofluorescence F—Flow cytometry E-P—ELISA-Peptide
Species Cross-Reactivity Key: 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.



Tri-Methyl Histone H3 (Lys4) Antibody specificity was determined by peptide ELISA. Each graph depicts a titration of this antibody and the corresponding reactivity toward the non-methyl, mono-methyl, di-methyl and tri-methyl states of the indicated histone H3 or H4 lysine residue.

Confocal immunofluorescent analysis of NIH/3T3 cells labeled with Tri-Methyl Histone H3 (Lys4) Antibody (green, left) compared to an isotype control (right). Actin filaments have been labeled with Alexa Fluor® 555 phalloidin (red).



Chromatin immunoprecipitations were performed with cross-linked chromatin from 4×10^6 HeLa cells and either 5 μ l of Tri-Methyl-Histone H3 (Lys4) Antibody or 2 μ l of Normal Rabbit IgG #2729, using SimpleChIP™ Enzymatic Chromatin IP Kit (Magnetic Beads) #9003. The enriched DNA was quantified by Real-Time PCR, using SimpleChIP™ Human GAPDH Exon 1 Primers #5516, SimpleChIP™ Human RPL30 Exon 3 Primers #7014, SimpleChIP™ Human MyoD1 Exon 1 Primers #4490, and SimpleChIP™ Human α Satellite Repeat Primers #4486. The amount of immunoprecipitated DNA in each sample is represented as signal relative to the total amount of input chromatin, which is equivalent to one.