Revision 1

Store at -20C

#8972

TRIM33 Antibody

Cell Signaling TECHNOLOGY®

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

Applications:	Reactivity:	Sensitivity:	MW (kDa):	Source/Isotype:	UniProt ID:	Entrez-Gene Id:
W, IP	H Mk	Endogenous	150	Rabbit	#Q9UPN9	51592

Product Usage Information

Application	Dilution
Western Blotting	1:1000
Immunoprecipitation	1:100

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.

Specificity/Sensitivity

TRIM33 Antibody recognizes endogenous levels of total TRIM33 protein. Based upon sequence alignment, this antibody is predicted to cross-react with TRIM33 isoforms A and B, but not with other TIF family members.

Species predicted to react based on 100% sequence homology

Mouse, Rat, Bovine, Dog, Horse

Source / Purification

Polyclonal antibodies are produced by immunizing animals with a synthetic peptide corresponding to residues surrounding Pro710 of human TRIM33 protein. Antibodies are purified by protein A and peptide affinity chromatography.

Background

The transcriptional intermediary factor 1 (TIF1) family represents a group of proteins with multiple histone-binding domains. In humans, this family comprises four proteins, TIF1α/TRIM24, TIF1β/TRIM28/KAP1, TIF1γ/TRIM33/Ectodermin, and TIF1δ/TRIM66, which are characterized by an amino-terminal tripartite motif (TRIM) domain consisting of a RING domain, two B boxes, a coiled-coil domain, and a carboxy-terminal PHD finger and bromodomain (1). Despite their similar overall structure, these proteins have diverse roles in transcriptional regulation. TIF1α functions as a ligand-dependent nuclear receptor coregulator and more recently has been implicated in regulating p53 stability (2). TIF1β is an intrinsic component of the N-CoR1 corepressor complex and the NuRD nucleosome-remodeling complex (3) and functions as a corepressor for Kruppel-associated box (KRAB) zinc-finger transcription factors (4). Furthermore, TIF1β promotes heterochromatin-mediated gene silencing formation by serving as a cofactor for heterochromatin protein HP1 (5). TIF1δ expression is restricted to the testis and has been shown to interact with HP1γ (6).
In contrast, the ubiquitous nuclear protein TRIM33 does not interact with either HP1 family members or chromatin-remodeling/modifying complexes. Rather, TRIM33 plays a pivotal role in signaling cascades driven by the TGF-β superfamily of ligands (7-9). A research study suggests that TRIM33 and Smad4 compete for binding to receptor phosphorylated Smad2/3 and that TRIM33-Smad2/3 and Smad4-Smad2/3 complexes complement one another in the TGF-β-dependent control of hematopoietic cell fate (9). Other studies, however, demonstrate that TRIM33 functions to repress signal relay by the TGF-β superfamily (7-8,10). Indeed, knockout of murine *Trim33* results in embryonic lethality due to upregulated Nodal signaling (10). Mechanistically, TRIM33 functions as an E3-ubiquitin ligase and promotes monoubiquitination of Smad4, a modification that impairs its ability to associate with phospho-Smad2 (8). This negative regulatory mechanism is further substantiated by the discovery that TRIM33 disrupts transcriptionally competent Smad complexes on the promoter/enhancer regions of TGF-β-responsive genes by associating with specific epigenetic marks on histone H3, which is a requirement for activating TRIM33's monoubiquitin ligase activity toward Smad4 (11). In line with the ability of TRIM33 to regulate the development of different blood cell lineages, it was shown that loss of TRIM33 expression due to epigenetic silencing of its promoter contributes to the pathogenesis of chronic myelomonocytic leukemia (12).

Background References

1. Meroni, G. and Diez-Roux, G. (2005) *Bioessays* 27, 1147-57.
2. Jain, A.K. and Barton, M.C. (2009) *Cell Cycle* 8, 3668-74.
3. Underhill, C. et al. (2000) *J Biol Chem* 275, 40463-70.
4. Schultz, D.C. et al. (2001) *Genes Dev* 15, 428-43.
5. Groner, A.C. et al. (2010) *PLoS Genet* 6, e1000869.
6. Khetchoumian, K. et al. (2004) *J Biol Chem* 279, 48329-41.
7. Dupont, S. et al. (2005) *Cell* 121, 87-99.

8. Dupont, S. et al. (2009) *Cell* 136, 123-35.
9. He, W. et al. (2006) *Cell* 125, 929-41.
10. Morsut, L. et al. (2010) *Development* 137, 2571-8.
11. Agricola, E. et al. (2011) *Mol Cell* 43, 85-96.
12. Aucagne, R. et al. (2011) *J Clin Invest* 121, 2361-70.

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 **IP:** Immunoprecipitation

Cross-Reactivity Key

H: Human **Mk:** Monkey

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Limited Uses