Anti-TDP-43 Antibody

Alternative Names: TAR DNA-binding protein 43, TARDBP, transactive response DNA binding protein 43 kDa, ALS10

Catalogue Number: AB18-10049-50ug

Size: 50 µg

Background Information

TAR DNA-binding protein 43 (TDP-43) is an RNA binding protein (RBP) that has been shown to bind both DNA and RNA and have multiple functions in transcriptional repression, pre-mRNA splicing and translational regulation. It belongs to the hnRNP protein family and is highly expressed in the pancreas, placenta, lung, genital tract and spleen[1]. Characterisation of transcriptome-wide binding sites revealed that thousands of RNAs are bound by TDP-43 in neurons. Mutations in TDP-43 have been associated with amyotrophic lateral sclerosis, frontotemporal dementia, Parkinson's disease and Alzheimer's disease.

TDP-43 is predominantly located in the nucleus under normal physiological conditions. However, hyperphosphorylated, fragmented and ubiquitinated forms of TDP-43 have been identified as core components of cytosolic inclusions in sporadic ALS and frontotemporal lobar degeneration (FTLD) [2,3,4,5,6,7,8].

TDP-43 contains a nuclear localising signal (NLS) as well as a nuclear export signal (NES)[8], which enables the shuttling of TDP-43 between the nucleus and the cytosol. Under normal conditions, TDP-43 interacts with mRNAs on which ribosomes are located separately, forming polysomes. Various stresses can induce clustering of ribosomes into a 'stalled' state, resulting in the formation of stress granules (SG) containing TIA-1, G3BP, ataxin-2 and eIF4G1/2.

In the stalled state, transcription is inhibited in a homeostatic response. However, sustained stress and TDP-43 misfolding creates aberrant SGs and pathogenic TDP-43 aggregates [9]. Misfolding and cytosolic mislocalisation also lead directly to a loss of normal TDP-43 function, and the resultant disruption of protein and RNA homeostasis is considered another likely pathogenic mechanism in addition to the toxicity of inclusions in ALS[9].

Product Information

Antibody Type:	Polyclonal	**Host:**	Rabbit
Isotype:	IgG	**Species Reactivity:**	Human, Mouse, Rat

Immunogen: Partial length recombinant human TDP-43 from the N-terminal region of the protein

Format: 50 µg in 50 µl PBS containing 0.02% sodium azide.

Storage Conditions: 6 months: 4˚C. Long-term storage: -20˚C. Avoid multiple freeze and thaw cycles.

Applications: WB IHC IF IP RIP

WB 1:500-2000. IHC 1:50-100. IF 1:20-100. IP 1:50-100. RIP 1:20-50.

Additional Information

Subcellular location:	Nucleus	MW:	43kDa (Intended as a general guide and does not allow for all isoforms and species variations)
Gene ID	23435	Uniprot ID:	Q13148

References

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2. Kwong LK, Neumann M, Sampathu DM, et al. (2007). TDP-43 proteinopathy: The neuropathology underlying major forms of sporadic and familial frontotemporal lobar degeneration and motor neuron disease. Acta Neuropathologica. 114 (1): 63–70.
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4. Neumann M, Sampathu DM, Kwong LK, Truax AC, et al. (2006). Ubiquitinated TDP-43 in Frontotemporal Lobar Degeneration and Amyotrophic Lateral Sclerosis. Science. 314 (5796): 130–3.
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6. Igaz, L. M. et al. Enrichment of C-terminal fragments in TAR DNA-binding protein-43 cytoplasmic inclusions in brain but not in spinal cord of frontotemporal lobar degeneration and amyotrophic lateral sclerosis. Am. J. Pathol. 173, 182–194 (2008).
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8. Winton, M. J. et al. Disturbance of nuclear and cytoplasmic TAR DNA-binding protein (TDP-43) induces disease-like redistribution, sequestration, and aggregate formation. J. Biol. Chem. 283, 13302–13309 (2008).
9. Yoshitaka Tamaki et al. Elimination of TDP-43 inclusions linked to amyotrophic lateral sclerosis by a misfolding-specific intrabody with dual proteolytic signals. Scientific Reports: volume 8, Article number: 6030 (2018)