LD Biopharma, Inc.
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- PRODUCT DATA SHEET -

Name of Product: Recombinant Human **TDP-43** Protein
Catalog Number: HTF-0940
Manufacturer: LD Biopharma, Inc. USA

Introduction

Human TAR DNA-binding protein 43 (TDP-43) gene encodes a RNA-binding protein that is involved in various steps of RNA biogenesis and processing. Preferentially binds, via its two RNA recognition motifs RRM1 and RRM2, to GU-repeats on RNA molecules predominantly localized within long introns and in the 3'UTR of mRNAs. In turn, it regulates the splicing of many non-coding and protein-coding RNAs including proteins involved in neuronal survival, as well as mRNAs that encode proteins relevant for neurodegenerative diseases. TDP-43 plays a role in maintaining mitochondrial homeostasis by regulating the processing of mitochondrial transcripts. It also regulates mRNA stability by recruiting CNOT7/CAF1 deadenylase on mRNA 3'UTR leading to poly(A) tail deadenylation and thus shortening. In response to oxidative insult, associates with stalled ribosomes localized to stress granules (SGs) and contributes to cell survival. It participates also in the normal skeletal muscle formation and regeneration, forming cytoplasmic myo-granules and binding mRNAs that encode sarcomeric proteins. TDP-43 plays a role in the maintenance of the circadian clock periodicity via stabilization of the CRY1 and CRY2 proteins in a FBXL3-dependent manner. It negatively regulates the expression of CDK6. TDP-43 regulates the expression of HDAC6, ATG7 and VCP in a PPIA/CYPA-dependent manner. Pathologic alterations of TDP-43 are a major hallmark of amyotrophic lateral sclerosis (ALS).

Full-length human TDP-43 cDNA (413aa. Isoform-I) was constructed with codon optimization using gene synthesis technology and expressed with a small T7 Tag (17aa) fusion at its N-terminal. It was expressed in E. coli as inclusion bodies. The final product was refolded using our unique "temperature shift inclusion body refolding" technology and chromatographically purified.

Gene Symbol:	TDP-43	(TARDBP; ALS10)
Accession Number:	NP_031401	
Species:	Human	
Size:	50 µg / Vial	
Composition:	0.5 mg/ml, sterile-filtered, in 20 mM pH 8.0 Tris-HCl Buffer, with proprietary formulation of NaCl, KCl, EDTA, Sucrose, DTT and others.	

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Storage: In liquid. Keep at -80°C for long term storage. Product is stable at 4 °C for at least two weeks.

Key References

Léon Beyer., et al., **TDP-43 as structure-based biomarker in amyotrophic lateral sclerosis annals of clinical and translational Neurology**. DOI: 10.1002/acn3.51256 (2020)

Iguchi,Y., et al., **Loss of TDP-43 causes age-dependent progressive motor neuron degeneration**. Brain 136 (PT 5), 1371-1382 (2013)

Wang,Y.T., et al., **The truncated C-terminal RNA recognition motif of TDP-43 protein plays a key role in forming proteinaceous aggregates**. J. Biol. Chem. 288 (13), 9049-9057 (2013)

Shodai,A., et al., **Conserved acidic amino acid residues in a second RNA recognition motif regulate assembly and function of TDP-43**. PLoS ONE 7 (12), E52776 (2012)

Applications

1. May be used for in vitro TDP-43 mediated gene transcription/ mRNA splicing regulation study in neuronal cells by intracellular delivery of this protein with protein delivery reagent such as ProFectin reagent kit.
2. May be used for mapping TDP-43 protein-protein interaction.
3. May be used as specific TDP-43 substrate protein for kinase, and ubiquitin (Sumo pathway) related enzyme functional screening assays.
4. Potential biomarker protein for ALS prognosis applications
5. As native human TDP-43 immunogen for specific antibody production.

Quality Control

Purity: > 91 % by SDS-PAGE.

Recombinant Human TDP-43 Protein Sequence (46.4 kD)

MASMTGGQQMGRGEFGSMSEYIRVTEDENDEPIEIPSEDDGTVLLSTVTAQFPGACGLRYRNPV
SQCMRGVRLVEGILHAPDAGWGNLVYVVNYPKDNKRKMDETDASSAVKVKRAVQKTSDLIVLGL
PWKTTEQDLKEYFSTFGEVLMVQVKKDLKTGHSKGFGFVRFTEYETQVKVMSQRHMIDGRWCDC

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KLPNSKQSQDEPLRSRKVFVGRCTEDMTEDELREFFSQYGDVMDVFIPKPFRAFAFVTFADDQI
AQSLCGEDLIIKGISVHISNAEPKHNSNRQLERSGRFGGNPGGFGNQGGFGNSRGGGAGLGNNQ
GSNMGGGMNFGAFSINPAMMAAAQAALQSSWGMMGMLASQQNQSGPSGNNQNQGNMQREPNQAF
GSGNNSYSGSNSGAAIGWGSASNAGSGSGFNGGFGSSMDSKSSGWGM