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Inspiration for Life Science

POLYCLONAL ANTIBODY

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Catalog No. TIP-TAU-P03

Anti Human Tau-N (Tau 1-16)

BACKGROUND

Tau is firstly reported microtubule associated protein (MAP), which was named after τ (tau) from a Greek letter, due to its functionality as a heat stable protein essential for microtubule assembly[1]. Normally, tau is localized mainly in axons of neural cells, where fibrosis and/or accumulated tau being phosphorylated or ubiquitinated being localized amongst cell bodies, dendrites and axons particularly in Alzheimer's disease and many other neurodegenerative diseases. It is known that the distribution pattern and packing density of tau has close relationship with differentiation of neuropathological stages[2]. Even though there is only 1 tau gene, several isoforms are expressed due to alternative splicing, where 6 tau isoforms has been identified in human adult brain[3]. 31-32 a.a. repeat sequence exists within molecular center to C terminus of tau protein. For adult human, 3-repeat (3R) tau and 4-repeat (4R) tau are expressed more or less the same amount. Interestingly, it is known that, in Alzheimer's disease, both fibrotic and phosphorylated 3R tau and 4R tau are expressed more or less the same amount within nerve cells, where in Pick's disease, 3R tau is localized in small nerve cells, where in corticobasal degeneration (CBD) and progressive supranuclear palsy (PSP), 4R tau is localized amongst nerve cells and glia cells[4]. As abnormal tau could be seen amongst many other diseases, it was thought to be by-product of the disease development. By the discovery of disease caused by abnormality of tau gene (FTDP-17), it is currently known that abnormality of tau causes many neurodegenerative diseases. As the mechanism of extent of the disease has been proved experimentally that intracellular transmission of prion-like abnormal protein being related, it is generating a lot of attention due to indication of pathogenesis and progression mechanism of many neurodegenerative diseases commencing with Alzheimer's disease could be described by similar prion-like transmission[5, 6]. Recently, structure of fibrotic tau those accumulate in Alzheimer's disease (i.e. paired helical filament, straight filament) has been revealed[7]

Product type	Primary antibody
Immunogen	CMAEPRQEFEVMEDHAG (Human Tau 1-16)
Raised in	Rabbit
Myeloma	-
Clone number	-
Isotype	-
Source	Serum
Purification	Protein A affinity chromatography
Form	Liquid. PBS with 0.1% NaN_3 as a preservative.
Concentration	1.0 mg/ml
Volume	100 µL
Label	Unlabeled
Specificity	Human tau
Cross reactivity	Human tau
Storage	Store below -20°C. (below -70°C for prolonged storage). Aliquot to avoid cycles of freeze/thaw.

Application notes **Recommended dilutions**	• **Western blotting:** 1/500 - 1/3000 • **Immunohistochemistry:** 1/500 - 1/3000 Other applications have not been tested. Optimal dilutions/concentrations should be determined by the end user.

References

1) Weingarten MD, Lockwood AH, Hwo SY, Kirschner MW. A protein factor essential for microtubule assembly. Proc Natl Acad Sci USA, 1975; 72:1858-62.

2) Braak H & Braak E: Neuropathological stageing of Alzheimer-related changes. Acta Neuropathol,1991; 82: 239-259.

3) Goedert M, Spillantini MG, Jakes R et al: Multiple isoforms of human microtubule-associated protein tau: sequences and localization inneurofibrillary tangles of Alzheimer's disease. Neuron, 1989; 3: 519-526

4) Taniguchi-Watanabe, S. et al: Biochemical classification of tauopathies by immunoblot, protein sequence and mass spectrometric analyses of sarkosyl-insoluble and trypsin-resistant tau. Acta Neuropathol, 2016, 131, 267-280.

5) Nonaka T, Watanabe ST, Iwatsubo T, Hasegawa M: Seeded aggregation and toxicity of alpha-synuclein and tau: cellular models of neurodegenerative diseases. J Biol Chem, 2010; 285: 34885-98.

6) Clavaguera F, Bolmont T, Crowther RA, et al: Transmission and spreading of tauopathy in transgenic mouse brain. Nat Cell Biol, 2009; 11: 909-13.

7) Fitzpatrick AWP, Falcon B, He S, Murzin AG, Murshudov G, Garringer HJ, Crowther RA, Ghetti B, Goedert M, Scheres SHW. Cryo-EM structures of tau filaments from Alzheimer's disease. Nature. 2017 Jul 13;547(7662):185-190. doi: 10.1038/nature23002. Epub 2017 Jul 5.

ANTIBODY CHARACTERIZATION

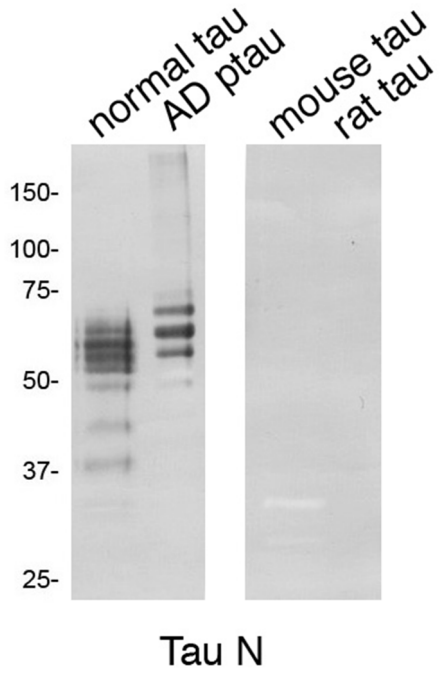

Figure 1. Immunoblot analyses with Tau-N antibody.
Lane 1: Normal human tau (heat stable fraction prepared from control human brain)
Lane 2: AD ptau (Sarkosyl-insoluble fraction prepared from AD brain)
Lane 3: Mouse tau (heat stable fraction prepared from adult mouse brain)
Lane 4: Rat tau (heat stable fraction prepared from adult rat brain)
Anti Tau-N antibody at 1/2000 dilution.

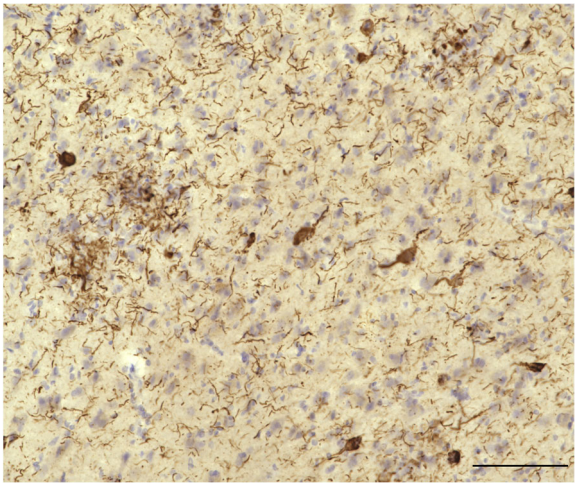

Figure 2. Immunostaining of AD brain section with Tau-N antibody.
Neurofibrillary tangles, neuropil threads and dystrophic neurites surrounding senile plagues are stained with the antibodies.
Scale bar: 100μm. Anti Tau-N antibody at 1/2000 dilution.

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