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Product Information

Tau 4-repeat domain, human recombinant, expressed in *E. coli*

Catalog Number **T9830**
Storage Temperature –20 °C

Product Description

Tau is a family of neuronal microtubule-associated proteins. Tau promotes microtubule assembly and stabilizes neuronal microtubules under physiological conditions. Under pathological conditions, tau proteins undergo conformational changes and aggregate into paired helical filaments (PHFs), core constituents of the neurofibrillary tangles found in tauopathies,[1-2] neuro-degenerative diseases resulting from the aggregation of tau proteins in the brain. The best known of these diseases is Alzheimer's disease.

The tau proteins are the products of alternative splicing from a single gene that in humans is designated *MAPT* (microtubule-associated protein tau). Alternative splicing of exons 2, 3, and 10 produces six tau isoforms (see Table 1 and Figure 1).[2-3] Three of them (isoforms 441, 412, and 383) contain a domain with four repeats, a result of inclusion of alternatively spliced exon 10. The other three (isoforms 410, 381, and 352) contain a domain with only three repeats in which the second repeat encoded by exon 10 is spliced out. The repeat domains, located at the carboxyl-terminal half of Tau, are believed to be important for microtubule binding as well as for the pathological aggregation of tau into PHFs.[1-2]

Tau 4-repeat domain is lyophilized from a solution of 20 mM sodium phosphate, pH 7.4, and 1 mM DTT.

This Tau 4-repeat domain product can be used for *in vitro* aggregation to form PHFs.[4-6]

Precautions and Disclaimer

This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

Preparation Instructions

Reconstitution in sterile water to a protein concentration of 1 mg/ml, results in a solution of ~20 mM sodium phosphate, pH 7.4.

Storage/Stability

The lyophilized product and reconstituted solutions should be stored at –20 °C or below. Repeated freezing and thawing is not recommended. Storage in "frost-free" freezers is not recommended.

Diluted working samples should be kept on ice and discarded if not used within 12 hours.

References

1. Ballatore, C. et al., Tau-mediated neuro-degeneration in Alzheimer's disease and related disorders. Nat. Rev. Neurosci., **8**, 663-672 (2007).
2. Lee, V.M. et al., Neurodegenerative tauopathies. Annu. Rev. Neurosci., **24**, 1121-1159 (2001).
3. Goedert, M. et al., Multiple isoforms of human microtubule-associated protein tau: sequences and localization in neurofibrillary tangles of Alzheimer's disease. Neuron, 3 519-526 (1989).
4. Pickhardt, M. et al., Anthraquinones inhibit tau aggregation and dissolve Alzheimer's paired helical filaments *in vitro* and in cells. J. Biol. Chem., **280**, 3628-3635 (2005).
5. Li, W. et al., Inhibition of tau fibrillization by oleocanthal via reaction with the amino groups of tau. J. Neurochem., **110**, 1339-1351 (2009).
6. Hattori, M. et al., Different inhibitory response of cyanidin and methylene blue for filament formation of tau microtubule-binding domain. Biochem. Biophys. Res. Commun., 374, 158-163 (2008).

Table 1.
Comparison of Tau Products

Catalog Number	Description	Variant	Exon 2	Exon 3	Exon 10	Number of Amino Acids	Mass (kDa)
T9830	Tau 4-repeat domain	4R fragment	–	–	+	130	13.8
T0576	Tau-441	2N4R	+	+	+	441	45.9
T0451	Tau-410	2N3R	+	+	–	410	42.6
T0326	Tau-412	1N4R	+	–	+	412	42.9
T0201	Tau-381	1N3R	+	–	–	381	39.7
T9825	Tau-383	0N4R	–	–	+	383	40.0
T9950	Tau-352	0N3R	–	–	–	352	36.8

Figure 1.
Tau 4-repeat domain aligned with six Tau isoforms