

# Tau and Alpha Synuclein Co-Polymer Fibrils

Human Recombinant Tau-441 (2N4R) and Human Recombinant Alpha Synuclein Co-Polymer Fibrils  
Catalog No. SPR-495



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## Product Name

Tau and Alpha Synuclein Co-Polymer Fibrils

## Description

Human Recombinant Tau-441 (2N4R) and Human Recombinant Alpha Synuclein Co-Polymer Fibrils

## Applications

WB, SDS PAGE, In vitro assay

## Concentration

Total Protein Concentration: 2mg/mL (1mg/ml of tau and 1mg/ml of aSyn)

## Conjugates

No tag

## Nature

Recombinant

## Species

Human

## Expression System

E. coli

## Amino Acid Sequence

Tau:  
MAEPRQEFVEMEDHAGTYGLGDRKDQGGYTMHQDQEGD TDAGLKESPLQTPTEDGSEEPGSETSDAKSTPTAEDVTAPLVD  
EGAPGKQAAAQPHTIPEGTAAEEAGIGDTPSLEDEAAGHV TQARMVSKSKDGTGSDDKKAKGADGKTKIATPRGAAPPGQK  
GQANATRIPAKTPPAPKTPPSSGEPKSGDRSGYSSPGSPGTPGSRSRTPSLPTPTREPKKVAVVRTPPKSPSSAKSRLQTAPV  
PMPDLKNVSKIGSTENLKHQPGGGKVQIINKKLDLSNVQSKCGSKDNIKHVPGGGSVQIVYKPV DLSKVTSKCGSLGNIHHK  
PGGGQVEVKSEKLDKDRVQSKIGSLDNITHVPGGGNKKIETHK LTFRENAKAKTDHGAEIVYKSPVVS GDTSPRHLSNVSSTG  
SIDMVDSPQLATLADEV SASLAKQGL

**Asyn:**

MDVFMKGLSKAKEGVVAAAETKQGVAAEAGKTKEGVLYVGSKTKEGVVHGVATVAEKTKEQVTNVGGAVVTGVTAVAQKTV  
EGAGSIAAATGFVKKDQLGKNEEGAPQEGILEDMPVDPDNEAYEMPSEEGYQDYEPEA

**Purity**

>95%

**Other Resources****Protein Length**

Full Length (Tau 2N4R: 1-441 aa, ASYN: 1-140 )

**Field Of Use**

Not for use in humans. Not for use in diagnostics or therapeutics. For in vitro research use only.

**Properties****Storage Buffer**

1X PBS pH 7.4

**Storage Temperature**

-80°C

**Shipping Temperature**

Dry Ice. Shipping note: Product will be shipped separately from other products purchased in the same order.

**Purification**

Ion-exchange Purified

**Cite This Product**

Human Recombinant Tau and Alpha Synuclein Co-Polymer Fibrils (StressMarq Biosciences Inc., Victoria BC CANADA, Catalog # SPR-495)

**Certificate Of Analysis**

Protein certified >95% pure on SDS-PAGE & Nanodrop analysis

**Biological Description**

## Alternative Names

MAPT, 2N4R, Tau40 neurofibrillary tangle protein, paired-helical filament, PHFs, SNCA, NACP, PARK1, asyn, alpha-synuclein, pre-formed fibril, PFFs, mixed fibrils

## Research Areas

Alzheimer's Disease, Neurodegeneration, Neuroscience, Parkinson's Disease, Synuclein, Tangles & Tau, Multiple System Atrophy

## Swiss Prot

P10636-8 and P37840-1

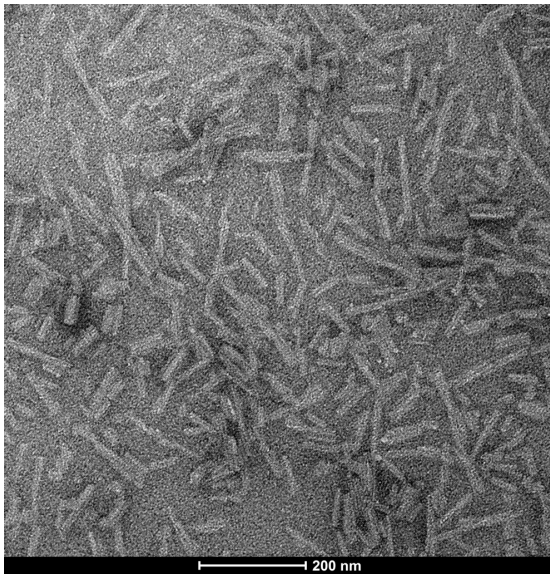
## Scientific Background

Brain-specific tau isoforms vary in the number of N-terminal inserts and C-terminal repeat domains due to alternative splicing of exons; the 2N4R isoform of tau is expressed in adult brain yet is absent from the fetal brain (1). Tau and alpha-synuclein polymerize into amyloid fibrils to form filamentous inclusions in neurodegenerative diseases such as Alzheimer's and Parkinson's disease. Tau has been shown to interact with alpha-synuclein in vitro (2), with synergistic cross-seeding between tau and alpha-synuclein resulting in polymerization of each other into fibrillary amyloid lesions in neuronal cultures and in vivo (3,4). Recombinant tau and alpha-synuclein co-polymer fibrils have demonstrated a more widespread transmission of induced pathology in a rodent model of tauopathies compared to pure Tau or alpha-synuclein fibrils alone (5). These co-polymer fibrils have also shown enhanced alpha-synuclein aggregation in vitro, and more severe alpha-synuclein pathology and Parkinson's disease-like symptoms in mice (6).

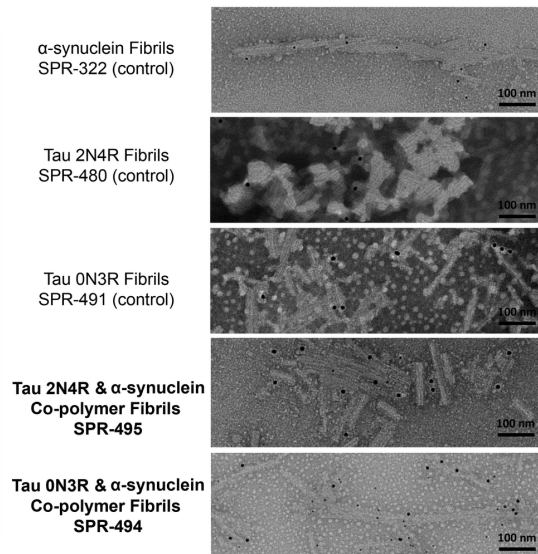
## References

1. Goedert et al. Multiple Isoforms of Human Microtubule-associated Protein Tau: Sequences and Localization in Neurofibrillary Tangles of Alzheimer's Disease. *Neuron*. 1989;3(4):519-526.
2. Jensen et al.  $\alpha$ -synuclein Binds to Tau and Stimulates the Protein Kinase A-catalyzed Tau Phosphorylation of Serine Residues 262 and 356. 1999. *JBC*. 274(36): 25481-25489. DOI:https://doi.org/10.1074/jbc.274.36.25481
3. Giasson et al. Initiation and Synergistic Fibrillization of Tau and Alpha-Synuclein. *Science*. 2003; 300: 636-40. DOI: 10.1126/science.1082324
4. Guo et al. Distinct  $\alpha$ -synuclein Strains Differentially Promote Tau Inclusions in Neurons. 2013. *Cell*. 154(1) doi:10.1016/j.cell.2013.05.057.
5. Williams et al. Differential Cross-seeding Properties of Tau and  $\alpha$ -synuclein in Mouse Models of Tauopathy and Synucleinopathy. *Brain Communications*. 2020; 2(2):fcaa090. doi:10.1093/braincomms/fcaa090
6. Pan et al. Tau Accelerates  $\alpha$ -synuclein Aggregation and Spreading in Parkinson's Disease. 2022. *Brain*. Doi: 10.1093/brain/awac171

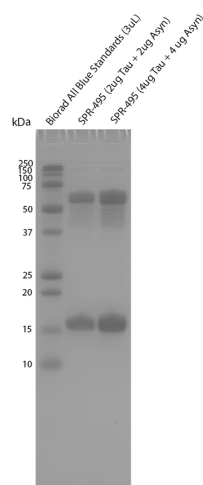
## Product Images



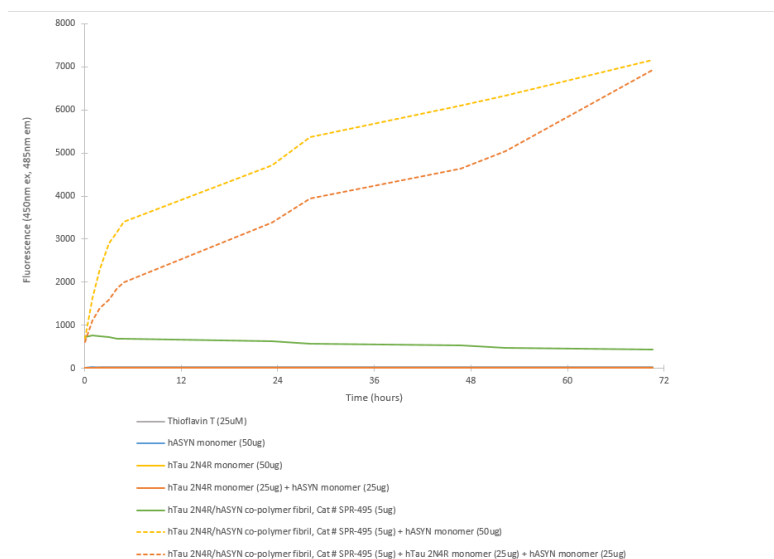
TEM of Tau 2N4R & Alpha Synuclein Co-Polymer Fibrils (SPR-495). Negative stain transmission electron microscopy images of SPR-495 acquired at 80 Kv on carbon coated 400 mesh copper grids using phosphotungstic acid and uranyl acetate stain.



Immuno-TEM of Tau & Alpha Synuclein Co-Polymer Fibrils. Fibrils absorbed onto carbon-coated copper grids. Grids were blocked with 1% BSA and 0.1% Tween-20 in PBS, incubated sequentially with primary antibodies at 20  $\mu\text{g}/\text{mL}$  in blocking buffer, washed, then incubated with secondary antibodies at 20  $\mu\text{g}/\text{mL}$  in blocking buffer, washed and stained with 2% uranyl acetate as a negative stain. 6nm (asyn) and 12nm (tau) signals only appear together in the same fibril strand for the co-polymer fibril samples, and no antibody cross reactivity is observed in control alpha-synuclein or tau fibrils. Primary antibodies: Mouse anti-human asyn monoclonal (StressMarq SMC-532) and rabbit anti-human tau polyclonal (StressMarq SPC-802); Secondary antibodies: 6nm Colloidal Gold-conjugated Goat Anti-Mouse (Jackson ImmunoResearch 115-195-146) and 12nm Colloidal Gold-conjugated Goat Anti-Rabbit (Jackson ImmunoResearch 111-205-144).



Bis-Tris SDS-PAGE (12%) of Tau 2N4R & Alpha Synuclein Co-Polymer Fibrils. MW ladder = Precision Plus Protein All Blue pre-stained standards.



In vitro Seeding activity of Tau 2N4R & Alpha Synuclein Co-Polymer Fibrils in ThT Assay. Tau 2N4R and Alpha Synuclein co-polymer fibrils seed fibril formation of both Alpha Synuclein monomers and of a mixture of Alpha Synuclein and Tau 2N4R monomers over 72 hours. Reactions (100uL) shaken at 600 rpm in Greiner-Bio 96 Well Non-Binding Cell Culture Microplates, Black (Greiner-Bio Catalog #655900) at 37°C and read with an XPS Microplate Reader set at 450nmex/485nmem.

## Product Citations (0)

Currently there are no citations for this product.

## Reviews

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There are no reviews yet.