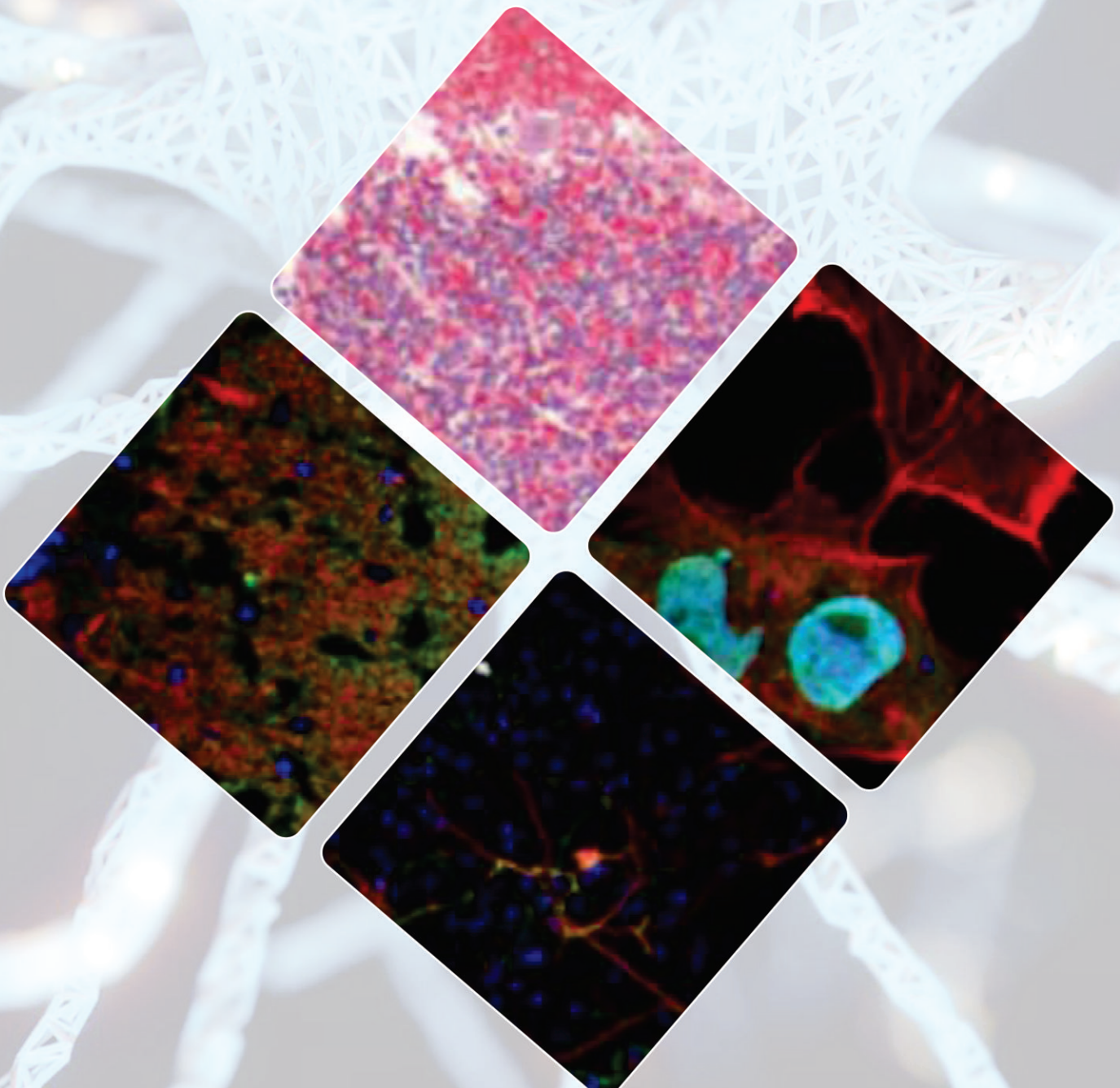




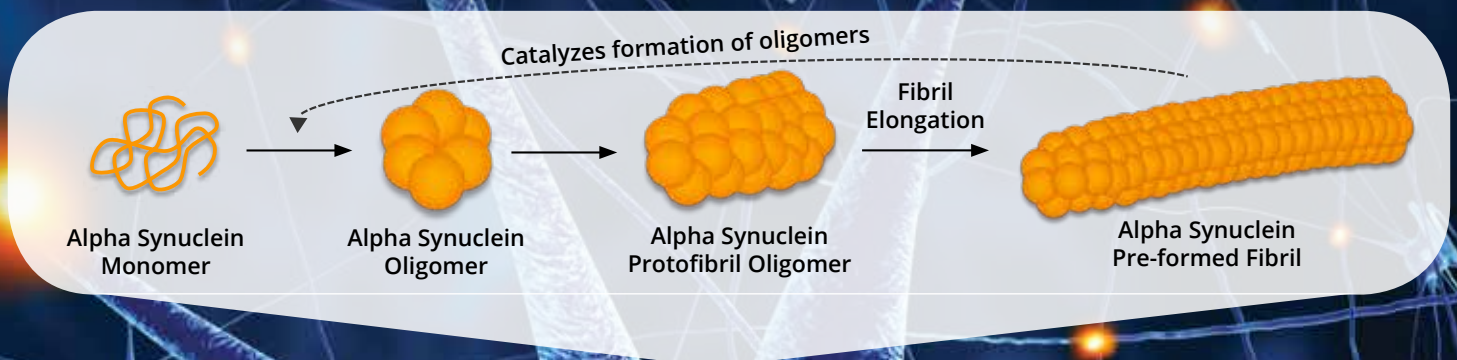
StressMarq
Biosciences INC.

Neurodegenerative Disease Research



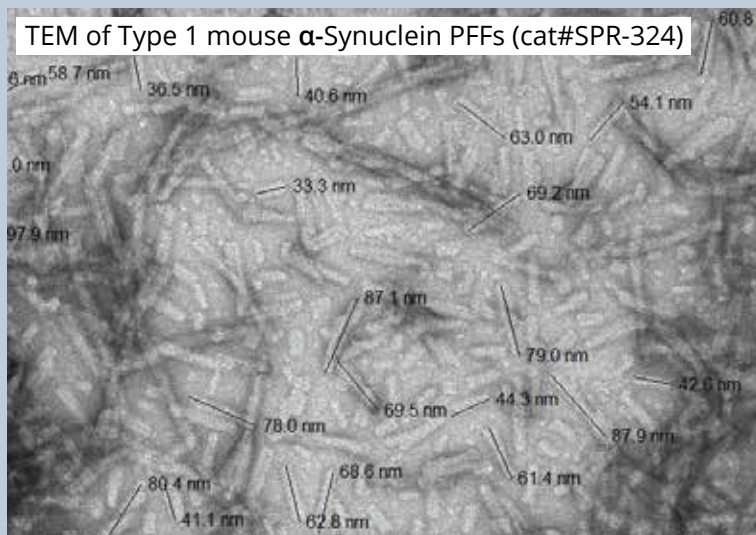
Alpha Synuclein

Reagents for Neurodegenerative Disease Research

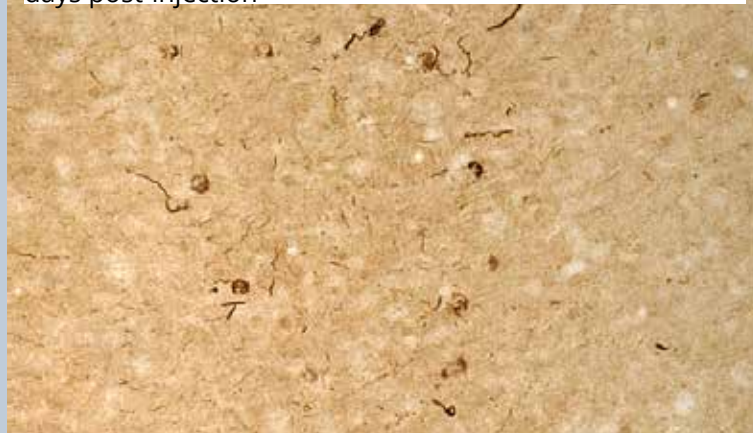


Alpha Synuclein Pre-formed Fibrils (PFFs)

Human and mouse PFFs induce Lewy body pathology in vitro and in vivo by seeding fibrillization of alpha synuclein monomers.

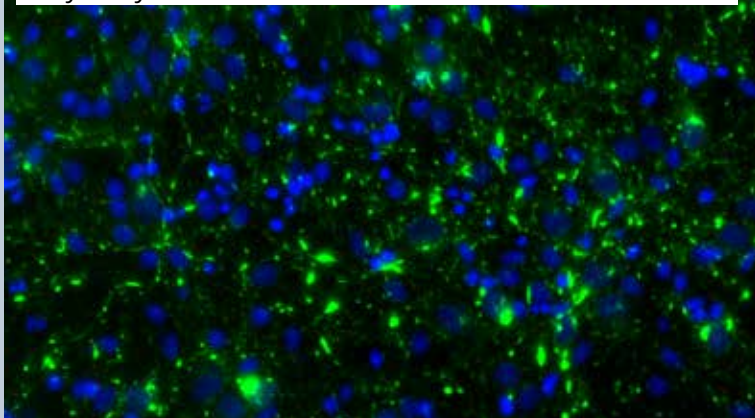


IHC of rat brain injected with Type 1 mouse α -synuclein PFFs (cat#SPR-324) shows alpha synuclein pathology 30 days post-injection

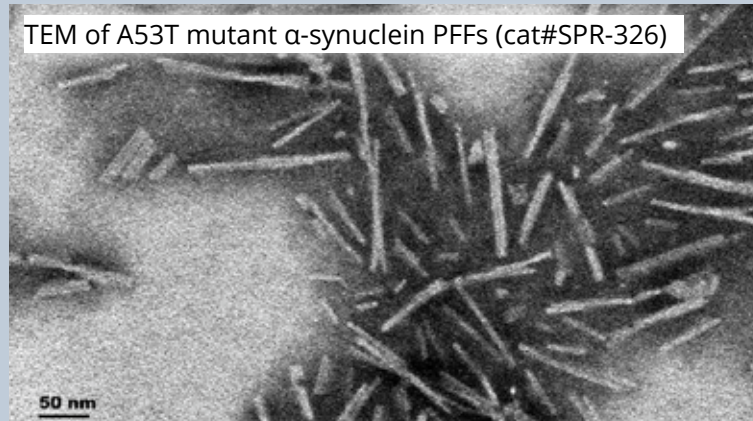


A53T is a missense point mutation of alpha synuclein. This mutation has been linked to early-onset Parkinson's Disease and enhanced alpha synuclein fibrillization.

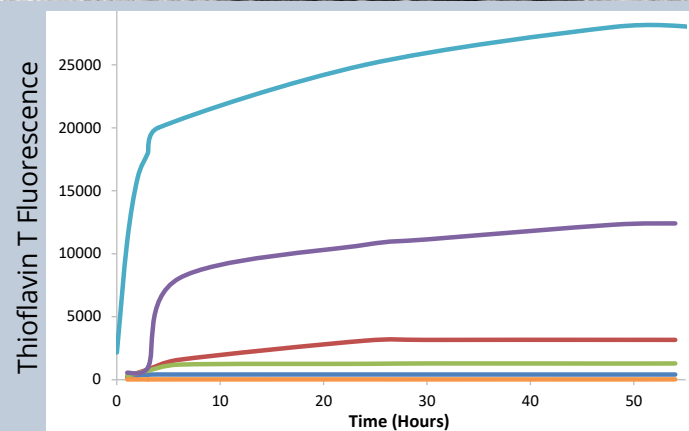
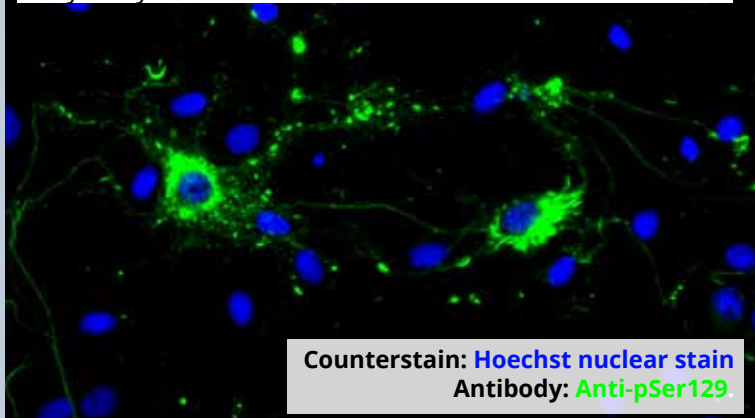
IHC of primary rat hippocampal neurons treated with Type 1 human α -synuclein PFFs (cat#SPR-322) shows Lewy body inclusion formation



TEM of A53T mutant α -synuclein PFFs (cat#SPR-326)



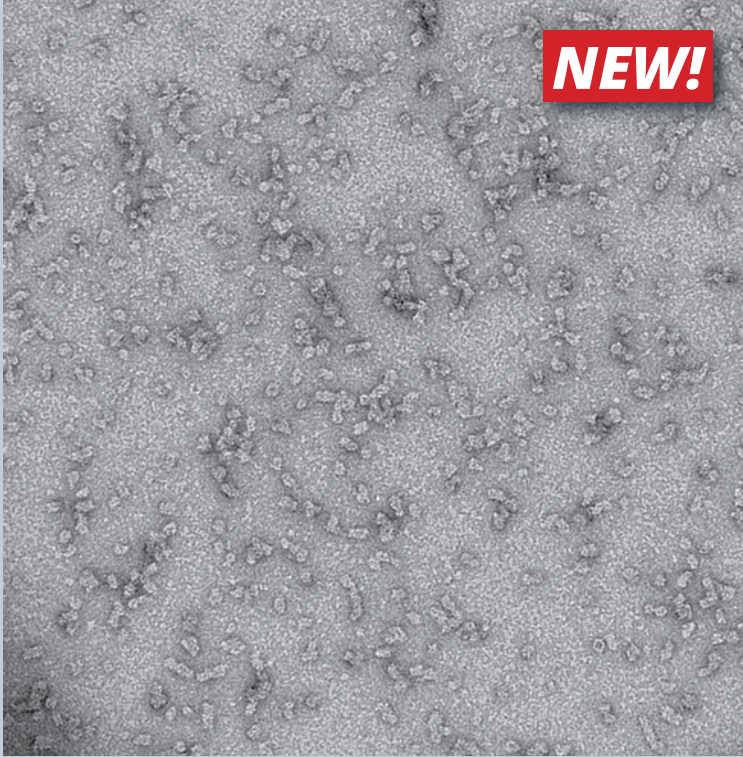
IHC of primary rat hippocampal neurons treated with Type 1 mouse α -synuclein PFFs (cat#SPR-324) shows Lewy body inclusion formation



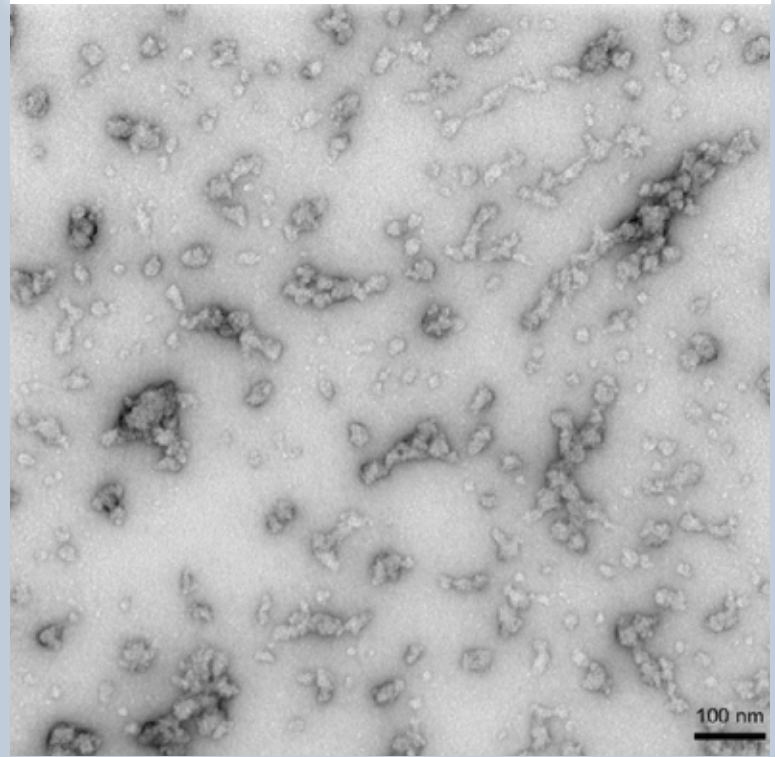
- A53T Monomer (100 μ M) + Type 1 A53T PFF (10 μ M)
- Type 1 Monomer (100 μ M) + Type 1 PFF (10 μ M)
- Type 1 Monomer (100 μ M) + Type 2 PFF (10 μ M)
- Type 2 Monomer (100 μ M) + Type 1 PFF (10 μ M)
- Type 2 Monomer (100 μ M) + Type 2 PFF (10 μ M)
- 25 μ M Thioflavin

Alpha Synuclein Pre-formed Fibrils and Oligomers

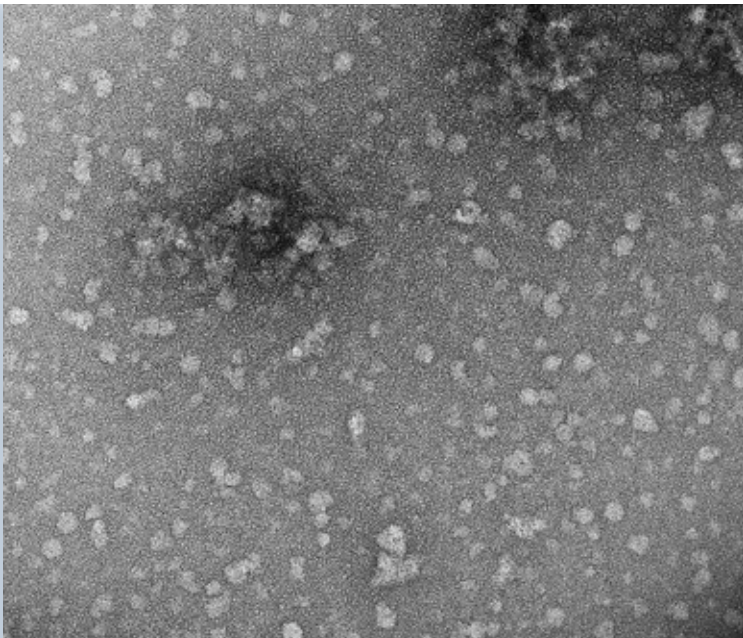
TEM of kinetically stable alpha synuclein oligomers (cat#SPR-484). These oligomers are generated without the addition of any inducers or inhibitors.



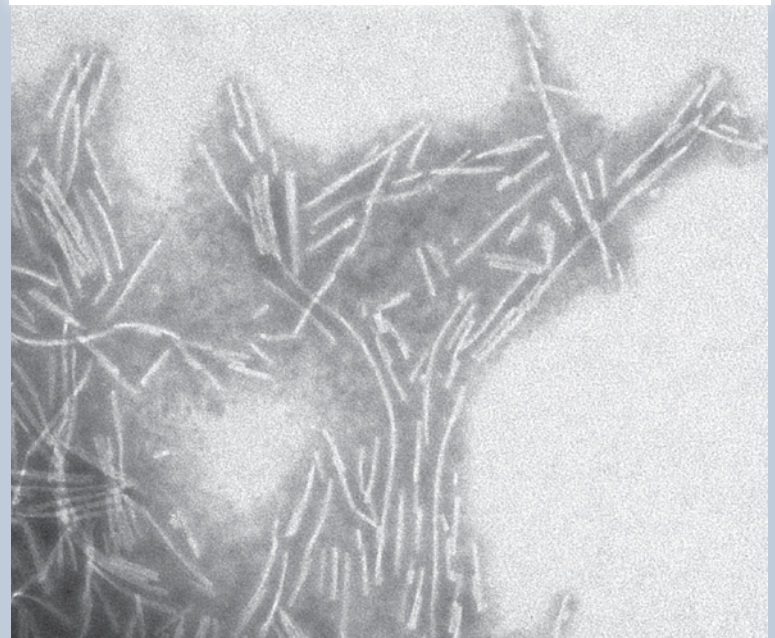
TEM of dopamine HCL stabilized alpha synuclein oligomers (cat#SPR-466). Dopamine can stabilize alpha synuclein in its oligomeric form, preventing it from aggregating into fibrils.



TEM of EGCG-stabilized alpha synuclein oligomers (cat#SPR-469). EGCG reduces alpha synuclein fibril formation in favour of spherical soluble oligomers.



TEM of alpha synuclein filaments (cat#SPR-450). Alpha synuclein filaments are structurally similar to fibrils, except they are soluble.



Alpha Synuclein Product Listing

Alpha Synuclein Proteins

Monomers

Description	Catalog#
Human Alpha Synuclein Monomers (Type 2)	SPR-316
Human Alpha Synuclein Monomers (Type 1)	SPR-321
Mouse Alpha Synuclein Monomers (Type 1)	SPR-323
Human Alpha Synuclein A53T Mutant Monomers (Type 1)	SPR-325
Human Alpha Synuclein N-Terminal Acetylated Monomers (Type 1) NEW	SPR-331
Rat Alpha Synuclein Monomers NEW	SPR-481

Pre-formed Fibrils

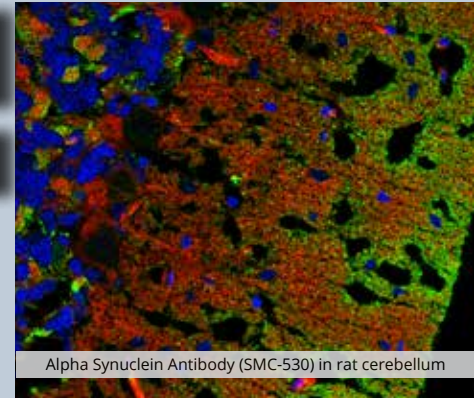
Description	Catalog#
Human Alpha Synuclein Pre-formed Fibrils (Type 1)	SPR-322
Human Alpha Synuclein Pre-formed Fibrils (ATTO 594 conjugated, Type 1) NEW	SPR-322-A594
Mouse Alpha Synuclein Pre-formed Fibrils (Type 1)	SPR-324
Human Alpha Synuclein Pre-formed Fibrils (Type 2)	SPR-317
Human Alpha Synuclein N-Terminal Acetylated Pre-formed Fibrils (Type 1) NEW	SPR-332
Human Alpha Synuclein A53T Mutant Pre-formed Fibrils (Type 1)	SPR-326
Rat Alpha Synuclein Pre-formed Fibrils NEW	SPR-482
Human Alpha Synuclein Pre-formed Fibrils (Type 3)	SPR-448
Human Alpha Synuclein Filaments (Immature Fibrils)	SPR-450

Oligomers

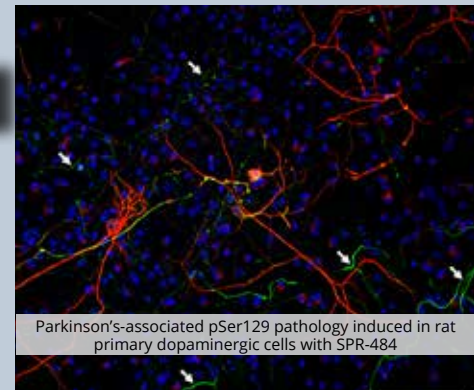
Description	Catalog#
Human Alpha Synuclein Oligomers (Kinetically Stable) NEW	SPR-484
Human Alpha Synuclein Oligomers (Dopamine HCl Stabilized)	SPR-466
Human Alpha Synuclein Oligomers (EGCG Stabilized)	SPR-469

Alpha Synuclein Antibodies

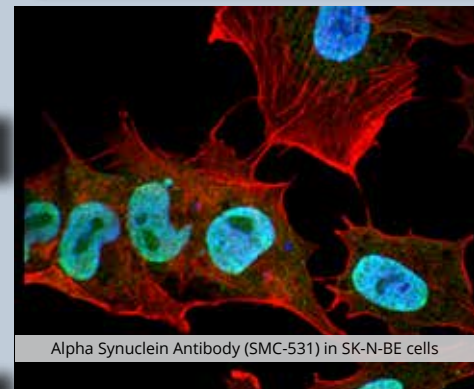
Target	Clone	Host	Applications	Reactivity	Catalog #
Alpha Synuclein	3C11	Mouse	WB, ICC/IF	Hu, Ms, Rt	SMC-530
Alpha Synuclein	10H7	Mouse	WB, ICC/IF	Hu, Ms, Rt	SMC-531
Alpha Synuclein	3F8	Mouse	WB, ICC/IF, IHC	Hu, Ms, Rt	SMC-532
Alpha Synuclein	4F1	Mouse	WB, ICC/IF, IHC	Hu, Ms, Rt	SMC-533
Alpha Synuclein NEW	J18	Rabbit	WB, IHC	Hu, Ms	SMC-600
Alpha Synuclein	PAb	Rabbit	WB, IHC	Hu, Ms, Rt	SPC-800
Alpha Synuclein (pSer129)	PAb	Rabbit	WB, ICC/IF, IHC	Hu, Ms, Rt	SPC-742
Alpha Synuclein (pTyr136)	PAb	Rabbit	WB	Hu, Ms, Rt	SPC-1435



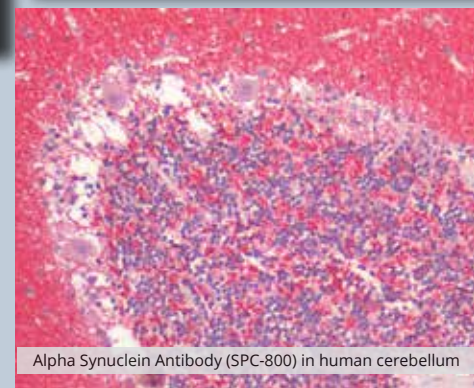
Alpha Synuclein Antibody (SMC-530) in rat cerebellum



Parkinson's-associated pSer129 pathology induced in rat primary dopaminergic cells with SPR-484



Alpha Synuclein Antibody (SMC-531) in SK-N-BE cells



Alpha Synuclein Antibody (SPC-800) in human cerebellum

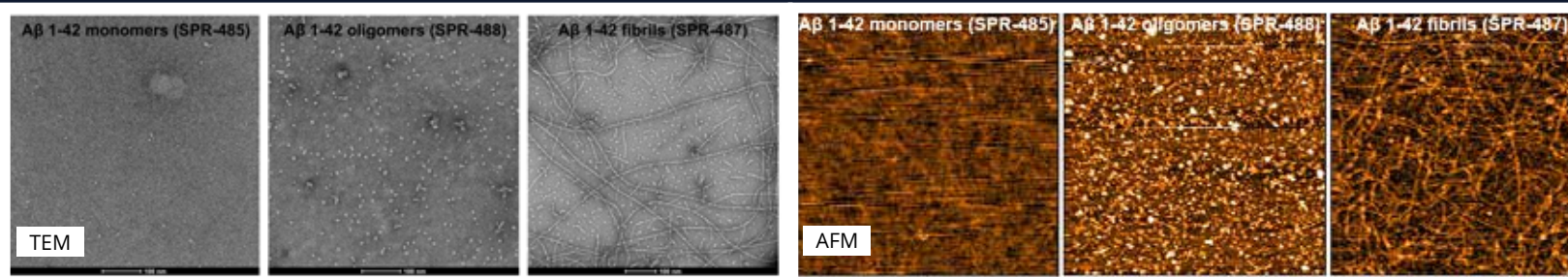
NEW!

Amyloid Beta

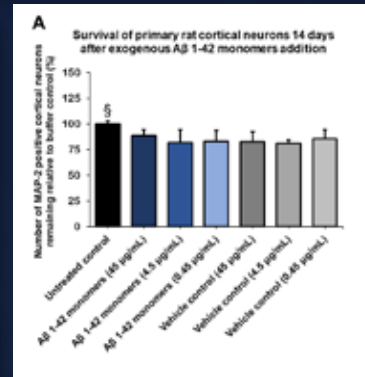
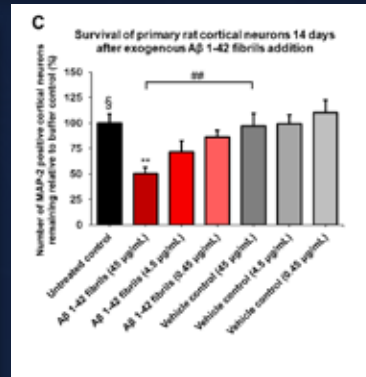
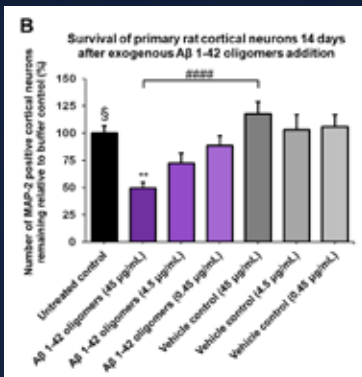
Monomers | Oligomers | Pre-formed Fibrils (PFF) | Antibodies

for Neurodegenerative Disease Research

Induce Amyloid Beta Toxicity with StressMarq's Oligomers and Pre-formed Fibrils



StressMarq's Amyloid Beta 1-42 Oligomers (cat#SPR-488) and Pre-formed Fibrils (cat#SPR-487) show a **dose-dependent toxicity** to primary rat cortical neurons. Monomers are not toxic (cat#SPR-485).



Fibrils and respective vehicle controls were initially sonicated in a Bioruptor. Test conditions were run in the same plate as untreated control and vehicle controls, which consisted of buffer without amyloid beta 1-42 protein. Data expressed as mean +/- s.e.m. (n=6). A global analysis of the data was performed using a one-way ANOVA followed by Dunnett's test; ** p<0.01 stats vs control; ## p<0.01, #### p<0.0001 stats vs vehicle control. § represents untreated control condition.

Oligomers

Pre-formed Fibrils

Monomers

Catalog#	Product Name	Available Sizes*
SPR-485	Amyloid Beta Peptide 1-42 (HFIP treated)	100ug 500ug 1mg
SPR-488	Amyloid Beta 1-42 Oligomers	100ug 200ug 500ug
SPR-487	Amyloid Beta 1-42 Pre-formed Fibrils	100ug 200ug 500ug

*Please inquire for bulk quantities.



Monomers



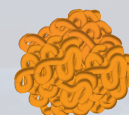
Oligomers



Protofibrils



Amyloid β Fibril

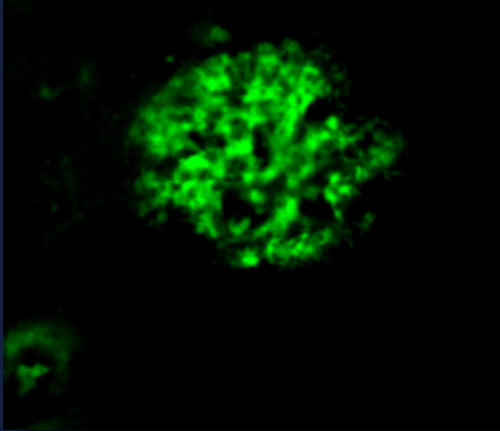


Amyloid Plaque

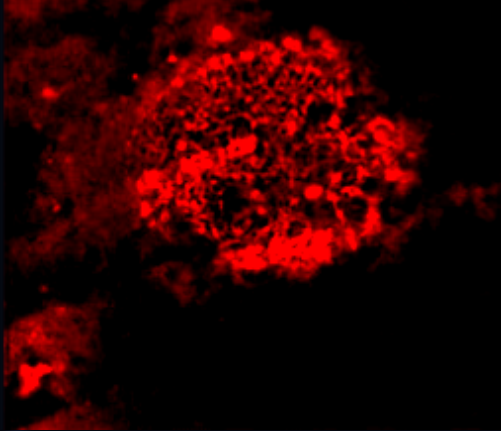
Amyloid Beta

Monomers | Oligomers | Pre-formed Fibrils (PFF) | Antibodies

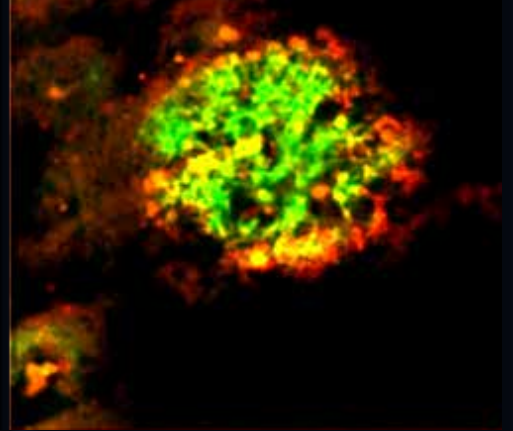
Anti-Amyloid beta Fibrils (SPC-507)
Human Alzheimer's Disease Brain Plaque



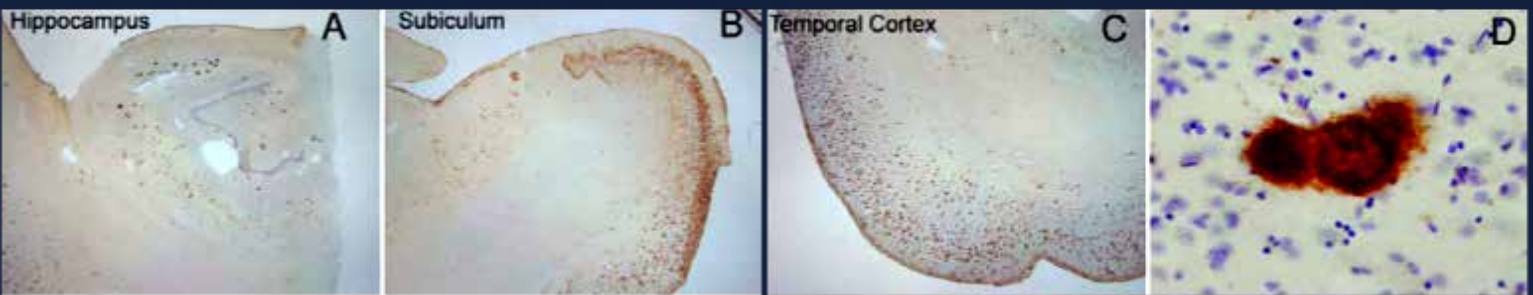
Anti-Amyloid beta Oligomers (SPC-506)
Human Alzheimer's Disease Brain Plaque



Composite
Human Alzheimer's Disease Brain Plaque



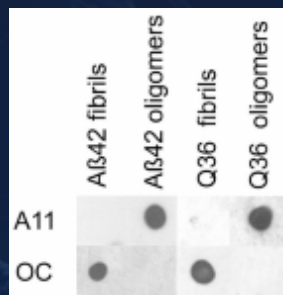
Amyloid beta Fibril (OC) Antibody (SPC-507D) | Human Alzheimer's Disease Brain Tissue



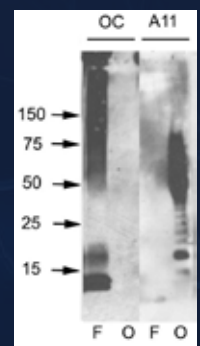
Extensive amyloid fibril (OC) labeling is observed in the hippocampus (A), subiculum (B) and frontal cortex (C) in Alzheimer's disease by Anti-Amyloid beta fibril antibody (SPC-507D). A higher magnification image illustrates that amyloid fibril positive deposits are dense and consist of fine fibrillar material (D).

Amyloid beta Oligomer (A11) and Amyloid beta Fibril (OC) Antibodies

Dot blot analysis of A β 42 and polyQ36 prefibrillar oligomers and fibrils. A β 42 and polyQ fibrils are only detectable with Amyloid beta fibril antibody (SPC-507D), while A β 42 and polyQ prefibrillar oligomers only react with Amyloid beta oligomer antibody (SPC-506D).



Western blot analysis of A β 42 fibrils and prefibrillar oligomers. A β 42 fibrils (F) and prefibrillar oligomers (O) were run on SDS polyacrylamide gels, transferred to nitrocellulose and probed with Anti-Amyloid beta fibril (SPC-507D) and Anti-Amyloid beta oligomer (SPC-506D) antibodies.



Catalog#	Product Name	Clonality	Host	Applications	Species Reactivity
SPC-506	Amyloid Oligomers (A11) Antibody	PAb	Rabbit	WB, IHC, ICC/IF, IP, ELISA, DB	Hu, Ms, Rt, Eu
SPC-507	Amyloid Fibrils (OC) Antibody	PAb	Rabbit	WB, IHC, ICC/IF, IP, ELISA, DB	Hu

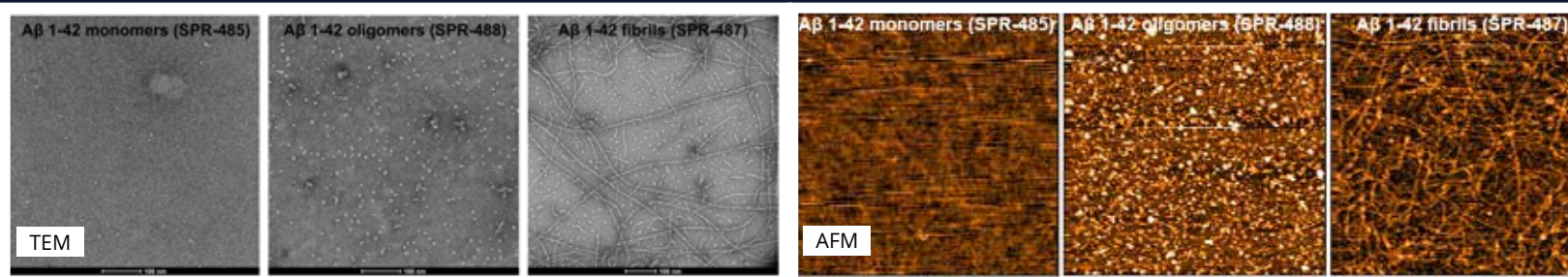
NEW!

Amyloid Beta

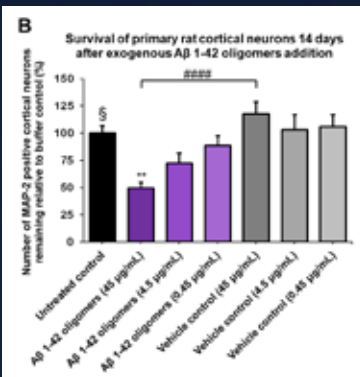
Monomers | Oligomers | Pre-formed Fibrils (PFF) | Antibodies

for Neurodegenerative Disease Research

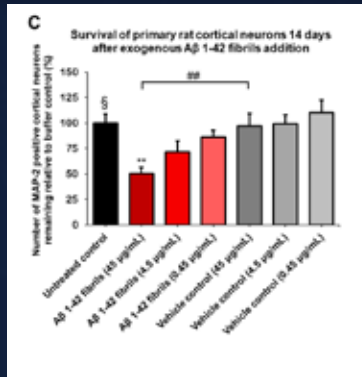
Induce Amyloid Beta Toxicity with StressMarq's Oligomers and Pre-formed Fibrils



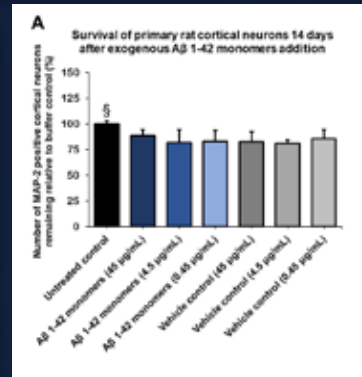
StressMarq's Amyloid Beta 1-42 Oligomers (cat#SPR-488) and Pre-formed Fibrils (cat#SPR-487) show a **dose-dependent toxicity** to primary rat cortical neurons. Monomers are not toxic (cat#SPR-485).



Oligomers



Pre-formed Fibrils



Monomers

Fibrils and respective vehicle controls were initially sonicated in a Bioruptor. Test conditions were run in the same plate as untreated control and vehicle controls, which consisted of buffer without amyloid beta 1-42 protein. Data expressed as mean +/- s.e.m. (n=6). A global analysis of the data was performed using a one-way ANOVA followed by Dunnett's test; ** p<0.01 stats vs control; ## p<0.01, #### p<0.0001 stats vs vehicle control. § represents untreated control condition.

Catalog#	Product Name	Available Sizes*
SPR-485	Amyloid Beta Peptide 1-42 (HFIP treated)	100ug 500ug 1mg
SPR-488	Amyloid Beta 1-42 Oligomers	100ug 200ug 500ug
SPR-487	Amyloid Beta 1-42 Pre-formed Fibrils	100ug 200ug 500ug

*Please inquire for bulk quantities.



Monomers



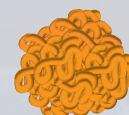
Oligomers



Protofibrils



Amyloid β Fibril

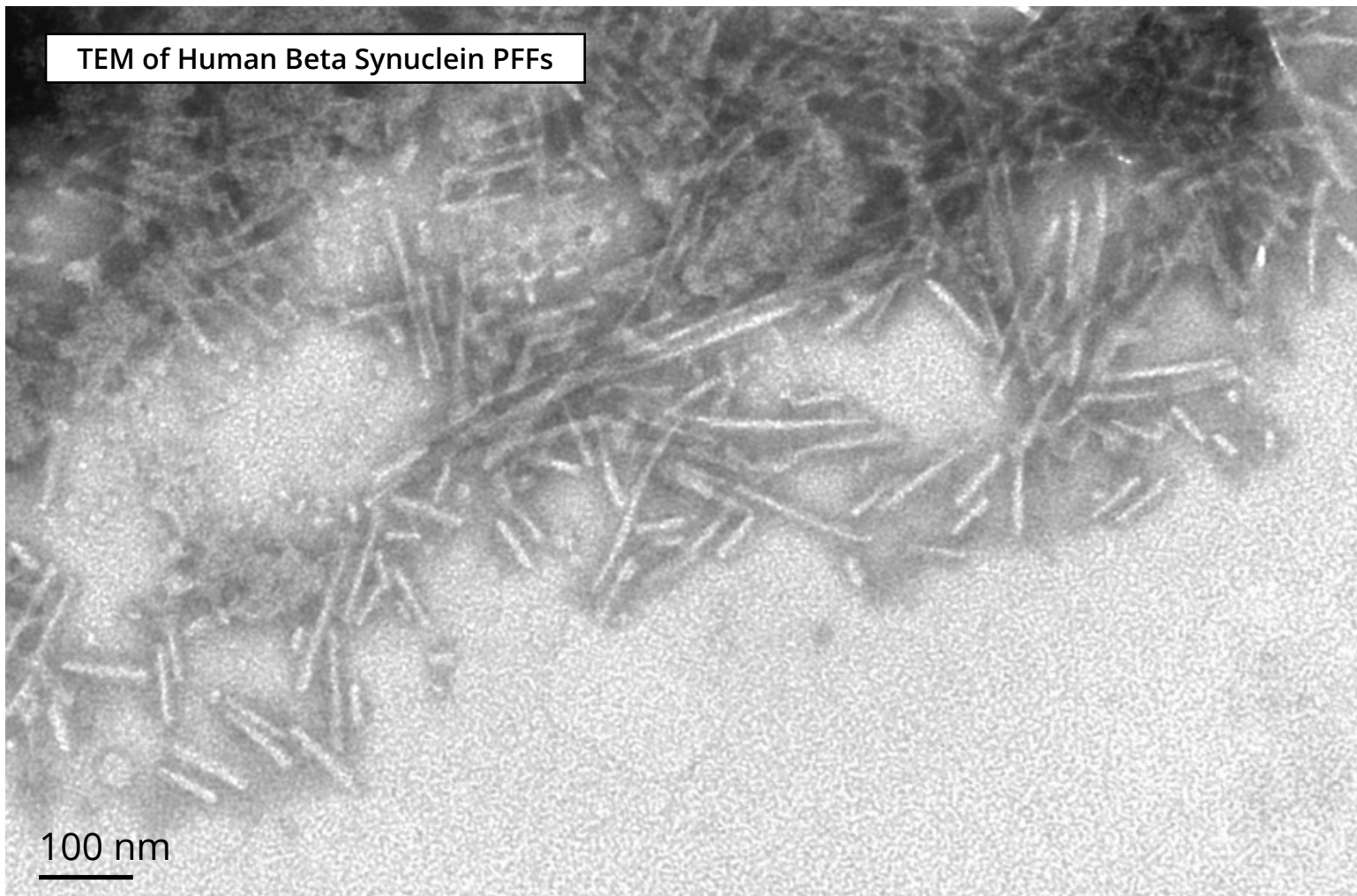


Amyloid Plaque

Beta Synuclein

Beta synuclein, like alpha synuclein, is found in presynaptic nerve terminals. It is believed to play a role in maintaining vesicular membrane curvature¹ and does not aggregate under physiological conditions.² WT beta synuclein inhibits the aggregation of alpha synuclein³ and mutant (V70M and P123H) beta synuclein has been associated with Dementia with Lewy Bodies (DLB).⁴

TEM of Human Beta Synuclein PFFs



Recombinant Beta Synuclein and Gamma Synuclein Proteins

Pre-formed Fibrils

Description	Catalog #
Human Beta Synuclein Pre-formed Fibrils	SPR-457
Mouse Beta Synuclein Pre-formed Fibrils**	SPR-458**
Human Gamma Synuclein Pre-formed Fibrils	SPR-459
Mouse Gamma Synuclein Pre-formed Fibrils	SPR-460

** Please inquire for availability

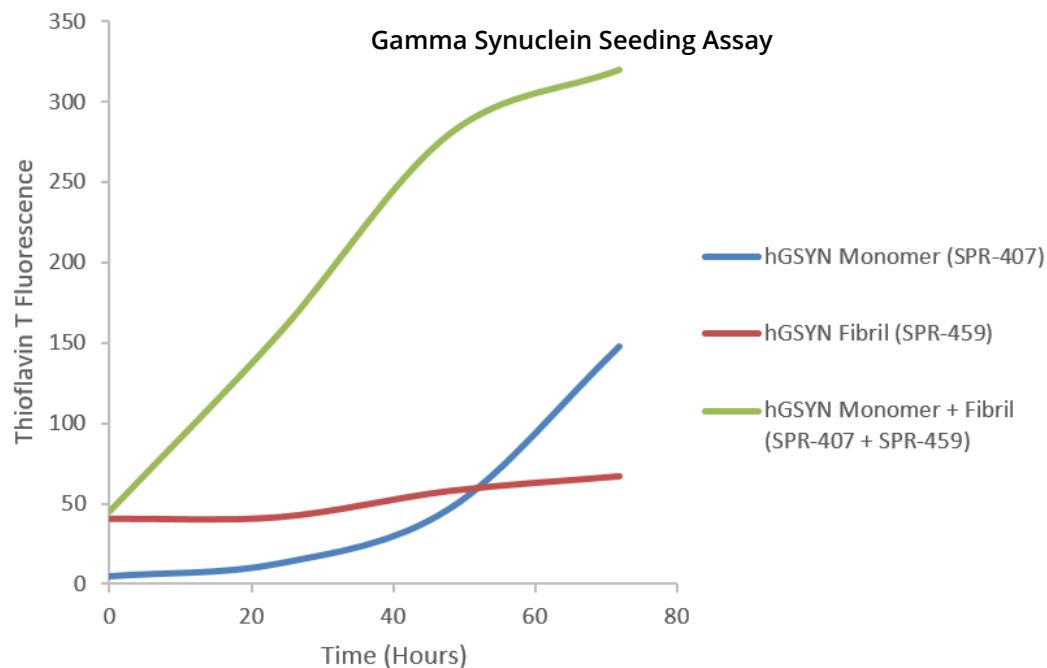
Monomers

Description	Catalog #
Human Beta Synuclein Monomers	SPR-405
Mouse Beta Synuclein Monomers	SPR-406
Human Gamma Synuclein Monomers	SPR-407
Mouse Gamma Synuclein Monomers	SPR-408

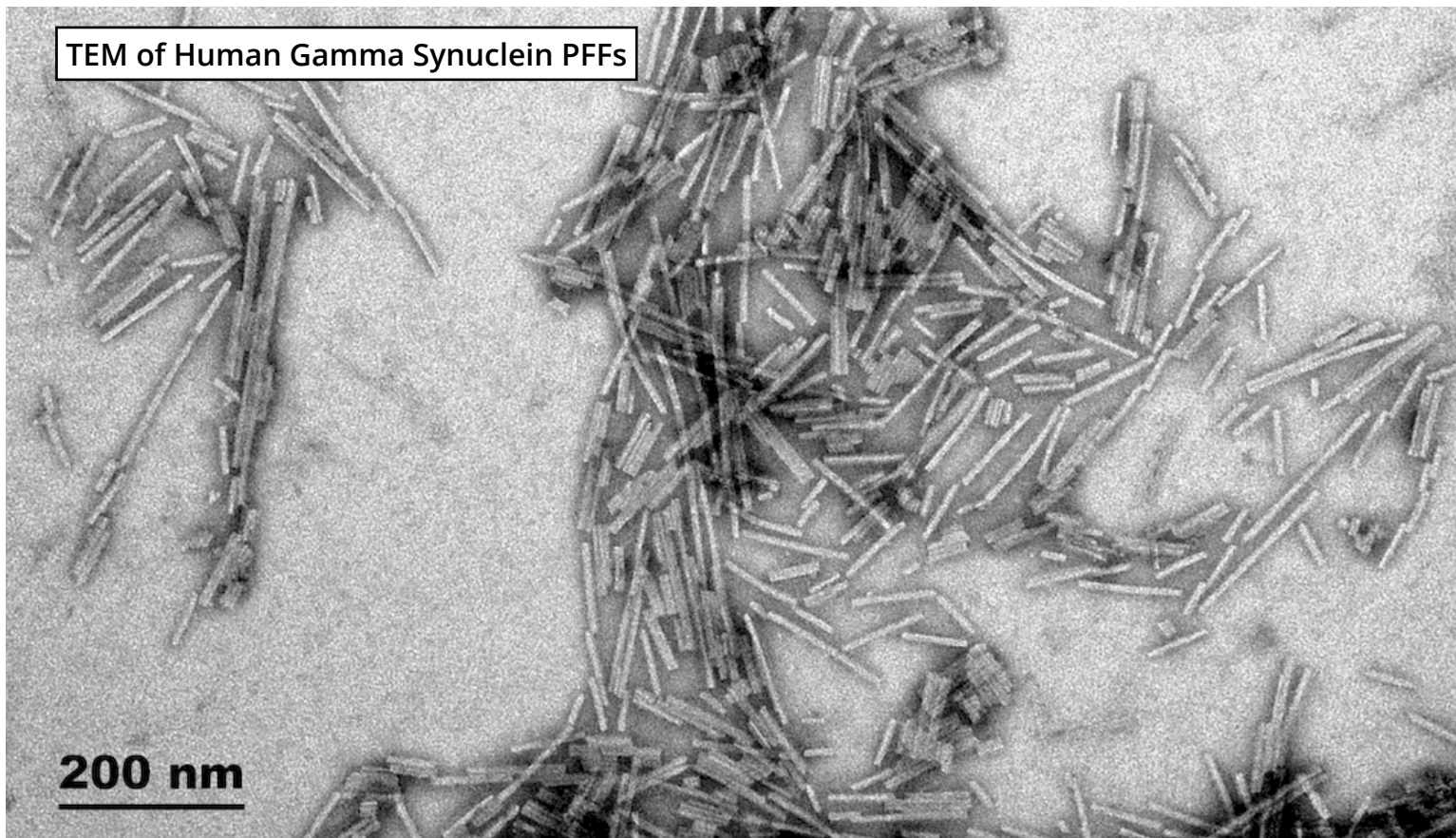
1. Westphal, C.H., Chandra, S.S. (2013). J Biol Chem. 288(3):1829-40.
2. Yamin, F. et al. (2005) Biochemistry. 44, 9096-9107.
3. Hashimoto, M. et al. (2001) Neuron. 32,213-223.
4. Ohtake, H. et al. (2004). Neurology. 63(5):805-11

Gamma Synuclein

Gamma synuclein is associated with neurodegenerative diseases as well as certain cancers. Human and mouse gamma synuclein PFFs and monomers are available from StressMarq. PFFs seed the fibrillization of monomers.



TEM of Human Gamma Synuclein PFFs

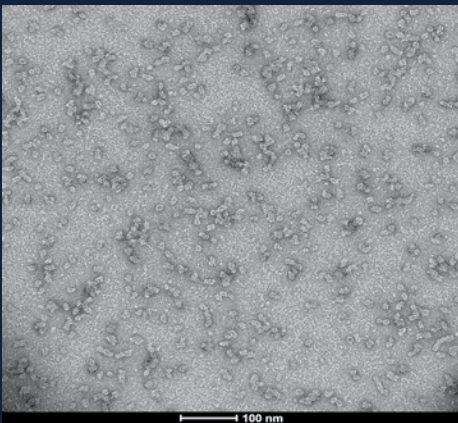


NEW!

Kinetically Stable Alpha Synuclein Oligomers

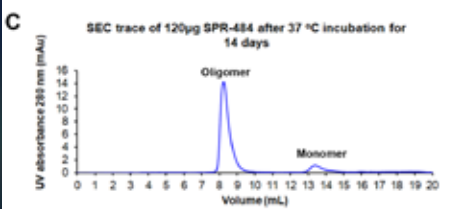
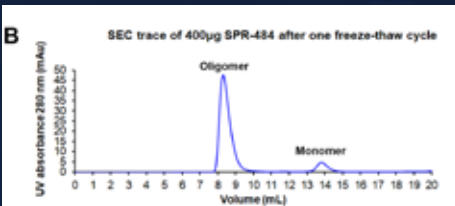
for Neurodegenerative Disease Research

Induce Toxicity and Pathology



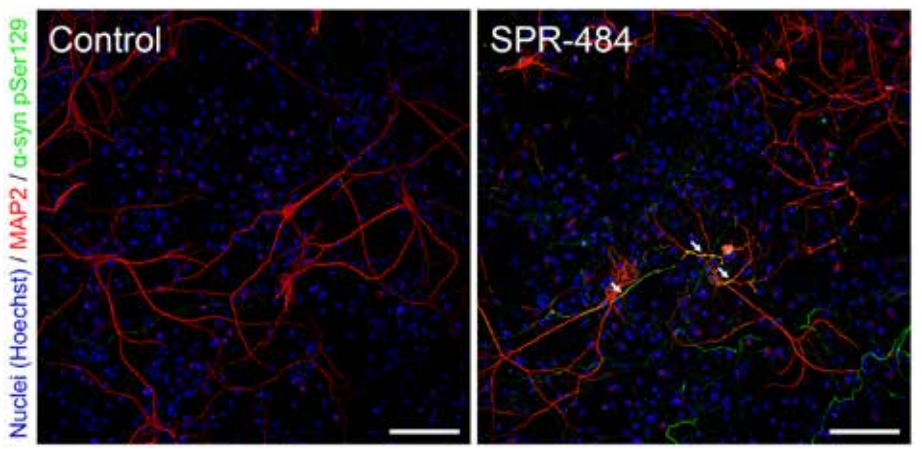
GLOBULAR

TEM of kinetically stable α -synuclein oligomers, cat# SPR-484



STABLE

Size-exclusion chromatography after a freeze-thaw cycle (B) & after 37C incubation for 14 days (C)



TOXIC

Left: Primary rat dopaminergic neurons 11 days after treatment with control PBS buffer (control). **Right:** Primary rat dopaminergic neurons 11 days after treatment with 10 μ g/mL SPR-484. Arrows emphasize several regions of strong pSer129 pathology in MAP2 positive neurons.

*StressMarq's kinetically stable alpha synuclein oligomers are **toxic to dopaminergic neurons** and **induce phosphorylation of alpha synuclein Ser129**, a pathology associated with Parkinson's.*

*These alpha synuclein oligomers are **generated without the addition of any inducers or inhibitors.***

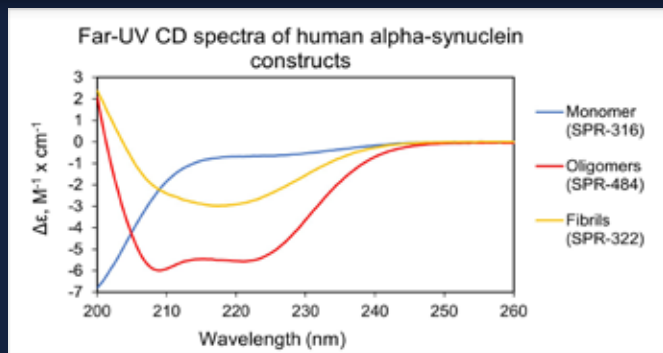
Catalog#	Product Name	Sizes*
SPR-484	Alpha Synuclein Oligomers (Kinetically Stable)	100ug 200ug 500ug

*Please inquire for bulk quantities.



Alpha Synuclein Oligomers, PFFs, Monomers

Distinct Secondary Structure Differences



Secondary structure as analyzed by CDNN deconvolution of 200-260nm spectral range

	Oligomers (SPR-484)	Fibrils (SPR-322)
Alpha helix	56%	24%
Beta sheet/turn	23%	40%
Random Coil	23%	31%
Total Sum	101%	96%

UV-CD data suggests that our Alpha Synuclein Oligomers have distinct secondary structure differences compared to monomers and fibrils. More specifically, our Kinetically Stable Alpha Synuclein Oligomers (cat#SPR-484) show a significantly higher alpha helix content and lower beta sheet/turn content than our Alpha Synuclein Pre-formed Fibrils (cat#SPR-322). Our Alpha Synuclein Monomers (cat#SPR-316) show a strong negative signal at 200 nm indicative of a disordered protein state (low secondary structure content).

Alpha Synuclein Oligomers

Description	Catalog#
Human Alpha Synuclein Oligomers (Kinetically Stable) NEW	SPR-484
Human Alpha Synuclein Oligomers (Dopamine HCl Stabilized)	SPR-466
Human Alpha Synuclein Oligomers (EGCG Stabilized)	SPR-469

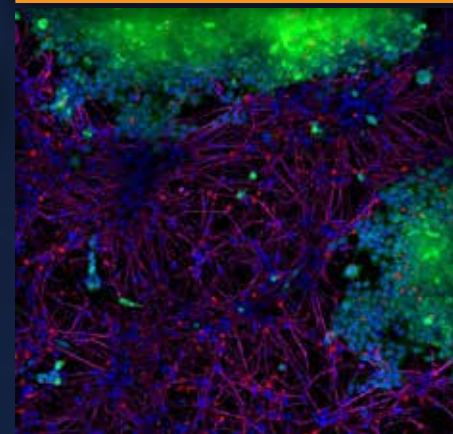
Alpha Synuclein Pre-formed Fibrils

Description	Catalog#
Human Alpha Synuclein Pre-formed Fibrils (Type 1)	SPR-322
Human Alpha Synuclein Pre-formed Fibrils (ATTO 594 conjugated, Type 1) NEW	SPR-322-A594
Mouse Alpha Synuclein Pre-formed Fibrils (Type 1)	SPR-324
Human Alpha Synuclein Pre-formed Fibrils (Type 2)	SPR-317
Human Alpha Synuclein N-Terminal Acetylated Pre-formed Fibrils (Type 1) NEW	SPR-332
Human Alpha Synuclein A53T Mutant Pre-formed Fibrils (Type 1)	SPR-326
Rat Alpha Synuclein Pre-formed Fibrils NEW	SPR-482
Human Alpha Synuclein Pre-formed Fibrils (Type 3)	SPR-448
Human Alpha Synuclein Filaments (Immature Fibrils)	SPR-450

Monomers

Description	Catalog#
Human Alpha Synuclein Monomers (Type 2)	SPR-316
Human Alpha Synuclein Monomers (Type 1)	SPR-321
Mouse Alpha Synuclein Monomers (Type 1)	SPR-323
Human Alpha Synuclein A53T Mutant Monomers (Type 1)	SPR-325
Human Alpha Synuclein N-Terminal Acetylated Monomers (Type 1) NEW	SPR-331
Rat Alpha Synuclein Monomers NEW	SPR-481

Cell-to-Cell Transmission of Pre-formed Fibrils



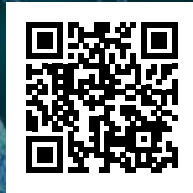
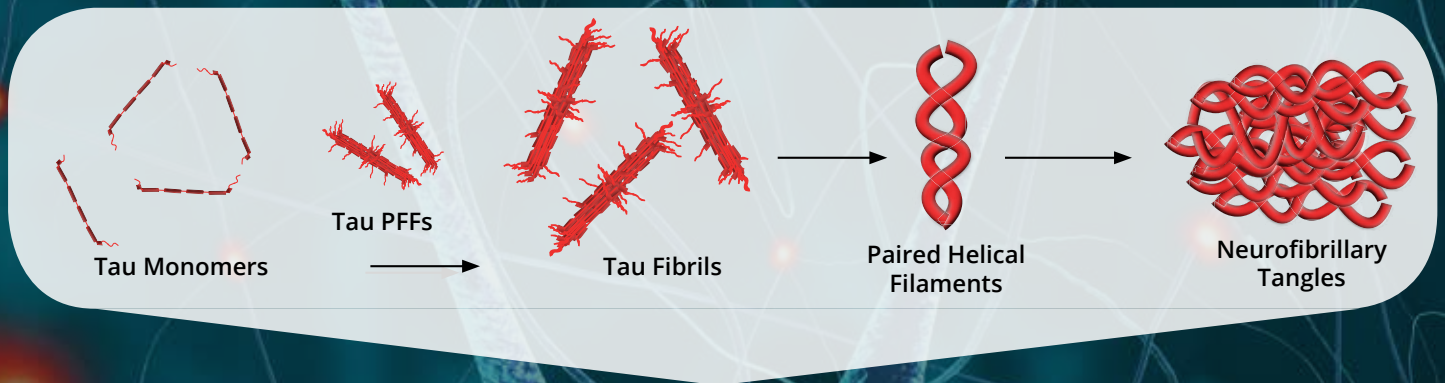
Hoechst/DNA | SHSY5Y-GFP | α -syn PFFs-555 | Tubulin

StressMarq's Alpha Synuclein PFFs (red) cat#SPR-322, were shown to be taken up by SH-SY5Y cells and transmitted to neuronal iPSCs within 14 days.



Tau

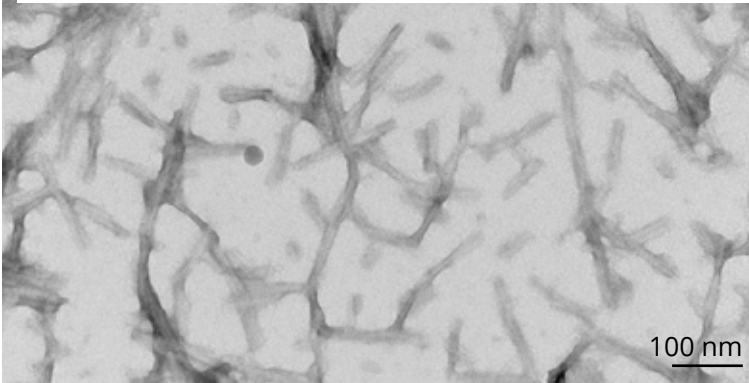
Reagents for Neurodegenerative Disease Research



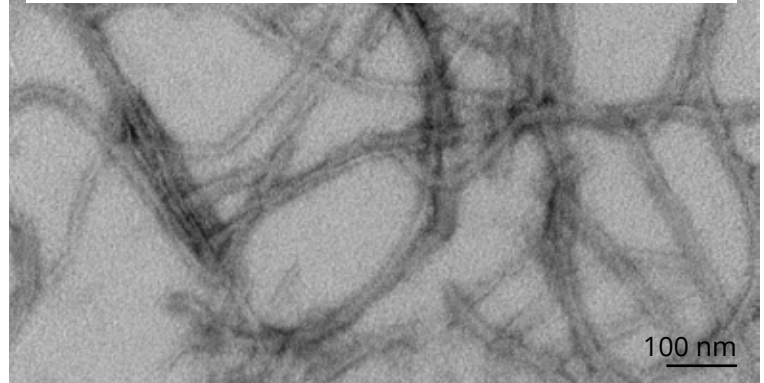
Tau Pre-formed Fibrils (PFFs)

Tau pre-formed fibrils (PFFs) seed fibrillization of tau monomers. Monomers and fibrils are available in both the full-length (2N4R/Tau441) and truncated forms (4R/K18 and dGAE). Both types of PFFs induce tau aggregation. Tau can be fibrillized using heparin or a linear anionic scaffold. Some varieties (dGAE WT and C322A, K18 Δ K280) fibrillize without a scaffold. A variety of mutants including P301L, P301S, C322A, and Δ K280 are also available. Full length P301S mutant Tau PFFs are also available labelled with ATTO 488 dye, giving them a fluorescent signal that can be tracked. Tau proteins can be expressed in E. coli and baculovirus. Baculovirus-expressed tau PFFs are endotoxin-free* and do not require a scaffold.

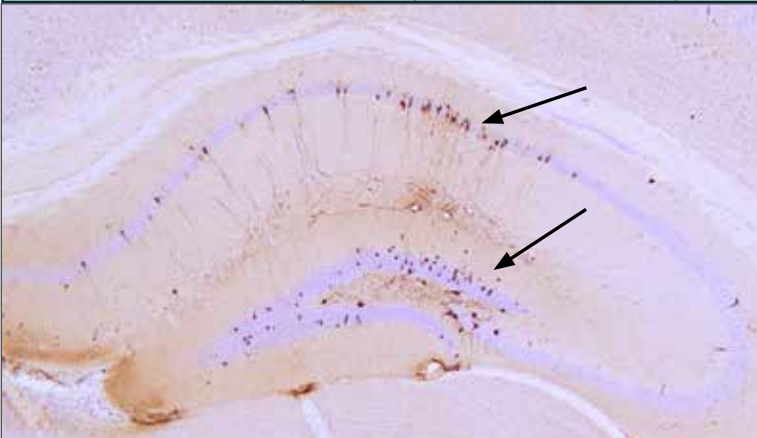
TEM of Tau441 (2N4R) P301S PFFs (cat#SPR-329)



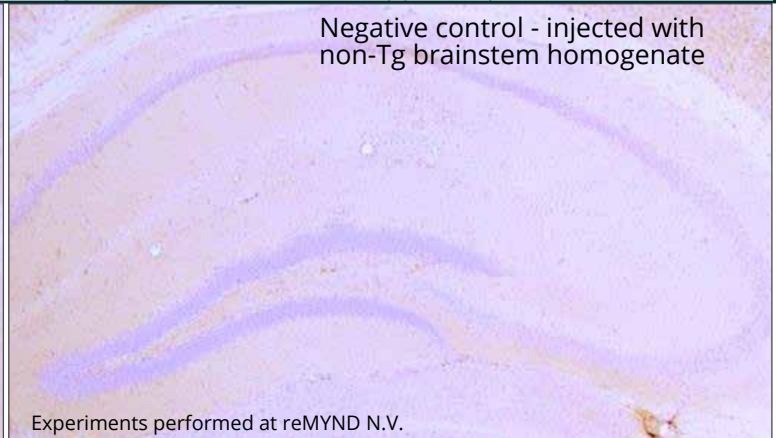
TEM of Tau (K18) P301L PFFs (cat#SPR-330)



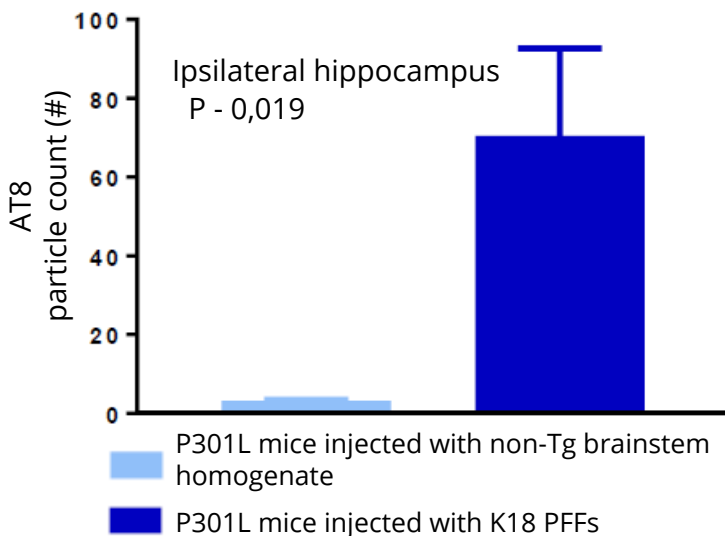
K18 P301L PFFs (cat#SPR-330) were injected into P301L mouse brains, where they seeded tau pathology within nine weeks. AT8 (pSer202/pThr205) tau antibody shows tangle-like inclusions in the hippocampus.



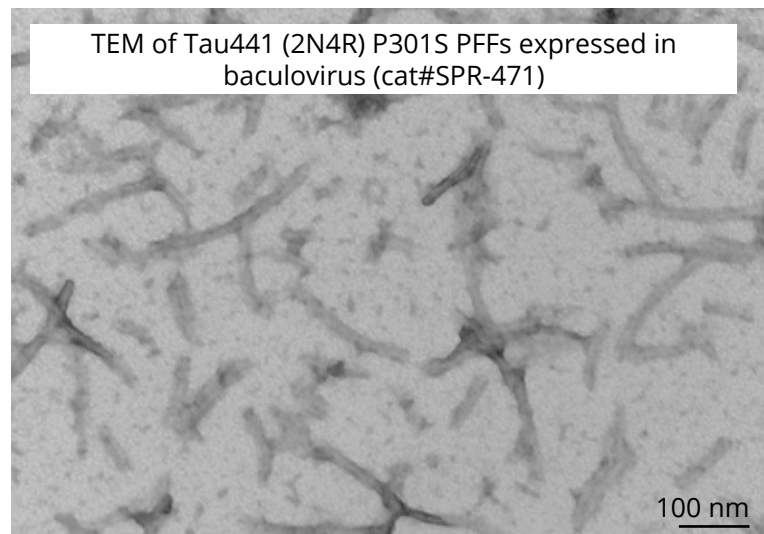
Negative control - injected with non-Tg brainstem homogenate



Experiments performed at reMYND N.V.



TEM of Tau441 (2N4R) P301S PFFs expressed in baculovirus (cat#SPR-471)

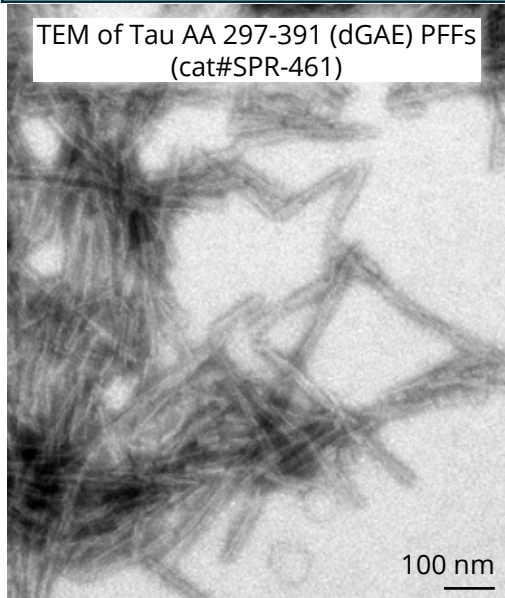


*Endotoxin <0.05 EU/mL, less than the detection limit of assay

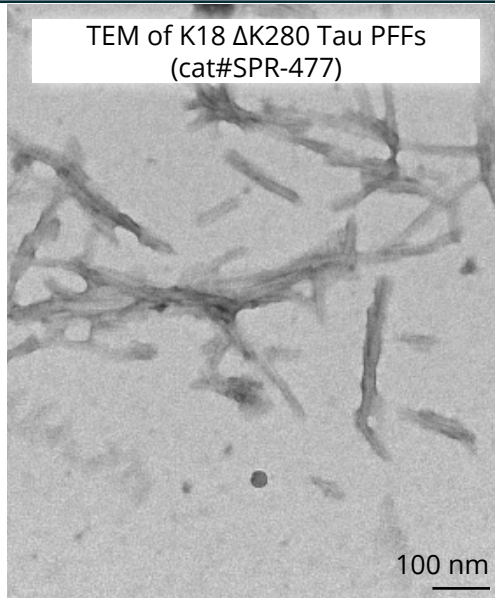
Tau Pre-formed Fibrils (PFFs) & Filaments

dGAE is a fragment of the tau protein consisting of amino acids 297-391. It is one of the core PHF subunits.¹ It includes both microtubule-binding domains and proline-rich regions and assembles into PHF-like fibrils in vitro without additives or templates. The C322A mutation increases tau's ability to form PHFs. K18 ΔK280 PFFs also fibrillize with no scaffold. Soluble tau filaments are made with a linear anionic scaffold.

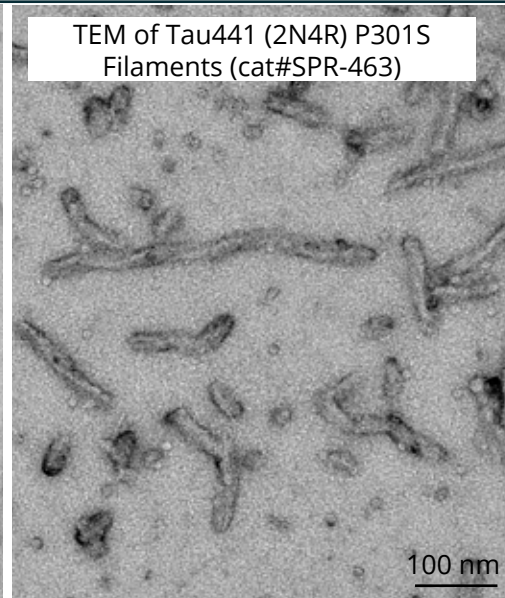
TEM of Tau AA 297-391 (dGAE) PFFs (cat#SPR-461)



TEM of K18 ΔK280 Tau PFFs (cat#SPR-477)



TEM of Tau441 (2N4R) P301S Filaments (cat#SPR-463)



Tau Monomers, Pre-formed Fibrils & Filaments

Monomers

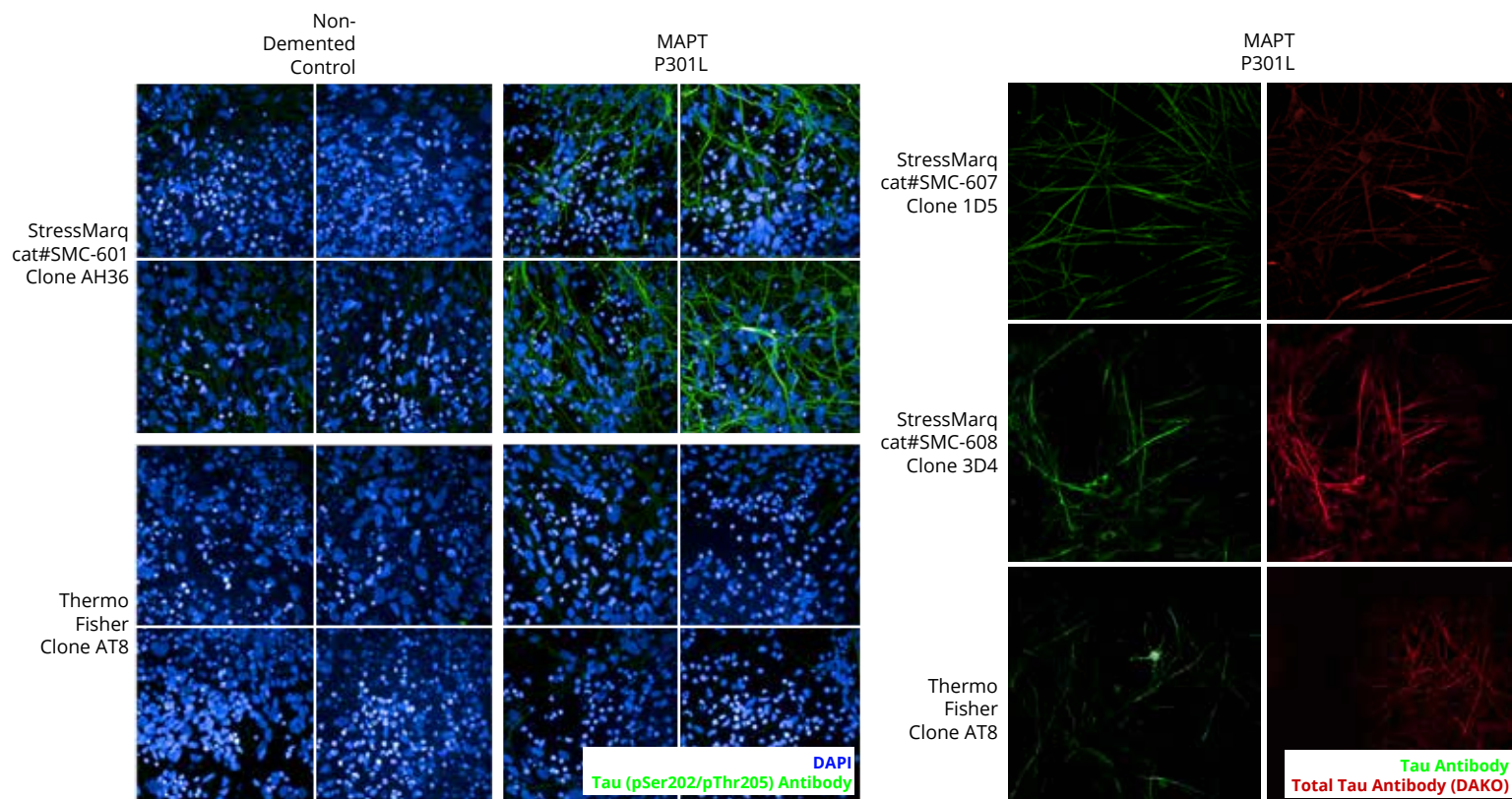
Product Description	Expression System	Catalog #
Human Tau441 (2N4R) Wild-Type Monomers	E. coli	SPR-479 NEW
Human Tau441 (2N4R) P301S Mutant Monomers	E. coli	SPR-327
Mouse Tau441 P301S Mutant Monomers	E. coli	SPR-474
Human Tau441 (2N4R) P301S Mutant	Baculovirus	SPR-473 NEW
Human Tau Truncated Fragment (AA297-391, dGAE) Monomers	E. coli	SPR-444
Human Tau Truncated Fragment (AA297-391, dGAE C322A) Monomers	E. coli	SPR-445
Human Tau (K18) P301L Mutant Monomers	E. coli	SPR-328
Human Tau (K18) ΔK280 Mutant Monomers	E. coli	SPR-476

Pre-formed Fibrils & Filaments

Product Description	Expression System	Catalog #
Human Tau441 (2N4R) Wild-Type Pre-formed Fibrils	E. coli	SPR-480 NEW
Human Tau441 (2N4R) P301S Mutant Pre-formed Fibrils	E. coli	SPR-329
Human Tau441 (2N4R) P301S Mutant Pre-formed Fibrils (conjugated with ATTO 488)	E. coli	SPR-329-A488 NEW
Human Tau441 (2N4R) P301S Pre-formed Fibrils	Baculovirus	SPR-471 NEW
Mouse Tau441 (2N4R) P301S Pre-formed Fibrils	E. coli	SPR-475
Human Tau Truncated Fragment (AA297-391) (dGAE) Pre-formed Fibrils	E. coli	SPR-461
Human Tau Truncated (AA297-391) (dGAE C322A) Pre-formed Fibrils	E. coli	SPR-462
Human Tau (K18) P301L Mutant Pre-formed Fibrils	E. coli	SPR-330
Human Tau (K18) ΔK280 Mutant Pre-formed Fibrils	E. coli	SPR-477
Human Tau441 (2N4R) P301S Mutant Filaments	E. coli	SPR-463

Tau Antibodies

Tau phosphorylation and fibrillization can be detected using monoclonal antibodies. Catalog# SMC-601 detects phosphorylation at Ser202 and Thr205, which occurs in PHF tau. Catalog# SMC-607 and catalog# SMC-608 were raised against Tau441(2N4R) P301S PFFs (cat#SPR-329). These antibodies were tested in iPSC-derived cortical neurons with and without the P301L mutation.



Tau Antibodies

Target	Clone	Host	Applications	Reactivity	Catalog #
Tau (pSer202/pThr205)	AH36	Rabbit	WB, DB, ICC/IF, ELISA	Hu	SMC-601
Tau (pSer396) NEW	Polyclonal	Rabbit	WB	Hu, Ms, Rt	SPC-1436
Tau (pSer422) NEW	Polyclonal	Rabbit	WB, IHC	Hu, Ms, Rt	SPC-1437
Tau (AA297-391) (dGAE)	Polyclonal	Rabbit	WB	Hu, Ms, Rt	SPC-806
Total Tau	3D4	Mouse	WB, DB, ICC/IF, ELISA	Hu, Ms, Rt	SMC-608
Tau	1D5	Mouse	WB, DB, ICC/IF, ELISA	Hu, Ms, Rt	SMC-607
Tau	Polyclonal	Rabbit	WB, IHC	Hu, Ms	SPC-801
Tau	Polyclonal	Rabbit	WB, IHC	Hu, Ms	SPC-802