Alpha Synuclein Protein

Human Recombinant Alpha Synuclein Oligomers (Kinetically Stable)
Catalog No. SPR-484

Product Name

Alpha Synuclein Protein

Description

Human Recombinant Alpha Synuclein Oligomers (Kinetically Stable)

Applications

WB, Native PAGE, In vivo assay, In vitro assay

Concentration

Lot/batch specific. See included datasheet.

Conjugates

No tag

Nature

Recombinant

Species

Human

Expression System

E. coli

Amino Acid Sequence

MDVFMKGLSK AKEGVVAAAE KTKQGVAEAA GKTKEGVLYV GSKTKEGVVH GVATVAEKTK EQVTNVGGAV VTGVTAVAQ K TVEGAGSIAA ATGFVKKDQL GKNEEGAPQE GILEDMPVDP DNEAYEMPSE EGYQDYEPEA

Purity

>95%

Protein Length

Full Length

Field Of Use

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

Properties

Storage Buffer

PB pH 7.4 (10 mM KH_2PO_4, 7.5 mM NaOH, pH 7.4)

Storage Temperature

-80ºC

Shipping Temperature

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

Purification

Ion-exchange Purified, monomer removed with 100K MWCO filter

Cite This Product

Human Recombinant Alpha Synuclein Oligomers (StressMarq Biosciences Inc., Victoria BC CANADA, Catalog # SPR-484)

Certificate Of Analysis

Certified >95% pure using Native-PAGE analysis.

Other Relevant Information

Kinetically stable a-syn oligomers are generated from monomer without an inducer/inhibitor, remain soluble oligomers for at least two weeks at 37 degrees, and are toxic to dopaminergic neurons.

Biological Description

Alternative Names

Alpha synuclein protein, Alpha-synuclein oligomer, Alpha synuclein protein oligomer, Alpha-synuclein protein, Non-A beta component of AD amyloid protein, Non-A4 component of amyloid precursor protein, NACP protein, SNCA protein, NACP protein, PARK1 protein, Alpha synuclein oligomers, Alpha Synuclein Protein Oligomers, SYN protein, Parkinson's disease familial 1 Protein

Research Areas

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

Cellular Localization

Cell membrane, Cytoplasm, Nucleus, Presynaptic Termini

Accession Number

NP_000336.1

Gene ID

6622

Swiss Prot

P37840

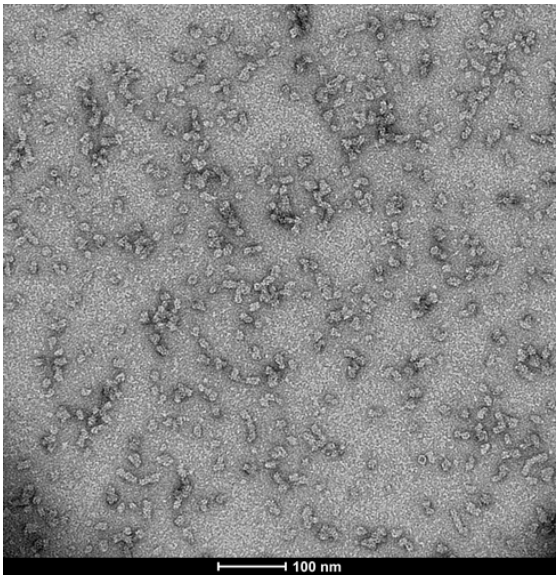
Scientific Background

Our kinetically stable oligomers of alpha-synuclein are generated without an inducer or inhibitor and remain stable for at least 2 weeks at 37oC. They present as globular structures under TEM, demonstrate toxicity in rat primary dopaminergic neurons and induce Parkinson's-associated alpha synuclein phosphoserine 129 pathology. These oligomers have been previously characterized as globular, cylindrical structures with a beta-sheet structure intermediate between monomers and fibrils, and were demonstrated to have a higher toxicity to neurons than alpha-synuclein fibrils (1,2). Alpha-Synuclein (SNCA) is expressed predominantly in the brain, where it is concentrated in presynaptic nerve terminals (3). Alpha-synuclein is highly expressed in the mitochondria of the olfactory bulb, hippocampus, striatum and thalamus (4). Functionally, it has been shown to significantly interact with tubulin (5), and may serve as a potential microtubule-associated protein. It has also been found to be essential for normal development of the cognitive functions; inactivation may lead to impaired spatial learning and working memory (6). SNCA fibrillar aggregates represent the major non A-beta component of Alzheimer's disease amyloid plaque, and a major component of Lewy body inclusions, and Parkinson's disease. Parkinson's disease (PD) is a common neurodegenerative disorder characterized by the progressive accumulation in selected neurons of protein inclusions containing alpha-synuclein and ubiquitin (7, 8).

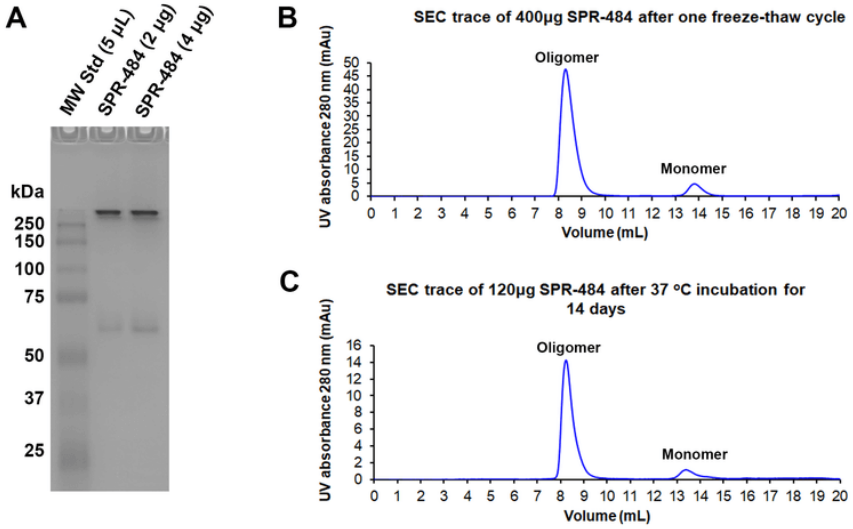
References

1. Chen, S.W., et. al. (2015). PNAS. E1994-E2003.
2. Lorenzen, N., et. al. (2014). JACS. 136: 3859-3868.
3. "Genetics Home Reference: SNCA". US National Library of Medicine. (2013).
4. Zhang L., et al. (2008) Brain Res. 1244: 40-52.
5. Alim M.A., et al. (2002) J Biol Chem. 277(3): 2112-2117.
6. Kokhan V.S., Afanasyeva M.A., Van'kin G. (2012) Behav. Brain. Res. 231(1): 226-230.
7. Spillantini M.G., et al. (1997) Nature. 388(6645): 839-840.
8. Mezey E., et al. (1998) Nat Med. 4(7): 755-757.

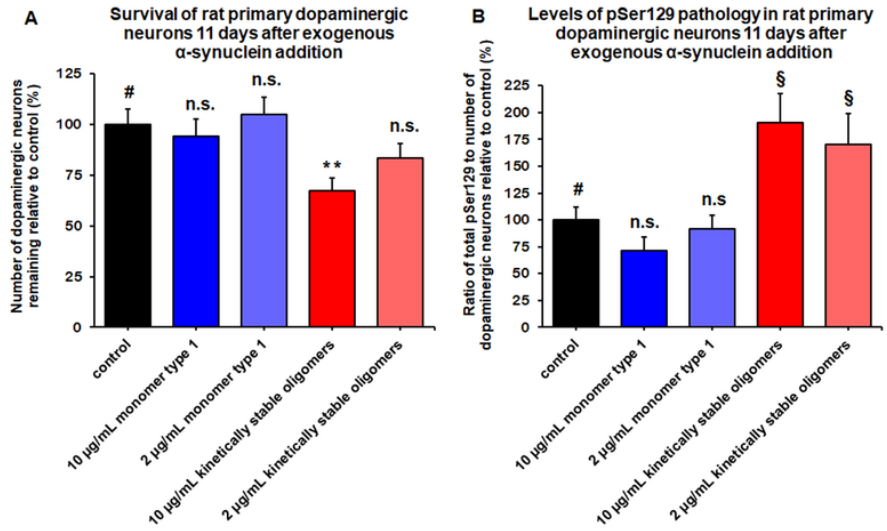
Product Images



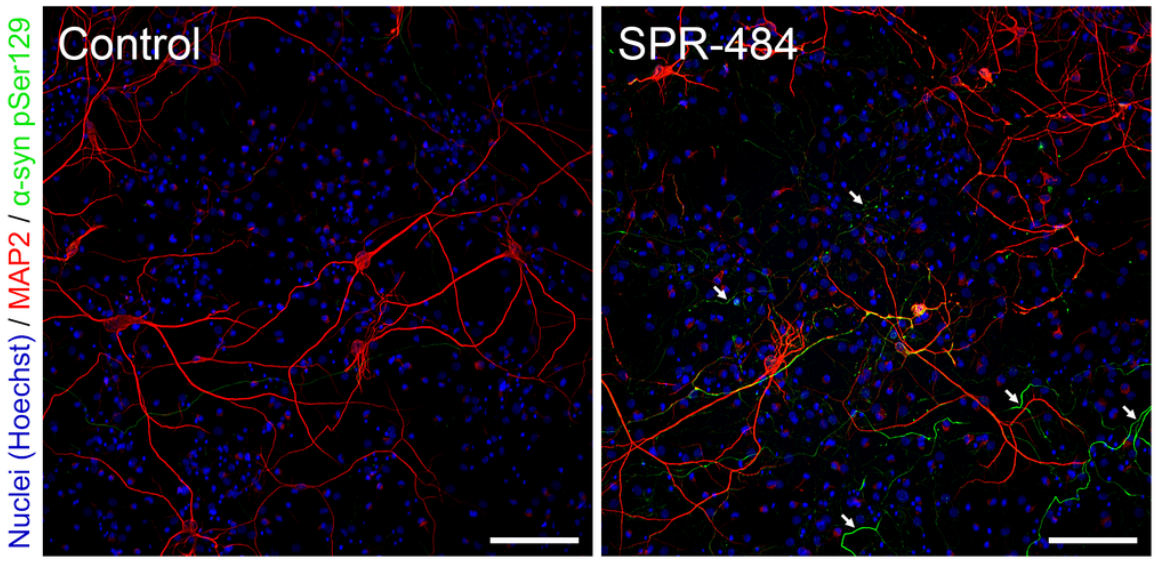
TEM of kinetically stable alpha-synuclein oligomers (SPR-484). Negative stain transmission electron microscopy images of SPR-484 acquired at 80 Kv on carbon coated 400 mesh copper grids using phosphotungstic acid and uranyl acetate stain.



Kinetically stable alpha-synuclein oligomers (SPR-484) are stable after a freeze-thaw cycle and when incubated at 37 oC for 2 weeks. Tris-Gylcine Native PAGE migration of kinetically stable alpha-synuclein oligomers after a freeze-thaw cycle (A). Size-exclusion chromatography of SPR-484 after a freeze-thaw cycle (B) and 37oC incubation for 14 days (C). By peak area, approximately 90% of SPR-484 remains oligomeric after freeze-thaw and 37oC treatments. SEC was performed on Superdex 200 10/300 GL Increase column in phosphate buffer pH 7.4. Note: Monomeric alpha-synuclein is an intrinsically disordered 14 kDa protein. Due to its extended confirmation in solution, migration of free monomeric alpha-synuclein is similar to that of a globular 60 kDa protein on Native PAGE and SEC.



Kinetically stable alpha-synuclein oligomers (SPR-484) are toxic to dopaminergic neurons and induce phosphorylation of alpha-synuclein Ser129, a pathology associated with Parkinson's disease. Survival of rat primary dopaminergic neurons 11 days after treatment quantified by anti-MAP2 antibody and expressed as a percentage of control (A). Levels of alpha-synuclein pSer129 present in rat primary dopaminergic neurons 11 days after treatment quantified by ratio of anti-alpha-synuclein pSer129 antibody to anti-MAP2 antibody expressed as a percentage of control (B). Mean +/- s.e.m; ** $p<0.01$ stats vs control, one-way Anova followed by Dunnett's test; § $p<0.05$, stats vs control, Student's t-test. Data is representative of n=6 experimental repeats for each condition; # represents control, n.s. indicates not significant $p>0.05$.



Representative immunohistochemistry images of Parkinson's-associated pSer129 pathology induced in rat primary dopaminergic cells by kinetically stable alpha-synuclein oligomers (SPR-484). Primary rat dopaminergic neurons 11 days after treatment with control PBS buffer (A). Primary rat dopaminergic neurons 11 days after treatment with 10 µg/mL SPR-484 (B). Nuclei appear blue (Hoechst), dopaminergic neurons appear red (MAP2) and pathology appears green (α-syn pSer129). Both cultures treated with chicken polyclonal anti-MAP-2 antibody, mouse monoclonal anti-αsyn pSer129-specific antibody, Alexa Fluor

488 goat anti-mouse IgG, Alexa Fluor 647 goat anti-chicken IgG, and fluorescent marker Hoechst in the same solution. White arrows emphasize several regions of strong pSer129 pathology. Scale bar represents 100 µm. Note: SPR-484 is generated recombinantly in E.coli and is non-phosphorylated prior to addition on neurons.

Product Citations (0)

Currently there are no citations for this product.

Reviews

There are no reviews yet.