

Product Information

Anti-phospho-Synapsin I (pSer⁶⁰³)

Developed in Rabbit, Affinity Isolated Antibody

Product Number **S 8192**

Product Description

Anti-phospho-Synapsin I (pSer⁶⁰³) is developed in rabbit using as immunogen a synthetic phosphorylated peptide derived from the region of rat synapsin I that is phosphorylated on serine 603. The antiserum is affinity purified using epitope-specific affinity chromatography with the phosphopeptide column followed by the non-phosphorylated peptide column. Anti-phospho-Synapsin I (pSer⁶⁰³) specifically recognizes rat synapsin I (78 kDa) phosphorylated at serine 603. It does not crossreact with the non-phosphorylated synapsin I. It is likely to detect human, mouse, chicken and *Xenopus* synapsin I based on sequence homology. It is used in immunoblotting, immunocytochemistry, immunoprecipitation and ELISA applications.

Synapsins constitute a family of synaptic vesicle phosphoproteins that are thought to regulate two distinct cellular functions: neuronal development and synaptic transmission. Synapsins are major components of mature nerve terminals, where they are highly enriched on small synaptic vesicles. Overexpression of synapsins leads to presynaptic differentiation in cell lines and accelerated synaptogenesis in embryonic cell cultures, whereas reduction of synapsins leads to delayed neuronal differentiation, axonal outgrowth and synaptogenesis. The dynamic association of synapsins with synaptic vesicles correlates with their role in activity-dependent plasticity and provides a potential new approach to neuronal regeneration after injury and in neurodegenerative diseases. Synapsin I plays a key role in the regulation of nerve terminal function in mature synapses, as well as a function in neuronal development.¹⁻³

Only two domains are conserved in all synapsins: a short N-terminal A domain with a single phosphorylation site for cAMP-dependent protein kinase (PKA) and CaM Kinase I, and a large central C domain that binds ATP and may be enzymatic. Serine 603 is phosphorylated by Ca²⁺-calmodulin-dependent protein kinase II (CAMKII) and may be alternatively phosphorylated by p21-activated kinases (PAKs) in neuronal cells in response to some stimulants.⁴ Dephosphorylation of Ser 603 is accomplished by protein phosphatase 2A (PP2A). In isolated nerve

terminals, rapid changes in synapsin I phosphorylation were observed on this site after Ca²⁺ entry.⁵ Phosphospecific synapsin antibodies will further the studies of the mechanism of neuronal growth and regeneration.⁶

Reagent

Anti-phospho-Synapsin I (Ser⁶⁰³) is supplied as a solution in 10 mM HEPES buffer, pH 7.5 containing 150 mM NaCl, 100 µg/ml bovine serum albumin and 50% glycerol.

Storage/Stability

Store at -20 °C. For extended storage, upon initial thawing, freeze in working aliquots. Do not store in frost-free freezers. Avoid repeated freezing and thawing to prevent denaturing the antibody. Working dilution samples should be discarded if not used within 12 hours. The antibody is stable for at least 6 months when stored appropriately.

Product Profile

A recommended working dilution of 1:1000 is determined by immunoblotting using rat brain hippocampal tissue homogenate. The same working dilution is recommended for immunocytochemistry, immunoprecipitation and ELISA applications.

Note: In order to obtain best results in different techniques and preparations we recommend determining optimal working concentration by titration test.

References

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3. Kao, H. T., et al., A protein kinase A-dependent molecular switch in synapsins regulates neurite outgrowth, *Nature Neurosci.*, **5**, 431-437 (2002).

4. Sakurada, K., et al., Synapsin I Is Phosphorylated at Ser⁶⁰³ by p21-activated Kinases (PAKs) *in Vitro* and in PC12 Cells Stimulated with Bradykinin. J. Biol. Chem., **277**, 45473 – 45479 (2002).
5. Jovanovic, J. N., et al., Opposing changes in phosphorylation of specific sites in synapsin I during Ca²⁺-dependent glutamate release in isolated nerve terminals, J. Neurosci., **21**, 7944-7953 (2001).
6. Menegon, A., et al., Use of phosphosynapsin I-specific antibodies for image analysis of signal transduction in single nerve terminals, J. Cell. Sci., **113**, 3573-3582 (2000).

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