

SYP (2): sc-136271

BACKGROUND

Synaptic vesicles participate in a cycle of fusion with the plasma membrane and reformation by endocytosis. Synaptic vesicle protein synaptophysin (SYP) is targeted to early endosomes in transfected fibroblasts and in neuroendocrine cells. SYP is an N-glycosylated integral membrane protein found in neurons and endocrine cells that associates into hexamers to form a large conductance channel. SYP contains four transmembrane domains and may function as a gap junction-like channel. Membrane cholesterol specifically interacts with SYP to play a role in vesicle formation. Synaptobrevin (VAMP) also binds to SYP and the resultant complex is upregulated during neuronal development, but is absent in exocytosis fusion complex. Thus, the synaptophysin-synaptobrevin complex is not essential for exocytosis, but rather provides a pool of synaptobrevin for exocytosis. In addition, the tail domain of brain Myosin V also forms a stable complex with synaptobrevin II and SYP, and this complex is disassembled upon the depolarization-induced entry of Ca²⁺ into intact nerve endings.

REFERENCES

1. Cowan, D., et al. 1990. Torpedo synaptophysin: evolution of a synaptic vesicle protein. *Brain Res.* 509: 1-7.
2. Linstedt, A.D. and Kelly, R.B. 1991. Endocytosis of the synaptic vesicle protein, synaptophysin, requires the COOH-terminal tail. *J. Physiol.* 85: 90-96.
3. Calakos, N. and Scheller, R.H. 1994. Vesicle-associated membrane protein and synaptophysin are associated on the synaptic vesicle. *J. Biol. Chem.* 269: 24534-24537.
4. Leimer, U., et al. 1996. Synthesis of the mammalian synaptic vesicle protein synaptophysin in insect cells: a model for vesicle biogenesis. *Exp. Cell Res.* 224: 88-95.
5. Prekeris, R. and Terrian, D.M. 1997. Brain Myosin V is a synaptic vesicle-associated motor protein: evidence for a Ca²⁺-dependent interactions with the synaptobrevin-synaptophysin complex. *J. Cell Biol.* 137: 1589-1601.
6. Becher, A., et al. 1999. The synaptophysin-synaptobrevin complex: a hallmark of synaptic vesicle maturation. *J. Neurosci.* 19: 1922-1931.
7. Huttner, W.B. and Schmidt, A. 2000. Lipids, lipid modification and lipid-protein interaction in membrane budding and fission—insights from the roles of endophilin A1 and synaptophysin in synaptic vesicle endocytosis. *Curr. Opin. Neurobiol.* 10: 543-551.

CHROMOSOMAL LOCATION

Genetic locus: SYP (human) mapping to Xp11.23; Syp (mouse) mapping to X A1.1.

SOURCE

SYP (2) is a mouse monoclonal antibody raised against amino acids 205-306 of SYP of rat origin.

PRODUCT

Each vial contains 50 µg IgG₁ in 0.5 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

APPLICATIONS

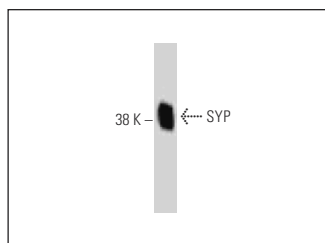
SYP (2) is recommended for detection of SYP of mouse, rat and human origin by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000), immunoprecipitation [1-2 µg per 100-500 µg of total protein (1 ml of cell lysate)] and immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500).

Suitable for use as control antibody for SYP siRNA (h): sc-36597, SYP siRNA (m): sc-36596, SYP shRNA Plasmid (h): sc-36597-SH, SYP shRNA Plasmid (m): sc-36596-SH, SYP shRNA (h) Lentiviral Particles: sc-36597-V and SYP shRNA (m) Lentiviral Particles: sc-36596-V.

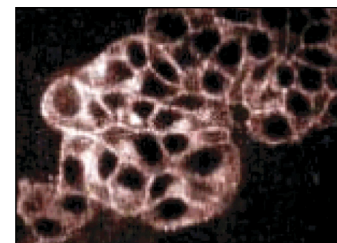
Molecular Weight of SYP: 38-48 kDa.

Positive Controls: SH-SY5Y cell lysate: sc-3812, IMR-32 cell lysate: sc-2409 or rat cerebellum extract: sc-2398.

DATA



SYP (2): sc-136271. Western blot analysis of SYP expression in rat cerebellum tissue extract.



SYP (2): sc-136271. Immunofluorescence staining of PC-12 cells showing cytoplasmic localization.

SELECT PRODUCT CITATIONS

1. Boczek, T., et al. 2012. Downregulation of PMCA2 or PMCA3 reorganizes Ca²⁺ handling systems in differentiating PC12 cells. *Cell Calcium* 52: 433-444.
2. Wang, Z., et al. 2018. Bafilomycin A1 alleviates depression-like symptoms in chronic unpredictable mild stress rats. *Mol. Med. Rep.* 18: 4587-4594.
3. Shakova, F.M., et al. 2021. Protective effects of PGC-1α activators on ischemic stroke in a rat model of photochemically induced thrombosis. *Brain Sci.* 11: 325.

STORAGE

Store at 4° C, **DO NOT FREEZE**. Stable for one year from the date of shipment. Non-hazardous. No MSDS required.

RESEARCH USE

For research use only, not for use in diagnostic procedures. Not for resale.



See **SYP (D-4): sc-17750** for SYP antibody conjugates, including AC, HRP, FITC, PE, and Alexa Fluor[®] 488, 546, 594, 647, 680 and 790.