

Synaptophysin1

Cat.No. 101 011; Monoclonal mouse antibody, 50 µg purified IgG (lyophilized)

Data Sheet

Reconstitution/ Storage	50 µg purified IgG, lyophilized. Albumin and azide were added for stabilization. For reconstitution add 50 µl H ₂ O to get a 1mg/ml solution in PBS. Then aliquot and store at -20°C to -80°C until use. Antibodies should be stored at +4°C when still lyophilized. Do not freeze! For detailed information, see back of the data sheet.
Applications	WB: 1 : 10000 (AP staining) IP: yes ICC: 1 : 100 up to 1 : 1000 IHC: 1 : 500 up to 1 : 1000 IHC-P: 1 : 500 up to 1 : 1000 ExM: yes (see remarks) EM: yes ELISA: yes (see remarks)
Clone	7.2
Subtype	IgG1 (λ light chain)
Immunogen	Full-length recombinant rat Synaptophysin (UniProt Id: P07825)
Epitop	AA 219 to 307 from rat Synaptophysin1 (UniProt Id: P07825) corresponding to the cytoplasmic tail.
Reactivity	Reacts with: human (P08247), rat (P07825), mouse (Q62277), mammals. Weaker signal: zebrafish, other vertebrates. Other species not tested yet.
Specificity	K.O. validated PubMed: 31940485
Remarks	Widely used as marker for nerve terminals and neuroendocrine tumors. For unknown reason, neuronal synaptophysin is better recognised than neuroendocrine synaptophysin. If this is a problem, the polyclonal rabbit antibody, cat. no. 101 002 or 101 203 are recommended. ExM: This antibody has been successfully used for the epitope-preserving magnified analysis of the proteome (eMAP) expansion microscopy method (Park et al. 2021. PMID: 34767453). Variance from the standard protocol: Expansion solution for imaging: 0.02X PBS ELISA: Suitable as capture antibody for sandwich-ELISA with cat. no. 101 002 as detector antibody. The ELISA-protocol for membrane proteins is recommended.

TO BE USED IN VITRO / FOR RESEARCH ONLY
NOT TOXIC, NOT HAZARDOUS, NOT INFECTIOUS, NOT CONTAGIOUS

Background

Synaptophysin1, also referred to as **p38-1**, is a membrane glycoprotein of synaptic vesicles that is ubiquitously expressed in all neurons and in many endocrine cells. It is currently the most widely used marker for nerve terminals and probably the best marker for the pathologist in differentiating neuroendocrine tumors.

Synaptophysin1 has four transmembrane domains with both N- and C-terminus facing the cytoplasm. It binds to synaptobrevin1 and synaptobrevin2 in detergent extracts but its function has not been elucidated completely. It forms a complex with dynamin at high Ca²⁺ concentration suggesting an involvement in synaptic vesicle endocytosis. As typical for synaptic vesicle proteins, synaptophysin1 represents a small protein family with two additional members, synaptoporin (synaptophysin2) and panthophysin. Like synaptophysin1, synaptoporin is widely expressed in neurons and colocalizes with synaptophysin1 on synaptic vesicles whereas panthophysin is expressed in all tissues.

Selected References for 101 011

SV2B regulates synaptotagmin 1 by direct interaction.
Lazzell DR, Belizaire R, Thakur P, Sherry DM, Janz R

The Journal of biological chemistry (2004) 27950: 52124-31. . **IHC, IP, WB**

Composition of isolated synaptic boutons reveals the amounts of vesicle trafficking proteins.

Wilhelm BG, Mandat S, Truckenbrodt S, Kröhnert K, Schäfer C, Rammner B, Koo SJ, Claßen GA, Krauss M, Haucke V, Urlaub H, et al.

Science (New York, N.Y.) (2014) 3446187: 1023-8. . **WB, ICC, IHC; tested species: mouse, rat**

Synaptic membrane proteins form stable microdomains in early endosomes.

Geumann U, Schäfer C, Riedel D, Jahn R, Rizzoli SO

Microscopy research and technique (2010) 736: 606-17. . **EM, ICC**

Liprin-α proteins are master regulators of human presynapse assembly.

Marcó de la Cruz B, Campos J, Molinaro A, Xie X, Jin G, Wei Z, Acuna C, Sterky FH

Nature neuroscience (2024) : . . **WB, ICC; tested species: human**

Molecular definition of distinct active zone protein machineries for Ca²⁺ channel clustering and synaptic vesicle priming.

Emperador-Melero J, Andersen JW, Metzbowser SR, Levy AD, Dharmasri PA, de Nola G, Blanpied TA, Kaeser PS

bioRxiv : the preprint server for biology (2023) : . . **WB, ICC; tested species: mouse**

The ER ladder is a unique morphological feature of developing mammalian axons.

Zamponi E, Meehl JB, Voeltz GK

Developmental cell (2022) 5711: 1369-1382.e6. . **WB, ICC; tested species: rat**

Identification of substrates of palmitoyl protein thioesterase 1 highlights roles of depalmitoylation in disulfide bond formation and synaptic function.

Gorenberg EL, Massaro Tieze S, Yücel B, Zhao HR, Chou V, Wirak GS, Tomita S, Lam TT, Chandra SS

PLoS biology (2022) 203: e3001590. . **WB, ICC; tested species: mouse**

Cooperative function of synaptophysin and synapsin in the generation of synaptic vesicle-like clusters in non-neuronal cells.

Park D, Wu Y, Lee SE, Kim G, Jeong S, Milovanovic D, Camilli P, Chang S

Nature communications (2021) 121: 263. . **WB, ICC; tested species: cos cells**

Multomics of synaptic junctions reveals altered lipid metabolism and signaling following environmental enrichment.

Borgmeyer M, Coman C, Has C, Schött HF, Li T, Westhoff P, Cheung YFH, Hoffmann N, Yuanxiang P, Behnisch T, Gomes GM, et al.

Cell reports (2021) 371: 109797. . **ICC, IHC; tested species: mouse, rat**

PKC-phosphorylation of Liprin-α3 triggers phase separation and controls presynaptic active zone structure.

Emperador-Melero J, Wong MY, Wang SSH, de Nola G, Nyitrai H, Kirchhausen T, Kaeser PS

Nature communications (2021) 121: 3057. . **WB, ICC; tested species: mouse**

Access the online factsheet including applicable protocols at <https://sysy.com/product/101011> or scan the QR-code.



FAQ - How should I store my antibody?

Shipping Conditions

- All our antibodies and control proteins / peptides are shipped lyophilized (vacuum freeze-dried) and are stable in this form without loss of quality at ambient temperatures for several weeks.

Storage of Sealed Vials after Delivery

- **Unlabeled** and **biotin-labeled antibodies** and **control proteins** should be stored at 4°C before reconstitution. **They must not be stored in the freezer when still lyophilized!** Temperatures below zero may cause loss of performance.
- **Fluorescence-labeled antibodies** should be reconstituted immediately upon receipt. Long term storage (several months) may lead to aggregation.
- **Control peptides** should be kept at -20°C before reconstitution.

Long Term Storage after Reconstitution (General Considerations)

- The storage freezer must not be of the frost-free variety ("no-frost freezer"). This cycle between freezing and thawing (to reduce frost-build-up), which is exactly what should be avoided. For the same reason, antibody vials should be placed in an area of the freezer that has minimal temperature fluctuations, for instance towards the back rather than on a door shelf.
- Aliquot the antibody and store frozen (-20°C to -80°C). Avoid very small aliquots (below 20 µl) and use the smallest storage vial or tube possible. The smaller the aliquot, the more the stock concentration is affected by evaporation and adsorption of the antibody to the surface of the storage vial or tube. Adsorption of the antibody to the surface leads to a substantial loss of activity.
- The addition of glycerol to a final concentration of 50% lowers the freezing point of your stock and keeps your antibody at -20°C in liquid state. This efficiently avoids freeze and thaw cycles.

Product Specific Hints for Storage

Control proteins / peptides

- Store at -20°C to -80°C.

Monoclonal Antibodies

- **Ascites** and **hybridoma supernatant** should be stored at -20°C up to -80°C. **Prolonged storage at 4°C is not recommended!** Unlike serum, ascites may contain proteases that will degrade the antibodies.
- **Purified IgG** should be stored at -20°C up to -80°C. Adding a carrier protein like BSA will increase long term stability. Many of our antibodies already contain carrier proteins. Please refer to the data-sheet for detailed information.

Polyclonal Antibodies

- **Crude antisera:** With anti-microbials added, they may be stored at 4°C. However, frozen storage (-20°C up to -80°C) is preferable.
- **Affinity purified antibodies:** Less robust than antisera. Storage at -20°C up to -80°C is recommended. Adding a carrier protein like BSA will increase long term stability. Most of our antibodies already contain carrier proteins. Please refer to the data-sheet for detailed information.

Fluorescence-labeled Antibodies

- Store as a liquid with 1 : 1 (v/v) glycerol at -20°C. Protect these antibodies from light exposure.

Avoid repeated freeze-thaw cycles for all antibodies!

FAQ - How should I reconstitute my antibody?

Reconstitution

- All our purified antibodies are lyophilized from PBS. To reconstitute the antibody in PBS, add the amount of deionized water given in the respective datasheet. If higher volumes are preferred, add water as mentioned above and then the desired amount of PBS and a stabilizing carrier protein (e.g. BSA) to a final concentration of 2%. Some of our antibodies already contain albumin. Take this into account when adding more carrier protein. For complete reconstitution, carefully remove the lid. After adding water, briefly vortex the solution. You can spin down the liquid by placing the vial into a 50 ml centrifugation tube filled with paper.
- If desired, add small amounts of azide or thimerosal to prevent microbial growth. This is especially recommended if you want to keep an aliquot a 4°C.
- After reconstitution of fluorescence-labeled antibodies, add 1 : 1 (v/v) glycerol to a final concentration of 50%. This lowers the freezing point of your stock and keeps your antibody in liquid state at -20°C.
- Glycerol may also be added to unlabeled primary antibodies. It is a suitable way to avoid freeze-thaw cycles.
- Please refer to our **tips and hints for subsequent storage** of reconstituted antibodies and control peptides and proteins.