

Synapsin1

Cat.No. 106 103; Polyclonal rabbit antibody, 50 µg specific antibody (lyophilized)

Data Sheet

Reconstitution/ Storage	50 µg specific antibody, lyophilized. Affinity purified with the immunogen. 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 : 1000 (AP staining) IP: yes ICC: 1 : 500 IHC: 1 : 500 IHC-P: 1 : 500
Immunogen	Synthetic peptide corresponding to AA 445 to 462 from mouse Synapsin1 (UniProt Id: O88935)
Reactivity	Reacts with: human (P17600), rat (P09951), mouse (O88935), pig, zebrafish. Other species not tested yet.
Specificity	Specific for synapsins 1a and 1b, no cross-reactivity to synapsin 2a/b. K.O. validated
Matching control	106-1P

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

Background

Synapsins are neuron-specific phosphoproteins that play a fundamental role in synaptic vesicle trafficking and neurotransmitter release. They are exclusively associated with small synaptic vesicles in presynaptic terminals, with little or no expression in non-neuronal tissues including neuroendocrine cells (1–4). In mammals, three distinct genes—SYN1, SYN2, and SYN3—encode more than eight isoforms through alternative splicing. Synapsin1 is one of the most specific markers of synapses throughout both the central and peripheral nervous systems. In addition to presynaptic terminals, it is localized to sensory nerve endings and peripheral innervation of the gastrointestinal tract, including the small intestine, where it contributes to neurotransmitter release in enteric and extrinsic nerves (2,3). Two splice variants, synapsin1a and synapsin1b, interact with synaptic vesicle membranes and the cytoskeletal proteins actin and spectrin (1). Synapsin2, also expressed in the nervous system, exists in at least two splice variants, whereas synapsin3 displays a more restricted distribution, being enriched in hippocampal neurons and developing neural circuits (4).

Synapsins are major neuronal phosphoproteins and substrates of several kinases, including PKA, CaMK I, and CaMK II, with synapsin1 serving as a reference substrate for calmodulin-dependent protein kinases (1,4). Beyond their established neuronal role, recent studies have implicated synapsins in glioblastoma biology. In particular, synapsin3 has been shown to promote neuronal-like differentiation of glioblastoma stem cells by antagonizing Notch signaling, thereby reducing tumor stemness and progression (5). Moreover, glioblastoma cells can exploit synaptic communication pathways, underscoring a broader role for synaptic proteins in tumor growth and plasticity (6).

Selected References for 106 103

Neuronal SphK1 acetylates COX2 and contributes to pathogenesis in a model of Alzheimer's Disease. Lee JY, Han SH, Park MH, Baek B, Song IS, Choi MK, Takuwa Y, Ryu H, Kim SH, He X, Schuchman EH, et al. Nature communications (2018) 9: 1479. . **WB, IHC; tested species: mouse**

Synaptic vesicle characterization of iPSC-derived dopaminergic neurons provides insight into distinct secretory vesicle pools. Fujise K, Mishra J, Rosenfeld MS, Rafiq NM. NPJ Parkinson's disease (2025) 11: 16. . **ICC, EM; tested species: human**

Learning and memory deficits and alzheimer's disease-like changes in mice after chronic exposure to microcystin-LR. Wang J, Chen Y, Zhang C, Xiang Z, Ding J, Han X. Journal of hazardous materials (2019) 373: 504-518. . **WB, ICC; tested species: mouse**

Human cerebral organoids model tumor initiation and infiltration in an autologous astrocyte-supported setting. Schickel E, Bender T, Kaysan L, Hufgard S, Mayer M, Grosshans DR, Thielemann C, Schroeder IS. iScience (2025) 289: 113334. . **ICC, IHC; tested species: human**

Harnessing synaptic vesicle release and recycling with antibody shuttle for targeted delivery of therapeutics to neurons. Yee KKL, Kumamoto J, Inomata D, Suzuki N, Harada R, Yumoto N. Molecular therapy. Methods & clinical development (2025) 332: 101476. . **ICC; tested species: human**

CXCL12 Engages Cortical Inhibitory Neurons to Enhance Dendritic Spine Plasticity and Structured Network Activity. Ho C, Luchetta J, Nash B, Festa LK, Johnson JA, Sacan A, Jackson JG, Sanz-Clemente A, Brandimarti R, Meucci O. The Journal of neuroscience : the official journal of the Society for Neuroscience (2025) 4524: . . **ICC; tested species: rat**

Transcriptional regulation by PHGDH drives amyloid pathology in Alzheimer's disease. Chen J, Hadi F, Wen X, Zhao W, Xu M, Xue S, Lin P, Calandrelli R, Richard JLC, Song Z, Li J, et al. Cell (2025) : . . **IHC; tested species: mouse, human**

Functional specificity of liquid-liquid phase separation at the synapse. Guzikowski NJ, Kavalali ET. Nature communications (2024) 15: 10103. . **ICC; tested species: rat**

Access the online factsheet including applicable protocols at <https://sysy.com/product/106103> 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.