SYSY Antibodies

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Synapsin1

Cat.No. 106 011C2; Monoclonal mouse antibody, 100 µg purified IgG (lyophilized)

Data Sheet

Reconstitution/ Storage	100 µg purified IgG, lyophilized, fluorescence-labeled with Cyanine 2. Albumin was added for stabilization. For **reconstitution** add 100 µl H_2O to get a 1mg/ml solution in PBS. Either add 1:1 (v/v) glycerol, then aliquot and store at -20°C until use, or store aliquots at -80°C without additives. Reconstitute immediately upon receipt! Avoid bright light when working with the antibody to minimize photo bleeching of the fluorescent dye. For detailed information, see back of the data sheet.
Applications	**WB**: N/A **IP**: N/A **ICC**: 1 : 100 up to 1 : 2000 **IHC**: 1 : 100 up to 1 : 500 **IHC-P (FFPE)**: not tested yet
Label	Cyanine 2
Clone	46.1
Subtype	IgG1
Immunogen	full-length recombinant rat Synapsin1 (UniProt Id: P09951)
Epitop	AA 435 to 475 from rat Synapsin1 (UniProt Id: P09951)
Reactivity	Reacts with: human (P17600), rat (P09951), mouse (O88935), mammals. Weaker signal: zebrafish, chicken, other vertebrates. Other species not tested yet.
Specificity	Specific for synapsin 1a and 1b independent of phosphorylation state. K.O. validated

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 011C2

Control of synaptic vesicle release probability via VAMP4 targeting to endolysosomes.
Ivanova D, Dobson KL, Gajbhiye A, Davenport EC, Hacker D, Ultanir SK, Trost M, Cousin MA
Science advances (2021) 718: . . **ICC, IHC; tested species: mouse**

miRNA profiling of hiPSC-derived neurons from monozygotic twins discordant for schizophrenia.
Räsänen N, Tiihonen J, Koskuvi M, Trontti K, Cheng L, Hill AF, Lehtonen Š, Vaurio O, Ojansuu I, Lähteenvuo M, Pietiläinen O, et al.
Schizophrenia (Heidelberg, Germany) (2025) 111: 21. . **ICC; tested species: human**

Developmental defects and impaired network excitability in a cerebral organoid model of KCNJ11 p.V59M-related neonatal diabetes.
Dalgin G, Tryba AK, Cohen AP, Park SY, Philipson LH, Greeley SAW, Garcia AJ
Scientific reports (2021) 111: 21590. . **IHC; tested species: human**

Actions of Rab27B-GTPase on mammalian central excitatory synaptic transmission.
Arias-Hervert ER, Xu N, Njus M, Murphy GG, Hou Y, Williams JA, Lentz SI, Ernst SA, Stuenkel EL
Physiological reports (2020) 89: e14428. . **IHC; tested species: mouse**

Selected General References

A phospho-switch controls the dynamic association of synapsins with synaptic vesicles.
Hosaka M et al. Neuron (1999) PubMed:10571231

Synapsin III promotes neuronal-like transdifferentiation of glioblastoma stem cells by disrupting JAG1-Notch1 interaction.
Deng Y et al. Neuro Oncol (2025) PubMed:39994412

Integrated proteogenomic characterization of glioblastoma evolution.
Kim KH et al. Cancer Cell (2024) PubMed:38215747

Access the online factsheet including applicable protocols at https://sysy.com/product/106011C2 or scan the QR-code.

FAQ - How should I store my antibody?

Shipping Conditions

- All SYSY antibodies and control proteins/peptides are shipped lyophilized (vacuum freeze-dried). In this form, they remain stable 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. **Do not freeze lyophilized antibodies**. Temperatures below 0°C may impair performance.
- **Fluorescence-labeled antibodies** should be reconstituted immediately upon receipt. Long-term storage of lyophilized fluorophore-conjugates may cause aggregation.
- **Control peptides** should be stored at -20°C before reconstitution.

Long Term Storage after Reconstitution (General Considerations)

- **Do not use frost-free ("no-frost") freezers.** These units periodically warm to remove ice buildup, causing freeze–thaw cycles that can damage antibodies.
- Store vials in areas with minimal temperature fluctuation - preferably toward the back of the freezer, not on the door.
- Aliquot reconstituted antibodies and store at –20°C to –80°C.
- Avoid very small aliquots (<20 µL), as evaporation and adsorption to tube surfaces can reduce antibody concentration and activity.
- Use the smallest practical storage vial to minimize surface area.
- Adding glycerol to a final concentration of 50% prevents freezing at -20°C, allowing storage in liquid form and effectively avoiding freeze–thaw cycles.

Product Specific Hints for Storage

Control proteins / peptides

- Store at -20°C to -80°C

Monoclonal Antibodies

- **Ascites and hybridoma supernatant:** Store at -20°C to -80°C
  Prolonged storage at 4°C is not recommended, as proteases present in ascites may degrade antibodies.
- **Purified IgG:** Store at -20°C to -80°C
  Adding a carrier protein (e.g., BSA) enhances long-term stability.
  Many SYSY antibodies already contain carrier proteins - refer to the respective datasheet for details.

Polyclonal Antibodies

- **Crude antisera:** Can be stored at 4°C with antimicrobials added, but -20°C to -80°C is preferred
- **Affinity-purified antibodies:** Less stable than antisera; store at -20°C to -80°C
  Adding a carrier protein such as BSA improves long-term stability.
  Most SYSY antibodies already contain carrier proteins - refer to the respective datasheet for details.

Fluorescence-labeled Antibodies

- Store as a liquid with 1:1 (v/v) glycerol at -20°C, and protect from light exposure

Avoid repeated freeze-thaw cycles for all antibodies!

FAQ - How should I reconstitute my antibody?

Reconstitution

- All purified SYSY antibodies are lyophilized from PBS. To reconstitute the antibody in PBS, add the volume of deionized water specified in the corresponding datasheet. If a larger final volume is desired, first add the recommended amount of water, then adjust with PBS and, if needed, add a stabilizing carrier protein (e.g., BSA) to a final concentration of 2%. Some SYSY antibodies already contain albumin; please take this into account before adding additional carrier protein.

For complete reconstitution, carefully remove the vial cap. After adding water, briefly vortex the solution. To collect the liquid at the bottom of the vial, place the vial inside a 50 ml centrifuge tube padded with paper and centrifuge briefly.

- If desired, small amounts of azide or thimerosal may be added to prevent microbial growth. This is particularly recommended when storing an aliquot at 4°C.
- After reconstitution of fluorescence-labeled antibodies, add glycerol 1:1 (v/v) to achieve a final concentration of 50%. This prevents freezing at –20°C and keeps the antibody in liquid form, effectively avoiding freeze–thaw cycles.
- Glycerol may also be added to unlabeled primary antibodies as a general measure to prevent freeze–thaw damage.
- For further guidance, please refer to our **storage tips** and recommendations for reconstituted antibodies, control peptides, and control proteins.