

## Synapsin1/2

Cat.No. 106 003; 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 <b>reconstitution</b> add 50 µl H <sub>2</sub> 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	<b>WB:</b> 1 : 1000 (AP staining) <b>IP:</b> yes <b>ICC:</b> 1 : 500 <b>IHC:</b> 1 : 500 <b>IHC-P:</b> 1 : 500 <b>DNA-PAINT:</b> yes (see remarks) <b>Clarity:</b> 1 : 200 (see remarks) <b>ELISA:</b> yes (see remarks)
Immunogen	Synthetic peptide corresponding to AA 2 to 28 from rat Synapsin1 (UniProt Id: P09951)
Reactivity	Reacts with: human (P17600, Q92777), rat (P09951, Q63537), mouse (O88935, Q64332), hamster, cow, zebrafish. Other species not tested yet.
Specificity	Specific for synapsins 1a/b and 2a/b. K.O. validated
Matching control	106-0P
Remarks	<b>DNA-PAINT:</b> This antibody has been successfully used for DNA-PAINT application (see Unterauer et al., 2024; <a href="#">PMID: 38552614</a> ). <b>Clarity:</b> This antibody has been successfully used for CLARITY application in human brain (Woelfle et al., 2023; <a href="#">PMID: 37221592</a> ). <b>ELISA:</b> Suitable as detector antibody for sandwich-ELISA with cat. no. <a href="#">106 011</a> as capture 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

**Synapsins** are neuron-specific phosphoproteins that are exclusively associated with small synaptic vesicles, with little or no expression in other tissues including neuroendocrine cells. In mammals, three distinct synapsin genes (synapsin 1, 2, and 3) encode more than eight neuronal isoforms.

**Synapsin 1** is one of the most specific markers of synapses throughout the central and peripheral nervous system. In addition to synaptic nerve terminals, the protein is also present in certain sensory nerve endings. It is expressed in two splice variants (synapsin 1a and synapsin 1b). Synapsin 1 interacts with vesicle membranes as well as with actin and spectrin.

**Synapsin 2** is expressed in the nervous system and also two splice variants were described so far, while synapsin 3 shows a more restricted expression pattern and is mainly found in the hippocampus. Synapsins are major phosphoproteins and are substrates for several protein kinases such as PKA, CaMK I and CaMK II. Synapsin 1 is widely used as reference substrate for calmodulin-dependent protein kinases.

### Selected References for 106 003

SHANK3 Antibody Validation: Differential Performance in Western Blotting, Immunocyto- and Immunohistochemistry. Lutz AK, Bauer HF, Ioannidis V, Schön M, Boeckers TM  
Frontiers in synaptic neuroscience (2022) 14: 890231. . **ICC, IHC; tested species: mouse**

Spatial proteomics in neurons at single-protein resolution. Unterauer EM, Shetab Boushehri S, Jevdokimenko K, Masullo LA, Ganji M, Sograte-Idrissi S, Kowalewski R, Strauss S, Reinhardt SCM, Perovic A, Marr C, et al.  
Cell (2024) 1877: 1785-1800.e16. . **DNA\_PAINT; tested species: rat**

CLARITY increases sensitivity and specificity of fluorescence immunostaining in long-term archived human brain tissue. Woelfle S, Deshpande D, Feldengut S, Braak H, Del Tredici K, Roselli F, Deisseroth K, Michaelis J, Boeckers TM, Schön M  
BMC biology (2023) 211: 113. . **CLARITY; tested species: human**

A CRHR1 antagonist prevents synaptic loss and memory deficits in a trauma-induced delirium-like syndrome. Cursano S, Battaglia CR, Urrutia-Ruiz C, Grabrucker S, Schön M, Bockmann J, Braumüller S, Radermacher P, Roselli F, Huber-Lang M, Boeckers TM, et al.  
Molecular psychiatry (2020) : . . **WB; tested species: mouse**

Protocol for SUM-PAINT spatial proteomic imaging generating neuronal architecture maps in rat hippocampal neurons. Unterauer EM, Schentarra EM, Jevdokimenko K, Boushehri SS, Marr C, Opazo F, Fornasiero EF, Jungmann R  
STAR protocols (2025) 61: 103637. . **DNA\_PAINT; tested species: rat**

3D bioprinting of human neural tissues with functional connectivity. Yan Y, Li X, Gao Y, Mathivanan S, Kong L, Tao Y, Dong Y, Li X, Bhattacharyya A, Zhao X, Zhang SC, et al.  
Cell stem cell (2024) 312: 260-274.e7. . **ICC; tested species: human**

Activity-Dependent Nucleation of Dynamic Microtubules at Presynaptic Boutons Controls Neurotransmission. Qu X, Kumar A, Blockus H, Waites C, Bartolini F  
Current biology : CB (2019) : . . **ICC; tested species: rat**

Loss of X-linked Protocadherin-19 differentially affects the behavior of heterozygous female and hemizygous male mice. Hayashi S, Inoue Y, Hattori S, Kaneko M, Shioi G, Miyakawa T, Takeichi M  
Scientific reports (2017) 71: 5801. . **ICC; tested species: mouse**

Selective Localization of Shanks to VGLUT1-Positive Excitatory Synapses in the Mouse Hippocampus. Heise C, Schroeder JC, Schoen M, Halbedl S, Reim D, Woelfle S, Kreutz MR, Schmeisser MJ, Boeckers TM  
Frontiers in cellular neuroscience (2016) 10: 106. . **IHC**

Access the online factsheet including applicable protocols at <https://sysy.com/product/106003> 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.