

ZnT3

Cat.No. 197 003; Polyclonal rabbit antibody, 50 µg specific antibody (lyophilized)

Data Sheet

Reconstitution/ Storage	50 µg specific antibody, lyophilized. Affinity purified with the immunogen. Albumin was 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 : 100 up to 1 : 500 IHC: 1 : 100 up to 1 : 500 IHC-P: 1 : 500
Immunogen	Recombinant protein corresponding to AA 2 to 75 from mouse ZnT3 (UniProt Id: P97441)
Reactivity	Reacts with: rat (Q6QIX3), mouse (P97441). No signal: zebrafish. Other species not tested yet.
Specificity	K.O. validated PubMed: 35263617
Matching control	197-0P

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

Background

The essential micronutrient zinc (Zn²⁺) plays an important role in many biological processes like growth, development, and reproduction. It is found in the active site of many enzymes, where ionization, polarization or replacement of Zn²⁺ bound water is involved in catalytic reactions. As a charged ion Zn²⁺ cannot cross biological membranes by simple diffusion and must be transported by specialized transport mechanisms. Two families of Zn²⁺ transporters, SLC30 (ZnT, Zn²⁺ transporter) and SLC39 (ZIP, Zinc (Zn²⁺)-Iron (Fe²⁺) permease), function in opposite directions to maintain cellular Zn²⁺ homeostasis (1).

Ten Zn²⁺ transporter proteins **ZnT1-10** have been described. All of them contain several transmembrane domains and a histidine rich intracellular loop (2).

In the central nervous system Zn²⁺ plays important roles in synaptic function and plasticity. At synapses Zn²⁺ is stored in synaptic vesicles by a mechanism depending on the integral membrane protein **ZnT3** (3). ZnT3 probably contributes to the prevention of aging-related cognitive loss, because ZnT3 expression levels fall with age and in patients with Alzheimer's or Parkinson's disease. Consistent with these results, aged ZnT3-KO mice exhibit deficits in learning and memory (3). ZnT3, along with other ZnT family members, is expressed in several endocrine organs, including the pituitary gland, adrenal glands, and thyroid but is absent in the pancreas (4). This transporter also plays an essential role in reproductive health as some studies have demonstrated ZnT3 expression in the ovary. It was reported that ZnT3 is expressed in mouse oocytes throughout all stages of follicular development, where it likely supports Zn²⁺ accumulation necessary for oocyte maturation. Disruption of ZnT3 in oocytes leads to impaired zinc storage, potentially compromising fertility (5). Interestingly, while ZnT3 mRNA is expressed in testis, no protein was detectable. This discrepancy between mRNA and protein levels highlights the importance of post-transcriptional regulation and protein stability in determining ZnT3's functional presence in reproductive tissues (6).

Selected References for 197 003

Colocalization of different neurotransmitter transporters on synaptic vesicles is sparse except for VGLUT1 and ZnT3. Upmanyu N, Jin J, Emde HV, Ganzella M, Bösch L, Malviya VN, Zhuleku E, Politi AZ, Ninov M, Silbern I, Leutenegger M, et al. Neuron (2022) : . . **WB, ICC; KO verified; tested species: rat**

Trans-synaptic Association of Vesicular Zinc Transporter 3 and Shank3 Supports Synapse-Specific Dendritic Spine Structure and Function in the Mouse Auditory Cortex. Manning A, Bender PTR, Boyd-Pratt H, Mendelson BZ, Hruska M, Anderson CT The Journal of neuroscience : the official journal of the Society for Neuroscience (2024) 4428: . . **WB, IHC; KO verified; tested species: mouse**

Chemogenetics with PSAM4-GlyR decreases excitability and epileptiform activity in epileptic hippocampus. Gonzalez-Ramos A, Berglind F, Kudláček J, Rocha ER, Melin E, Sebastião AM, Valente CA, Ledri M, Andersson M, Kokaia M Gene therapy (2024) : . . **IHC; tested species: mouse**

Gao1 and Gao2 deletion differentially affect hippocampal mossy fiber tract anatomy and neuronal morphogenesis. Hölte M, Wolkowicz A, Brunk I, Baron J, Ahnert-Hilger G Journal of neurochemistry (2024) : . . **IHC; tested species: mouse**

Regulation of hippocampal mossy fiber-CA3 synapse function by a Bcl11b/C1ql2/Nrxn3(25b+) pathway. Koumoundourou A, Rannap M, De Bruyckere E, Nestel S, Reissner C, Egorov AV, Liu P, Missler M, Heimrich B, Draguhn A, Britsch S, et al. eLife (2024) 12: . . **IHC; tested species: mouse**

Access the online factsheet including applicable protocols at <https://sysy.com/product/197003> 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 at 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.