SYSY Antibodies

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GABA-A receptor γ2 extracellular

Cat.No. 224 004; Polyclonal Guinea pig antibody, 100 µl antiserum (lyophilized)

Data Sheet

Reconstitution/ Storage	100 µl antiserum, lyophilized. For **reconstitution** add 100 µl H_2O, then aliquot and store at -20°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 : 100 up to 1 : 1:500 (AP staining) (see remarks) **IP**: yes **ICC**: 1 : 500 (see remarks) **IHC**: 1 : 500 up to 1 : 2000 (see remarks) **IHC-P (FFPE)**: not tested yet **IHC-Fr**: 1 : 500 (see remarks)
Immunogen	Synthetic peptide corresponding to AA 39 to 67 from mouse GABA-A receptor γ2 (UniProt Id: P22723)
Reactivity	Reacts with: human (P18507), rat (P18508), mouse (P22723). Other species not tested yet.
Specificity	Specific for GABA-A receptor γ2. Does not discriminate between the L and S form.
Matching control	224-0P
Remarks	**WB**: To avoid protein aggregation, do not heat samples for SDS-PAGE. The antibody is less sensitive in westernblotting compared to the rabbit antibody (cat. no. 224 003). **ICC**: This antibody can be used for the surface staining of living cells. **IHC**: Antigen retrieval with citrate buffer pH 6 is required. **IHC-Fr**: 4% formaldehyde/PFA fixation is recommended.

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

Background

Gamma-**a**mino**b**utyric **a**cid type **A** (**GABA-A**) receptors mediate the majority of inhibitory neurotransmission in the brain. These receptor proteins are ligand gated chloride ion channels and consist of a pentameric combination of different subunits (alpha, beta, **gamma**, delta, epsilon and rho). The resulting heterogenous population of GABA-A receptor subtypes are expressed throughout the brain with specific cellular and subcellular expression patterns.

Selected References for 224 004

The kinesin KIF21B participates in the cell surface delivery of γ2 subunit-containing GABAA receptors.
Labonté D, Thies E, Kneussel M
European journal of cell biology () 938-9: 338-46. . **IP, ICC**

Distinct mechanisms drive sequential internalization and degradation of GABAARs during global ischemia and reperfusion injury.
Garcia JD, Wolfe SE, Stewart AR, Tiemeier E, Gookin SE, Guerrero MB, Quillinan N, Smith KR
iScience (2023) 2610: 108061. . **ICC, UPTAKE; tested species: rat**

Nanoscale Subsynaptic Domains Underlie the Organization of the Inhibitory Synapse.
Crosby KC, Gookin SE, Garcia JD, Hahm KM, Dell'Acqua ML, Smith KR
Cell reports (2019) 2612: 3284-3297.e3. . **ICC, IHC; tested species: rat**

Estradiol modulates the efficacy of synaptic inhibition by decreasing the dwell time of GABAA receptors at inhibitory synapses.
Mukherjee J, Cardarelli RA, Cantaut-Belarif Y, Deeb TZ, Srivastava DP, Tyagarajan SK, Pangalos MN, Triller A, Maguire J, Brandon NJ, Moss SJ, et al.
Proceedings of the National Academy of Sciences of the United States of America (2017) 11444: 11763-11768. . **ICC, WB**

TRPM2 and CaMKII Signaling Drives Excessive GABAergic Synaptic Inhibition Following Ischemia.
Burch AM, Garcia JD, O'Leary H, Haas A, Orfila JE, Tiemeier E, Chalmers N, Smith KR, Quillinan N, Herson PS
The Journal of neuroscience : the official journal of the Society for Neuroscience (2024) 4419: . . **ICC, UPTAKE; tested species: mouse**

Artemisinin-treatment in pre-symptomatic APP-PS1 mice increases gephyrin phosphorylation at Ser270: a modification regulating postsynaptic GABAAR density.
Kiss E, Kins S, Gorgas K, Orlik M, Fischer C, Endres K, Schlicksupp A, Kirsch J, Kuhse J
Biological chemistry (2021) : . . **ICC, IHC; tested species: mouse,rat**

Artesunate restores the levels of inhibitory synapse proteins and reduces amyloid-β and C-terminal fragments (CTFs) of the amyloid precursor protein in an AD-mouse model.
Kiss E, Kins S, Zöller Y, Schilling S, Gorgas K, Groß D, Schlicksupp A, Rosner R, Kirsch J, Kuhse J
Molecular and cellular neurosciences (2021) 113: 103624. . **WB, IHC; tested species: mouse**

Gephyrin filaments represent the molecular basis of inhibitory postsynaptic densities.
Macha A, Liebsch F, Bruckisch EHW, Burdina N, von Stülpnagel I, Benting K, Gunkel M, Behrmann E, Schwarz G
Nature communications (2025) 161: 8293. . **ICC; tested species: mouse**

Nexilin regulates cell surface expression of extrasynaptic GABAA receptors by binding to actin.
Bright DP, Schulte C, Halff EF, Lumb MJ, Kittler JT, Maric HM, Smart TG
Neuropharmacology (2025) 279: 110633. . **ICC; tested species: rat**

Structural and functional reorganization of inhibitory synapses by activity-dependent cleavage of neuroligin-2.
Xu N, Cao R, Chen SY, Gou XZ, Wang B, Luo HM, Gao F, Tang AH
Proceedings of the National Academy of Sciences of the United States of America (2024) 12118: e2314541121. . **ICC; tested species: mouse**

ATAD1 Regulates Neuronal Development and Synapse Formation Through Tuning Mitochondrial Function.
Yan HH, He JJ, Fu C, Chen JH, Tang AH
International journal of molecular sciences (2024) 261: . . **ICC; tested species: rat**

Access the online factsheet including applicable protocols at https://sysy.com/product/224004 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.