SYSY Antibodies

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GAD2 (GAD65)

Cat.No. 198 104; 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 : 1000 (AP staining) **IP**: yes **ICC**: 1 : 500 up to 1 : 2000 **IHC**: 1 : 500 **IHC-P**: 1 : 300 **ExM**: external data
Immunogen	Recombinant protein corresponding to the amino terminus of mouse GAD2 (UniProt Id: P48320)
Reactivity	Reacts with: human (Q99259), rat (P18088), mouse (P48318). Other species not tested yet.
Specificity	Specific for GAD 2 / GAD 65.
Matching control	198-1P

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

Background

The **g**lutamic **a**cid **d**ecarboxylases GAD1 and GAD2, also referred to as GAD67 and GAD65 respectively, synthesize γ-aminobutyric acid (GABA), the major inhibitory neurotransmitter in the central nervous system. Therefore, GADs are widely used markers for the GABAergic system (1). The hydrophilic GAD1 can heterodimerize with the membrane achored GAD2 and a part of GAD1 is targeted to inhibitory nerve terminals by this mechanism (2). Although both proteins exhibit significant differences in their N-terminus they share high homology in the rest of the molecule (3).
GAD1 and 2 also occur in rodent pancreatic islets of Langerhans, whereas human islets mainly express GAD2 which has been identified as a major autoantigen in type 1 diabetes (3).

Selected References for 198 104

Nrg1 haploinsufficiency alters inhibitory cortical circuits.
Navarro-Gonzalez C, Carceller H, Benito Vicente M, Serra I, Navarrete M, Domínguez-Canterla Y, Rodríguez-Prieto Á, González-Manteiga A, Fazzari P
Neurobiology of disease (2021) 157: 105442. . **WB, IHC; tested species: mouse**

Cerebrospinal fluid-contacting neuron tracing reveals structural and functional connectivity for locomotion in the mouse spinal cord.
Nakamura Y, Kurabe M, Matsumoto M, Sato T, Miyashita S, Hoshina K, Kamiya Y, Tainaka K, Matsuzawa H, Ohno N, Ueno M, et al.
eLife (2023) 12: . . **IHC, EXM; tested species: mouse**

Structure of excitatory synapses and GABAA receptor localization at inhibitory synapses are regulated by neuroplastin-65.
Herrera-Molina R, Sarto-Jackson I, Montenegro-Venegas C, Heine M, Smalla KH, Seidenbecher CI, Beesley PW, Gundelfinger ED, Montag D
The Journal of biological chemistry (2014) 28913: 8973-88. . **ICC; tested species: mouse**

Control of contextual memory through interneuronal α5-GABAA receptors.
Zhu M, Abdulzahir A, Perkins MG, Chu CC, Krause BM, Casey C, Lennertz R, Ruhl D, Hentschke H, Nagarajan R, Chapman ER, et al.
PNAS nexus (2023) 24: pgad065. . **IHC; tested species: mouse**

Neuronal Autophagy Regulates Presynaptic Neurotransmission by Controlling the Axonal Endoplasmic Reticulum.
Kuijpers M, Kochlamazashvili G, Stumpf A, Puchkov D, Swaminathan A, Lucht MT, Krause E, Maritzen T, Schmitz D, Haucke V
Neuron (2021) 1092: 299-313.e9. . **ICC; tested species: mouse**

GABA bouton subpopulations in the human dentate gyrus are differentially altered in mesial temporal lobe epilepsy.
Alhourani A, Fish KN, Wozny TA, Sudhakar V, Hamilton RL, Richardson RM
Journal of neurophysiology (2020) 1231: 392-406. . **IHC; tested species: human**

Optogenetic "low-theta" pacing of the septohippocampal circuit is sufficient for spatial goal finding and is influenced by behavioral state and cognitive demand.
Mouchati PR, Kloc ML, Holmes GL, White SL, Barry JM
Hippocampus (2020) 3011: 1167-1193. . **IHC; tested species: rat**

Assemblies of Perisomatic GABAergic Neurons in the Developing Barrel Cortex.
Modol L, Bollmann Y, Tressard T, Baude A, Che A, Duan ZRS, Babij R, De Marco García NV, Cossart R
Neuron (2020) 1051: 93-105.e4. . **IHC; tested species: mouse**

Diazepam Accelerates GABAAR Synaptic Exchange and Alters Intracellular Trafficking.
Lorenz-Guertin JM, Bambino MJ, Das S, Weintraub ST, Jacob TC
Frontiers in cellular neuroscience (2019) 13: 163. . **ICC; tested species: rat**

The X-Linked Intellectual Disability Gene Zdhhc9 Is Essential for Dendrite Outgrowth and Inhibitory Synapse Formation.
Shimell JJ, Shah BS, Cain SM, Thouta S, Kuhlmann N, Tatarnikov I, Jovellar DB, Brigidi GS, Kass J, Milnerwood AJ, Snutch TP, et al.
Cell reports (2019) 298: 2422-2437.e8. . **ICC; tested species: rat**

Access the online factsheet including applicable protocols at https://sysy.com/product/198104 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.