SYSY Antibodies

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Kv3.1b

Cat.No. 242 003; 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 **reconstitution** add 50 µl H_2O 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 : 500 **IHC**: 1 : 200 up to 1 : 500 **IHC-P (FFPE)**: not tested yet **ExM**: external data (see remarks) **EM**: external data (see remarks)
Immunogen	Synthetic peptide corresponding to AA 567 to 585 from mouse Kv3.1b (UniProt Id: P15388)
Reactivity	Reacts with: human (P48547), rat (P25122), mouse (P15388), cow. No signal: zebrafish. Other species not tested yet.
Specificity	K.O. validated PubMed: 35510987
Matching control	242-0P
Remarks	**ExM**: This antibody has been successfully applied and published for this method by customers (see application-specific references). **EM**: This antibody has been successfully applied and published for this method by customers (see application-specific references).

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

Background

Voltage-gated potassium (Kv) channels regulate many aspects of neuronal excitability like shaping of action potentials or modulating spike patterns.
Mammalian neurons express more than 20 different Kv subunits that can be subdivided into 12 families. Heteromeric assembly of 4 subunits and differential phosphorylation of Kv channels gives rise to a huge molecular and functional diversity.
The related proteins Kv3.1 - Kv3.4 form the Shaw-type subfamily. **Kv3.1b**, also known as **Kcnc 1**, is highly enriched in neurons that fire at high frequencies such as fast spiking (FS) interneurons of the cortex and hippocampus and neurons in the globus pallidus.

Selected References for 242 003

Light-microscopy-based connectomic reconstruction of mammalian brain tissue.
Tavakoli MR, Lyudchik J, Januszewski M, Vistunou V, Agudelo Dueñas N, Vorlaufer J, Sommer C, Kreuzinger C, Oliveira B, Cenameri A, Novarino G, et al.
Nature (2025) 6428067: 398-410. . **EXM; tested species: mouse**

Activation of GluN2D-containing NMDA receptors promotes development of axons and axon-carrying dendrites of cortical interneurons.
Köhler I, Rennau LM, Hoffmann L, Demianchuk E, Kaczmarski M, Sobierajski E, Riedel C, Wahle P
Cerebral cortex (New York, N.Y. : 1991) (2025) 356: . . **WB; tested species: rat**

Variability in the Munc13-1 content of excitatory release sites.
Karlocai MR, Heredi J, Benedek T, Holderith N, Lorincz A, Nusser Z
eLife (2021) 10: . . **EM; tested species: mouse**

A High-Resolution Method for Quantitative Molecular Analysis of Functionally Characterized Individual Synapses.
Holderith N, Heredi J, Kis V, Nusser Z
Cell reports (2020) 324: 107968. . **IHC; tested species: rat**

Transient juvenile demyelination impairs maturation and function of parvalbumin-positive interneurons in the prefrontal cortex.
Hijazi S, Pascual-García M, Nabawi Y, Kushner SA
PLoS biology (2025) 239: e3003421. . **IHC; tested species: mouse**

HCN channels at the cell soma ensure the rapid electrical reactivity of fast-spiking interneurons in human neocortex.
Szegedi V, Bakos E, Furdan S, Kovács BH, Varga D, Erdélyi M, Barzó P, Szücs A, Tamás G, Lamsa K
PLoS biology (2023) 212: e3002001. . **IHC; tested species: human,mouse**

Different priming states of synaptic vesicles underlie distinct release probabilities at hippocampal excitatory synapses.
Aldahabi M, Balint F, Holderith N, Lorincz A, Reva M, Nusser Z
Neuron (2022) : . . **EM; tested species: mouse**

Kv3.3 subunits control presynaptic action potential waveform and neurotransmitter release at a central excitatory synapse.
Richardson A, Ciampani V, Stancu M, Bondarenko K, Newton S, Steinert JR, Pilati N, Graham BP, Kopp-Scheinpflug C, Forsythe ID
eLife (2022) 11: . . **IHC; KO verified; tested species: mouse**

Selected General References

Precise localization of the voltage-gated potassium channel subunits Kv3.1b and Kv3.3 revealed in the molecular layer of the rat cerebellar cortex by a pre-embedding immunogold method.
Puente N et al. Histochem. Cell Biol. (2010) PubMed:20857303

Quantitative analysis of neurons with Kv3 potassium channel subunits, Kv3.1b and Kv3.2, in macaque primary visual cortex.
Constantinople CM et al. J. Comp. Neurol. (2009) PubMed:19634181

Subcellular localization of the voltage-gated potassium channels Kv3.1b and Kv3.3 in the cerebellar dentate nucleus of glutamic acid decarboxylase 67-green fluorescent protein transgenic mice.
Alonso-Espinaco V et al. Neuroscience (2008) PubMed:18682278

Access the online factsheet including applicable protocols at https://sysy.com/product/242003 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.