SYSY Antibodies

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# Kir4.1

**Cat.No. 472 005; Polyclonal Guinea pig 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 up to 1 : 2000 (AP staining) (see remarks)<br>**IP**: yes<br>**ICC**: 1 : 1000 up to 1 : 3000<br>**IHC**: 1 : 500 up to 1 : 1000 (see remarks)<br>**IHC-P (FFPE)**: 1 : 500 up to 1 : 1000<br>**IHC-Fr**: 1 : 500 up to 1 : 1000 (see remarks) |
| Immunogen | Recombinant protein corresponding to residues near the carboxy terminus of human Kir4.1. (UniProt Id: P78508) |
| Reactivity | Reacts with: mouse (Q9JM63), rat (P49655), human (P78508).<br>Other species not tested yet. |
| Remarks | **WB**: To avoid protein aggregation, do not heat samples for SDS-PAGE.<br>**IHC**: Antigen retrieval with citrate buffer pH 6 can be applied to improve the signal-to-noise ratio.<br>For optimal results in retina tissue, follow the retina protocol.<br>**IHC-Fr**: Methanol fixation is recommended. |

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

## Background

Astrocyte membranes are highly permeable to $K^+$ ions, leading to a hyperpolarized resting membrane potential and low input membrane resistance. The main player in mediating these properties is the Kir4.1 inward rectifying $K^+$ channel [1, 2]. Without Kir4.1, astrocytes lack their signature $K^+$ currents, which are sensitive to $K^+$ blockers such as $Ba2^+$ [3, 4]. The Kir4.1 channels are expressed throughout the brain, but are found in the highest concentrations in the olfactory bulb, cerebellum, brain stem, spinal cord and midbrain. While Kir4.1 is not expressed in neurons, it is expressed in a variety of CNS glia, including oligodendrocytes, and astrocytes. Protoplasmic astrocytes within the grey matter have higher Kir4.1 expression than fibrous astrocytes within the white matter [2, 5]. The expression of Kir4.1 increases with age, particularly within the first 10 days postnatally. This increase is associated with both an increase of the inward current in developing astrocytes and a shift away from oligodedroglial expression of Kir4.1 [6, 3].

For more information on protein expression pattern, please refer to the overview image in our SYSY Antibodies ATLAS.

## Selected General References

Turning down the volume: Astrocyte volume change in the generation and termination of epileptic seizures.
Murphy TR et al. Neurobiol Dis (2017) PubMed:28438505

The role of glial-specific Kir4.1 in normal and pathological states of the CNS.
Nwaobi SE et al. Acta Neuropathol (2016) PubMed:26961251

Subcellular localization of K+ channels in mammalian brain neurons: remarkable precision in the midst of extraordinary complexity.
Trimmer JS et al. Neuron (2015) PubMed:25611506

Analysis of astroglial K+ channel expression in the developing hippocampus reveals a predominant role of the Kir4.1 subunit.
Seifert G et al. J Neurosci (2009) PubMed:19515915

Conditional knock-out of Kir4.1 leads to glial membrane depolarization, inhibition of potassium and glutamate uptake, and enhanced short-term synaptic potentiation.
Djukic B et al. J Neurosci (2007) PubMed:17942730

Kir4.1 channels regulate swelling of astroglial processes in experimental spinal cord edema.
Dibaj P et al. J Neurochem (2007) PubMed:17953658

Access the online factsheet including applicable protocols at https://sysy.com/product/472005 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.