SYSY Antibodies

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MLC1

Cat.No. 525 005; 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) **IP**: not tested yet **ICC**: 1 : 500 up to 1 : 1000 **IHC**: 1 : 1000 up to 1 : 2000 (see remarks) **IHC-P (FFPE)**: 1 : 1000 up to 1 : 2000
Immunogen	Synthetic peptide corresponding to residues near the amino terminus of mouse MLC1 (UniProt Id: Q8VHK5)
Reactivity	Reacts with: mouse (Q8VHK5), rat (D4ABB2), human (Q15049). Other species not tested yet.
Specificity	K.O. validated
Remarks	**IHC**: Antigen retrieval with citrate buffer pH 6 is required.

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

Background

MLC1 is a membrane protein highly expressed in the distal processes of astrocytes, particularly in perivascular, subpial, and subependymal regions. Recessive mutations in MLC1 genes cause Megalencephalic leukoencephalopathy with subcortical cysts (MLC). Additionally, MLC1 upregulation has been observed in brain tissues affected by multiple sclerosis, Alzheimer's disease, and Creutzfeldt-Jakob disease.
Although its precise function remains unclear, MLC1 interacts with various proteins, including adhesion proteins such as GlialCAM, chloride channels like CLCN2, and gap junction proteins such as connexin 43. It also modulates receptor tyrosine kinases, including EGFR and Axl, by suppressing their enzymatic activity.
MLC1 plays a crucial role in restoring astrocyte homeostasis after inflammation by inhibiting IL-1β–induced inflammatory signaling pathways (pERK, pNF-kB) (3). Experimental in vitro and ex vivo studies suggest that MLC1 contributes to cell volume regulation in astrocytes during osmotic stress by modulating anion channels (VRAC) and Ca^{2+} influx.
Recent findings indicate that loss of MLC1 disrupts astrocyte–excitatory synapse interactions, potentially affecting extracellular glutamate dynamics under conditions of impaired glutamate transporter activity (5). Furthermore, MLC1 stabilizes membrane structure fluctuations in primary astrocytes by regulating actin filament branching (2).

Selected General References

Megalencephalic Leukoencephalopathy: Insights Into Pathophysiology and Perspectives for Therapy.
Bosch A et al. Front Cell Neurosci (2020) PubMed:33551753

A novel role for MLC1 in regulating astrocyte-synapse interactions.
Kater MSJ et al. Glia (2023) PubMed:37002718

Mlc1-Expressing Perivascular Astrocytes Promote Blood-Brain Barrier Integrity.
Morales JE et al. J Neurosci (2022) PubMed:34965971

Plasma membrane localization of MLC1 regulates cellular morphology and motility.
Hwang J et al. Mol Brain (2019) PubMed:31888684

Megalencephalic Leukoencephalopathy with Subcortical Cysts Protein-1 (MLC1) Counteracts Astrocyte Activation in Response to Inflammatory Signals.
Brignone MS et al. Mol Neurobiol (2019) PubMed:31209783

Access the online factsheet including applicable protocols at https://sysy.com/product/525005 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.