

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. For reconstitution add 50 µl H ₂ O 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 IHC-P: 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). Other species not tested yet.
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-κB) (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 Ca²⁺ 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 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 at 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.