SYSY Antibodies

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LAT1

Cat.No. 519 005; 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 (AP-staining) **IP**: not tested yet **ICC**: not tested yet **IHC**: not tested yet **IHC-P**: not tested yet **IHC-G**: 1 : 1000 (see remarks)
Immunogen	Recombinant protein corresponding to residues near the amino terminus of rat LAT1 (UniProt Id: Q63016)
Reactivity	Reacts with: human (Q01650), rat (Q63016), mouse (Q9Z127). Other species not tested yet.
Remarks	**IHC-G**: 9% glyoxal, 8% acetic acid, in ddH2O, pH 4.2-4.4, according to Konno et al. 2023 is recommended

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

Background

LAT1 is ubiquitously expressed, with highest levels observed in the brain, spleen, bone marrow, testis, and placenta. In the blood-brain barrier, LAT1 is localized on both apical and basolateral membranes. In other polarized epithelia, it is mainly localized in basolateral membranes. In the placenta, LAT1 is present on both, the maternal and fetal surfaces of the syncytiotrophoblasts (1, 2).
Like all members of the heteromeric amino acid transporter (HAT, SLC7) family, LAT1 resides in the plasma membrane in a heterodimeric form. The LAT1 holotransporter consists of a 55-kDa light chain, SCL7A5 (LAT1 proper), and an escort protein called the heavy chain covalently linked to the light chain via a disulfide bond. LAT1 heterodimerizes with the 4F2hc (SLC3A2) heavy chain, an N-glycosylated ~68-kD transmembrane protein with one membrane-spanning domain. While transport carried out by either chain alone is negligible, the heavy chain is only needed to stabilize the dimer and facilitate its translocation to the plasma membrane, and the actual transport is carried out by the light chain (3).
LAT1 takes part in the transport of a wide range of neutral amino acids, especially ones with large branched or aromatic side chains. Tryptophan, phenylalanine, leucine, and histidine are transported with high affinity. Glutamine as an uptake substrate has a low affinity toward LAT1. Histidine and tyrosine are transported bidirectionally, whereas the others are preferentially transported in the inward direction only. LAT1 displays asymmetrical affinity towards bidirectionally transported substrates, with extracellular versus intracellular Km values being in the micromolar versus millimolar range (4). The generally accepted mode of function of LAT1 is obligatory antiport, i.e. the exchange of a large and neutral extracellular substrate for an abundant intracellular amino acid such as glutamine (5).

Selected General References

The SLC3 and SLC7 families of amino acid transporters.
Fotiadis D et al. Mol Aspects Med (2013) PubMed:23506863

The Human SLC7A5 (LAT1): The Intriguing Histidine/Large Neutral Amino Acid Transporter and Its Relevance to Human Health.
Scalise M et al. Front Chem (2018) PubMed:29988369

Insights into the Structure, Function, and Ligand Discovery of the Large Neutral Amino Acid Transporter 1, LAT1.
Singh N et al. Int J Mol Sci (2018) PubMed:29695141

Activation of system L heterodimeric amino acid exchangers by intracellular substrates.
Meier C et al. EMBO J (2002) PubMed:11847106

Human L-type amino acid transporter 1 (LAT1): characterization of function and expression in tumor cell lines.
Yanagida O et al. Biochim Biophys Acta (2001) PubMed:11557028

Access the online factsheet including applicable protocols at https://sysy.com/product/519005 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.