SYSY Antibodies

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LAT1 (SLC7A5)

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 (FFPE)**: not tested yet **IHC-Fr**: 1 : 1000 (see remarks) **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-Fr**: Methanol-acetone fixation is recommended. **IHC-G**: 9% glyoxal fixation 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 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.