SYSY Antibodies

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Mfsd2a

Cat.No. 541 003; Polyclonal rabbit 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_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**: not tested yet **IP**: not tested yet **ICC**: not tested yet **IHC**: not tested yet **IHC-P (FFPE)**: not tested yet **IHC-Fr**: 1 : 500 up to 1 : 1000 (see remarks)
Immunogen	Synthetic peptide corresponding to residues surrounding AA 20 of mouse Mfsd2a (UniProt Id: Q9DA75)
Remarks	**IHC-Fr**: Methanol fixation is recommended.

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

Background

Major facilitator superfamily domain-containing protein 2A (Mfsd2a) is a transmembrane protein that functions as a sodium-dependent transporter of lysophosphatidylcholine (LPC)–bound fatty acids, including the essential omega-3 fatty acid docosahexaenoic acid (DHA) (1). It is selectively expressed in endothelial cells of the central nervous system (CNS) vasculature and is a key regulator of blood–brain barrier (BBB) integrity (2). Mfsd2a maintains BBB function by suppressing caveolae-mediated transcytosis in brain endothelial cells, thereby limiting vesicular transport across the endothelium (2,3). Reduced expression of Mfsd2a has been associated with BBB disruption in several neurological conditions, including cerebral ischemia, hemorrhage, and chronic cerebral hypoperfusion (3,4).
In addition to its role at the BBB, Mfsd2a is expressed in other tissues where it contributes to lipid transport and metabolic processes. For instance, Mfsd2a has been implicated in lipid metabolism in the liver and in pulmonary surfactant homeostasis in the lung (5,6). Altered Mfsd2a expression has also been associated with cancer. Reduced Mfsd2a levels have been reported in non-small cell lung cancer and are linked to altered cell cycle regulation and cell–matrix interactions, suggesting a tumor suppressor role (7). Furthermore, downregulation of Mfsd2a in tumor-associated brain vasculature contributes to BBB disruption and altered lipid metabolism in brain metastases (8).

Selected General References

Mfsd2a is a transporter for the essential omega-3 fatty acid docosahexaenoic acid.
Nguyen LN et al. Nature (2014) PubMed:24828044

The lipid transporter Mfsd2a maintains pulmonary surfactant homeostasis.
Wong BH et al. J Biol Chem (2022) PubMed:35150739

Mfsd2a Reverses Spatial Learning and Memory Impairment Caused by Chronic Cerebral Hypoperfusion via Protection of the Blood-Brain Barrier.
Qu C et al. Front Neurosci (2020) PubMed:32612494

Metastatic Brain Tumors Disrupt the Blood-Brain Barrier and Alter Lipid Metabolism by Inhibiting Expression of the Endothelial Cell Fatty Acid Transporter Mfsd2a.
Tiwary S et al. Sci Rep (2018) PubMed:29844613

Blood-Brain Barrier Permeability Is Regulated by Lipid Transport-Dependent Suppression of Caveolae-Mediated Transcytosis.
Andreone BJ et al. Neuron (2017) PubMed:28416077

Mfsd2a+ hepatocytes repopulate the liver during injury and regeneration.
Pu W et al. Nat Commun (2016) PubMed:27857132

An alternate perspective on the roles of TIMPs and MMPs in pathology.
Moore CS et al. Am J Pathol (2012) PubMed:22033229

MFSD2A is a novel lung tumor suppressor gene modulating cell cycle and matrix attachment.
Spinola M et al. Mol Cancer (2010) PubMed:20236515

Access the online factsheet including applicable protocols at https://sysy.com/product/541003 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.