SYSY Antibodies

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# MLC-2A

**Cat.No. 311 011; Monoclonal mouse antibody, 100 µg purified IgG (lyophilized)**

## Data Sheet

| | |
|---|---|
| Reconstitution/ Storage | 100 µg purified IgG, lyophilized. Albumin and azide were added for stabilization.<br>For **reconstitution** add 100 µl $H_2O$ to get a 1mg/ml solution in PBS. Then aliquot and store at -20°C to -80°C until use.<br>Antibodies should be stored at +4°C when still lyophilized. Do not freeze!<br>For detailed information, see back of the data sheet. |
| Applications | **WB**: 1 : 100 up to 1 : 2000 (AP staining)<br>**IP**: not tested yet<br>**ICC**: external data (see remarks)<br>**IHC**: 1 : 500<br>**IHC-P (FFPE)**: 1 : 200 up to 1 : 1000<br>**FACS**: external data (see remarks) |
| Clone | 56F5 |
| Subtype | IgG2b (κ light chain) |
| Immunogen | Full-length recombinant human MLC-2A (UniProt Id: Q01449) |
| Reactivity | Reacts with: human (Q01449), rat, mouse (Q9QVP4).<br>No signal: chicken.<br>Other species not tested yet. |
| Specificity | Specific for MLC-2A, no cross-reactivity to MLC-2V. |
| Matching control | 311-0P |
| Remarks | **ICC**: This antibody has been successfully applied and published for this method by customers (see application-specific references). It has not been validated using our standard protocols.<br>**FACS**: This antibody has been successfully applied and published for this method by customers (see application-specific references).<br>This antibody has been successfully applied and published for this method by customers (see application-specific references). It has not been validated using our standard protocols. |

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

## Background

During cardiogenesis two major isoforms of **m**yosin **l**ight **c**hain **2** are co-expressed in a tightly regulated manner. **MLC-2A** is only present in the atrium while MLC-2V is exclusively expressed in the ventricle. Knock out studies revealed that the 2A isoform cannot substitute for the 2V variant in the ventricular chamber.
Recently it has been demonstrated that embryonic and adult stem cells can be differentiated into cardiomyocytes which may generate suitable replacements for damaged heart tissue in the future. This monoclonal antibody is a useful tool to distinguish between ventricle and atrium specific cardiomyocytes.

## Selected References for 311 011

LEFTY-PITX2 signaling pathway is critical for generation of mature and ventricular cardiac organoids in human pluripotent stem cell-derived cardiac mesoderm cells.
Song MH, Choi SC, Noh JM, Joo HJ, Park CY, Cha JJ, Ahn TH, Ko TH, Choi JI, Na JE, Rhyu IJ, et al.
Biomaterials (2021) 278: 121133. . **WB, ICC, FACS; tested species: human**

Highly enriched cardiomyocytes from human embryonic stem cells.
Xu XQ, Zweigerdt R, Soo SY, Ngoh ZX, Tham SC, Wang ST, Graichen R, Davidson B, Colman A, Sun W
Cytotherapy (2008) 104: 376-89. . **ICC, IHC**

JAK2 as a surface marker for enrichment of human pluripotent stem cells-derived ventricular cardiomyocytes.
Liew LC, Poh BM, An O, Ho BX, Lim CYY, Pang JKS, Beh LY, Yang HH, Soh BS
Stem cell research & therapy (2023) 141: 367. . **WB, ICC; tested species: human**

Continuous WNT Control Enables Advanced hPSC Cardiac Processing and Prognostic Surface Marker Identification in Chemically Defined Suspension Culture.
Halloin C, Schwanke K, Löbel W, Franke A, Szepes M, Biswanath S, Wunderlich S, Merkert S, Weber N, Osten F, de la Roche J, et al.
Stem cell reports (2019) 132: 366-379. . **ICC, FACS; tested species: human**

Direct nkx2-5 transcriptional repression of isl1 controls cardiomyocyte subtype identity.
Dorn T, Goedel A, Lam JT, Haas J, Tian Q, Herrmann F, Bundschu K, Dobreva G, Schiemann M, Dirschinger R, Guo Y, et al.
Stem cells (Dayton, Ohio) (2015) 334: 1113-29. . **ICC, IHC**

Simultaneous voltage and calcium mapping of genetically purified human induced pluripotent stem cell-derived cardiac myocyte monolayers.
Lee P, Klos M, Bollensdorff C, Hou L, Ewart P, Kamp TJ, Zhang J, Bizy A, Guerrero-Serna G, Kohl P, Jalife J, et al.
Circulation research (2012) 11012: 1556-63. . **ICC, FACS**

Phosphorylation and translocation of heat shock protein 27 and alphaB-crystallin in human myocardium after cardioplegia and cardiopulmonary bypass.
Clements RT, Sodha NR, Feng J, Mieno S, Boodhwani M, Ramlawi B, Bianchi C, Sellke FW
The Journal of thoracic and cardiovascular surgery (2007) 1346: 1461-70. . **WB, IHC; tested species: human**

Rat atrial engineered heart tissue: a new in vitro model to study atrial biology.
Krause J, Löser A, Lemoine MD, Christ T, Scherschel K, Meyer C, Blankenberg S, Zeller T, Eschenhagen T, Stenzig J
Basic research in cardiology (2018) 1135: 41. . **IHC-P; tested species: rat**

Elongating human heart organoids recapitulate early cardiac morphogenesis and axial organization.
Lee J, Kim A, Jeong Y, Choi E, Kim TY, Nabukenya M, Kim D, Lee J, Bae GU, Kang JS
Developmental cell (2026) 619: 1898-1914.e7. . **ICC; tested species: human**

Human iPSC cardiomyocyte patch transplantation modifies extracellular matrix and fibroblast behavior after myocardial infarction.
Torigata K, Matsuura R, Nagatomo F, Thiha M, Hikita T, Iseoka H, Takagi H, Koshimizu U, Sakakima H, Izumi S, Hatano A, et al.
iScience (2026) 294: 115341. . **IHC; tested species: human**

Access the online factsheet including applicable protocols at https://sysy.com/product/311011 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.