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. 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. 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 : 100 up to 1 : 2000 (AP staining) **IP**: not tested yet **ICC**: 1 : 500 **IHC**: 1 : 500 **IHC-P**: 1 : 200 up to 1 : 1000
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). No signal: chicken. Other species not tested yet.
Specificity	Specific for MLC-2A, no cross-reactivity to MLC-2V.
Matching control	311-0P
Remarks	**ICC**: The following fixatives are possible: methanol, 4% formaldehyde/PFA

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**

AI-guided laser purification of human iPSC-derived cardiomyocytes for next-generation cardiac cell manufacturing.
Saraithong P, Krajcarski P, Kusaka Y, Yamada M, Matsumoto J, Cunningham H, Salih S, Jones D, Baddhan D, Hausner C, Anumonwo J, et al.
Communications biology (2025) 81: 745. . **WB; tested species: human**

The modulation of calcium and chloride channels induces cardiomyocytes from human pluripotent stem cells.
Meng Y, Deng C, Xiao X, Wei S, Song C, Wang J, Lei CL, Liu W, Chen G
International journal of biological sciences (2025) 211: 95-108. . **ICC; 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 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.