SYSY Antibodies

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Pyruvate carboxylase

Cat.No. 494 005; 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**: 1 : 500 **IHC**: 1 : 500 up to 1 : 1000 **IHC-P (FFPE)**: not tested yet
Immunogen	Synthetic peptide corresponding to residues near the carboxy terminus of mouse Pyruvate carboxylase (UniProt Id: Q05920)
Reactivity	Reacts with: mouse (Q05920), rat (P52873), human (P11498). Other species not tested yet.
Specificity	K.D. validated

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

Background

Pyruvate carboxylase (PC) is a mitochondrial enzyme catalyzing the ATP-dependent carboxylation of pyruvate to oxaloacetate (1). This is a central biochemical reaction controlling whole-body energetics (2). It is the first step of gluconeogenesis and the main anaplerotic reaction to replenish tricarboxylic acid (TCA) cycle intermediates. Additionally, it is involved in e.g. lipogenesis or insulin secretion.
PC shows high expression in liver and kidney, the primary organs of gluconeogenesis, which synthesize and export glucose into the bloodstream (3).
In the brain, PC plays a critical anaplerotic role during metabolism as well. It is predominately expressed in astrocytes and is needed for the de novo synthesis of glutamate, the main excitatory neurotransmitter (see Featured Topic The Glutamatergic Synapse). Recent literature indicates that PC is also expressed in a subpopulation of neurons (4). There is evidence that gluconeogenesis exists in brain astrocytes (5) and this is becoming more recognized as an important alternative glucose source for neurons, specifically in ischemic stroke and brain tumors. PC has been associated with metabolic reprogramming of cancer cells and tumor progression in a variety of cancer models (2).

Selected General References

Immunocytochemical examination of neural rat and mouse primary cultures using monoclonal antibodies raised against pyruvate carboxylase.
Cesar M et al. J Neurochem (1995) PubMed:7722517

Liver or kidney: Who has the oar in the gluconeogenesis boat and when?
Sahoo B et al. World J Diabetes (2023) PubMed:37547592

The presence of pyruvate carboxylase in the human brain and its role in the survival of cultured human astrocytes.
Gondáš E et al. Physiol Res (2023) PubMed:37449752

Pyruvate carboxylase and cancer progression.
Kiesel VA et al. Cancer Metab (2021) PubMed:33931119

Cerebral Gluconeogenesis and Diseases.
Yip J et al. Front Pharmacol (2016) PubMed:28101056

Access the online factsheet including applicable protocols at https://sysy.com/product/494005 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.