SYSY Antibodies

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Tau

Cat.No. 314-0P; control protein, 100 µg protein (lyophilized)

Data Sheet

Reconstitution/ Storage	100 µg protein, lyophilized. For **reconstitution** add 100 µl H_2O to get a 1mg/ml solution in TBS. Then aliquot and store at -20°C to -80°C until use. Control proteins should be stored at +4°C when still lyophilized. Do not freeze! For detailed information, see back of the data sheet.
Immunogen	Recombinant protein corresponding to the N-terminal half of mouse Tau-D (UniProt Id: P10637-5)
Recommended dilution	Optimal concentrations should be determined by the end-user.
Matching antibodies	314 002, 314 003, 314 004, 314 006, 314 011, 314 008, 314 308
Remarks	This control protein consists of the recombinant protein (aa 3 - 214 of mouse tau) that has been used for immunization. It has been tested in preadsorption experiments and blocks efficiently and specifically the corresponding signal in Western blots. The amount of protein needed for efficient blocking depends on the titer and on the affinity of the antibody to the antigen.

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

Background

There are two major classes of heat-stable microtubule-associated proteins (MAPs): MAP2 and Tau (MAPT).
Tau is expressed in several isoforms in human brain (Tau-A, 2N4R/Tau-F, 1N4R/Tau-E, 0N4R/Tau-D, 2N3R/Tau-C, 1N3R/Tau-B, 0N3R) and rodents (Tau-A, 2N4R/Tau-F, 1N4R/Tau-E, 0N4R/Tau-D) (1). Tau helps to stabilize axonal microtubules and modulate axonal transport, with isoform diversity and phosphorylation status determining their dynamics and affinity for microtubules. Tauopathies, often associated with abnormal phosphorylation (2, 3), can be classified according to the Tau isoforms present in the pathological inclusions. For instance, Pick's disease (PiD) is characterized by tangles containing 3R-Tau isoforms (0N3R, 1N3R, and 2N3R), whereas 4R-Tau (0N4R, 1N4R, and 2N4R) accumulates in disorders like progressive supranuclear palsy (PSP) and corticobasal degeneration (CBD). In Alzheimer's disease (AD) aggregates consist of all Tau isoforms (1).
Tau is abundantly expressed in the central and peripheral nervous system. Compared to the CNS, the PNS shows a predominance of 4R Tau isoforms (0N4R, 1N4R, 2N4R), which are thought to provide stronger microtubule binding and stability needed for long peripheral axons (1, 4).

Since microtubule dynamics are central to cell division, migration, and morphology, aberrations in Tau expression have been implicated in several types of cancer (5). Notably, Tau is increasingly recognized for its role in tumor progression and resistance to cancer therapy, with glioblastoma (GBM), making Tau a potential biomarker and therapeutic target (6,7).

Selected General References

The six brain-specific TAU isoforms and their role in Alzheimer's disease and related neurodegenerative dementia syndromes.
Buchholz S et al. Alzheimers Dement (2024) PubMed:38556838

Big Tau: What We Know, and We Need to Know.
Fischer I et al. eNeuro (2023) PubMed:37164636

Tau Protein as Therapeutic Target for Cancer? Focus on Glioblastoma.
Hedna R et al. Cancers (Basel) (2022) PubMed:36358803

Tau regulates the microtubule-dependent migration of glioblastoma cells via the Rho-ROCK signaling pathway.
Breuzard G et al. J Cell Sci (2019) PubMed:30659115

Physiological and pathological phosphorylation of tau by Cdk5.
Kimura T et al. Front Mol Neurosci (2014) PubMed:25076872

Expression and silencing of the microtubule-associated protein Tau in breast cancer cells.
Spicakova T et al. Mol Cancer Ther (2010) PubMed:21062914

Tau phosphorylation: physiological and pathological consequences.
Stoothoff WH et al. Biochim Biophys Acta (2005) PubMed:15615646

Access the online factsheet including applicable protocols at https://sysy.com/product/314-0P 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.