SYSY Antibodies

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Dopamine receptor D1

Cat.No. 376 017; Monoclonal rat 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 (AP-staining) (see remarks) **IP**: not tested yet **ICC**: 1 : 500 **IHC**: 1 : 500 **IHC-P**: 1 : 250 up to 1 : 500
Clone	SY-41C12
Subtype	IgG2a (κ light chain)
Immunogen	Recombinant protein comprising the C-terminal cytoplasmic domain of mouse Dopamine receptor D1 (UniProt Id: Q61616)
Reactivity	Reacts with: mouse (Q61616), rat (P18901). Other species not tested yet.
Remarks	**WB**: This antibody shows a reduced sensitivity in Western blot experiments.

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

Background

Dopamine receptors transduce the signal of the neurotransmitter dopamine. Dopamine regulates a variety of functions including locomotor activity, emotion, food intake, hormone secretion, learning, and memory. The dysregulation of the dopaminergic system results in several neurological and neuropsychiatric diseases including Parkinson's disease, dystonia, and schizophrenia. Dopamine plays also an important role in the pathogenesis of hypertension by regulating epithelial sodium transport and by interacting with vasoactive hormones.
All five dopamine receptors belong to the 7-transmembrane domain, G protein-coupled receptor superfamily. They have been divided into two subfamilies: Two D1-like receptor subtypes (**D1** and D5) couple to the G protein Gs and activate adenylyl cyclase, increasing the intracellular concentration of the second messenger cAMP. The other receptor subtypes belong to the D2-like subfamily (**D2**, D3, and D4) and are prototypic of G protein-coupled receptors that inhibit adenylyl cyclase.
Dopamine receptors can form heteromeric complexes with dopamine receptors from other subtypes or with receptors of other endogenous signaling ligands. These heteromeric complexes have functional properties distinct from the component receptors or are able to modulate the canonical signaling.
Dopamine receptor D1 is widely distributed throughout the brain with the highest expression in the striatum. In the periphery, the D1 receptor has been detected in the adrenal cortex, kidney and heart. Recently, it was shown that dopamine receptor D1 is expressed in breast cancer, thereby identifying this receptor as a novel therapeutic target in this disease. D1 receptor overexpression is associated with advanced breast cancer and poor prognosis.
Dopamine receptor D2 is most abundant in the striatum where it is expressed in medium spiny neurons. Functionally, the D1 and D2 receptors have been implicated in the regulation of both locomotor and cognitive functions.

Selected General References

Expression and therapeutic targeting of dopamine receptor-1 (D1R) in breast cancer.
Borcherding DC et al. Oncogene (2016) PubMed:26477316

Dopamine receptor heteromeric complexes and their emerging functions.
George SR et al. Prog. Brain Res. (2014) PubMed:24968781

Dopamine receptor mapping with PET imaging in Parkinson's disease.
Niccolini F et al. J. Neurol. (2014) PubMed:24627109

Dysregulation of dopamine-dependent mechanisms as a determinant of hypertension: studies in dopamine receptor knockout mice.
Zeng C et al. Am. J. Physiol. Heart Circ. Physiol. (2008) PubMed:18083900

D1 and D2 dopamine-receptor modulation of striatal glutamatergic signaling in striatal medium spiny neurons.
Surmeier DJ et al. Trends Neurosci. (2007) PubMed:17408758

Insights into the role of dopamine receptor systems in learning and memory.
El-Ghundi M et al. Rev Neurosci (2007) PubMed:17405450

D1 dopamine receptor supersensitivity in the dopamine-depleted striatum animal model of Parkinson's disease.
Gerfen CR et al. Neuroscientist (2003) PubMed:14678578

Dopamine receptors: from structure to function.
Missale C et al. Physiol. Rev. (1998) PubMed:9457173

Access the online factsheet including applicable protocols at https://sysy.com/product/376017 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.