SYSY Antibodies

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Antibody Sampler Kit for Neuronal Compartments (cat. no. 802-ASK)

Synaptophysin1 (p38-1)

Cat.No. 101 011; Monoclonal mouse antibody, 10 µg purified IgG (lyophilized)

Data Sheet

Reconstitution/ Storage	10 µg purified IgG, lyophilized. Albumin and azide were added for stabilization. For **reconstitution** add 10 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 : 10000 (AP staining) **IP**: yes **ICC**: 1 : 500 up to 1 : 1000 **IHC**: 1 : 500 up to 1 : 1000 **IHC-P (FFPE)**: 1 : 500 up to 1 : 1000 (see remarks) **ExM**: external data (see remarks) **EM**: external data (see remarks) **ELISA**: yes (see remarks)
Clone	7.2
Subtype	IgG1 (λ light chain)
Immunogen	Full-length recombinant rat Synaptophysin (UniProt Id: P07825)
Epitop	AA 219 to 307 from rat Synaptophysin1 (UniProt Id: P07825) corresponding to the cytoplasmic tail.
Reactivity	Reacts with: human (P08247), rat (P07825), mouse (Q62277), mammals. Weaker signal: zebrafish, other vertebrates. Other species not tested yet.
Specificity	K.O. validated PubMed: 31940485
Remarks	Widely used as marker for nerve terminals and neuroendocrine tumors. For unknown reason, neuronal synaptophysin is better recognised than neuroendocrine synaptophysin. If this is a problem, the polyclonal rabbit antibody, cat. no. 101 002 or 101 203 are recommended. **IHC-P (FFPE)**: For fluorescent detection, an optimized AGR time of 30 minutes is recommended for best results. **ExM**: This antibody has been successfully applied and published for this method by customers (see application-specific references). **EM**: This antibody has been successfully applied and published for this method by customers (see application-specific references). **ELISA**: The ELISA-protocol for membrane proteins is required. Suitable as capture antibody for sandwich-ELISA. Please refer to the protocol for suitable detector antibodies.

Synaptophysin1, also referred to as **p38-1**, is a membrane glycoprotein of synaptic vesicles that is ubiquitously expressed in all neurons and in many endocrine cells. It is currently the most widely used marker for nerve terminals and probably the best marker for the pathologist in differentiating neuroendocrine tumors.
Synaptophysin1 has four transmembrane domains with both N- and C-terminus facing the cytoplasm. It binds to synaptobrevin1 and synaptobrevin2 in detergent extracts but its function has not been elucidated completely. It forms a complex with dynamin at high Ca^{2+} concentration suggesting an involvement in synaptic vesicle endocytosis. As typical for synaptic vesicle proteins, synaptophysin1 represents a small protein family with two additonal members, synaptoporin (synaptophysin2) and panthophysin. Like synaptophysin1, synaptoporin is widely expressed in neurons and colocalizes with synaptophysin1 on synaptic vesicles whereas panthophysin is expressed in all tissues.

Piccolo

Cat.No. 142 104; Polyclonal guinea pig antibody, 30 µl antiserum (lyophilized)

For more information on protein expression pattern, please refer to the overview image in our SYSY Antibodies ATLAS.

Data Sheet

Reconstitution/ Storage	30 µl antiserum, lyophilized. For **reconstitution** add 30 µl H_2O, then aliquot and store at -20°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) (see remarks) **IP**: yes **ICC**: 1 : 500 up to 1 : 1000 **IHC**: 1 : 200 **IHC-P (FFPE)**: 1 : 500
Immunogen	Recombinant protein corresponding to a central region of rat piccolo (UniProt Id: Q9JKS6)
Reactivity	Reacts with: rat (Q9JKS6), mouse (Q9QYX7). Other species not tested yet.
Specificity	K.O. validated PubMed: 32122952
Remarks	**WB**: This antibody detects an additional band of ~65 kDa.

Background

Piccolo, also referred to as **Aczonin**, is a large protein which consists of an N-terminal Zn^{2+} finger, several piccolo-bassoon homology domains (PBH-domains) and C-terminal PDZ and C2 domains. In general it is found together with bassoon, a related huge multi-domain protein of the CAZ (cytoskeletal matrix assembled at active zones).
Piccolo is supposed to be a scaffolding protein for proteins involved in endo- and exocytosis of synaptic vesicles. Recently piccolo has been shown to interfere with clathrin mediated endocytosis by binding to the F-actin and dynamin binding protein Abp1.

For more information on protein expression pattern, please refer to the overview image in our SYSY Antibodies ATLAS.

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Antibody Sampler Kit for Neuronal Compartments (cat. no. 802-ASK)

Homer1b/c

Cat.No. 160 018; Recombinant rabbit antibody, 10 µg recombinant IgG (lyophilized)

Data Sheet

Reconstitution/ Storage	10 µg purified recombinant IgG, lyophilized. Albumin and azide were added for stabilization. For **reconstitution** add 10 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**: yes **ICC**: 1 : 500 **IHC**: 1 : 500 **IHC-P (FFPE)**: 1 : 1000
Clone	Rb72G2
Subtype	IgG1 (κ light chain)
Immunogen	Recombinant protein corresponding to the C-terminal half of human Homer1b. (UniProt Id: Q86YM7-1)
Reactivity	Reacts with: human (Q86YM7-1), mouse (Q9Z2Y3), rat (Q9Z214). Other species not tested yet.
Specificity	Specific for homer 1b and 1c; no cross-reactivity to homer 1a.
Remarks	This antibody is a chimeric antibody based on the monoclonal mouse antibody SY-72G2. The constant regions of the heavy and light chains have been replaced with rabbit specific sequences. The antibody can therefore be used with standard anti-rabbit secondary reagents. The antibody has been expressed in mammalian cells.

Background

Homer is a scaffolding protein localized in the postsynaptic density (PSD) and is highly enriched at excitatory synapses. It acts as a molecular adaptor by binding to metabotropic glutamate receptors (mGluRs) (1), TRPC1 channels, Shank family proteins (2), and several other signaling molecules, organizing them into distinct clusters and thereby establishing specific signaling domains within the PSD.
By cross-linking these proteins, Homer plays a crucial role in structural and functional organization of the PSD, contributing to the maturation of dendritic spines and the regulation of synaptic plasticity. Homer and Shank, in particular, form a mesh-like matrix that serves as a platform for

MAP2

Cat.No. 188 01, Monoclonal mouse antibody, 20 µg purified IgG (lyophilized)

Data Sheet

Reconstitution/ Storage	20 µg purified IgG, lyophilized. Albumin and azide were added for stabilization. For **reconstitution** add 20 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) (see remarks) **IP**: not tested yet **ICC**: 1 : 200 up to 1 : 1000 (see remarks) **IHC**: 1 : 200 up to 1 : 500 **IHC-P (FFPE)**: 1 : 500 up to 1 : 2000 **IHC-Fr**: 1 : 500 (see remarks) **IHC-G**: 1 : 500 (see remarks) **DNA-PAINT**: external data (see remarks)
Clone	198A5
Subtype	IgG1 (κ light chain)
Immunogen	Recombinant protein corresponding to residues near the amino terminus of human Map2 (UniProt Id: P11137-4)
Epitop	AA 82 to 96 from human MAP2-4 hu (UniProt Id: P11137-4)
Reactivity	Reacts with: human (P11137), rat (P15146), mouse (P20357). No signal: zebrafish. Other species not tested yet.
Specificity	Specific for MAP2; recognizes all four isoforms.
Matching control	188-0P
Remarks	**WB**: Due to the large size of this protein, we recommend NuPAGE 3-8% Tris-Acetate gels for SDS-PAGE. **ICC**: The following fixatives are possible: 4% formaldehyde/PFA, methanol. **IHC-Fr**: Acetone fixation is recommended. **IHC-G**: The following fixatives are possible: 3% glyoxal, 9% glyoxal. **DNA-PAINT**: This antibody has been successfully applied and published for this method by customers (see application-specific references).

Background

The assembly of the PSD is mediated by scaffolding proteins (3). Homer1 is one of the most abundant scaffolding proteins in the PSD (4). Homer1 binds to mGluR1/5 and IP3R, and Homer1 binds to Shank and GKAP, thereby linking mGluR1/5 to the NMDA receptor complex (5). Homer1 is also involved in the regulation of dendritic spine morphogenesis (6). Homer1 is also involved in the regulation of dendritic spine morphogenesis (6).

Antibodies to Homer1b/c are useful for studying the role of Homer1 in synaptic plasticity, learning, and memory. They can also be used to investigate the role of Homer1 in neurological disorders such as autism, schizophrenia, and addiction (7).

Homer1b/c is a protein that is found in the brain and is involved in synaptic plasticity, learning, and memory. It is also implicated in neurological disorders such as autism, schizophrenia, and addiction. Antibodies to Homer1b/c are useful for studying the role of Homer1 in these processes and for developing potential therapeutic interventions.

Background

Microtubule-associated proteins (MAPs) are essential components of the cytoskeleton, playing crucial roles in maintaining cell structure, intracellular transport, and cell division. They interact with microtubules, which are dynamic polymers composed of tubulin subunits, and regulate their stability and organization. MAPs can be broadly classified into two groups: structural MAPs, which primarily contribute to microtubule stability, and motor MAPs, which facilitate the movement of cargo along microtubules.

MAP2 is a family of neuronal microtubule-associated proteins (MAPs) that are primarily found in the dendrites and cell bodies of neurons. They are essential for maintaining the structural integrity of microtubules, which are crucial components of the cytoskeleton. MAP2 proteins are also involved in regulating microtubule dynamics, such as their assembly and disassembly, and in anchoring microtubules to other cellular structures.

There are four main isoforms of MAP2: MAP2A, MAP2B, MAP2C, and MAP2D. These isoforms are generated through alternative splicing of the MAP2 gene. The high molecular weight isoforms MAP2A/B (~280 kDa) and low molecular weight isoforms MAP2C/D (~70 kDa) differ in their specific tubulin-binding core domain, important for dendritic stabilization and neuritogenesis (2).

For more information on protein expression pattern, please refer to the overview image in our SYSY Antibodies Atlas.

Since microtubule dynamics are central to cell division, migration, and morphology, aberrations in MAP2 and Tau expression have been implicated in several types of cancer.

Glial neoplasms: MAP2 is a widely used marker in neuropathology and neuro-oncology. MAP2 immunoreactivity helps distinguish glial neoplasms in neuropathology, and its expression tends to vary according to tumor grade (3). While classic low-grade gliomas often show robust MAP2 staining, higher-grade tumors may exhibit less-specific and more heterogeneous patterns. Moreover, in melanoma, reduced MAP2 expression correlates with increased tumor aggressiveness, underscoring its potential role as a tumor-suppressive marker (4).

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Antibody Sampler Kit for Neuronal Compartments (cat. no. 802-ASK)

NeuN

Cat.No. 266 004; Polyclonal Guinea pig antibody, 30 µl antiserum (lyophilized)

Data Sheet

Reconstitution/ Storage	30 µl antiserum, lyophilized. For **reconstitution** add 30 µl H_2O, then aliquot and store at -20°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**: not tested yet **IP**: not tested yet **ICC**: 1 : 500 **IHC**: 1 : 100 up to 1 : 500 **IHC-P (FFPE)**: 1 : 200 up to 1 : 1000 **IHC-Fr**: 1 : 500 (see remarks) **ExM**: external data (see remarks)
Immunogen	Recombinant protein corresponding to AA 1 to 97 from mouse NeuN (UniProt Id: Q8BIF2)
Reactivity	Reacts with: rat (D4A2H6), mouse (Q8BIF2), human (A6NFN3). Other species not tested yet.
Remarks	**IHC-Fr**: Acetone fixation is recommended. **ExM**: This antibody has been successfully applied and published for this method by customers (see application-specific references).

Background

NeuN (**Neu**ronal **N**uclei) is a neuron-specific nuclear protein that has been identified as Fox-3/Rbfox3, a member of the Fox-1 family of transcription factors.
NeuN is only expressed in the nuclei of differentiated neurons. In some neurons - Purkinje cells, sympathetic ganglion cells, INL retinal cells, Cajal-Retzius cells, inferior olivary, and dentate nucleus neurons - NeuN is not detectable.

For more information on protein expression pattern, please refer to the overview image in our SYSY Antibodies ATLAS.

Tau

Cat.No. 314 308; Recombinant Guinea pig antibody, 30 µg recombinant IgG (lyophilized)

Data Sheet

Reconstitution/ Storage	30 µg purified recombinant IgG, lyophilized. Albumin and azide were added for stabilization. For **reconstitution** add 30 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 **IHC-P (FFPE)**: 1 : 5000
Clone	Gp248E5
Subtype	IgG2 (κ light chain)
Immunogen	Recombinant protein corresponding to the N-terminal half of mouse Tau-D (UniProt Id: P10637-5)
Reactivity	Reacts with: rat (P19332), mouse (P10637). Weaker signal: human (P10636). No signal: zebrafish. Other species not tested yet.
Specificity	This antibody binds phosphorylated and non-phosphorylated tau proteins. The sequence used for immunization is present in all splice variants except human TauA (UniProt Id: P10636-3)
Matching control	314-0P
Remarks	This antibody is a chimeric antibody based on the monoclonal mouse antibody clone 248E5. The constant regions of the heavy and light chains have been replaced by guinea pig specific sequences. Therefore, the antibody can be used with standard anti-guinea pig secondary reagents. The antibody has been expressed in mammalian cells.

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 Pattern of Tau isoforms in PNS neurons is different. Peripheral neurons 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).

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Antibody Sampler Kit for Neuronal Compartments (cat. no. 802-ASK)

β-Actin

Cat.No. 251 011; Monoclonal mouse antibody, 20 µg purified IgG (lyophilized)

Data Sheet

Reconstitution/ Storage	20 µg purified IgG, lyophilized. Albumin and azide were added for stabilization. For **reconstitution** add 20 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 up to 1 : 10000 **IP**: yes **ICC**: 1 : 500 (see remarks) **IHC**: not tested yet **IHC-P (FFPE)**: not tested yet
Clone	130B4
Subtype	IgG1 (κ light chain)
Immunogen	Synthetic peptide corresponding to AA 2 to 16 from mouse β-Actin (UniProt Id: P60710)
Reactivity	Reacts with: rat (P60711), mouse (P60710), zebrafish, human (P60709), Drosophila melanogaster. Other species not tested yet.
Specificity	May cross-react to α- and γ-actin due to sequence homology.
Remarks	**ICC**: The following fixatives are possible: 4% formaldehyde/PFA, methanol.

Background

The two major cytoskeletal proteins involved in cell motility are myosin and **actin**. Monomeric actin is a globular protein that is expressed in all eukaryotic cells. Actin is the major subunit of microfilaments, a major component of the cytoskeleton, and of thin filaments, part of the contractile apparatus in muscle cells.
Actin is involved in many cellular processes including cell motility, maintenance of cell shape, and organelle trafficking.
Three main groups of actin have been identified. α-actins are found in muscle tissues whereas β- and γ-actins co-exist in most cell types as components of the cytoskeleton.