Synaptic Systems

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Synaptotagmin 1 lumenal domain

Cat.No. 105 221; Monoclonal mouse antibody, 200 µl hybridoma supernatant (lyophilized)

Data Sheet

Reconstitution/ Storage	200 µl hybridoma supernatant, lyophilized. For reconstitution add 200 µl H_2O, then aliquot and store at -20°C until use.
Applications	**WB**: 1 : 1000 up to 1 : 10000 (AP staining) **IP**: yes **ICC**: 1 : 100 **IHC**: 1 : 500 **IHC-P/FFPE**: not tested yet
Clone	604.1
Subtype	IgG3 (κ light chain)
Immunogen	Synthetic peptide corresponding to AA 1 to 12 from rat Synaptotagmin1 (UniProt Id: P21707)
Epitop	Epitop: AA 1 to 12 from rat Synaptotagmin1 (UniProt Id: P21707)
Reactivity	Reacts with: rat (P21707). No signal: mouse (P46096), zebrafish. Other species not tested yet.
Specificity	Specific for rat synaptotagmin 1, no cross-reactivity to other synaptotagmins. (K.O. verified)
Remarks	This antibody can be used for labeling of recycling synaptic vesicles by adding to living neurons or as a marker for exocytosis in isolated nerve terminals.This antibody is of high affinity but not as strong as clone 41.1.This antibody is strongly recommended when binding to Protein G is required.

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

Synaptotagmin 1 also known as **p65**, is an integral membrane glycoprotein of neuronal synaptic vesicles and secretory granules of neuroendocrine cells that is widely (but not ubiquitously) expressed in the central and peripheral nervous system. It has a variable N-terminal domain that is exposed to the lumen of the vesicle and a conserved cytoplasmic tail that contains two Ca^{2+}-binding C2-domains. Ca^{2+}-binding to synaptotagmin triggers exocytosis of synaptic vesicles, thus linking Ca^{2+}-influx during depolarization to neurotransmitter release.
Lumenal antibodies were used in living neurons to label synaptic vesicles from the outside via endocytotic uptake.

Selected References SYSY Antibodies

Structural elements that underlie Doc2β function during asynchronous synaptic transmission.
Xue R, Gaffaney JD, Chapman ER
Proceedings of the National Academy of Sciences of the United States of America (2015) 112(31): E4316-25. **WB, ICC; KO verified; tested species: mouse**

Storage and uptake of D-serine into astrocytic synaptic-like vesicles specify gliotransmission.
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The Journal of neuroscience : the official journal of the Society for Neuroscience (2013) 33(8): 3413-23. **IP, IHC; tested species: rat**

SV2B regulates synaptotagmin 1 by direct interaction.
Lazzell DR, Belizaire R, Thakur P, Sherry DM, Janz R
The Journal of biological chemistry (2004) 279(50): 52124-31. **IP, WB; tested species: mouse**

STED microscopy reveals that synaptotagmin remains clustered after synaptic vesicle exocytosis.
Willig KI, Rizzoli SO, Westphal V, Jahn R, Hell SW
Nature (2006) 440(7086): 935-9. **UPTAKE**

Mechanism-based rescue of Munc18-1 dysfunction in varied encephalopathies by chemical chaperones.
Guiberson NGL, Pineda A, Abramov D, Kharel P, Carnazza KE, Wragg RT, Dittman JS, Burré J
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Loss of Doc2-Dependent Spontaneous Neurotransmission Augments Glutamatergic Synaptic Strength.
Ramirez DMO, Crawford DC, Chanaday NL, Trauterman B, Monteggia LM, Kavalali ET
The Journal of neuroscience : the official journal of the Society for Neuroscience (2017) 37(26): 6224-6230. **UPTAKE; tested species: rat**

BDNF enhances spontaneous and activity-dependent neurotransmitter release at excitatory terminals but not at inhibitory terminals in hippocampal neurons.
Shinoda Y, Ahmed S, Ramachandran B, Bharat V, Brockelt D, Altas B, Dean C
Frontiers in synaptic neuroscience (2014) 6: 27. **ICC; tested species: rat**

CSPα knockout causes neurodegeneration by impairing SNAP-25 function.
Sharma M, Burré J, Bronk P, Zhang Y, Xu W, Südhof TC
The EMBO journal (2012) 31(4): 829-41. **WB; tested species: mouse**

Imaging of evoked dense-core-vesicle exocytosis in hippocampal neurons reveals long latencies and kiss-and-run fusion events.
Xia X, Lessmann V, Martin TF
Journal of cell science (2009) 122(Pt 1): 75-82. **ICC; tested species: rat**

Postsynaptic Neuroligin1 regulates presynaptic maturation.
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Proceedings of the National Academy of Sciences of the United States of America (2009) 106(32): 13564-9. **UPTAKE; tested species: mouse**

Borna disease virus blocks potentiation of presynaptic activity through inhibition of protein kinase C signaling.
Volmer R, Monnet C, Gonzalez-Dunia D
PLoS pathogens (2006) 2(3): e19. **UPTAKE; tested species: rat**

Phosphorylation of synapsin I by cAMP-dependent protein kinase controls synaptic vesicle dynamics in developing neurons.
Bonanomi D, Menegon A, Miccio A, Ferrari G, Corradi A, Kao HT, Benfenati F, Valtorta F
The Journal of neuroscience : the official journal of the Society for Neuroscience (2005) 25(32): 7299-308. **UPTAKE**

Synaptic targeting of N-type calcium channels in hippocampal neurons.
Maximov A, Bezprozvanny I
The Journal of neuroscience : the official journal of the Society for Neuroscience (2002) 22(16): 6939-52. **UPTAKE; tested species: rat**

Calcium-dependent interaction of the cytoplasmic region of synaptotagmin with membranes. Autonomous function of a single C2-homologous domain.
Chapman ER, Jahn R
The Journal of biological chemistry (1994) 269(8): 5735-41. **WB; tested species: rat**

Selected General References

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Annual review of neuroscience (1998) 21: 75-95.

The synaptic vesicle cycle: a cascade of protein-protein interactions.
Südhof TC
Nature (1995) 375(6533): 645-53.