

## Synaptotagmin 4

Cat.No. 105 043; Polyclonal rabbit antibody, 50 µg specific antibody (lyophilized)

### Data Sheet

Reconstitution/ Storage	50 µg specific antibody, lyophilized. Affinity purified with the immunogen. Rabbit serum albumin was added for stabilization. For reconstitution add 50 µl H <sub>2</sub> O to get a 1mg/ml solution in PBS. Then aliquot and store at -20°C until use.
Applications	<b>WB:</b> 1 : 100 up to 1 : 1000 (AP staining) <b>IP:</b> yes <b>ICC:</b> not recommended (see remarks) <b>IHC:</b> not recommended <b>IHC-P/FFPE:</b> not tested yet
Immunogen	Recombinant protein corresponding to AA 40 to 151 from rat Synaptotagmin4 (UniProt Id: P50232)
Reactivity	Reacts with: rat (P50232), mouse (P40749). Other species not tested yet.
Specificity	Specific for synaptotagmin 4. (K.O. verified)
matching control	105-4P
Remarks	<b>ICC: ICC/IHC:</b> Antibody 2 (cat. no. 105 143) is recommended for these applications.

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

Up to now at least 17 synaptotagmins have been identified. **Synaptotagmin 4** is composed of a vesicular, a transmembrane and two C2 domains. Only the C2B domain is able to bind calcium. In the C2A domain one of the calcium binding aspartates has been substituted for serine leading to a loss of its binding capabilities.

The localization of synaptotagmin 4 is still under discussion. A localization to synaptic vesicles (SVs) has been postulated but more recent studies suggest that it is present in the Golgi compartment, in distal parts of neurites and on large dense core vesicles (LDCVs) of NGF differentiated PC12 cells.

### Selected References SYSY Antibodies

Involvement of complexin 2 in docking, locking and unlocking of different SNARE complexes during sperm capacitation and induced acrosomal exocytosis.

Tsai PS, Brewis IA, van Maaren J, Gadella BM  
PloS one (2012) 7(3): e32603. **WB, ICC; tested species: pig**

Cell therapy modulates expression of Tax1-binding protein 1 and synaptotagmin IV in a model of optic nerve lesion.  
Mesentier-Louro LA, Coronel J, Zaverucha-do-Valle C, Mencalha A, Paredes BD, Abdelhay E, Mendez-Otero R, Santiago MF  
Investigative ophthalmology & visual science (2012) 53(8): 4720-9. **WB, IHC**

Loss of synaptotagmin IV results in a reduction in synaptic vesicles and a distortion of the Golgi structure in cultured hippocampal neurons.

Arthur CP, Dean C, Pagratis M, Chapman ER, Stowell MH  
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Synaptotagmin-IV modulates synaptic function and long-term potentiation by regulating BDNF release.  
Dean C, Liu H, Dunning FM, Chang PY, Jackson MB, Chapman ER  
Nature neuroscience (2009) 12(6): 767-76. **WB, ICC; IP**

Synaptotagmin IV: a multifunctional regulator of peptidergic nerve terminals.  
Zhang Z, Bhalla A, Dean C, Chapman ER, Jackson MB  
Nature neuroscience (2009) 12(2): 163-71. **WB, EM**

Synaptotagmin 4 Regulates Pancreatic β Cell Maturation by Modulating the Ca<sup>2+</sup> Sensitivity of Insulin Secretion Vesicles.  
Huang C, Walker EM, Dadi PK, Hu R, Xu Y, Zhang W, Sanavia T, Mun J, Liu J, Nair GG, Tan HYA, et al.  
Developmental cell (2018) 45(3): 347-361.e5. **WB, IHC; tested species: mouse**

Distinct subsets of Syt-IV/BDNF vesicles are sorted to axons versus dendrites and recruited to synapses by activity.  
Dean C, Liu H, Staudt T, Stahlberg MA, Vingill S, Bückers J, Kamin D, Engelhardt J, Jackson MB, Hell SW, Chapman ER, et al.  
The Journal of neuroscience : the official journal of the Society for Neuroscience (2012) 32(16): 5398-413. **WB, ICC**

Synaptotagmin oligomerization is essential for calcium control of regulated exocytosis.  
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Proceedings of the National Academy of Sciences of the United States of America (2018) 115(32): E7624-E7631. **WB; tested species: rat**

Reduced insulin secretion correlates with decreased expression of exocytotic genes in pancreatic islets from patients with type 2 diabetes.

Andersson SA, Olsson AH, Esguerra JL, Heimann E, Ladenvall C, Edlund A, Salehi A, Taneera J, Degerman E, Groop L, Ling C, et al.  
Molecular and cellular endocrinology (2012) 364(1-2): 36-45. **WB**

REST/NRSF governs the expression of dense-core vesicle gliosecretion in astrocytes.  
Prada I, Marchaland J, Podini P, Magrassi L, D'Alessandro R, Bezzi P, Meldolesi J  
The Journal of cell biology (2011) 193(3): 537-49. **WB**

Neuropeptide exocytosis involving synaptotagmin-4 and oxytocin in hypothalamic programming of body weight and energy balance.

Zhang G, Bai H, Zhang H, Dean C, Wu Q, Li J, Guariglia S, Meng Q, Cai D  
Neuron (2011) 69(3): 523-35. **IHC**

Deferoxamine-induced neurite outgrowth and synapse formation in postnatal rat dorsal root ganglion (DRG) cell cultures.  
Nowicki M, Kosacka J, Spanel-Borowski K, Borlak J  
European journal of cell biology (2009) 88(10): 551-62. **WB**

### Selected General References

Altered hippocampal short-term plasticity and associative memory in synaptotagmin IV (-/-) mice.  
Ferguson GD, Wang H, Herschman HR, Storm DR  
Hippocampus (2004) 14(8): 964-74.

Structural basis for the evolutionary inactivation of Ca<sup>2+</sup> binding to synaptotagmin 4.  
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Nature structural & molecular biology (2004) 11(9): 844-9.

Reduced anxiety and depression-like behavior in synaptotagmin IV (-/-) mice.  
Ferguson GD, Herschman HR, Storm DR  
Neuropharmacology (2004) 47(4): 604-11.

Synaptotagmin IV regulates glial glutamate release.  
Zhang Q, Fukuda M, Van Bockstaele E, Pascual O, Haydon PG  
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