Synaptic Systems

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Gephyrin

Cat.No. 147 111; Monoclonal mouse 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 until use.
Applications	**WB**: 1 : 1000 up to 1 : 5000 **IP**: yes **ICC**: 1 : 500 up to 1 : 1000 **IHC**: yes , methanol-acetone fixation **IHC-P/FFPE**: not recommended **ELISA**: yes
Clone	3B11
Subtype	IgG1 (κ light chain)
Immunogen	Recombinant protein corresponding to AA 307 to 735 from rat Gephyrin (UniProt Id: Q03555)
Epitop	Epitop: AA 326 to 550 from rat Gephyrin (UniProt Id: Q03555)
Reactivity	Reacts with: human (Q9NQX3), rat (Q03555), mouse (Q8BUV3), zebrafish. Other species not tested yet.
Specificity	Detects all splice variants that contain a complete E-domain including the C6 domain. K.O. PubMed: 26829712
Remarks	This antibody is highly recommended for Western blot experiments and immunoprecipitation.

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

Gephyrin is a bifunctional protein which is essential for both synaptic clustering of inhibitory neurotransmitter receptors in the central nervous system and the biosynthesis of the molybdenum cofactor (MoCo) in peripheral tissues. It co-purifies with the inhibitory glycine receptor (GlyR) and is expressed abundantly in all brain areas which contain synapses.

Selected References SYSY Antibodies

Extracellular signal-regulated kinase and glycogen synthase kinase 3β regulate gephyrin postsynaptic aggregation and GABAergic synaptic function in a calpain-dependent mechanism.
Tyagarajan SK, Ghosh H, Yévenes GE, Imanishi SY, Zeilhofer HU, Gerrits B, Fritschy JM
The Journal of biological chemistry (2013) 28814: 9634-47. . **WB, IP**

Estradiol modulates the efficacy of synaptic inhibition by decreasing the dwell time of GABAA receptors at inhibitory synapses.
Mukherjee J, Cardarelli RA, Cantaut-Belarif Y, Deeb TZ, Srivastava DP, Tyagarajan SK, Pangalos MN, Triller A, Maguire J, Brandon NJ, Moss SJ, et al.
Proceedings of the National Academy of Sciences of the United States of America (2017) 11444: 11763-11768. . **ICC, WB**

Neuroligin-4 is localized to glycinergic postsynapses and regulates inhibition in the retina.
Hoon M, Soykan T, Falkenburger B, Hammer M, Patrizi A, Schmidt KF, Sassoè-Pognetto M, Löwel S, Moser T, Taschenberger H, Brose N, et al.
Proceedings of the National Academy of Sciences of the United States of America (2011) 1087: 3053-8. . **WB, IHC**

The small GTPase ARF6 regulates GABAergic synapse development.
Kim H, Jung H, Jung H, Kwon SK, Ko J, Um JW
Molecular brain (2020) 131: 2. . **WB, ICC; tested species: rat**

Receptor protein tyrosine phosphatase delta is not essential for synapse maintenance or transmission at hippocampal synapses.
Han KA, Lee HY, Lim D, Shin J, Yoon TH, Liu X, Um JW, Choi SY, Ko J
Molecular brain (2020) 131: 94. . **WB, ICC; tested species: mouse**

S-sulfocysteine/NMDA receptor-dependent signaling underlies neurodegeneration in molybdenum cofactor deficiency.
Kumar A, Dejanovic B, Hetsch F, Semtner M, Fusca D, Arjune S, Santamaria-Araujo JA, Winkelmann A, Ayton S, Bush AI, Kloppenburg P, et al.
The Journal of clinical investigation (2017) 12712: 4365-4378. . **WB, ICC; tested species: mouse**

Several posttranslational modifications act in concert to regulate gephyrin scaffolding and GABAergic transmission.
Ghosh H, Auguadri L, Battaglia S, Simone Thirouin Z, Zemoura K, Messner S, Acuña MA, Wildner H, Yévenes GE, Dieter A, Kawasaki H, et al.
Nature communications (2016) 7: 13365. . **IP, WB**

An E3-ligase-based method for ablating inhibitory synapses.
Gross GG, Straub C, Perez-Sanchez J, Dempsey WP, Junge JA, Roberts RW, Trinh le A, Fraser SE, De Koninck Y, De Koninck P, Sabatini BL, et al.
Nature methods (2016) 138: 673-8. . **WB, ICC; tested species: mouse,zebrafish**

Synaptic localization of α5 GABA (A) receptors via gephyrin interaction regulates dendritic outgrowth and spine maturation.
Brady ML, Jacob TC
Developmental neurobiology (2015) 7511: 1241-51. . **WB, ICC; tested species: rat**

Differential localization of gamma-aminobutyric acid type A and glycine receptor subunits and gephyrin in the human pons, medulla oblongata and uppermost cervical segment of the spinal cord: an immunohistochemical study.
Waldvogel HJ, Baer K, Eady E, Allen KL, Gilbert RT, Mohler H, Rees MI, Nicholson LF, Faull RL
The Journal of comparative neurology (2010) 5183: 305-28. . **WB, IHC; tested species: human**

Phosphorylation on Ser 359 of the α2 subunit in GABA type A receptors down-regulates their density at inhibitory synapses.
Nakamura Y, Morrow DH, Nathanson AJ, Henley JM, Wilkinson KA, Moss SJ
The Journal of biological chemistry (2020) : . . **WB; tested species: rat**

Distinct Pathogenic Genes Causing Intellectual Disability and Autism Exhibit a Common Neuronal Network Hyperactivity Phenotype.
Frega M, Selten M, Mossink B, Keller JM, Linda K, Moerschen R, Qu J, Koerner P, Jansen S, Oudakker A, Kleefstra T, et al.
Cell reports (2020) 301: 173-186.e6. . **ICC; tested species: rat**

Autism-Misregulated eIF4G Microexons Control Synaptic Translation and Higher Order Cognitive Functions.
Gonatopoulos-Pournatzis T, Niibori R, Salter EW, Weatheritt RJ, Tsang B, Farhangmehr S, Liang X, Braunschweig U, Roth J, Zhang S, Henderson T, et al.
Molecular cell (2020) : . . **WB; tested species: mouse**

Calsyntenin-3 interacts with both α- and β-neurexins in the regulation of excitatory synaptic innervation in specific Schaffer collateral pathways.
Kim H, Kim D, Kim J, Lee HY, Park D, Kang H, Matsuda K, Sterky FH, Yuzaki M, Kim JY, Choi SY, et al.
The Journal of biological chemistry (2020) : . . **WB; tested species: mouse**

A Role for mir-26a in Stress: A Potential sEV Biomarker and Modulator of Excitatory Neurotransmission.
Lafourcade CA, Fernández A, Ramírez JP, Corvalán K, Carrasco MÁ, Iturriaga A, Bátiz LF, Luarte A, Wyneken U
Cells (2020) 96: . . **WB; tested species: rat**