Synaptic Systems

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Rab 3a

Cat.No. 107 111; Monoclonal mouse antibody, 100 µg purified IgG (lyophilized)

Data Sheet

Reconstitution/ Storage	100 µg purified IgG, lyophilized. 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 (AP staining) **IP**: yes **ICC**: 1 : 1000 up to 1 : 2000 **IHC**: 1 : 200 **IHC-P/FFPE**: 1 : 200 **EM**: yes **ELISA**: yes (see remarks)
Clone	42.2
Subtype	IgG1 (κ light chain)
Immunogen	Recombinant protein corresponding to AA 1 to 220 from rat Rab3a (UniProt Id: P63012)
Epitop	Epitop: AA 191 to 220 from rat Rab3a (UniProt Id: P63012)
Reactivity	Reacts with: human (P20336), rat (P63012), mouse (P63011), mammals. Other species not tested yet.
Specificity	Specific for mammalian Rab 3a. (K.O. verified)
Remarks	**ELISA**: Suitable as capture antibody for sandwich-ELISA with cat. no. 107 102 as detector antibody (protocol for sandwich-ELISA).

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

Rab 3 is a member of the Rab protein family that belongs to the ras-related superfamily of small monomeric GTPases. Four related isoforms of Rab 3 are known (**Rab 3a**, 3b, **3c**, and **3d**). Rab 3a and 3c are predominantly expressed in neurons and neuroendocrine cells where they are localized to synaptic vesicles. Unlike the integral membrane proteins of synaptic vesicles, Rab 3a/c is absent from the Golgi complex and thus does not result in immunostaining of the axo-dendritic region as sometimes seen with e.g. synaptophysin, synaptobrevin/VAMP, or synaptogyrin.
Rab 3b and 3d are expressed in non-neuronal tissues such as adipocytes and the exocrine pancreas (3d). It has been shown that overexpression of Rab 3 inhibits Ca^{2+} regulated excocytosis and converts it into an constitutive Ca^{2+} independent exocytosis mechanism.

Selected References SYSY Antibodies

Association of Rab3A with synaptic vesicles at late stages of the secretory pathway.
Matteoli M, Takei K, Cameron R, Hurlbut P, Johnston PA, Südhof TC, Jahn R, De Camilli P
The Journal of cell biology (1991) 115(3): 625-33. **ICC, IHC, WB, EM; tested species: rat,frog**

Quantitative analysis of synaptic vesicle Rabs uncovers distinct yet overlapping roles for Rab3a and Rab27b in Ca2+-triggered exocytosis.
Pavlos NJ, Grønborg M, Riedel D, Chua JJ, Boyken J, Kloepper TH, Urlaub H, Rizzoli SO, Jahn R
The Journal of neuroscience : the official journal of the Society for Neuroscience (2010) 30(40): 13441-53. **WB, IP, ICC**

JIP3 localises to exocytic vesicles and focal adhesions in the growth cones of differentiated PC12 cells.
Caswell PT, Dickens M
Molecular and cellular biochemistry (2017) : . **WB, ICC; 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. **WB, ICC; tested species: rat**

Myosin5a tail associates directly with Rab3A-containing compartments in neurons.
Wöllert T, Patel A, Lee YL, Provance DW, Vought VE, Cosgrove MS, Mercer JA, Langford GM
The Journal of biological chemistry (2011) 286(16): 14352-61. **WB, ICC; tested species: mouse**

Biochemical, molecular and behavioral phenotypes of Rab3A mutations in the mouse.
Yang S, Farias M, Kapfhamer D, Tobias J, Grant G, Abel T, Bućan M
Genes, brain, and behavior (2007) 6(1): 77-96. **WB, IP**

Rabphilin knock-out mice reveal that rabphilin is not required for rab3 function in regulating neurotransmitter release.
Schlüter OM, Schnell E, Verhage M, Tzonopoulos T, Nicoll RA, Janz R, Malenka RC, Geppert M, Südhof TC
The Journal of neuroscience : the official journal of the Society for Neuroscience (1999) 19(14): 5834-46. **WB, IHC**

Synaptic targeting of rabphilin-3A, a synaptic vesicle Ca2+/phospholipid-binding protein, depends on rab3A/3C.
Li C, Takei K, Geppert M, Daniell L, Stenius K, Chapman ER, Jahn R, De Camilli P, Südhof TC
Neuron (1994) 13(4): 885-98. **WB, IHC**

Synapsin-dependent reserve pool of synaptic vesicles supports replenishment of the readily releasable pool under intense synaptic transmission.
Vasileva M, Horstmann H, Geumann C, Gitler D, Kuner T
The European journal of neuroscience (2012) 36(8): 3005-20. **ELISA**

The reduction in glutamate release is predictive of cognitive and emotional alterations that are corrected by the positive modulator of AMPA receptors S 47445 in perinatal stressed rats.
Morley-Fletcher S, Zuena AR, Mairesse J, Gatta E, Van Camp G, Bouwalerh H, Riozzi B, Battaglia G, Pittaluga A, Olivero G, Mocaer E, et al.
Neuropharmacology (2018) 135: 284-296. **WB; tested species: rat**

SNARE Complex-associated Proteins in the Lateral Amygdala of Macaca mullatta Following Long-term Ethanol Drinking.
Alexander NJ, Rau AR, Jimenez VA, Daunais JB, Grant KA, McCool BA
Alcoholism, clinical and experimental research (2018) : . **WB; tested species: monkey**

The Prion Protein Regulates Synaptic Transmission by Controlling the Expression of Proteins Key to Synaptic Vesicle Recycling and Exocytosis.
Peggion C, Stella R, Chemello F, Massimino ML, Arrigoni G, Cagnin S, Biancotto G, Franchin C, Sorgato MC, Bertoli A
Molecular neurobiology (2018) : . **WB; tested species: mouse**

Generation of a novel human cytomegalovirus bacterial artificial chromosome tailored for transduction of exogenous sequences.
Close WL, Bhandari A, Hojeij M, Pellett PE
Virus research (2017) 242: 66-78. **WB; tested species: human**

A novel method for culturing stellate astrocytes reveals spatially distinct Ca2+ signaling and vesicle recycling in astrocytic processes.
Wolfes AC, Ahmed S, Awasthi A, Stahlberg MA, Rajput A, Magruder DS, Bonn S, Dean C
The Journal of general physiology (2017) 149(1): 149-170. **WB**

OCD-like behavior is caused by dysfunction of thalamo-amygdala circuits and upregulated TrkB/ERK-MAPK signaling as a result of SPRED2 deficiency.
Ullrich M, Weber M, Post AM, Popp S, Grein J, Zechner M, Guerrero González H, Kreis A, Schmitt AG, Üçeyler N, Lesch KP, et al.
Molecular psychiatry (2017) : . **WB**

Ethanol Mediated Inhibition of Synaptic Vesicle Recycling at Amygdala Glutamate Synapses Is Dependent upon Munc13-2.
Gioia DA, Alexander N, McCool BA
Frontiers in neuroscience (2017) 11: 424. **WB; tested species: mouse**