Synaptic Systems

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Rab 3a

Cat.No. 107 102; Polyclonal rabbit antibody, 200 µl antiserum (lyophilized)

Data Sheet

Reconstitution/ Storage	200 µl antiserum, lyophilized. For reconstitution add 200 µl H_2O, then aliquot and store at -20°C until use.
Applications	**WB**: 1 : 1000 (AP staining) **IP**: yes **ICC**: 1 : 1000 **IHC**: yes **IHC-P/FFPE**: not tested yet **ELISA**: yes (see remarks)
Immunogen	Synthetic peptide corresponding to AA 2 to 14 from rat Rab3a (UniProt Id: P63012)
Reactivity	Reacts with: human (P20336), rat (P63012), mouse (P63011), hamster, cow, zebrafish. Other species not tested yet.
Specificity	Specific for Rab 3a.
matching control	107-1P
Remarks	**ELISA**: Suitable as detector antibody for sandwich-ELISA with cat. no. 107 111 as capture 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

Localization versus function of Rab3 proteins. Evidence for a common regulatory role in controlling fusion.
Schlüter OM, Khvotchev M, Jahn R, Südhof TC
The Journal of biological chemistry (2002) 277(43): 40919-29. **WB, IHC**

SV31 is a Zn2+-binding synaptic vesicle protein.
Barth J, Zimmermann H, Volknandt W
Journal of neurochemistry (2011) 118(4): 558-70. **WB, ICC**

Distribution of synaptic vesicle proteins in the mammalian retina identifies obligatory and facultative components of ribbon synapses.
Von Kriegstein K, Schmitz F, Link E, Südhof TC
The European journal of neuroscience (1999) 11(4): 1335-48. **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**

Cochlear ablation in neonatal rats disrupts inhibitory transmission in the medial nucleus of the trapezoid body.
Hruskova B, Trojanova J, Kralikova M, Melichar A, Suchankova S, Bartosova J, Burianova JS, Popelar J, Syka J, Turecek R
Neuroscience letters (2019) : . **IHC; tested species: rat**

The GTPase Rab26 links synaptic vesicles to the autophagy pathway.
Binotti B, Pavlos NJ, Riedel D, Wenzel D, Vorbrüggen G, Schalk AM, Kühnel K, Boyken J, Erck C, Martens H, Chua JJ, et al.
eLife (2015) 4: e05597. **WB**

Proteomic screening of glutamatergic mouse brain synaptosomes isolated by fluorescence activated sorting.
Biesemann C, Grønborg M, Luquet E, Wichert SP, Bernard V, Bungers SR, Cooper B, Varoqueaux F, Li L, Byrne JA, Urlaub H, et al.
The EMBO journal (2014) 33(2): 157-70. **WB; tested species: mouse**

Composition of isolated synaptic boutons reveals the amounts of vesicle trafficking proteins.
Wilhelm BG, Mandad S, Truckenbrodt S, Kröhnert K, Schäfer C, Rammner B, Koo SJ, Claßen GA, Krauss M, Haucke V, Urlaub H, et al.
Science (New York, N.Y.) (2014) 344(6187): 1023-8. **IHC; tested species: mouse**

Glomerular podocytes possess the synaptic vesicle molecule Rab3A and its specific effector rabphilin-3a.
Rastaldi MP, Armelloni S, Berra S, Li M, Pesaresi M, Poczewski H, Langer B, Kerjaschki D, Henger A, Blattner SM, Kretzler M, et al.
The American journal of pathology (2003) 163(3): 889-99. **IHC**

Selected General References

RAB3 and synaptotagmin: the yin and yang of synaptic membrane fusion.
Geppert M, Südhof TC
Annual review of neuroscience (1998) 21: 75-95.

Dominant negative Rab3D mutants reduce GTP-bound endogenous Rab3D in pancreatic acini.
Chen X, Ernst SA, Williams JA
The Journal of biological chemistry (2003) 278(50): 50053-60.

Rab3D: a regulator of exocytosis in non-neuronal cells.
Millar AL, Pavios NJ, Xu J, Zheng MH
Histology and histopathology (2002) 17(3): 929-36.

Molecular cloning of the mouse homologue of Rab3c.
Pavlos NJ, Xu J, Papadimitriou JM, Zheng MH
Journal of molecular endocrinology (2001) 27(1): 117-22.

The small GTP-binding protein Rab3A regulates a late step in synaptic vesicle fusion.
Geppert M, Goda Y, Stevens CF, Südhof TC
Nature (1997) 387(6635): 810-4.

Characterization of Rab3A, Rab3B and Rab3C: different biochemical properties and intracellular localization in bovine chromaffin cells.
Lin CG, Lin YC, Liu HW, Kao LS
The Biochemical journal (1997) 324 (Pt 1): 85-90.

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

Synaptic vesicles and exocytosis.
Jahn R, Südhof TC
Annual review of neuroscience (1994) 17: 219-46.