

Supplementary information S1 (table) | **Human Rab GTPases and their close orthologues**

Rab	Family	Localization	Function	Effectors	Refs
RAB1 A,B	RAB3	ER exit sites, IC	COP-I-mediated ER-Golgi transport. COP-II-mediated Golgi-ER transport, IC-PM transport	Golgin-84, Golgin-95, p115, GM130, Giantin	1-7
RAB2 A,B	RAB11	IC	ER-Golgi transport, maturation of pre-Golgi intermediates, Golgi-ER transport	Golgin-45, ICA69, PKC $\lambda$ /t	8-16
RAB3 A,B,C,D	RAB3	Synaptic vesicles, secretory granules	Regulated exocytosis	Rabphilin, Rabin3, RIM1/2, Granuphilin, Noc2, synapsin	17-29
RAB4 A,B,C	RAB11	EEs, REs	Endocytic recycling, G4V trafficking	Rabip4, RCP, Rabenosyn-5, Rabaptin-5	30-36
RAB5 A,B,C	RAB5	EEs, CCVs, Caveosomes, PM	Endocytosis, early endosome fusion, phagosome maturation, growth factor signalling	Rabaptin-5, Rabenosyn-5, EEA1, p150/Vps15, Rabankyrin-5, APPL1/2, type II inositol 5-phosphatase, type Ia PtdIns(3,4)P <sub>2</sub> 4-phosphatase, p110 $\beta$ , HAP40	8,37-49
RAB6 A,B,C	RAB6	Golgi	Intra-Golgi traffic, ER-Golgi traffic, Endosome-Golgi transport, Golgi-PM traffic, cytokinesis	Giantin, Rabankyrin-6, Rab6IP1, GCC185, Bicaudal D1, TMF/ARA160, Mint3, Vps52	50-66
RAB7 A*,B	RAB7	LEs	EE-LE trafficking, lysosome biogenesis, phagosome maturation	RILP, Vps26/29/35 trimer (retromer subcomplex), Vps34, p150/Vps15	8,67-71
RAB8 A,B	RAB1	TGN, G4Vs	TGN-PM trafficking, G4V translocation, ciliogenesis, basolateral and dendritic sorting, adherens junction assembly	Optineurin, FIP-2, Myosin Vb (only Rab8a), JRAB	72-78
RAB9 A,B,C	RAB7	LEs	LE-TGN trafficking	TIP47, p40, GCC185	61,79-83
RAB10	RAB3	TGN, G4Vs, ER	TGN-PM trafficking, G4V translocation, basolateral sorting	Rim1	7,84-86
RAB11 A,B	RAB11	REs	Endocytic recycling, cytokinesis	Nuf, FIP-2, FIP-3, FIP-4, FIP-5, Sec15 (exocyst cubunit), RCP, Myosin Vb, Protrudin (NB: binds GDP-bound form)	36,73,87-97
RAB12	RAB3	TGN, SGs	Transport from cell periphery to pericentriolar region	TGN-PM trafficking	98,99
RAB13	RAB3	Tight junctions, EEs	Biogenesis of tight junctions	JRAB	78,100
RAB14	RAB11	EEs, TGN	Phagosome maturation, TGN-EE trafficking		101,102
RAB15	RAB3	EEs, REs	Trafficking through EEs, endocytic recycling	REP15	103-105
RAB17	RAB5	Apical REs	Trafficking through apical REs, ciliogenesis		106-108
RAB18	RAB18	ER, Lipid droplets, SGs	Formation of lipid droplets from ER, ER-Golgi trafficking, negative regulator of neuroendocrine secretion		109-112
RAB19 A,B	RAB19	Golgi			113,114
RAB20	RAB5	Dense apical tubules	Connexin-43 trafficking		109,115
RAB21	RAB5	EEs	Integrin endocytosis, cytokinesis		116-118
RAB22	RAB5	EEs, TGN	EE-TGN and TGN-EE transport, attenuation of phagosome maturation	EEA1	98,119-122

## SUPPLEMENTARY INFORMATION

Rab	Family	Localization	Function	Effectors	Refs
RAB23**	RAB23	PM, EEs	Phagosome-lysosome fusion, negative regulator of sonic hedgehog signalling, ciliogenesis		123-128
RAB24	RAB5	Autophagosomes, nucleus	Induction of autophagy	Cyclophilin A, GABARAP	98,129,130
RAB25	RAB11	Apical REs	Transport through apical REs, integrin recycling	Myosin Vb, Integrin $\alpha 5\beta 1$	97,131-133
RAB26	RAB3	SGs	Regulated exocytosis of SGs	Rim1	86,134
RAB27 A***, B	RAB3	SGs, Melanosomes, T-cell granules	Regulated secretion, Myosin Va recruitment to melanosomes and T-cell granules	Rabphilin, melanophilin, Noc2, Slp1, Slp2, Slp3, Slp4/ granuphilin, Slp5, Munc13-4	86,135-142
RAB28	RAB28	N.D.	N.D.		143
RAB29	RAB29	N.D.	N.D.		144
RAB30	RAB19	Golgi	N.D.	Golgin-97, GCC88, GM130 (in <i>Drosophila</i> )	113,145
RAB31 /22B	RAB5	TGN, EEs	TGN-PM and TGN-EE trafficking, attenuation of G4V trafficking		121,145-148
RAB32	RAB29	Melanosomes, mitochondria	Anchoring of PKA, post-Golgi trafficking of melanogenic enzymes, mitochondrial dynamics	Regulatory subunit type II of PKA	147,149,150
RAB33 A,B	RAB19	Medial Golgi	Golgi-ER trafficking, autophagy	Atg16L, GM130, Rabaptin-5	151,152
RAB34	RAB34	Plasma membrane, macropinosomes, Golgi	Macropinocytosis, lysosome positioning	RILP, Hmunc13	153-155
RAB35	RAB3	REs	Endocytic recycling, cytokinesis, phagosome-lysosome fusion, immunological synapse formation		127,156,157
RAB36	RAB34	N.D.	N.D.		158
RAB37	RAB3	SGs	Mast cell degranulation	Rim1	86,159
RAB38	RAB29	Melanosomes	Melanosome biogenesis	Varp	149,160-163
RAB39	RAB11	Golgi	N.D.	GCC88 (in <i>Drosophila</i> )	113,164
RAB40A,B,C	RAB3	Golgi (in <i>Xenopus</i> )	Ubiquitination and localization of Rab2 (in <i>Xenopus</i> )	ElonginB/C, Cullin5 (in <i>Xenopus</i> )	165
RAB41	RAB6	N.D.	N.D.		166
RAB42	RAB11	N.D.	N.D.		143
RAB43	RAB19	Golgi	ER-Golgi trafficking		110,167
RAB44	RAB3	N.D.	N.D.		143

Classification into subfamilies is according to Refs 143 and 168. Rab-like proteins with distant similarities to the Rab family have not been included in the table.

\* Mutated in Charcot-Marie-Tooth type 2B disease. \*\* Mutated in Griscelli syndrome type 2. \*\*\* Mutated in Carpenter's syndrome.

Abbreviations: EE, early endosome; ER, endoplasmic reticulum; G4V, GLUT4 vesicle; IC, pre-Golgi intermediate compartment; LE, late endosome; N.D., not determined; PM, plasma membrane; RE, recycling endosome; SG, secretory granule, SV, synaptic vesicle; TGN, *trans*-Golgi network.

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