

**Supplemental Table 1A. Rab Constructs**

<b>Protein</b>	<b>Species</b>	<b>Accession Number</b>	<b>Residue Number</b>	<b>Cloning Vector</b>
Rab1A	Human	NM_030981	2-208	pGEX4T1
Rab2A	Human	NM_002865	2-212	pGEX6P1
Rab3A	Mouse	BI739240	2-220	modified pET15b
Rab4A	Human	M_28211	2-213	pGEX4T1
Rab5C	Mouse	NM_004162	2-216	pGEX4T1
Rab6A	Human	AA210997	2-208	pGEX4T1
Rab7	Mouse	BI159347	2-207	pGEX4T1
Rab8A	Human	NM_153317	2-207	pGEX4T1
Rab9	Mouse	BC008160	2-201	pGEX6P1
Rab10	Human	NM_016131	2-200	pGEX4T1
Rab11A	Human	NM_017382	2-216	pGEX4T1
Rab12	Rat	M83676	2-209	pGEX4T1
Rab13	Human	NM_002870	2-203	pGEX4T1
Rab14	Human	NM_016322	2-215	pGEX6P1
Rab15	Mouse	BF160330	2-212	pGEX4T1
Rab17	Human	BC050426	2-212	pGEX4T1
Rab18	Human	NM_021252	2-206	pGEX4T1
Rab19	Mouse	AI050254	2-217	pGEX4T1
Rab20	Human	BC026025	2-204	pGEX4T1
Rab21	Human	NM_014999	16-225	pGEX4T1
Rab22A	Mouse	NM_020673	2-194	pGEX4T1
Rab23	Mouse	NM_008999	2-237	pGEX4T1
Rab24	Mouse	NM_130781	2-203	pGEX4T1
Rab25	Mouse	NM_016899	2-213	pGEX4T1
Rab26	Human	NM_014353	2-190	pGEX4T1
Rab27B	Human	NM_004163	2-227	pGEX4T1
Rab28	Mouse	XM_293673	2-221	pGEX4T1
Rab29	Rat	NM_133590	2-203	pGEX4T1
Rab30	Human	NM_014488	2-203	pGEX4T1
Rab32	Human	NM_006834	22-195	pGEX4T1
Rab33B	Mouse	NM_016858	4-176	pGEX4T1
Rab34	Human	NM_031934	2-259	pGEX4T1
Rab35	Human	NM_006861	2-201	pGEX4T1
Rab36	Mouse	XM_125709	2-267	pGEX4T1
Rab37	Human	BC040547	2-223	pGEX4T1
Rab38	Human	NM_022337	2-211	pGEX4T1
Rab39	Human	NM_084662	2-217	pGEX4T1

**Supplemental Table1B. Constructs used for crystallization**

<b>Constructs</b>	<b>Residue Number</b>	<b>Cloning Vector</b>	<b>N-terminal Residues derived from Tag</b>
Ypt1p	8-172	modified pET15b	MGHHHHHHHGS
Rab2A	2-170	pGEX6P1	GPLGS
Rab4A	2-172	pGEX6P1	GPLGS
Rab4A Q67L	18-185	modified pET28a	GS
Rab5C	18-185	pGEX4T1	GS
Rab6A	10-177	pGEX4T1	GS
Rab9	4-175	pGEX6P1	GPLGS
Rab11A	8-175	modified pET15b	MGHHHHHHHGS L V P R G S
Rab14	2-175	pGEX6P1	GPLGS
Rab21	16-183	pGEX4T1	GS
Rab21	16-183	modified pET15b	MGHHHHHHHGS L V P R G S
Rab22A	2-169	pGEX4T1	GS
Rab22A Q64L*	2-169	modified pET28a	GS
Rab23	6-172	pGEX4T1	GS
Rab33	30-202	modified pET15b	MGHHHHHHHGS L V P R G S
Rabenosyn	458-503	pGEX6P1	GPLGS
Rabenosyn	440-503	pGEX6P1	GPLGS
Rabenosyn	728-784	pGEX4T1	GS

\* This construct contains an additional PCR-induced mutation, V22M, which has no effect on the affinity for Rabenosyn or EEA1 and no effect on the structure compared with the GppNHp-bound form of wild type Rab22A.