

Table S1. Empirically substantiated TA proteins

UniProt ID	Subcellular Location	Method	References
AOFB_HUMAN	Mitochondria	immunofluorescence	[1]
SYJ2B_HUMAN	Mitochondria	immunofluorescence	[2]
CYB5B_HUMAN	ER	fractionation	[3]
BAX_HUMAN	mitochondria	fluorescence	[4, 5, 6, 7, 8]
MIRO1_HUMAN	mitochondria	fluorescence	[9, 10]
MIRO2_HUMAN	mitochondria	fluorescence	[9, 11]
FIS1_HUMAN	mitochondria	immunofluorescence, fluorescence	[12, 13, 14, 15]
MAVS_HUMAN	mitochondria, peroxisome	immunofluorescence (maybe)	[16, 17]
GDAP1_HUMAN	mitochondria	fluorescence, immunofluorescence	[18]
MTX1_HUMAN	mitochondria	similarity (fluorescence; GFP)	[19, 20]
TOM7_HUMAN	mitochondria	fluorescence	[21]
CYB5_HUMAN	mitochondria	immunofluorescence	[22]
HMOX1_HUMAN	ER	fluorescence (CFP)	[23]
SC61B_HUMAN	ER	fractionation	[24]
SC61G_HUMAN	ER		[24]
AL3A2_HUMAN	ER (microsome)	fractionation	[25]
PTN1_HUMAN	ER	fluorescence	[26]
VAPA_HUMAN	ER, Golgi, plasma, nucleus	immunofluorescence, fractionation	[27, 28]
SLMAP_HUMAN	plasma membrane	immunofluorescence	[29]
STX1A_HUMAN	synaptic vesicle membrane	similarity (immunofluorescence)	[30]
STX1B_HUMAN	plasma membrane	immunofluorescence	[31]
STX2_HUMAN	plasma membrane	fractionation, fluorescence	[30, 32, 33]
STX3_HUMAN	plasma membrane	fractionation, fluorescence	[32, 33]
STX5_HUMAN	ER, Golgi	fluorescence	[30, 34, 35]
STX4_HUMAN	plasma membrane	fractionation, fluorescence	[30, 32, 33]
STX6_HUMAN	Golgi	immunofluorescence	[35, 36]
STX7_HUMAN	Golgi	fluorescence	[35, 37]
STX8_HUMAN	ER, plasma	antibody	[35, 38]
STX10_HUMAN	Golgi	immunofluorescence	[39]
STX12_HUMAN	Golgi	solubilize with detergent, immunofluorescence	[40]
STX16_HUMAN	Golgi	immunofluorescence	[41]
STX18_HUMAN	ER	fractionation, immunofluorescence	[42, 43]
GOSR1_HUMAN	Golgi	fractionation, immunofluorescence	[34, 44, 45, 46, 47]
BET1_HUMAN	Golgi	similarity (immunofluorescence)	[48]
VAMP1_HUMAN	synaptic vesicle membrane, mitochondria	immunofluorescence	[49, 50]
VAMP2_HUMAN	synaptic vesicle membrane, plasma membrane	immunofluorescence	[50]
VAMP3_HUMAN	endosome	immunofluorescence	[51]
VAMP4_HUMAN	Golgi, lysosome, endosome	immunofluorescence	[52]
VAMP5_HUMAN	plasma membrane	immunofluorescence	[53]
VAMP8_HUMAN	plasma membrane	immunofluorescence	[52, 54]
VAMP7_HUMAN	ER	immunofluorescence, immunoelectroscopy	[52, 55]
FMP32_YEAST	mitochondria	GFP, ms, fractionation	[56, 57, 58, 59]
FIS1_YEAST	mitochondria	GFP, fractionation	[56, 59, 60]
TOM5_YEAST	mitochondria	direct assay, fractionation, ms	[58, 59, 61]
TOM6_YEAST	mitochondria	fractionation, complex	[58, 59]
TOM7_YEAST	mitochondria	direct assay	[58, 59, 62]

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TOM22_YEAST	mitochondria	fractionation, ms	[58, 59, 63]
PRM3_YEAST	nuclear outer membrane	GFP	[56, 64, 65, 66, 67]
KAR1_YEAST	nuclear outer membrane	inference, GFP	[68, 69]
UBC6_YEAST	ER, plasma (possibly)	immunofluorescence	[70]
SCS2_YEAST	ER, nuclear	immunofluorescence, fluorescence	[57, 71, 72, 73]
CSM4_YEAST	ER, nuclear	fluorescence	[56]
HLJ1_YEAST	ER	fluorescence	[56]
YSY6_YEAST	ER	fluorescence	[57, 74]
SC6B2_YEAST	ER	inference (part of a complex)	[75]
DPM1_YEAST	ER	fluorescence,	[57, 76]
SC61G_YEAST	ER	fluorescence, part of a known complex	[57]
SC6B1_YEAST	ER	inference (part of a complex)	[77]
PGC1_YEAST	mitochondria, lipid particles	fluorescence, fractionation	[56, 58, 59, 78]
PEX15_YEAST	ER, peroxisome	fluorescence	[57, 79]
CYB5_YEAST	ER	immunofluorescence	[80, 81]
HPH1_YEAST	ER	fluorescence	[56, 82]
HPH2_YEAST	ER	fluorescence	[82]
FAR10_YEAST	ER	fluorescence	[56]
VPS64_YEAST	ER	fluorescence	[56, 57]
SEC20_YEAST	ER	treatment with sodium carbonate	[83]
SEC22_YEAST	ER, Golgi	immunofluorescence	[84, 85]
UFE1_YEAST	ER	immunofluorescence	[86]
USE1_YEAST	ER	immunofluorescence, fluorescence, sodium carbonate	[57, 87, 88]
SED5_YEAST	Golgi	fluorescence, immunofluorescence, sodium carbonate	[89, 90]
GOSR1_YEAST	Golgi	immunofluorescence	[91, 92]
BET1_YEAST	ER, possibly Golgi	fractionation	[93]
BOS1_YEAST	ER, possibly Golgi	fractionation	[93]
TLG1_YEAST	trans-Golgi network (TGN)	immunofluorescence, fractionation, solubilization	[94, 95]
SFT1_YEAST	Golgi	immunofluorescence	[96]
TLG2_YEAST	trans-Golgi network (TGN)	immunofluorescence, fluorescence	[95, 97]
STX8_YEAST	endosome, Golgi	fluorescence	[98]
PEP12_YEAST	Golgi	fractionation, solubilization	[99]
VTH1_YEAST	Golgi	immunofluorescence, solubilization	[100]
NYV1_YEAST	vacuole	fluorescence	[57]
VAM3_YEAST	vacuole	immunofluorescence	[101]
SNC1_YEAST	vacuole, plasma, Golgi	fluorescence	[102, 103]
SNC2_YEAST	Golgi	fluorescence	[103, 104]
SSO1_YEAST	plasma, vacuole	fluorescence	[105]
SSO2_YEAST	plasma	fluorescence	[105]
YD012_YEAST	plasma	fluorescence	[56, 57]
YBM6_YEAST	plasma	fluorescence	[56]
PHM6_YEAST	vacuole	fluorescence	[57]
Q9SMS0_ARATH	chloroplast	large-scale analysis	[106]
Q9FJT9_ARATH	chloroplast, mitochondria, plastid	large-scale analysis	[106, 107]
Q9M1X3_ARATH	thylakoid, chloroplast envelope, chloroplast,	large-scale analysis, fractionation	[106, 108, 109, 110, 111, 112]
Q9SKK2_ARATH	chloroplast	large-scale analysis	[112]
OEP61_ARATH	plastid	fluorescence, solubilization (Na ₂ CO ₃),	[113, 114]
Q9FDW8_ARATH	plastid	fluorescence, immunofluorescence,	[115]

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Q9SLI4_ARATH	chloroplast, thylakoid membrane	large-scale analysis	[106, 108, 111]
Q8S8K0_ARATH	chloroplast, thylakoid membrane	large-scale analysis	[106, 111]
O80952_ARATH	chloroplast envelope, mitochondria	large-scale analysis, fluorescence	[110, 116, 117]
TOM5_ARATH	mitochondria, plastid	large-scale analysis	[107, 118]
Q94K78_ARATH	mitochondria	large-scale analysis	[119, 120, 121]
TO221_ARATH	mitochondria	complex	[122]
TO202_ARATH	mitochondria	large-scale analysis, part of a known complex	[118, 119, 123]
TO201_ARATH	mitochondria	complex	[123]
Q944S8_ARATH	mitochondria, vacuole membrane	large-scale analysis	[119, 124]
Q9LXR8_ARATH	mitochondria, peroxisome	fluorescence, large-scale analysis	[118, 119, 125]
Q9SIQ8_ARATH	mitochondria	fractionation, solubilization, large-scale analysis	[119, 126]
TO203_ARATH	mitochondria	fractionation (ms), complex	[123, 127]
O64471_ARATH	mitochondria, plastid*	fractionation (ms), large-scale analysis	[107, 118, 119, 127]
TO222_ARATH	mitochondria, vacuole membrane*	fractionation (ms), large-scale analysis	[107, 118, 123, 127]
NDB3B_ARATH	mitochondria	extraction (Na ₂ CO ₃), fractionation	[126]
TO204_ARATH	mitochondria, vacuole membrane*	extraction (Na ₂ CO ₃), fractionation, complex, large-scale analysis	[123, 124, 126]
Q9SHJ6_ARATH	mitochondria	fluorescence (YFP, GFP), fractionation, large-scale analysis	[107, 118, 124, 125, 128]
NDB3A_ARATH	mitochondria	fractionation (ms), large-scale analysis, complex	[120, 129]
Q8RXF8_ARATH	mitochondria	fluorescence, large-scale analysis	[119, 120, 130]
TOM6_ARATH	mitochondria	fractionation (ms), large-scale analysis	[127, 131]
Q9C7G5_ARATH	mitochondria	fractionation (ms)	[132]
O22825_ARATH	mitochondria	fractionation (ms), large-scale analysis	[118]
Q93YW7_ARATH	mitochondria	fluorescence	[133]
Q9FNB2_ARATH	mitochondria	large-scale analysis	[107, 119]
Q9C7H2_ARATH	ER	fractionation (ms), large-scale analysis	[118, 134]
O23037_ARATH	ER	fluorescence	[135, 136]
Q9ZWT2_ARATH	ER	fluorescence	[115, 137]
STLP2_ARATH	ER, plasma	fractionation, solubilization, fluorescence (GFP, YFP), large-scale analysis	[107, 138, 139]
SYP61_ARATH	Golgi	fluorescence	[140, 141]
SYP72_ARATH	ER	fluorescence	[141]
CYB51_ARATH	ER, plasma	fluorescence, large-scale analysis	[107, 137]
SYP71_ARATH	ER, plasma	fluorescence (YFP, GFP), large-scale analysis	[107, 141, 142]
FDFT_ARATH	ER, plasma	fluorescence, large-scale analysis	[107, 134, 143]
SYP73_ARATH	ER	fluorescence	[141, 144]
VAP22_ARATH	plasma	large-scale analysis	[134, 145]
CYB52_ARATH	ER	fluorescence, large-scale analysis	[115, 118, 137, 146]
O65688_ARATH	ER	fluorescence	[143]
SEC22_ARATH	ER, Golgi	fluorescence (GFP, CFP), large-scale analysis	[145, 147, 148, 149, 150, 151]
VTI11_ARATH	vacuole, Golgi	fluorescence	[141, 152, 153, 154]
SYP81_ARATH	ER	fluorescence	[141, 149]
VAP12_ARATH	ER, plasma	fluorescence, large-scale analysis	[145, 151, 155]
VAP11_ARATH	plasma, ER	immunofluorescence, large-scale analysis	[107, 145, 156, 157]

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O23465_ARATH	ER, plasma	solubilization, large-scale analysis	[134, 158]
O23144_ARATH	ER, plasma	fractionation, fluorescence	[159, 160]
Q9ZVC6_ARATH	ER	fluorescence, large-scale analysis	[134, 161]
GOS12_ARATH	vacuole, Golgi	fluorescence, large-scale analysis	[134, 141, 162]
VTI12_ARATH	plasma	fluorescence, immunofluorescence	[141, 152, 163]
GOS11_ARATH	Golgi	fluorescence, large-scale analysis	[141, 164]
MEM12_ARATH	Golgi	fluorescence	[141]
SYP31_ARATH	Golgi	fluorescence, immunofluorescence	[141, 165]
MEM11_ARATH	Golgi	fluorescence (GFP, YFP)	[141, 166, 167]
BET11_ARATH	Golgi, plasma	fluorescence, large-scale analysis	[141, 145, 167]
SYP32_ARATH	Golgi	fluorescence, large-scale analysis	[134, 141]
SY124_ARATH	plasma	fluorescence, large-scale analysis	[134, 141, 145, 151, 168, 169]
SY132_ARATH	plasma	fluorescence, large-scale analysis	[134, 141, 145, 148, 151, 168, 170]
Q8S8J6_ARATH	plasma	large-scale analysis	[134, 151, 158]
SY125_ARATH	plasma	fluorescence, large-scale analysis	[141, 168]
SY131_ARATH	plasma	fluorescence, large-scale analysis	[141, 145, 168]
S61G3_ARATH	plasma	large-scale analysis	[145]
VA726_ARATH	plastid, plasma	fluorescence (GFP), large-scale analysis	[112, 141, 171]
NPS12_ARATH	plasma	fluorescence, large-scale analysis	[141, 145, 151]
FKB42_ARATH	ER	fluorescence, immunofluorescence	[172, 173, 174, 175]
Q944S5_ARATH	plasma	large-scale analysis	[176]
VAP22_ARATH	plasma	large-scale analysis	[134, 145, 176]
SY111_ARATH	plasma	fluorescence, large-scale analysis	[141, 145, 168, 177]
GEX2_ARATH	plasma	fluorescence	[178]
VAP21_ARATH	plasma, ER	large-scale analysis	[118, 176]
NPS11_ARATH	plasma	fluorescence, large-scale analysis	[141, 176]
Q9SN26_ARATH	plasma	large-scale analysis	[176]
SY123_ARATH	plasma	fluorescence	[141, 168]
Q9SRZ3_ARATH	plasma	large-scale analysis	[176]
PAS1_ARATH	nucleus, cytosol, plasma	fluorescence, large-scale analysis	[134, 179, 180, 181]
SY112_ARATH	plasma, nucleus	ms, GFP	[141, 182]
NAC78_ARATH	nucleus	fluorescence	[183]

Fluorescence refers to any method that detects subcellular localization by binding of GFP or YFP to the target sequence. Immunofluorescence is a method involving sequences marked with histidine tags or other markers and antibodies to which fluorescent proteins such as GFP are bound. Large-scale analysis refers to a thorough investigation of sequences within a given organelle fraction using tandem mass spectrometry (MS/MS) and other similar techniques. Extraction (Na₂CO₃) indicates a method to confirm the presence or absence of a TMD by sodium carbonate treatment.

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