

Supplementary Tables, List and Figures:

Supplementary Table 1. *Shank3* under-expressed proteins.

Gene names	Fold change	p-value
Purg	0.75	0.008445
Cacng3	0.76	0.008939
Kcnj9	0.71	0.015197
Ide	0.7	0.014658
Igsf9b	0.73	0.008609
Gng3	0.58	0.048645
Aagab	0.57	0.0364
Cdk16	0.75	0.022767
Guf1	0.66	0.030304
Ddx50	0.76	0.023191
Gng2	0.6	0.02202
Snrpe	0.68	0.017727

Supplementary Table 2. *Shank3* over-expressed proteins.

Gene names	Fold change	p-value
Calb2	1.45	0.046963
Acta2;Actg2	1.42	0.001539
Rps6ka2	1.44	0.04061
Ptprf	1.37	0.041294
Dhdh	1.38	0.029467
Nhsl2	1.44	0.035077
Kctd4	1.42	0.017663
Ache	1.58	0.012956
Dennd1a	1.45	0.005525
Fam210a	1.74	0.035629
Ap3b1	1.59	0.004662
Efnb3	1.62	0.004407
Enpp2	1.35	0.04649
Slc6a3	3.73	0.038722
Tspan14	1.41	0.037403
Sncg	1.52	0.033312
Fam20b	1.95	0.004703
Fxyd1	2.14	0.046456
Rab27b	1.48	0.042849
Tiam1	1.31	0.015955
Ddc	1.75	0.003437

Gene names	Fold change	p-value
Pcif1	1.64	0.021452
Penk	2.01	0.010879
Ptpn5	1.33	0.047522
Minos1	1.34	0.005993
Pcbd1	1.54	0.017455
Cnr1	1.36	0.025846
Ppp1r1b	1.68	0.043952
Ogfrl1	1.42	0.007224
Srp19	1.44	0.026011
C2cd5	1.7	0.014684
Ankrd63	2	0.023785
Pde10a	2.73	0.023544
Mocs3	1.39	0.008756
Gnal	1.97	0.010779
Adcy5	1.76	0.02839
Actn2	1.34	0.001432
Pik3ca	1.48	0.034687
Pde1b	1.43	0.013369
Nup98	5.29	0.037665
Ajap1	1.7	0.034087
Gosr1	1.4	0.02532

Supplementary Table 3. *Cntnap2*

under-expressed proteins.

	Gene names	Fold change	p-value
	Sqrdl	0.284937	6.77E-05
	Dock7	0.71497	0.000206
	Cntnap2	0.007812	0.000787
	Mertk	0.597088	0.00099
	Ube2v2	0.733972	0.001106
	Cntn2	0.03199	0.001219
	Yars2	0.739811	0.004105
	Scamp4	0.183619	0.004626
	Tsc2	0.748305	0.008331
	Coro2a	0.753134	0.013142
	Asap2	0.752559	0.01315
	Rmnd5a	0.629115	0.018257
	Chn1	0.749643	0.024067
	Hdac6	0.75317	0.024368
	Prkcd	0.755372	0.024664
	Faim2	0.728336	0.031798
	Pigu	0.687952	0.033449
	Smcr8	0.675762	0.036781
	Grid1	0.626553	0.045823
	Lamb2	0.692591	0.047094
	Sar1b	0.759426	0.049626

Supplementary Table 4. *Cntnap2*

over-expressed proteins.

Gene names	Fold change	p-value
Wrb	1.334707	9.62E-06
Eppk1	55.87849	1.44E-05
Cep162	1.657968	0.001515
Diaph1	1.404576	0.002479
Isca2	1.30173	0.002685
Map1LC3A	1.310993	0.003047
Fmn2	1.3123	0.005702
Cbs	1.450846	0.010644
Sumo2	1.463268	0.015516
Mrpl40	1.369928	0.017629
Arl2	1.431683	0.020937
Mt1	1.494034	0.023287
Fam114a2	1.54624	0.028
Nedd8	1.321287	0.02847
Ttc39c	1.760458	0.030956
Slc25a42	1.329498	0.032998
Mtap	1.34681	0.033219
Llgl1	1.310704	0.046138
Tgolin1; Tgolin2	1.511139	0.047392
Cdk18	1.421033	0.049238

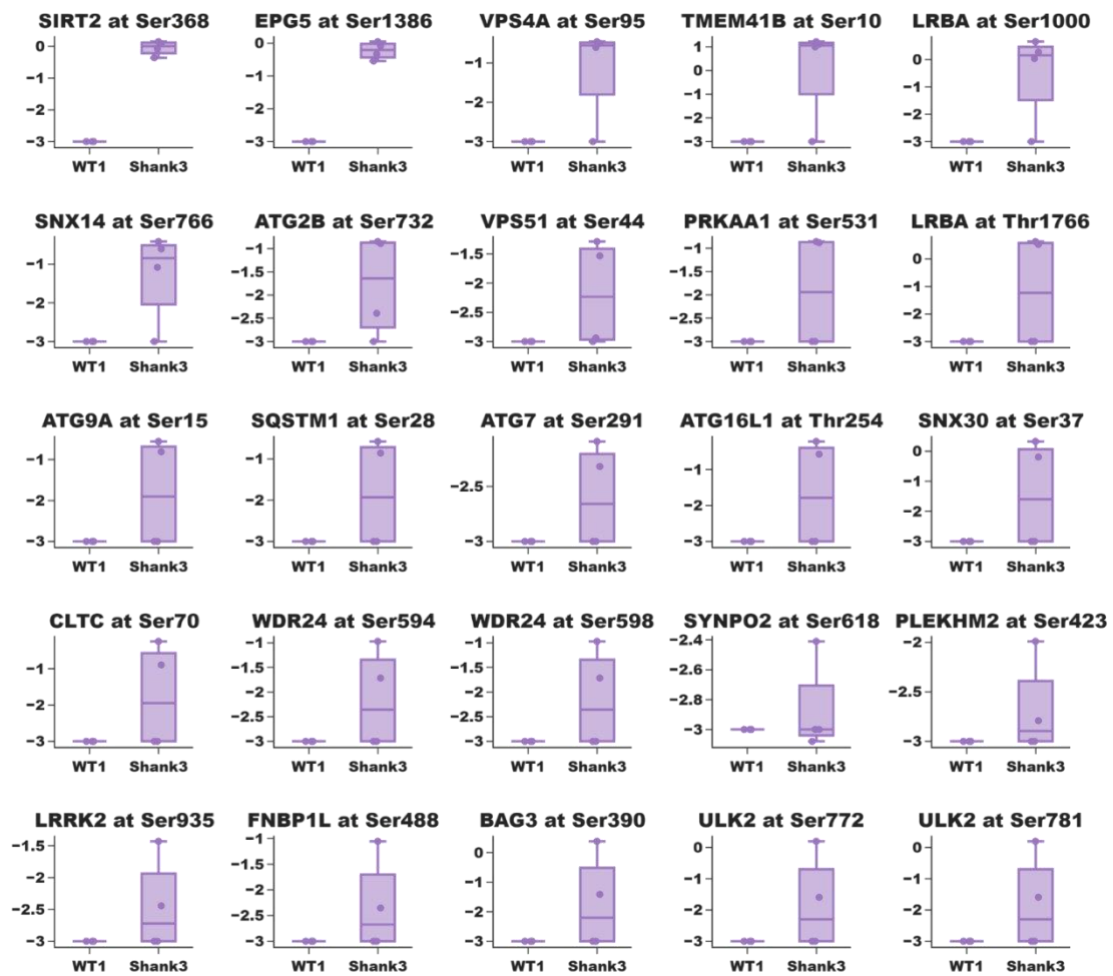
Supplementary list 1

Dlgap1, Dlgap2, Dagla, Shank1, Shank2, Shank3, Atp2b2, Sptbn1, Ephb2, Rims1, Iqsec2, Pogz, Syn1, Nbea, Cic, Cadps2, Ank2, Grm5, Arhgap32, Pclo, Ctnnd2, Syngap1, Stxbp1, Grin2b, Anks1b, Camk2a.

Supplementary list 1. SFARI genes and their corresponding proteins contain UPSs in Shank3 and Cntnap2 mouse models.

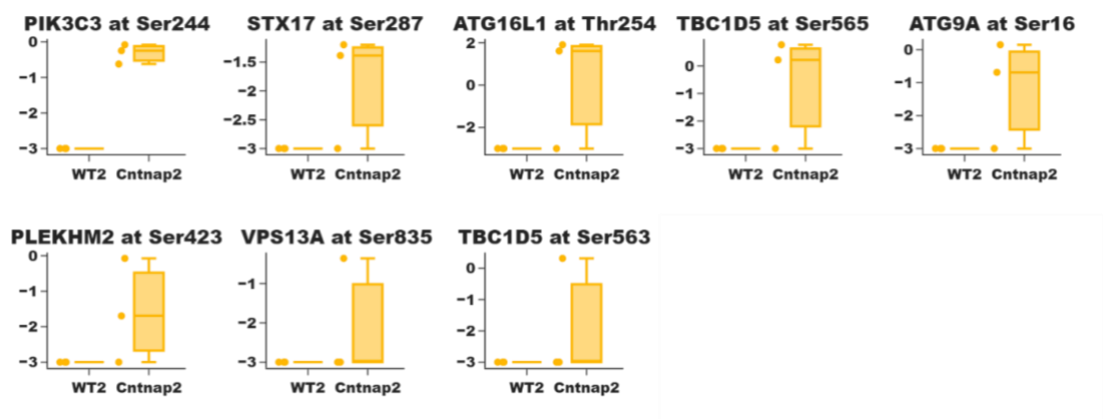
Supplementary Figures:

Supplementary Figure 1:



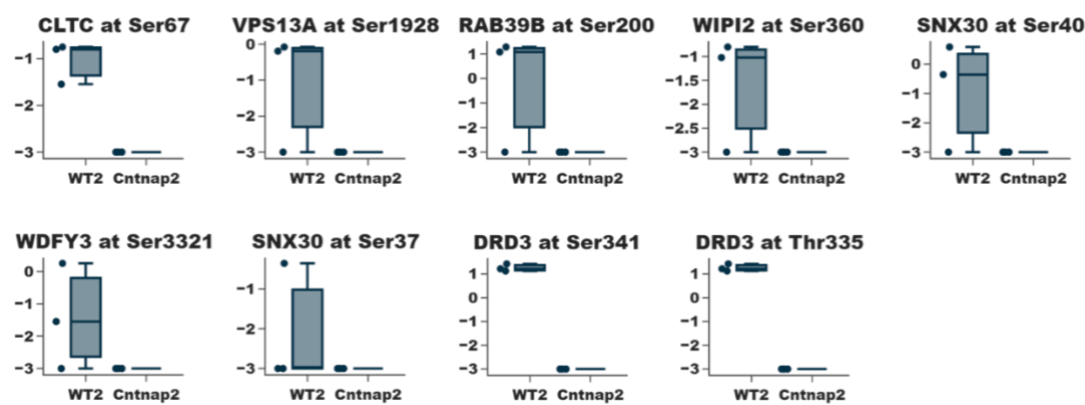
Supplementary Figure 1. *Shank3* phosphorylation in KO unique phosphorylation sites of autophagy-associated proteins.

Supplementary Figure 2:



Supplementary Figure 2. *Cntnap2* phosphorylation in KO unique phosphorylation sites of autophagy-associated proteins.

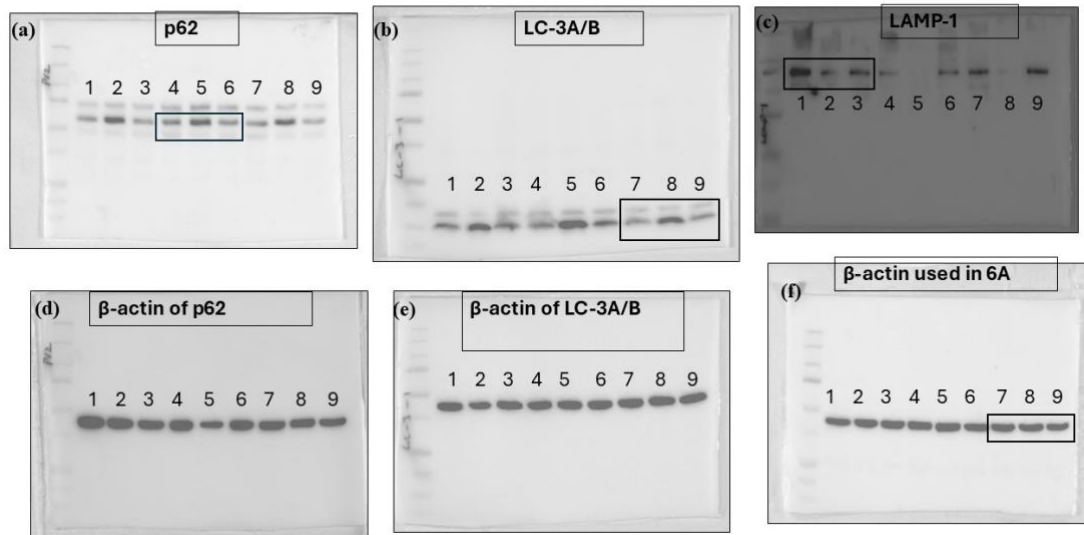
Supplementary Figure 3:



Supplementary Figure 3. *Cntnap2* phosphorylation in WT unique phosphorylation sites of autophagy associated proteins.²⁰

Supplementary Figure 4:

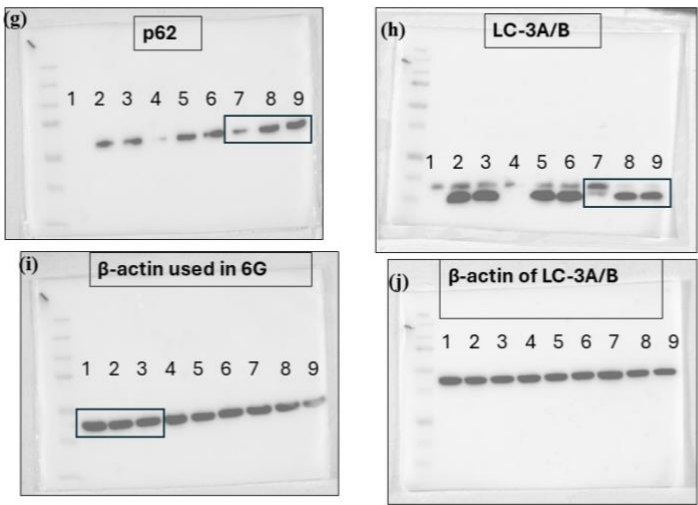
Uncropped Blot of representative image 6A



Supplementary figure 4. Uncropped Western blot images corresponding to the representative blot shown in Figure 6A. (a) Uncropped Western blot image of p62. (b) Uncropped Western blot image of LC-3A/B. (c) Uncropped Western blot image of LAMP-1. (d) β -actin loading control for p62. (e) β -actin loading control for LC3A/B. (f) β -actin loading control for LAMP-1, also used as a representative β -actin for Figure 6A. Lanes 1, 4, and 7 correspond to wild-type (WT) SH-SY5Y cells; lanes 2, 5, and 8 correspond to SHANK3 KO SH-SY5Y cells; and lanes 3, 6, and 9 correspond to SHANK3 KO SH-SY5Y cells treated with 7-NI in all the blot of Supplementary figure 4.

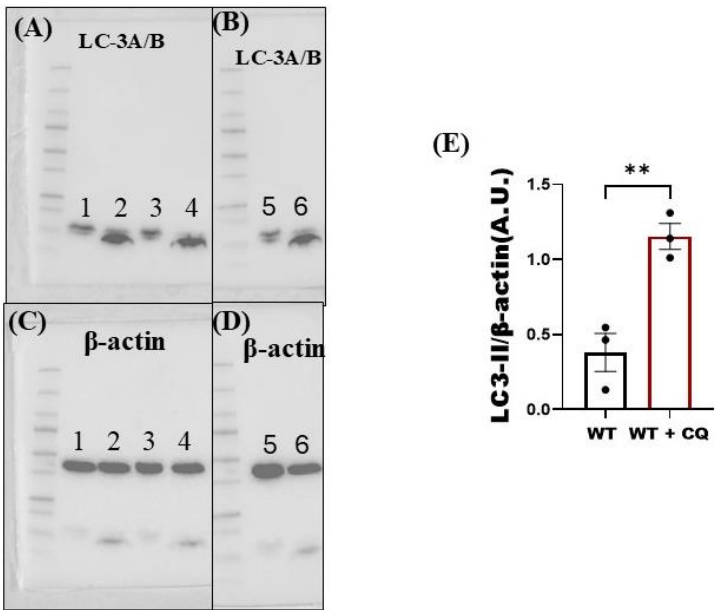
Supplementary Figure 5

Uncropped Blot of representative image 6G



Supplementary figure 5. Uncropped Western blot images corresponding to the representative blot shown in Figure 6G. (g) Uncropped Western blot image of p62. (h) Uncropped Western blot image of LC-3A/B. (i) β -actin loading control for p62, also used as the representative β -actin in Figure 6G. (j) β -actin loading control for LC-3A/B. Lanes 1, 4, and 7 correspond to wild-type (WT) primary cultured neurons; lanes 2, 5, and 8 correspond to Shank3 KO primary cortical neurons; and lanes 3, 6, and 9 correspond to Shank3 KO primary cultured neurons treated with CQ in all the blot of Supplementary figure 5.

Supplementary Figure 6



Supplementary Figure 6: Western blot images of LC-3A/B and β -actin. Groups: WT and WT + CQ neurons. (A-B) Western blot images of LC-3A/B and (C-D) β -actin were used as a loading control for LC-3A/B. 1,3 and 5 represent WT neurons treated with vehicle. 2,4 and 6 represent WT neurons treated with Chloroquine (20 μ m for 4h). Statistical analysis of the relative abundance of LC3-II/ β -actin (n=3 in each group). An unpaired T-test was performed, **p<0.01.