Figure S1

UAS Controls

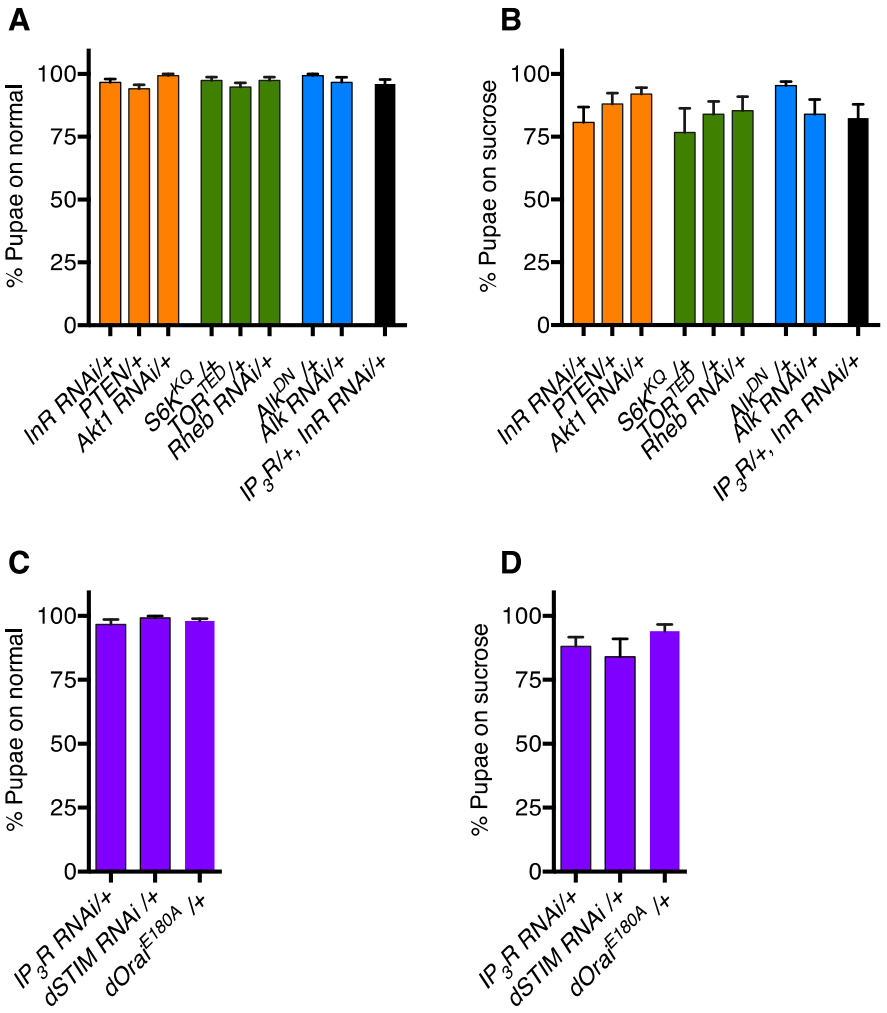


Fig. S1A-D. Pupation rate for controls. UAS lines used in Fig 1 were crossed to *CS* (+) and larvae were scored for pupation on normal or sucrose-only media. n=6 batches of 25 each.

Figure S2

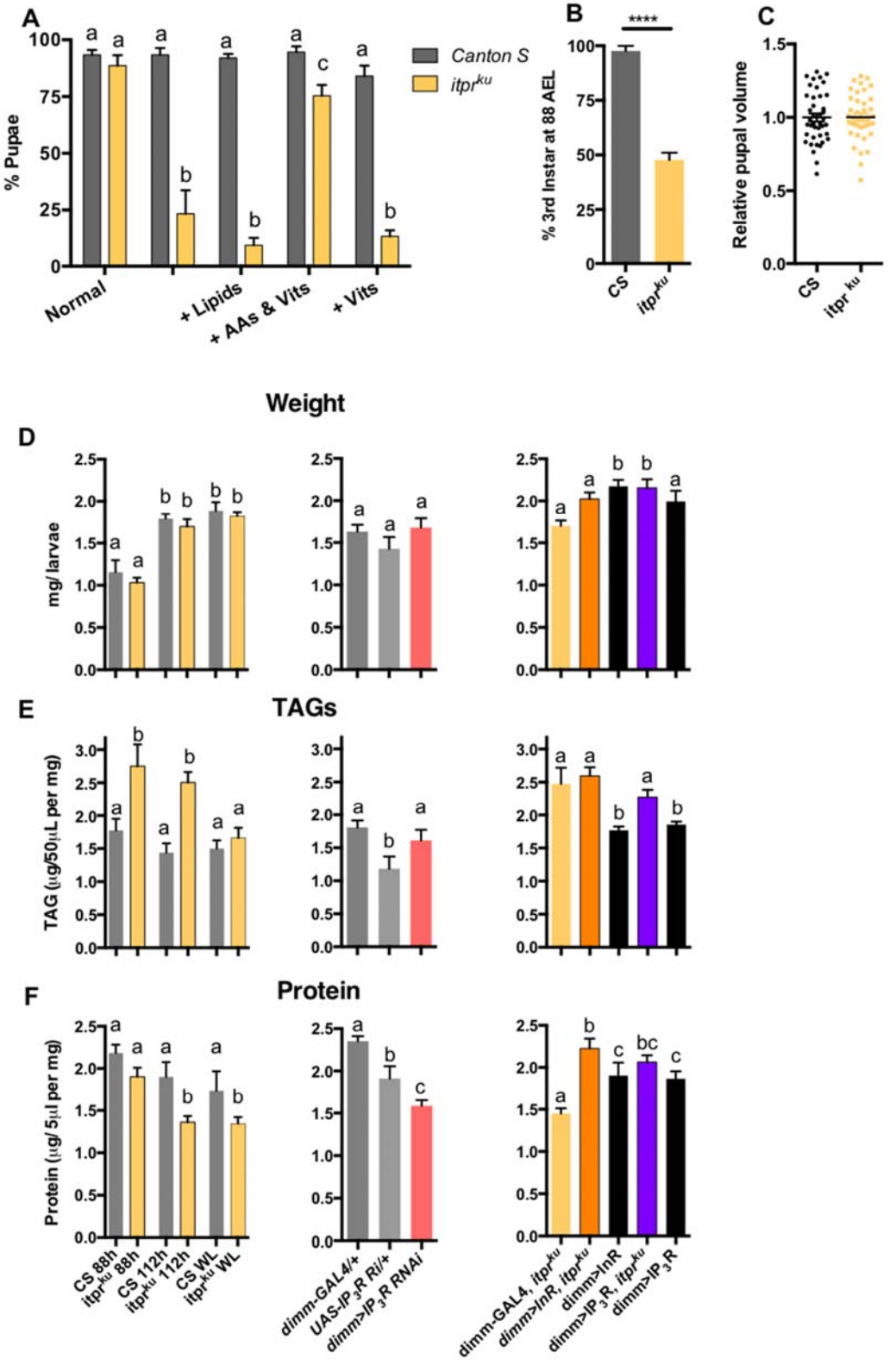


Fig. S2 (A) % pupation of 88h *itpr*^{ku} larvae on normal food or 100mM sucrose with 1mM Total Brain Lipids (+ Lipids), 1X Grace's insect media (+ AAs & Vits) or 1X RPMI vitamin solution (+ Vits). n = 6 batches of 25 larvae, except + Vits where n = 3 batches of 25 larvae. Bars with the same alphabet represent statistically indistinguishable groups (2way ANOVA with Sidak's multiple comparisons $p<0.05$).**(B)** % of 3rd instar larvae recovered at 88h AEL. Note that in *itpr*^{ku} there were only two populations of larvae: 2nd or 3rd instar. n ≥ 4 batches of > 50 larvae each. Unpaired *t* test **** $p<0.0001$ **(C)** Relative pupal volume . n=40. Unpaired *t* test was ns. **(D-F)** Weight, TAGs and protein levels of larvae. These values were used to compute protein/TAG ratios for Fig. 2D, 2E and 2H. For *CS vs itpr*^{ku} measurements were made across three time points (n = 4 for 88h and WL; n = 8 for 112h). Note that the time of wandering larvae for CS and *itpr*^{ku} are not the same as *itpr*^{ku} delays pupation (Fig. 2B). For the rest of the genotypes, measurements were performed at 112h AEL (n≥8). Bars with the same alphabet represent statistically indistinguishable groups (one-way ANOVA with post hoc Tukey's test $p<0.05$).

Figure S3

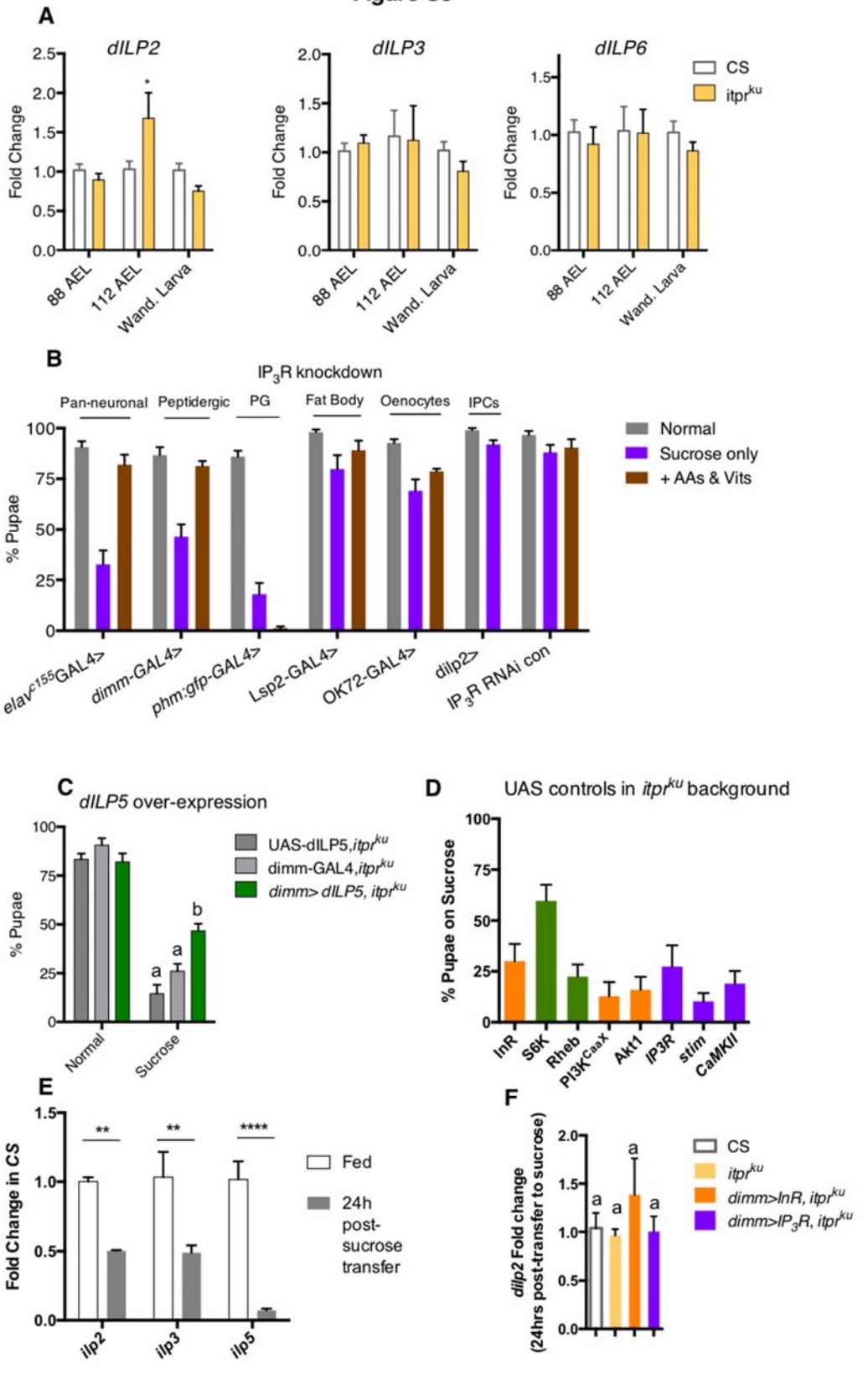


Fig. S3 (A) Transcript levels of various *dilps* in larval brains normalized to *rp49*. Unpaired *t* test was ns for each time point except *ilp2* at 112AEL * p<0.05 **(B)** % pupae formed on normal, sucrose-only or AAs & Vits (1X Grace's insect media) by larvae with RNAi mediated knockdown of IP_3R in various tissues and organs as indicated. Except for *dimm-GAL4*, all knockdowns were in the presence of *UAS-dicer*. IP_3R RNAi control: *UAS-IP$_3$R RNAi/+;UAS-dicer/+.* n=6 batches of 25 larvae, except for *OK72-GAL4* where n=4 batches of 25 larvae **(C)** % pupae formed on normal or sucrose-only media, by larvae with over-expression of *dILP5* in NE cells of *itpr^{ku}* .**(D)** % pupae formed on sucrose-only media by UAS controls of various over-expressed molecules, in the background of *itpr^{ku}*. Note that *UAS-S6K* was leaky, as it rescued *itpr^{ku}* in the absence of the driver *dimm-GAL4*. n=6 batches of 25 larvae **(E)** *dILP 2,3* and *5* transcript in 88h AEL *CS* larvae starved for 24hours on sucrose-only media. n=3. Unpaired t-test **p<0.01, ****p<0.0001 **(F)** Relative transcript levels of *dILP2* relative to *rp49,* in 88h AEL 3rd instar larvae starved for 24h on sucrose-only media. n=4. Fold change normalized to *rp49*. Bars with the same alphabet represent statistically indistinguishable groups (one-way ANOVA with post hoc Tukey's test p<0.05).

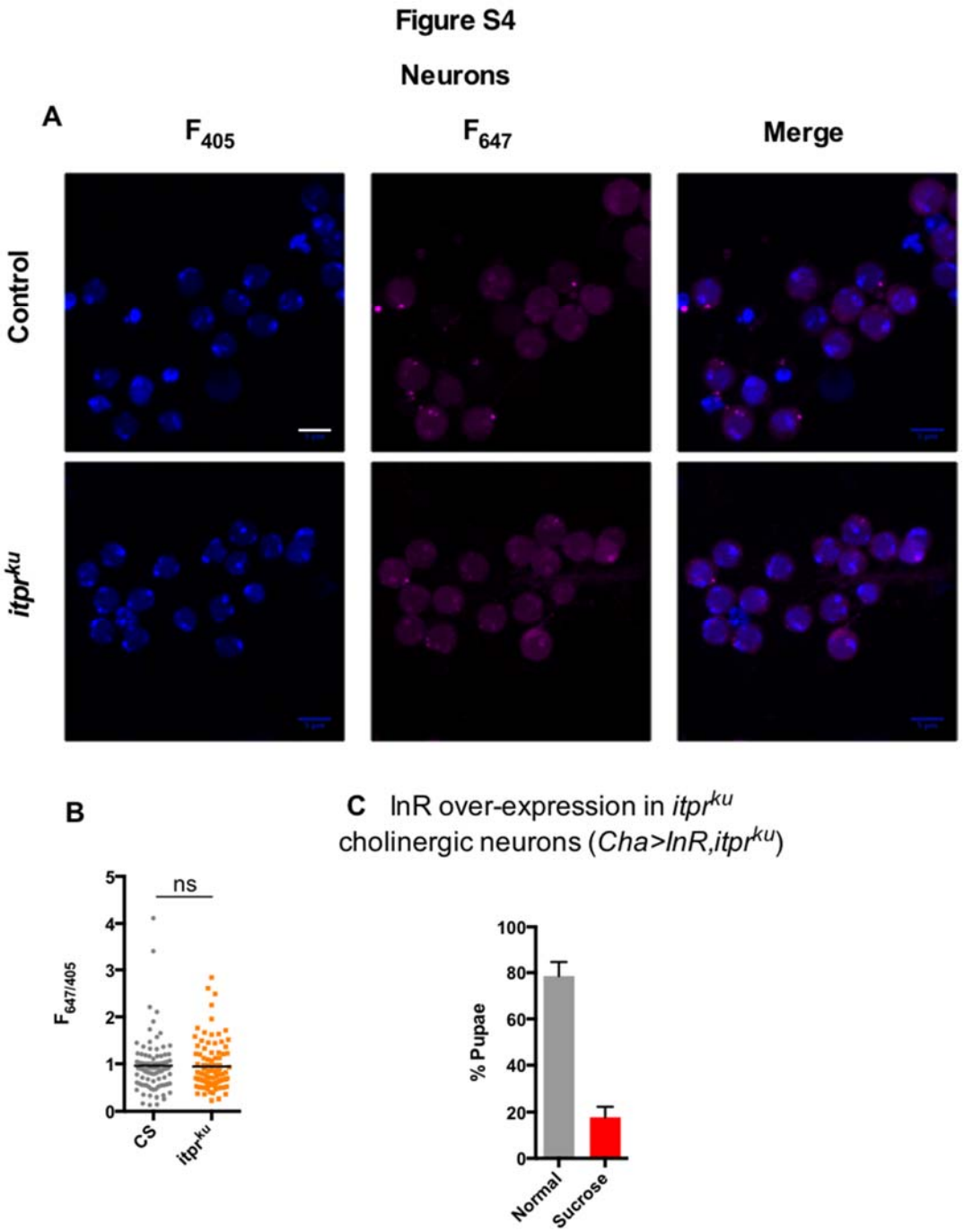
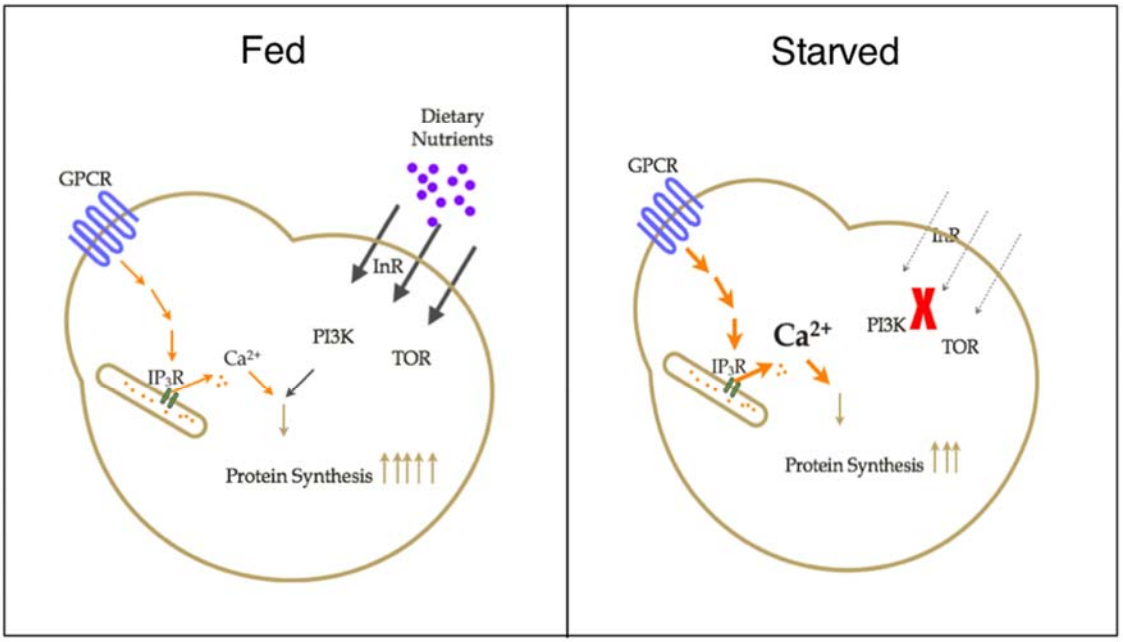


Fig. S4 (A) Representative confocal z-projection stack of primary neuronal cells in culture, treated with *in vivo* protein synthesis detection kit. Scale bar 5μm **(B)** Quantification of F_{647} and F_{405} from confocal images. n≥ 80 Unpaired *t* test. **(C)** % pupation when 88h AEL *itpr*^{ku} over-expressing InR in cholinergic neurons were transferred to normal or sucrose-only media.

Figure S5

Proposed Model in NE cells



Supplemental Experimental Procedure

Fly strains

Canton S (CS) was used as the wild type control. The following strains were obtained from Bloomington Stock Centre: *UAS-InRRNAi* (#31594), *UAS-AktRNAi* (#33615), *UAS-TOR^{TED}* (#7013), *UAS-S6K^{KQ}* (#6911), *UAS-Alk RNAi* (#27518), *UAS-Rheb RNAi* (#33966), *UAS-InR* (#8262), *UAS-Rheb* (#9689), *UAS-Akt1*(#8191), *UAS-S6K* (#6911), *Elav^{c155}-GAL4* (#458), *lsp2-GAL4* (#27451), *ok72GAL4* (#6486), *UAS CAMKII* (#29662), *UAS dicer* (#24648),
The following were from Vienna Drosophila Research Centre stock collection: *UAS-itpr RNAi* (1063), *UAS-STIM RNAi* (47073)
The following were kind gifts: *phm:gfp-GAL4* (Michael O'Connor), *dimm^{c929}-GAL4* (Paul H Taghert), *UAS-dmycp110^{CaaX}* (Ernst Hafen), *UAS-eGFP* (Michael Rosbash), *UAS-Alk^{DN}* (Manfred Frasch), *UAS-PTEN* (Bruce Edgar), *Cha-GAL4* (Toshihiro Kitamoto)
The following were generated in our laboratory: *itpr^{ka1091}*, *itpr^{ug3}* , UAS-Orai^{E180A}, UAS-*itpr^{+}*, *UAS-Stim*

RT-PCR primers
dilp2
5' CCATGAGCAAGCCTTTGTCC 3'
5' TTCACTGCAGAGCGTTCCTTG3'
dilp3
5' ACTCGACGTCTTCGGGATG3'
5' CGAGGTTTACGTTCTCGGCT3'
dilp5
5' ACTCACTGTCGAGCATTCGG3'
5' GAGTCGCAGTATGCCCTCAA3'
dilp6
5' TGGTTCTCAAAGTGCCGAC3'
5' GAAATACATCGCCAAGGGC3'