**Supplementary file 1. Full genotypes of flies used in this study**

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| **Figure** | **Full Genotype** |
| **Figure 1** | |
| C | *Or67d-QF,UAS-Httex1Q25-GFPattP3/(+/Y) ; GH146-Gal4/QUAS-Httex1Q25-mCherryattP24* |
| D | *Or67d-QF,UAS-Httex1Q25-GFPattP3/(+/Y) ; GH146-Gal4/QUAS-Httex1Q91-mCherryattP24* |
| E,F,G,J,K | *Or67d-QF,UAS-Httex1Q25-GFPattP3/(+/Y) ; GH146-Gal4,QUAS-Httex1Q91-mCherryattP24/+* |
| H,I,J,K | *Or67d-QF,UAS-Httex1Q25-GFPattP3/QUAS-RFP-Httex1-12Q138attP3B ; GH146-Gal4/+* |
| **Figure 1 - figure supplement 1** | |
| A,F | *elav[C155]-Gal4/UAS-Httex1Q91-mCherryattP3* |
| B,F | *elav[C155]-Gal4/+ ; UAS-Httex1Q25-GFPattP24/+* |
| C,F | *elav[C155]-Gal4/UAS-Httex1Q91-mCherryattP3 ; UAS-Httex1Q25-GFPattP24/+* |
| D,F | *elav[C155]-Gal4/UAS-Httex1Q91-mCherryattP3 ; UAS-mCD8-GFP/+* |
| E,F | *elav[C155]-Gal4/UAS-Httex1Q91-mCherryattP3 ; UAS-GFPattP24/+* |
| **Figure 1 - figure supplement 2** | |
| A,B,C,D | *Or67d-QF,UAS-Httex1Q25-GFPattP3/Y ; GH146-Gal4,QUAS-Httex1Q91-mCherryattP24/+* |
| **Figure 1 - figure supplement 3** | |
| A,E,F | *Or67d-QF,UAS-Httex1Q25-GFPattP3/+ ; GH146-Gal4/QUAS-Httex1Q25-mCherryattP24* |
| B,E,F | *Or67d-QF/Y ; GH146-Gal4,QUAS-Httex1Q91-mCherryattP24/UAS-mCD8-GFP* |
| C,E,F | *Or67d-QF,UAS-Httex1Q25-GFPattP3/QUAS-Gal80 ; GH146-Gal4/QUAS-Httex1Q91-mCherryattP24* |
| D,E,F | *Or67d-QF,UAS-Httex1Q25-GFPattP3/+ ; GH146-Gal4/QUAS-Httex1Q91-mCherryattP24 ; UAS-QS/+* |
| **Figure 1 - figure supplement 4** | |
| A1-4,B1-4,C,D | *pebbled-Gal4/QUAS-Httex1Q91-mCherryattP3 ; UAS-Httex1Q25-GFPattP24/+ ; GH146-QF/+* |
| **Figure 2** | |
| A,B,E,F,G | *Or67d-QF,UAS-Httex1Q25-GFPattP3/(+/Y) ; GH146-Gal4,QUAS-Httex1Q91-mCherryattP24/+* |
| C,D,F,H | *Or67d-QF,UAS-Httex1Q25-GFPattP3/QUAS-RFP-Httex1-12Q138attP3B ; GH146-Gal4/+* |
| **Figure 3** | |
| A,C,D | *Or67d-QF,UAS-Httex1Q25-GFPattP3/Y ; GH146-Gal4,QUAS-Httex1Q91-mCherryattP24/+ ; QUAS-nucLacZ/+* |
| B,C,D | *Or67d-QF,UAS-Httex1Q25-GFPattP3/Y ; GH146-Gal4,QUAS-Httex1Q91-mCherryattP24/+; QUAS-shibirets1#5/+* |
| C,D | *Or67d-QF,UAS-Httex1Q25-GFPattP3/Y ; GH146-Gal4,QUAS-Httex1Q91-mCherryattP24/+; QUAS-shibirets1#7/+* |
| E,G,H | *Or67d-QF,UAS-Httex1Q25-GFPattP3/Y ; GH146-Gal4,QUAS-Httex1Q91-mCherryattP24/+ ; QUAS-nucLacZ/+* |
| F,G,H | *Or67d-QF,UAS-Httex1Q25-GFPattP3/Y ; GH146-Gal4,QUAS-Httex1Q91-mCherryattP24/QUAS-TeTxLC#4c ; +/(Dh/Tm6b)* |
| G,H | *Or67d-QF,UAS-Httex1Q25-GFPattP3/Y ; GH146-Gal4,QUAS-Httex1Q91-mCherryattP24/Pin; QUAS-TeTxLC#9c/+* |
| I,K,L | *Or67d-QF,UAS-Httex1Q25-GFPattP3/+ ; GH146-Gal4,QUAS-Httex1Q91-mCherryattP24/+ ; QUAS-nucLacZ/+* |
| K,L | *Or67d-QF,UAS-Httex1Q25-GFPattP3/QUAS-dTrpA#5 ; GH146-Gal4,QUAS-Httex1Q91-mCherryattP24/+* |
| J,K,L | *Or67d-QF,UAS-Httex1Q25-GFPattP3/+ ; GH146-Gal4,QUAS-Httex1Q91-mCherryattP24/+ ; QUAS-dTrpA#6/+* |
| K,L | *Or67d-QF,UAS-Httex1Q25-GFPattP3/+ ; GH146-Gal4,QUAS-Httex1Q91-mCherryattP24/QUAS-dTrpA#7* |
| **Figure 4** | |
| A,C | *Or67d-QF,QUAS-Httex1Q91-mCherryattP3/+ ; QUAS-mCD8-GFP/+ ; QUAS-nucLacZ/+* |
| B,C | *Or67d-QF,QUAS-Httex1Q91-mCherryattP3/+ ; QUAS-mCD8-GFP/+ ; QUAS-shibirets1#7/+* |
| D,F,G | *Or67d-QF,QUAS-Httex1Q91-mCherryattP3/Y ; UAS-Httex1Q25-YFPattP24/+ ; repo-Gal4/QUAS-nucLacZ* |
| E,F,G | *Or67d-QF,QUAS-Httex1Q91-mCherryattP3/Y ; UAS-Httex1Q25-YFPattP24/+ ; repo-Gal4/QUAS-shibirets1#7* |
| F,G | *Or67d-QF,QUAS-Httex1Q91-mCherryattP3/Y ; UAS-Httex1Q25-YFPattP24/+ ; repo-Gal4/QUAS-shibirets1#5* |
| **Figure 5** | |
| A,C,D | *Or67d-QF,UAS-Httex1Q25-GFPattP3/(+/Y) ; GH146-Gal4,QUAS-Httex1Q91-mCherryattP24/+ ; drpr5/+* |
| B,C,D | *Or67d-QF,UAS-Httex1Q25-GFPattP3/(+/Y) ; GH146-Gal4,QUAS-Httex1Q91-mCherryattP24/+ ; drpr5/drpr5* |
| E,G | *Or67d-QF,QUAS-Httex1Q91-mCherryattP3/(+/Y)* |
| F,G | *Or67d-QF,QUAS-Httex1Q91-mCherryattP3/(+/Y) ; ; drpr5/drpr5* |
| **Figure 5 - figure supplement 1** | |
| A,C,D | *Or67d-QF,UAS-Httex1Q25-GFPattP3/QUAS-shibirets1#2 ; GH146-Gal4,QUAS-Httex1Q91-mCherryattP24/+* |
| B,C,D | *Or67d-QF,UAS-Httex1Q25-GFPattP3/QUAS-shibirets1#2 ; GH146-Gal4,QUAS-Httex1Q91-mCherryattP24/+ ; drpr5/drpr5* |
| **Figure 5 - figure supplement 2** | |
| A,E,F | *Or67d-QF,UAS-Httex1Q25-GFPattP3/Y ; GH146-Gal4,QUAS-Httex1Q91-mCherryattP24/+* |
| B,E,F | *Or67d-QF,UAS-Httex1Q25-GFPattP3/Y ; GH146-Gal4,QUAS-Httex1Q91-mCherryattP24/repo-Gal80* |
| C,E,F | *Or67d-QF,UAS-Httex1Q25-GFPattP3/Y ; GH146-Gal4,QUAS-Httex1Q91-mCherryattP24/+ ; UAS-FFLuc attP2/+* |
| D,E,F | *Or67d-QF,UAS-Httex1Q25-GFPattP3/Y ; GH146-Gal4,QUAS-Httex1Q91-mCherryattP24/+ ; UAS-DraperRNAi#5/+* |
| **Figure 5 - figure supplement 3** | |
| A1-2,C,E,F | *Or67d-QF,QUAS-Httex1Q91-mCherryattP3/+ ; UAS-Atg8a-GFP/+ ; repo-Gal4/+* |
| B1-2,D,E,F | *Or67d-QF,QUAS-Httex1Q91-mCherryattP3/+ ; UAS-GFP-Lamp1/+ ; repo-Gal4/+* |
| E,F | *Or67d-QF,QUAS-Httex1Q91-mCherryattP3/+ ; UAS-mCD8-GFP/+ ; repo-Gal4/+* |
| **Figure 6** | |
| A,E | *Or83b-Gal4,UAS-Httex1Q25-GFPattP24/+ ; drpr5/+* |
| B,E | *Or83b-Gal4,UAS-Httex1Q91-GFPattP24/+ ; drpr5/+* |
| C,E | *Or83b-Gal4,UAS-Httex1Q25-GFPattP24/+ ; drpr5/drpr5* |
| D,E | *Or83b-Gal4,UAS-Httex1Q91-GFPattP24/+ ; drpr5/drpr5* |
| F,J,K | *Or67d-QF,UAS-Httex1Q25-GFPattP3/Y ; GH146-Gal4,QUAS-Httex1Q91-mCherryattP24/+ ; QUAS-nucLacZ/+* |
| G,J,K | *Or67d-QF,UAS-Httex1Q25-GFPattP3/Y ; GH146-Gal4,QUAS-Httex1Q91-mCherryattP24/+; QUAS-p35/+* |
| H,J,K | *Or67d-QF,UAS-Httex1Q25-GFPattP3/Y ; GH146-Gal4,QUAS-Httex1Q91-mCherryattP24/UAS-LacZ* |
| I,J,K | *Or67d-QF,UAS-Httex1Q25-GFPattP3/Y ; GH146-Gal4,QUAS-Httex1Q91-mCherryattP24/UAS-p35* |
| **Figure 7** | |
| B,C,D,E,F,G,I,J | *Or67d-QF,QUAS-Httex1Q91-mCherryattP3/+ ; GH146-LexA::GAD,LexAop-Httex1Q25-YFPattP24/UAS-Httex1Q25-3xHAattP24 ; repo-Gal4/+* |
| H,I,J | *Or67d-QF,QUAS-Httex1Q91-mCherryattP3/+ ; GH146-LexA::GAD,LexAop-Httex1Q25-YFPattP24/UAS-Httex1Q25-3xHAattP24 ; repo-Gal4/UAS-DraperRNAi#5* |
| **Figure 7 - figure supplement 1** | |
| A1-2 | *GH146-LexA::GAD,LexAop-Httex1Q25-YFPattP24/UAS-Httex1Q25-3xHAattP24 ; repo-Gal4/+* |
| B1-2 | *Or67d-QF/+ ; GH146-LexA::GAD,LexAop-Httex1Q25-YFPattP24/QUAS-Httex1Q25-mCherryattP24* |
| C1-2 | *Or67d-QF/+ ; QUAS-Httex1Q25-mCherryattP24/UAS-Httex1Q25-3xHAattP24 ; repo-Gal4/+* |
| **Video 1** | |
|  | *Or67d-QF,UAS-Httex1Q25-GFPattP3/(+/Y) ; GH146-Gal4,QUAS-Httex1Q91-mCherryattP24/+* |