

**Supplementary file 2. Stimulus conditions used for the experiment shown in Figure 6.**

Tested neuronal pairs	Red light intensity ( $\mu\text{W}/\text{mm}^2$ )	Number of pulses delivered	Runs / number of flies tested
aJO to aBN1	~50	50	10 / 3
aJO to aBN2	~50 to 290	10	6 / 3
aJO to aDN1	~ 290 to 800	20	9 / 3
aJO to aDN2	~800	100 to 200	14 / 4
aBN1 to aDN	~50	5 to 20	pre-drug = 13 / 5 drug = 24
aBN1 to aBN2	~50	10 to 50	pre-drug = 10 / 3 drug = 11
aBN2 to aBN1	~290 ~800	50 20 and 50	pre-drug = 12 / 5 drug = 21
aBN2 to aDN1	~290 ~50	20 to 30 20	pre-drug = 13 / 4 drug = 19
aBN2 to aDN2	<i>Mecamylamine:</i> ~ 290 ~ 500 ~ 800  <i>Picrotoxin:</i> ~50 ~50 ~ 290	15 to 30 20 50  20 50 20	pre-drug = 16 / 5 drug = 21  pre-drug = 10 / 4 drug = 10
pBPLexAp65U control to aBN2	~1000	50	8 / 3
pBPLexAp65U control to aDN2	~800-1000	50	11 / 5