**Data and code used for making Extended Data Fig. 4**

**Folder: ExtDataFig4a**

* IHC\_pIP10SGSL: Expression pattern of pIP10 split-LexA and split-Gal4.

**Folder: ExtDataFig4b-d**

Analysis

* ExtDataFig04\_TuningCurve\_OptStim\_Song\_HighMagSine.m: Code for plotting the tuning curves of pulse and sine songs induced by optogenetics in Extended Data Fig. 4b–d.

Data/Summary

* dataset.csv: A spreadsheet describing the genotype for each microphone recording channel in each experiment.
* EthogramCombPulseTrain\_\*: Files containing the time course of pulse/sine songs. Row: fly ID; Column: time bins.
* Mic\_\*: Flies containing audio data for each experiment.
* OptStim\_\*: Files containing the timings of optogenetic stimulation in each experiment.

**Folder: ExtDataFig4e-j**

Analysis

* ExtDataFig04\_AveTimeCourse\_OptStim\_Neuron.m: Code for plotting the time course of ΔF/F recorded from dPR1 and TN1A in Extended Data Fig. 4e,h.
* TS\_Img.mat: Time stamps of calcium imaging.
* TS\_OptStimImg.mat: Timings of optogenetic stimulation during calcium imaging.
* ExtDataFig04\_AveTimeCourse\_OptStim\_Song.m: Code for plotting the time course of and the proportions of pulse and sine song in Extended Data Fig. 4e,h.
* ExtDataFig04\_OptStim\_TuningCurve\_Neuron.m: Code for plotting the tuning curves of calcium signals of each neuron induced by optogenetics in Extended Data Fig. 4f,i.
* ExtDataFig04\_OptStim\_TuningCurve\_Song.m: Code for plotting the tuning curves of pulse and sine songs induced by optogenetics in Extended Data Fig. 4g,j.

Data/Summary\_GENOTYPE

* EthogramComb.mat: File containing the time course of pulse/sine songs. Row: fly ID; Column: time bins at the resolution of microphone recording (1 kHz).
* EthogramCombImg.mat: Same as EthogramComb.mat but the time resolution of calcium imaging.
* FtimeCourseComb.mat: Mean calcium signals (F) in each ROI and the optogenetic stimulation strength in each trial. F\_comb: Time course of F for each ROI (ROI x Time bins x Blocks). Stim\_comb: Stimulation strength (from 1 to 6) in each trial (Column: block; Row: trial).
* EthogramCombPulseTrain.mat: Same as EthogramComb.mat but the inter-pulse intervals are designated as “pulse.”

**Folder: ExtDataFig4lm**

Analysis

* ExtDataFig04\_AveTimeCourse\_OptStim\_WingCut\_Neuron.m: Code for plotting the tuning curves of calcium signals of each neuron induced by optogenetics in Extended Data Fig. 4l,m.
* TS\_Img.mat: Time stamps of calcium imaging.
* TS\_OptStimImg.mat: Timings of optogenetic stimulation during calcium imaging.

Data/Summary\_GENOTYPE

* FtimeCourseComb.mat: Mean calcium signals (F) in each ROI and the optogenetic stimulation strength in each trial. F\_comb: Time course of F for each ROI (ROI x Time bins x Blocks). Stim\_comb: Stimulation strength (from 1 to 6) in each trial (Column: block; Row: trial).