**Data and code used for making Fig. 6**

**Folder: Fig6a**

* IHC\_pMP2: Expression pattern of the pMP2 split-Gal4.

**Folder: Fig6c-h**

Analysis

* Fig06\_Example\_TimeCourseRaw\_pIP10NP.m: Code for plotting the example time courses of delta F/F for pIP10 neurons in Fig. 6c.
* Fig06\_Example\_TimeCourseRaw\_pMP2NP.m: Code for plotting the example time courses of delta F/F for a pMP2 neuron in Fig. 6f.
* Fig06\_AveTimeCourseSongTrans\_pIP10.m: Code for plotting calcium signals and song probabilities during song type transitions in Fig. 6d.
* Fig06\_AveTimeCourseSongTrans\_pMP2.m: Code for plotting calcium signals and song probabilities during song type transitions in Fig. 6g.
* Fig06\_BidirRespMod\_Normalized.m: Code for plotting the mean change in ΔF/F after song-type transitions relative to ΔF/F before the transitions in Fig. 6e,h,.

Data/Summary\_GENOTYPE

* Dataset.csv: A spreadsheet summarizing the imaged ROIs and singing behavior in each experiment.
* 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).
* SongExplorer: A folder containing audio data and song segmentation results for each recording.
* Transitions.mat: Variables for running Fig01\_AveTimeCourseSongTrans.m.
* SongTypePrefIndex.mat: Variables for running Fig06\_BidirRespMod\_Normalized.m.
* ResponseIndex.mat: Response index, which characterizes if a neuron showed a response to optogenetic stimulation, for each recording (pIP10) or neuron (pMP2).