

This data set shows responses of auditory cortical neurons to gap-in-noise stimuli. We used chronically implanted tetrodes to record from 534 auditory cortical neurons in awake mice during presentations of gaps in continuous background white noise. Neurons showed several distinct types of gap responses. Many cells show a characteristic burst of spikes evoked by the end of the gap (i.e. the resumption of noise), which we refer to as the Gap Termination Response (GTR). In this sample, 39% of cells (210/534) showed significant GTRs (i.e., spiking during the 50 ms post-gap interval that was significantly greater than for background noise without a gap, paired t-test). The GTRs were typically tuned for gap duration. Cells ranged from tightly to broadly tuned for gap duration. We quantified the selectivity of GTRs for gap duration using a Gap Tuning Index (GTI, possible values from 0-1, see below). The cells are presented below sorted by GTI, from highest (well-tuned) to lowest (untuned). A few cells responded with only an off-response locked to noise offset (23/534, or 4%). Much more common were cells that showed both off-responses and GTRs (108/534, 20% of all cells, or 51% of the 210 cells that showed GTRs).

Methods: We used an array of 8 tetrodes in freely moving awake C57bl6 mice. We histologically verified the placement of the tetrodes in auditory cortex. Data were acquired with 32-channel RHD2000 hardware (Intan Technologies) and Open Ephys software (<http://open-ephys.org>), and the spiking activity of individual neurons was isolated offline using the MClust spike sorting package (<http://redishlab.neuroscience.umn.edu/MClust/MClust.html>). Gap stimuli (50 repetitions at each duration) were delivered from a free-field speaker directly overhead. Gap stimuli are indicated by horizontal grey bars, with gap durations indicated at the left (0-256 ms, where “0 ms” indicates background noise without a gap). The red shaded window shows the 50 ms post-gap interval that we used to measure the GTR. The gap duration tuning curve at right plots the GTR as a function of gap duration. Listed above this plot are the Cell ID, GTI, best gap duration, and a p-value for the response to the best gap duration (given by a paired t-test comparing to trials without a gap). The Gap Tuning Index (GTI) quantifies how selective neuronal GTRs were for gap duration. This measure compares the responses to best gap duration to the worst gap duration, as given by $GTI = (best_gap_response - worst_gap_response) / (best_gap_response + worst_gap_response)$. GTI varies from 0 to 1 and reflects the depth of modulation in the gap duration tuning curve. For robustness we averaged the two best gap responses together, as well as the two worst gap responses. Cells without a significant GTR were excluded from this analysis (and were assigned a GTI of NaN).











































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































