**Supplemental Table S1.** Summary table detailing sample sizes and parameter values for all sensory characterization comparisons (Figures 3-5).

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Comparison** | **Number of Units** | | | | **Median Value ± 95% CI** | | | |
| **L5** | **L6** | **L5 CF** | **L6 CT** | **L5** | **L6** | **L5 CF** | **L6 CT** |
| Pure tone stimuli: FRA bandwidth (Figure 3C) | 174/509 | 172/625 | 44/132 | 27/83 | 1 ± 0.07 | 1 ± 0.07 | 1.1 ± 0.13 | 0.9 ± 0.17 |
| Pure tone stimuli: latency (Figure 3D) | 20 ± 0.83 | 13 ± 1.08 | 21 ± 1.79 | 13 ± 1.14 |
| Random stimuli: sparsity (Figure 3G) | 211/509 | 274/625 | 50/132 | 38/83 | 0.39 ± 0.04 | 0.46 ± 0.03 | 0.28 ± 0.06 | 0.41 ± 0.1 |
| DRC stimuli: STRF predictive power (Figure 5B) | 372/509 | 295/625 | 81/132 | 51/83 | 0.06 ± 0.01 | 0.1 ± 0.02 | 0.06 ± 0.03 | 0.09 ± 0.05 |
| DRC stimuli: CM predictive power (Figure 5B) | 0.08 ± 0.01 | 0.12 ± 0.02 | 0.08 ± 0.02 | 0.12 ± 0.05 |

**Supplemental Table S2.** Summary table detailing sample sizes for all connectivity comparisons (Figures 6-7).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Comparison** | **Number of Units** | | | |
| **L5 CF -> RS** | **L5 CF -> FS** | **L6 CT -> RS** | **L6 CT -> FS** |
| Normalized firing rate (Figure 6D) | 501 | 96 | 296 | 63 |
|  | **Number of Pairs** | | | |
| **L5 CF <-> RS** | **L5 CF <-> FS** | **L6 CT <-> RS** | **L6 CT <-> FS** |
| CCov integral (Figure 7D) | 2353 | 448 | 981 | 209 |
| Asymmetry index (Figure 7H) | 189 | 56 | 128 | 54 |

**Supplemental Table S3.** Summary table detailing firing rates evoked by all presented stimuli.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Stimulus** | **Evoked Firing Rate (Hz)** | | | |
| **L5** | **L6** | **L5 CF** | **L6 CT** |
| Pure tones | 19.32 ± 2.41 | 20.15 ± 2.91 | 22.05 ± 4.8 | 20.38 ± 8.33 |
| Random stimuli | 21.75 ± 2.65 | 23 ± 2.79 | 19.25 ± 4.58 | 23.75 ± 6.66 |
| DRC | 7.6 ± 0.69 | 7.15 ± 0.68 | 9.05 ± 1.51 | 10.2 ± 2.49 |