

### **Remondes and Wilson Supplementary Methods**

Details the data analysis.

### **Remondes and Wilson Supplementary Figure S1**

Illustrates the SWR extraction procedure, based on the power of 150-250Hz LFP, and the z-score of MUA.

### **Remondes and Wilson Supplementary Figure S2**

Illustrates the measure used to estimate the magnitude of single-unit SWR response.