Supplemental Material

Title Page

Memory impairment and alterations in prefrontal cortex gamma band activity following methamphetamine sensitization

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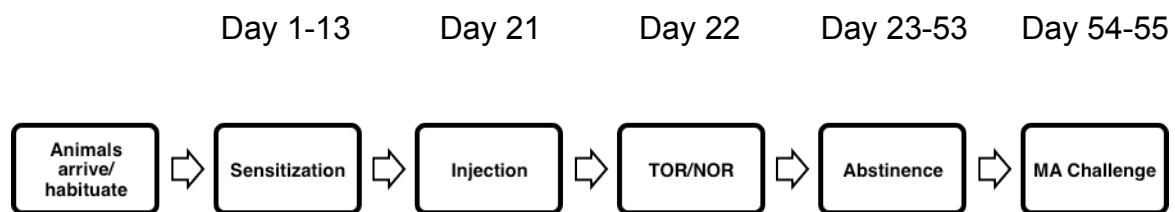Indiana University School Of Medicine Stark Neuroscience Institute
Indiana University-Purdue University Indianapolis School of Science Institute for Mathematical Modeling and Computational Sciences
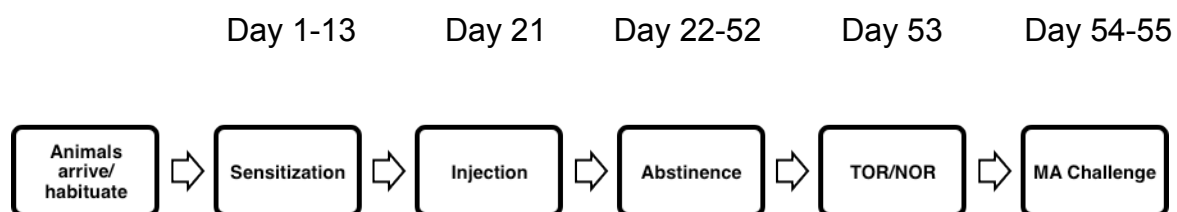402 N. Blackford, LD 124
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a

Day 1-13 Day 21 Day 22 Day 23-53 Day 54-55

| Animals arrive/ habituate | ⇨ | Sensitization | ⇨ | Injection | ⇨ | TOR/NOR | ⇨ | Abstinence | ⇨ | MA Challenge |

b

Day 1-13 Day 21 Day 22-52 Day 53 Day 54-55

| Animals arrive/ habituate | ⇨ | Sensitization | ⇨ | Injection | ⇨ | Abstinence | ⇨ | TOR/NOR | ⇨ | MA Challenge |

Fig. S1 A timeline of the experiments following one day of abstinence (a) and thirty days of abstinence (b)

Stabilize
Recording

Baseline

10 min

30 min

10 min

40 min

SAL injection
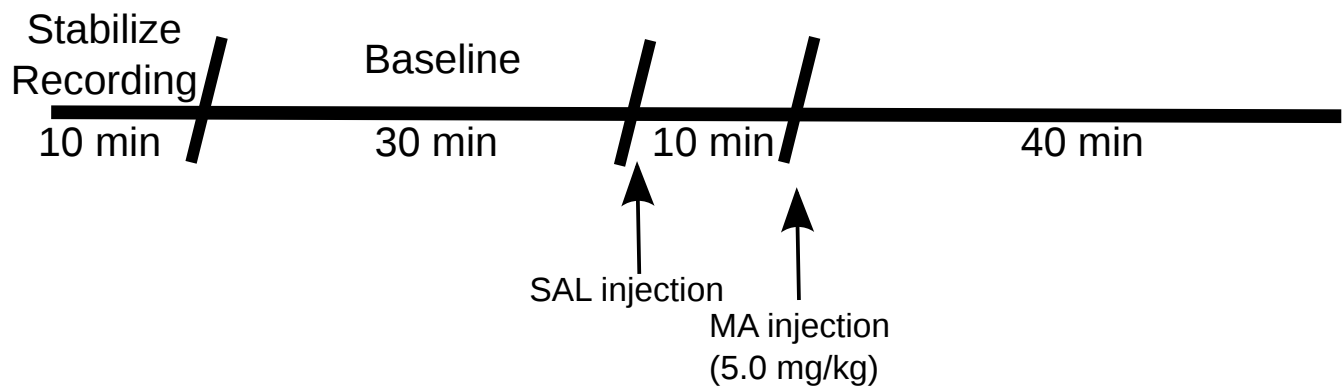
MA injection
(5.0 mg/kg)

Fig. S2 After optimizing tetrode placement to maximize cell yield, 10 minutes were allowed prior to any data collection to ensure the stability of the recording. Baseline recordings were then obtained for 30 minutes, followed by 10 minutes of recording following a SAL injection, and 40 minutes of additional recording after a 5.0 mg/kg MA injection
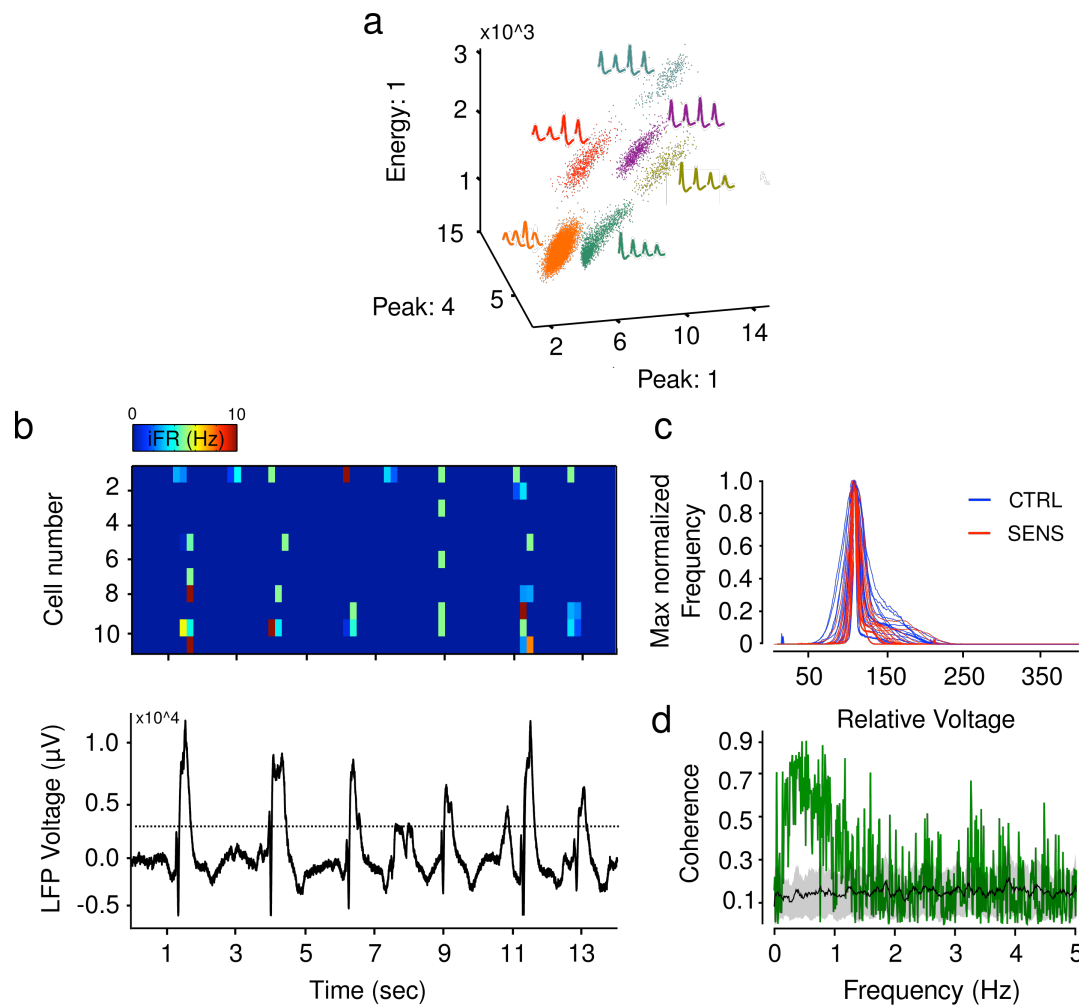
Fig. S3 Data collected during the baseline period (prior to SAL injection). (A) A representative example of 6 single units isolated from a single tetrode from a CTRL animal following spike sorting. Each spike is plotted by the features of its waveform, and the mean waveform from each wire is color coded with its corresponding cluster in the scatter plot. (B, top) Single unit activity from 10 units and (B, bottom) the simultaneously recoded LFP. Note that single unit firing corresponds to increases in voltage (SO) observed in the LFP, such that a large portion of spike activity was observed during large, positive going, voltage deflections in the LFP. The dotted line (bottom) corresponds to the threshold employed to detect SO in subsequent analyses. (C) Max normalized frequency and relative voltage between CTRL and SENS animals during the baseline condition. Note the positive skew in each, which indicates

transient fluctuations into an up-state. (D) A representative example from one CTRL animal where spike train – LFP coherence was computed from the native LFP (green line) compared with surrogate data generated by random permutations of the spike trains. The black trace represents mean coherence of the shuffled data sets and the gray shaded region corresponds to ± 1 standard deviation. A large increase in coherence is observed between 0-1 Hz, which corresponds to the frequency of the SO. In the raw data sets (green line), synchrony in this frequency band was much higher than that observed in surrogate data (black line)
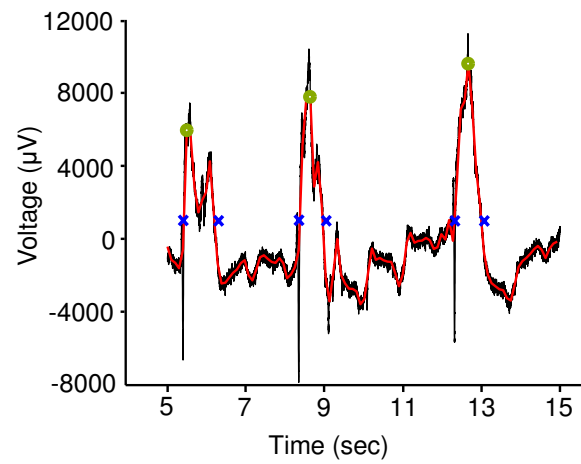
Fig. S4 A SO was detected when there was an increase in voltage of > 2000 mV that lasted longer than 200 msec. The initiation and termination times of the SO are marked with a blue x, while the peak of the SO is marked with a green circle

	CTRL	**SENS**
	Pre-injection	*Pre-injection*
Cv	1.29 +/- 0.59	1.29 +/- 0.43
Lv	1.28 +/- 0.39	1.23 +/- 0.42
B	0.16 +/- 0.49	0.19 +/- 0.45
Criteria	0.50	0.55

*All data presented for Cv, Lv, and B are median values +/- interquartile range (IQR)

Table S1 Firing properties indicated by median values and IQR of CTRL and SENS groups pre-injection. Cv = coefficient of variation; Lv = local variation; B = Burst fraction.