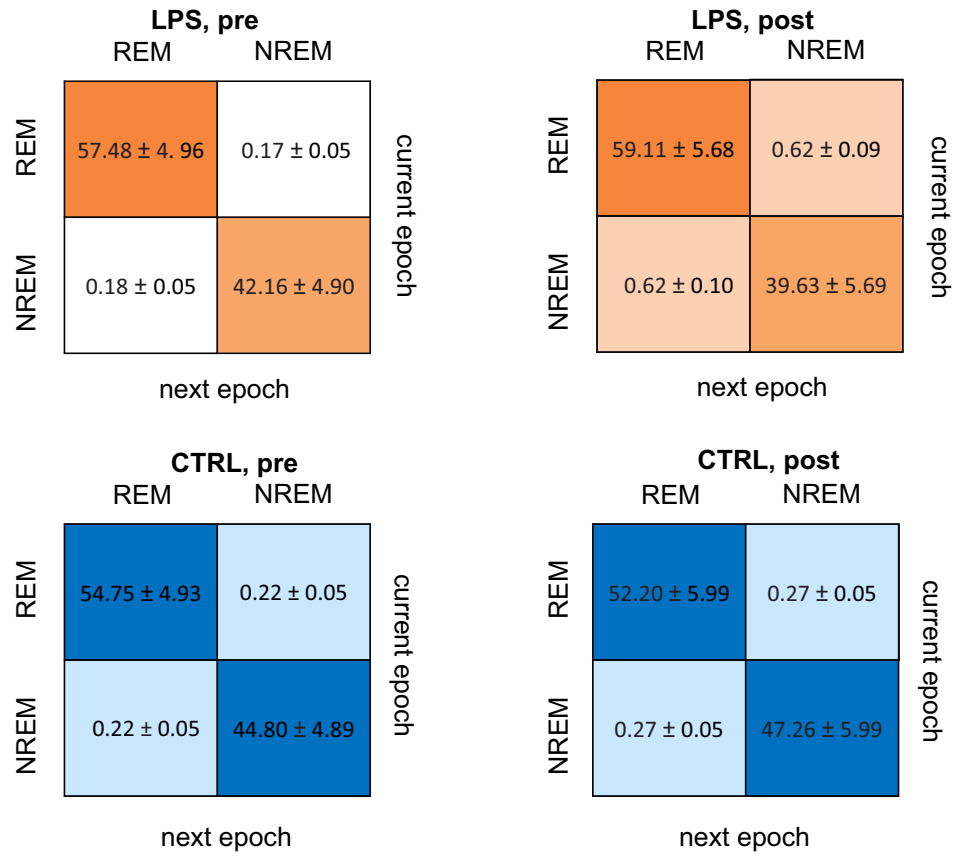


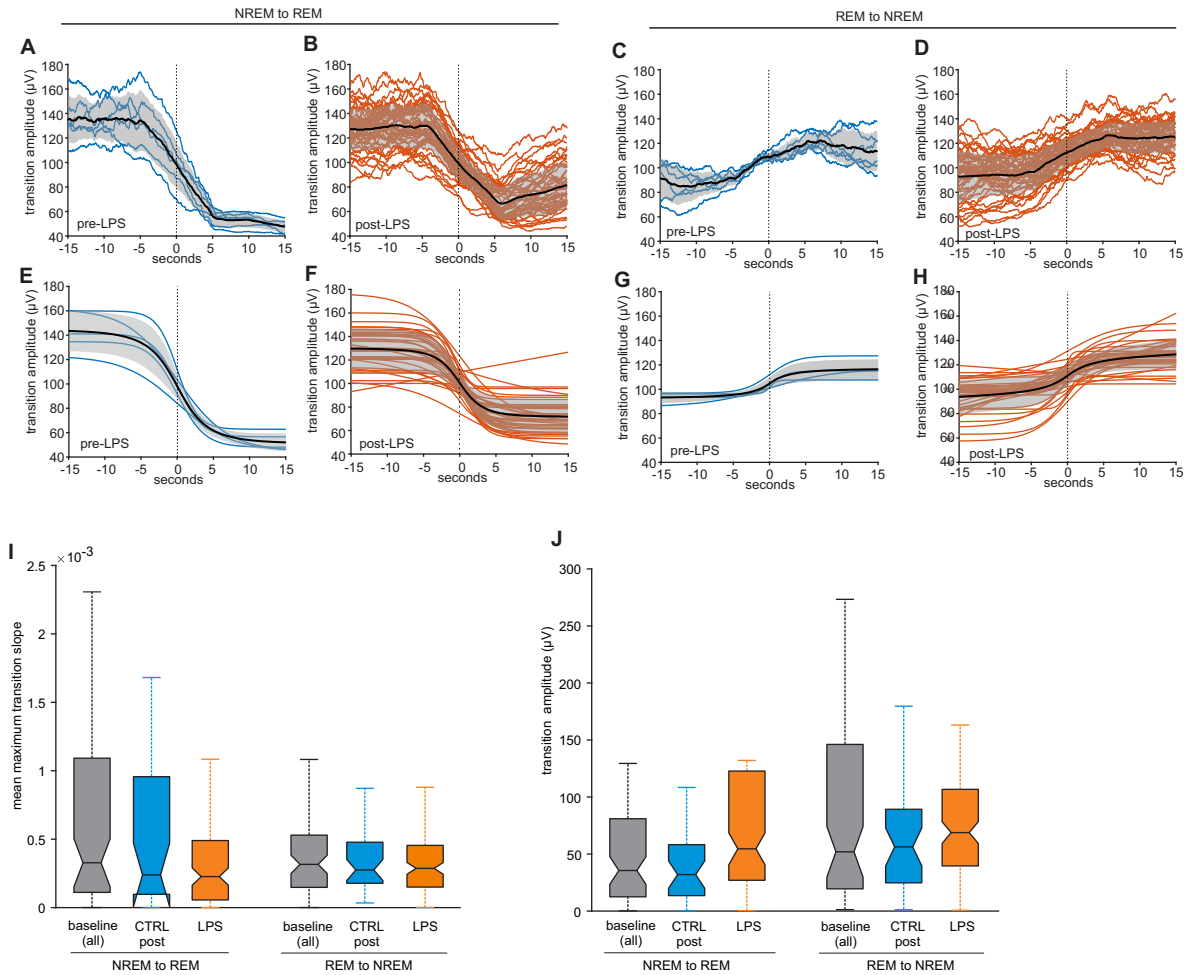
Supplemental Figure S1. LPS injection increased serum IL -1 β .

Each point represents IL -1 β serum concentration in control or LPS rats 8-9 hours after saline or LPS injection. Bar graphs show mean $\pm$ s.e.m. **p < 0.01



Supplemental Figure S2. LPS increased transition probability from REM to NREM and from NREM to REM.

Each cell shows average transition probability per epoch from REM to REM, REM to NREM, NREM to REM or NREM to NREM states pre and post injection in controls (CTRL) and LPS animals.



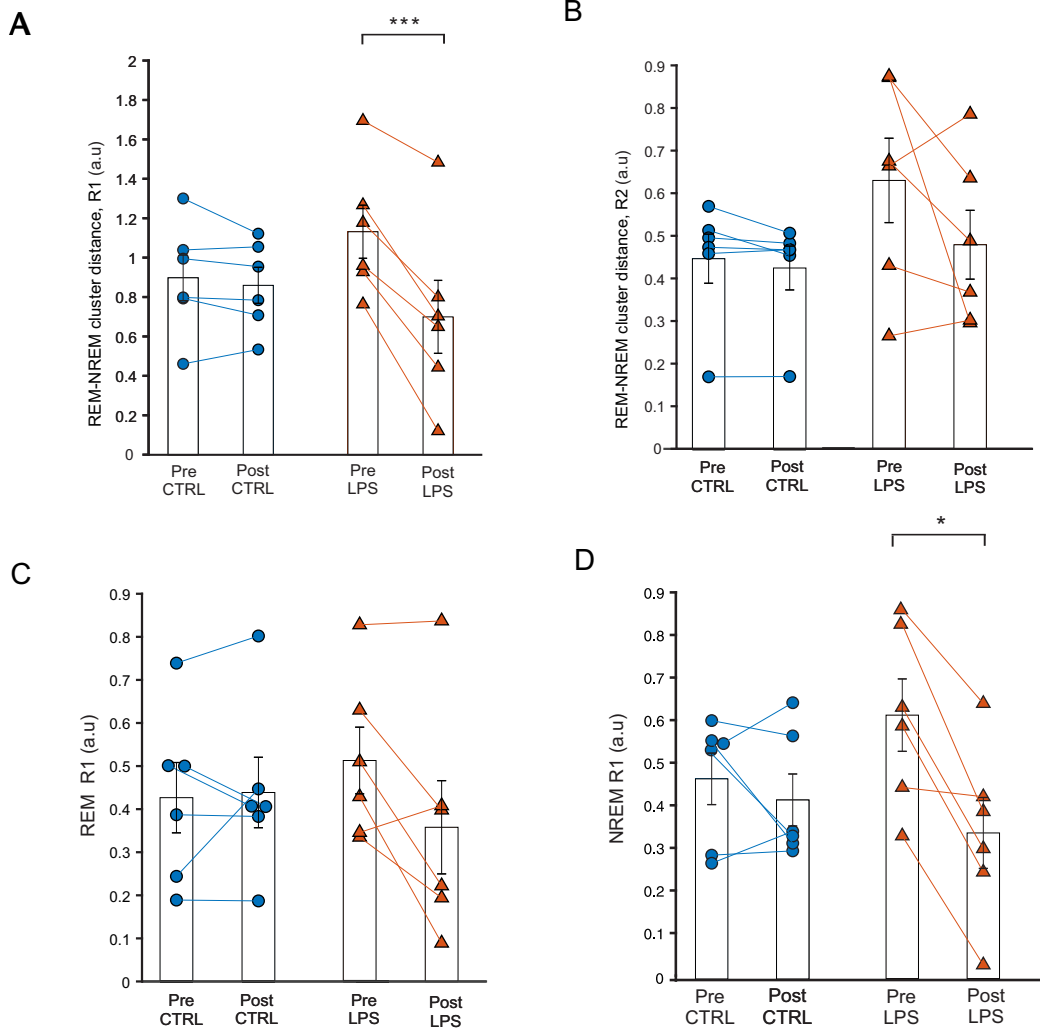
Supplemental Figure S3. State transition characteristics before and after LPS injection.

A-D: Smoothed EEG traces for state transitions for a representative animal at before (A,C) and after LPS injection (B,D). NREM-to-REM transitions are shown in A and B, REM-to-NREM transitions are shown in C and D. Mean traces are shown in black, with standard deviation in gray.

E-H: Fitted curves used to calculate transition dynamics in NREM-to-REM (E,F) and REM-to-NREM (G,H) transitions (G,H) at before (E,G) and after LPS injection (F,H) for the traces shown in A-D. Mean fitted curves are shown in black, with standard deviation in gray.

I: Box plots showing medians and quartiles for maximum transition slope for all NREM-to-REM and REM-to-NREM transitions in all pre-injection recordings (N = 80 and N = 79, resp., 12 rats), post-injection in controls (CTRL, N = 37 and N = 34, resp., 6 rats), and after LPS injection (N = 123 and N = 116, resp., 6 rats).

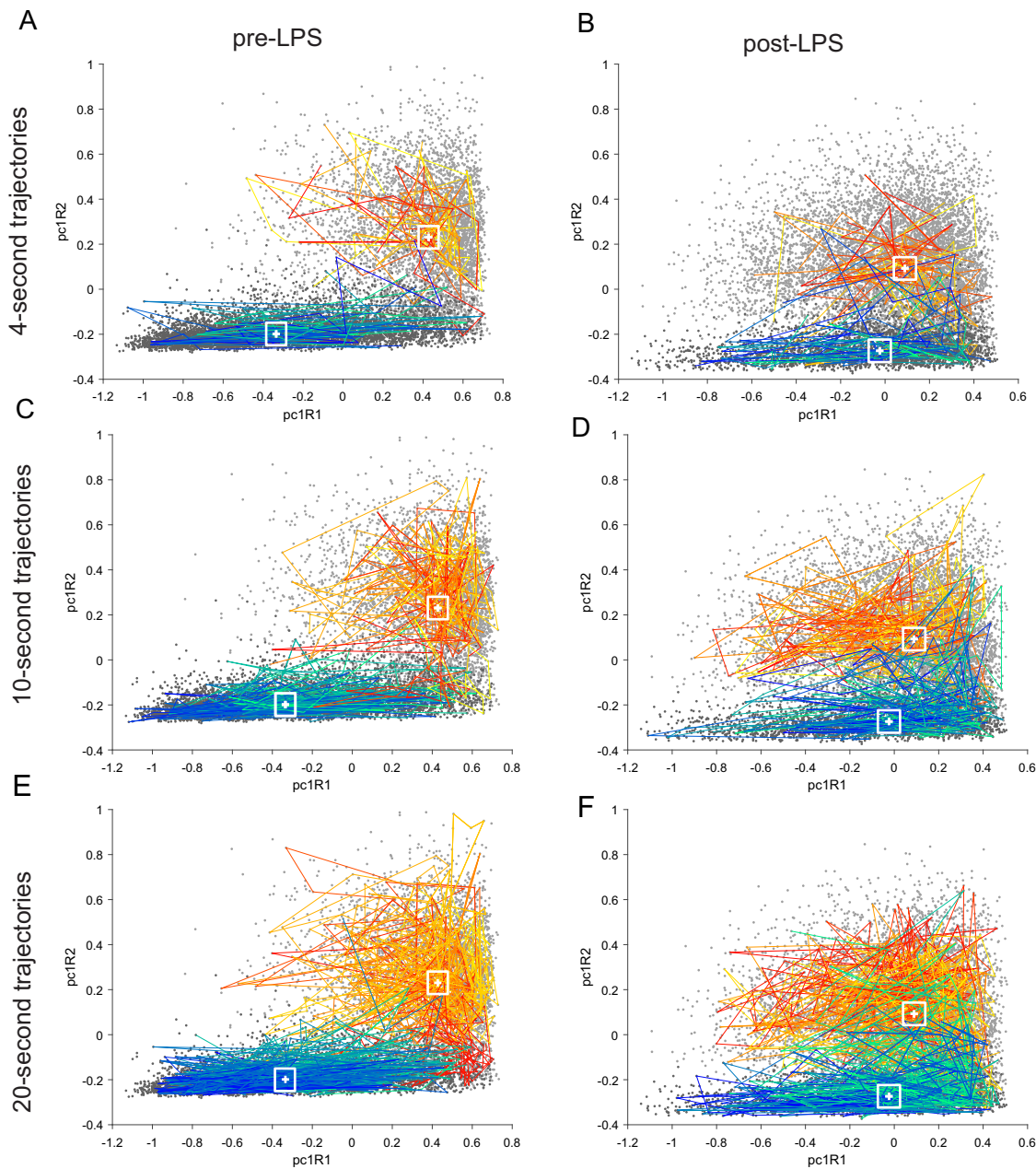
J: Box plots showing medians and quartiles for transition amplitudes for all NREM-to-REM and REM-to-NREM transitions in all pre-injection recordings (N = 80 and N = 79, resp., 12 rats), post-injection in controls (CTRL, N = 37 and N = 34, resp., 6 rats), and after LPS injection (N = 123 and N = 116, resp., 6 rats).



Supplemental Figure S4. LPS leads to spectral changes in the 1-9 Hz frequency range in both REM and NREM.

A - B: Each data point represents the distance between REM and NREM cluster medians along R1 (A) or R2 (B) in CTRL (circles) and LPS (triangles) animals pre or post injection. Bars represent mean $\pm$ s.e.m. *** $p < 0.001$

C - D: Each data point represents median of R1 of REM (C) or NREM (D) in CTRL (circles) and LPS (triangles) animals' pre or post injection. Bars represent mean $\pm$ s.e.m. ** $p < 0.05$; *** $p < 0.001$.



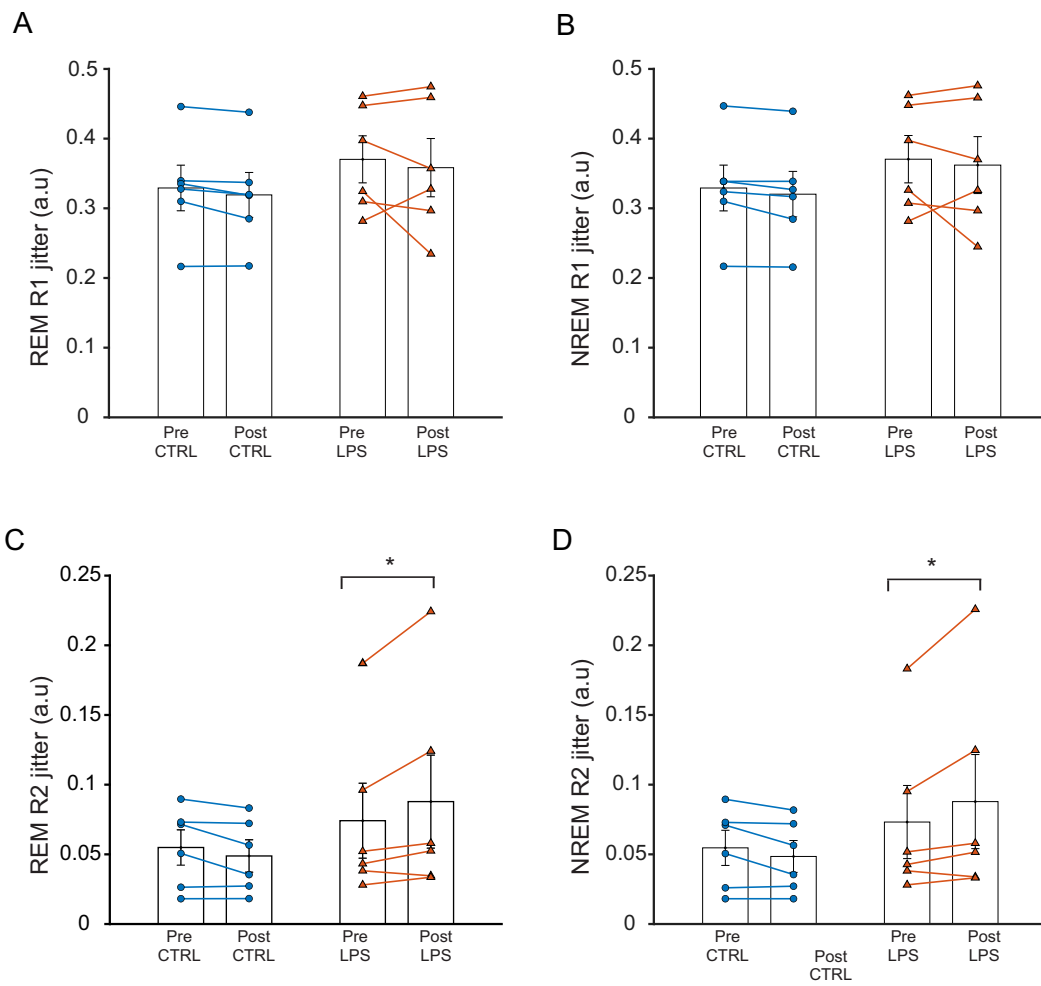
Supplemental Figure S5. Representative 4-, 10-, and 20-second long trajectories in state space.

A-F White boxes indicate the region around the state cluster median where the detected incoming and outgoing trajectories end resp. start. 15 incoming and 15 outgoing trajectories are shown for each state. Plotted trajectories were chosen at random.

Trajectories starting or ending in NREM are shown in blue-green, and REM trajectories are shown in red-yellow.

Although second-to-second positions in state space vary widely and points that are neighboring in time are not always closely spaced together in state space, overall trajectories sampled around a cluster median remain mostly within the boundaries of that cluster.

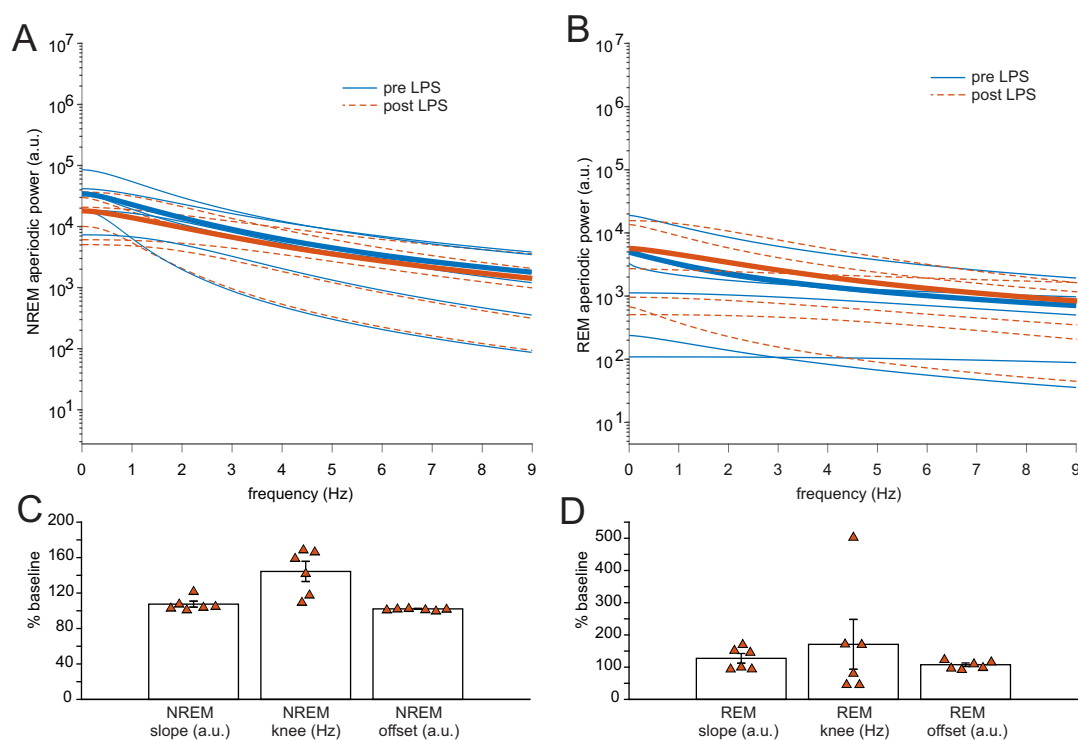
This is the case at baseline, but also after LPS injection. Similar patterns were observed for short trajectories (4 s, A-B) and longer trajectories (10 s, C-D, 20 s E-F).



Supplemental Figure S6. LPS leads to within-state instability in high frequency range R2 (1-15 Hz/1-45 Hz).

A-B: Median jitter values of REM (A) and NREM (B) along R1 in CTRL (circles) and LPS (triangles) animals pre or post injection. Bars represent mean $\pm$ SEM.

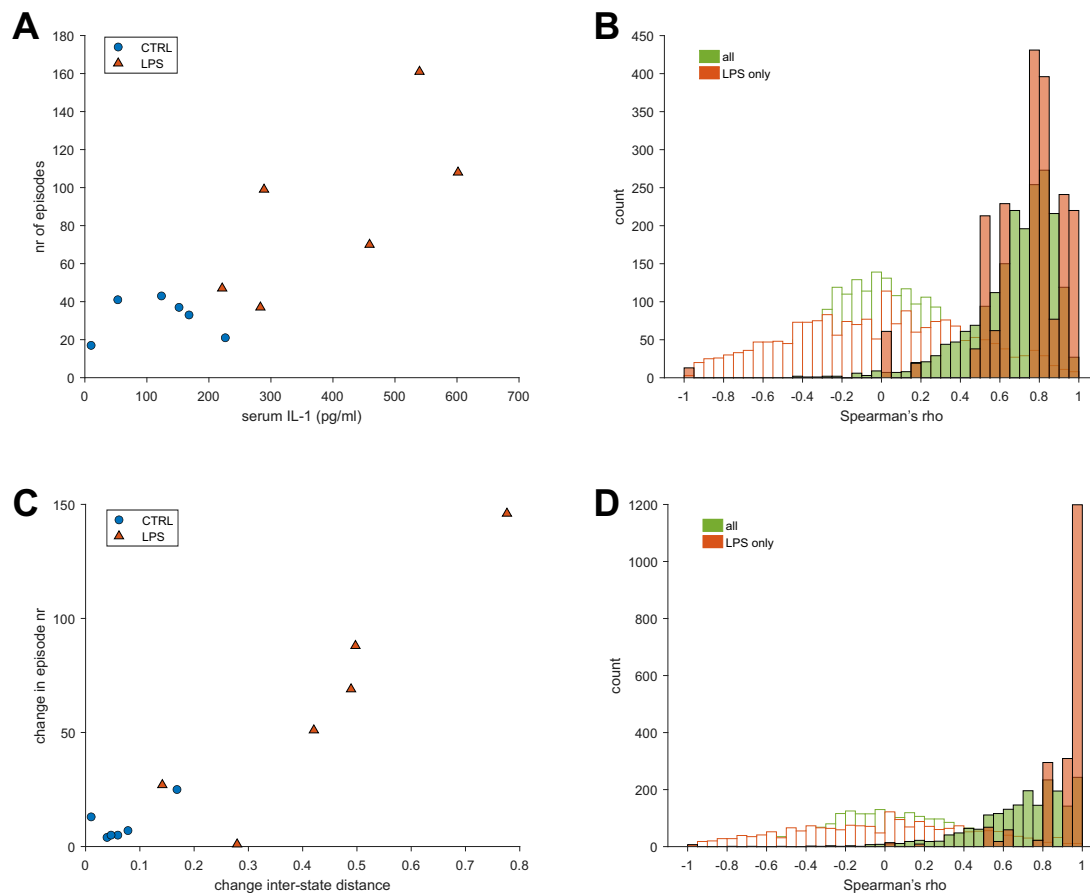
C-D: Median jitter of REM (A) or NREM (B) along R2 in CTRL (circles) and LPS (triangles) animals pre or post injection. Bars represent mean $\pm$ SEM. * $p < 0.05$



Supplemental Figure S7. Effects of LPS injection on aperiodic spectrum components

A-B Aperiodic component of the FOOOF model in NREM (A) and REM (B) pre (blue, solid lines) and post LPS injection (orange, dashed lines). Thin lines show aperiodic components of individual spectra, thick lines show group averages.

C-D Post LPS changes in individual variables determining the aperiodic spectral component: slope, knee frequency and offset in NREM (C) and REM (D). Bars and error bars show mean $\pm$ s.e.m, triangles show values for individual rats.



Supplemental Figure S8. Relations between inflammation severity, fragmentation, and inter-state distance

A Relation between IL-1 concentration and state fragmentation, expressed as the total number of NREM and REM episodes.

B Bootstrapped results of Spearman correlations between IL-1 concentration and number of episodes. Filled bars show the results for all animals (green) and LPS only (orange). Open bars show the corresponding randomly sampled results.

C Relation between the change in state fragmentation, expressed as the total number of NREM and REM episodes, and change in inter-state distance.

D Bootstrapped results of Spearman correlations between change in number of episodes and change in inter-state distance. Filled bars show the results for all animals (green) and LPS only (orange). Open bars show the corresponding randomly sampled results.

STATE	TIME	R ²	FIT ERROR
NREM	pre LPS	0.995 ± 0.002	0.031 ± 0.006
	post LPS	0.996 ± 0.002	0.029 ± 0.008
REM	pre LPS	0.987 ± 0.008	0.035 ± 0.007
	post LPS	0.985 ± 0.011	0.035 ± 0.006

Supplemental Table ST1 Goodness-of-fit values for the used FOOF models in NREM and REM