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Cortical drive and thalamic feed-forward inhibition control thalamic output synchrony during absence seizures

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25 **SUPPLEMENTARY TABLES**

26

27

A

		GAERS								
		TC			**Wake Active NRT**			**Wake Quiescent NRT**		
		Seizure	Wake	Sleep	Seizure	Wake	Sleep	Seizure	Wake	Sleep
Total Firing (Hz)	**Mean**	**5.4**	**11.4**	**5.5**	**52.0**	**38.6**	**19.2**	**3.8**	**4.6**	**4.8**
	9th Pctile	1.0	3.2	7.9	11.5	21.2	10.9	0.1	0.8	0.0
	91st Pctile	10.9	18.6	9.7	72.5	55.9	33.0	10.0	8.0	12.5
Burst Firing (Hz)	**Mean**	**0.9**	**0.4**	**0.8**	**1.6**	**0.3**	**0.4**	**0.3**	**0.2**	**0.2**
	9th Pctile	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.1
	91st Pctile	0.8	0.5	1.0	3.7	0.4	0.8	1.3	0.5	0.7
Tonic Firing (Hz)	**Mean**	**2.8**	**9.3**	**2.4**	**14.1**	**25.0**	**9.7**	**2.1**	**2.9**	**2.7**
	9th Pctile	0.6	2.1	0.7	1.1	13.1	5.6	0.0	0.6	0.0
	91st Pctile	4.7	14.3	4.6	24.3	31.9	17.4	5.7	5.9	6.5

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B

		GAERS			GHB		
		TC	**WA NRT**	**WQ NRT**	**TC**	**WA NRT**	**WQ NRT**
Total Firing (per SWC)	**Mean**	**0.9**	**6.2**	**0.5**	**0.9**	**2.4**	**2.4**
	9th Pctile	0.1	1.4	0.0	0.2	1.2	1.2
	91st Pctile	1.8	10.7	1.4	2.2	5.2	1.2
Burst Firing (per SWC)	**Mean**	**0.1**	**0.2**	**0**	**0.1**	**0.2**	**0**
	9th Pctile	0.0	0	0	0	0	0
	91st Pctile	0.4	0.5	0.5	0.3	0.3	0.1
Tonic Firing (per SWC)	**Mean**	**0.4**	**1.7**	**0.3**	**0.5**	**0.8**	**0.8**
	9th Pctile	0.1	0.0	0.0	0.1	0.5	0.5
	91st Pctile	0.8	3.3	3.3	1.3	1.4	1.4

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32 **Supplementary Table 1. Firing rates of TC and NRT neurons during different**
33 **behavioral states in GAERS and during GHB-elicited ASs.**
34 Mean firing rates in Hz (A) and per-SWC (B) (with 9th and 91st percentiles (Pctile)) for each
35 neuronal population (GAERS TC n = 139; wake-active, WA, NRT n = 13; wake-quiescent,
36 WQ, NRT n = 12) (GHB TC n = 39; wake-active, WA, NRT; n = 18, wake-quiescent, WQ,
37 NRT n = 3) during wake/interictal periods, ASs and non-REM sleep.

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	GAERS		GHB	
	TC	**WA NRT**	**TC**	**WA NRT**
Total Firing	-15 ms	+9 ms	-13 ms	+8 ms
Burst Firing	-16 ms	+7 ms	-14 ms	-2 ms
Tonic Firing	-17 ms	+28 ms	-7 ms	+10 ms

39 **Supplementary Table 2. Latency of the peak of TC and NRT neuron firing to the SWC**
40 **spike during ASs in GAERS and GHB models.**
41 Values are the latency of the peak of different firing types (total, burst, tonic) of TC and
42 wake-active (WA) NRT neurons with respect to the SWC spike (set as time 0), calculated
43 from the SWC spike-triggered averages shown in Fig. 4a and Supplementary Fig. 8a. Wake-
44 quiescent NRT neurons are not included because of the lack of identifiable peaks in their ictal
45 firing (Supplementary Fig. 8a).

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Neurons	g_{SE} (% of Pas)	g_{SI} (% of Pas)	SDg_{SE} (%)	SDg_{SI} (%)
TC	20	80	100	100
NRT1	20	80	60	60
NRT2	20	80	60	60
PY1	20	80	150	150
PY2	20	80	150	150

Synapses	G (μS)	Delay (ms)
TC-PY1 (AMPA)	0.02	2
TC-PY2 (AMPA)	0.01	2
PY1-TC1 (AMPA)	0.015	2
PY2-TC2 (AMPA)	0.0001	2
PY1-NRT1 (AMPA)	0.005	2
PY1-NRT2 (AMPA)	0.005	2
PY2-NRT1 (AMPA)	0.005	2
PY2-NRT2 (AMPA)	0.005	2
TC-NRT1 (AMPA)	0.03/0.001	0
TC-NRT2 (AMPA)	0.03/0.001	0
NRT1-TC (GABA-A)	0.1	0
NRT2-TC (GABA-A)	0.1	0

Supplementary Table 3. Biophysical model main parameters.

Note the two values of TC-NRT synaptic weight that were tested in Fig. 8c and d. Delay is the synaptic delay, g_{SE} is the average excitatory synaptic conductance, SD_{gSE} is the standard deviation of the excitatory synaptic conductance. g_{SI} is the average inhibitory synaptic conductance, and SD_{gSI} is the standard deviation of the inhibitory synaptic conductance. Pas is passive conductance.