SUPPLEMENTARY TABLES

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

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

Supplementary Table 1. Firing rates of TC and NRT neurons during different behavioral states in GAERS and during GHB-elicited ASs.

Mean firing rates in Hz (A) and per-SWC (B) (with 9^{th} and 91^{st} percentiles (Pctile)) for each neuronal population (GAERS TC n = 139; wake-active, WA, NRT n = 13; wake-quiescent, WQ, NRT n = 12) (GHB TC n = 39; wake-active, WA, NRT; n = 18, wake-quiescent, WQ, NRT n = 3) during wake/interictal periods, ASs and non-REM sleep.

	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

Supplementary Table 2. Latency of the peak of TC and NRT neuron firing to the SWC spike during ASs in GAERS and GHB models.

Values are the latency of the peak of different firing types (total, burst, tonic) of TC and wake-active (WA) NRT neurons with respect to the SWC spike (set as time 0), calculated from the SWC spike-triggered averages shown in Fig. 4a and Supplementary Fig. 8a. Wake-quiescent NRT neurons are not included because of the lack of identifiable peaks in their ictal firing (Supplementary Fig. 8a).

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.