

Supplementary Tables

Table S1: Patients. Demographics, pathology and neuropsychological evaluation. Abbreviations: Hand: Dominant handedness. Tests indicated with n/a were not performed for clinical reasons. WAIS-III: IQ scores from the Wechsler Adult Intelligence Scale: performance IQ (PIQ), verbal IQ (VIQ), full scale IQ (FSIQ), verbal comprehension index (VCI), perceptual organization index (POI). All WAIS-III scores are on average 100 with a s.d. of 15 in the normal population (69 and less falls in the clinically abnormal range, 70-79 borderline, 80-89 low average, 90-109 average, 110-119 high average, 120-129 superior, 130+ very superior). WMS-R and WMS-III are the Wechsler memory scale revised and version 3, respectively. Subtests are verbal paired associates (VPA), logical memory (LM) and visual reproduction (Vis). 1 and 2 are immediate and delayed, respectively. Scores are raw scores.

ID	Age	Sex	Hand Dom	Epilepsy Diagnosis	WAIS-III / WAIS-IV (*)					WMS-R / WMS-III (*)					
					PIQ	VIQ	VCI	POI	FSIQ	VPA1	VPA2	LM1	LM2	Vis1	Vis2
H09	55	M	R	right temporal	97	98	100	103	98	18	7	22	14	31	25
H10	37	M	R	Left frontal	79	64	n/a	n/a	68	n/a	n/a	n/a	n/a	n/a	n/a
H11	16	M	L	right lateral frontal	84	91	88	84	88	17	8	n/a	n/a	31	29
H14	31	M	L	Bilateral indep. temporal	n/a	n/a	112	111	n/a	11	6	18	11	40	16
H15	45	M	R	Right mesial temporal	64	59	59	69	58	n/a	n/a	n/a	n/a	30	13
H16	34	F	R	right frontal	84	68	68	89	74	8	5	16	10	n/a	n/a
H17	19	M	R	left inferior frontal	128	131	122	133	134	24	6	34	37	40	39
H18	40	M	R	Right temporal	69	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	25	8
H19	34	M	R	Left frontal	81	74	76	80	86	n/a	n/a	20	19	35	32
H21	20	M	R	Not localized	n/a	n/a	93	89	n/a	23	8	34	33	34	32
H23	35	M	R	Left temporal	n/a	n/a	74	86	n/a	11	3	13	4	34	32
H27	41	M	R	Bilateral indep. temporal	86	91	86	88	89	n/a	n/a	n/a	n/a	n/a	n/a
H28	23	M	R	Right mesial temporal	79	77	78	80	76	n/a	n/a	n/a	n/a	n/a	n/a
H29	18	F	L	Left deep insula	104	110	107	101	107	n/a	n/a	n/a	n/a	n/a	n/a
H31	30	M	R	Right temporal	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
H33	29	M	R	Left temporal	113	104	101	123	108	11	5	21	15	41	41
H41	19	M	R	Right posterior temporal	92	100	107	95	97	22	6	31	27	36	37
H42	29	M	R	Not localized	87	75	78	91	79	16	6	22	14	37	36
H43	27	F	L	Left temporal	n/a	n/a	84	86	n/a	19	8	18	17	30	24
H44	58	F	L	Right temporal	74	77	72	78	74	12	5	10	3	34	28
C24	47	F	n/a	Not localized	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
C25	36	F	R	Bilateral indep. temporal	107	105	107	105	107	19*	8*	29*	30*	38*	38*
C26	56	F	L	Right temporal	107	92	96	109	99	15*	6*	26*	17*	35*	33*
C27	45	M	R	Left temporal	79	61	57	80	66	n/a	n/a	n/a	1*	17*	11*
C29	19	M	R	Left temporal neocortical	113	95	89	121	103	20*	8*	19*	19*	37*	38*

C31	31	M	R	Left temporal neocortical	n/a	n/a	72*	79*	69*	21*	10*	n/a	n/a	n/a	n/a
C32	19	M	R	Not localized (generalized)	n/a	n/a	83*	n/a	80*	22*	18*	n/a	n/a	n/a	n/a
C33	44	F	R	Right temporal	99	76	80	103	85	19*	5*	20*	24*	35*	28*

Table S2: Electrophysiological properties of neurons. Abbreviations are: visually selective (VS), memory selective (MS). Firing rates are over the duration of the experiment (overall) or mean rates across all correct trials of a neuron (baseline period is 1s before stimulus onset, stimulus period is 1.5s long starting 200ms after stimulus onset). P-values (right column) specify the likelihood of observing this many selective cells by chance by repeating the same selection procedure after randomly permuting the order of trials (1000 runs). * = Bootstrap p-values are set to 1/N where N=number of runs if none of the bootstrap samples contained more cells that observed.

	Nr of neurons	Overall firing rate \pm sd (Range) [Hz]	Baseline rate \pm sd (Range) [Hz]	Post-Stimulus rate \pm sd (Range) [Hz]	p-value bootstrap, nr significant cells
All sessions (Group 0)	1065	1.84 \pm 2.66 (0.01-23.68)	1.79 \pm 2.66 (0-26.19)	1.93 \pm 2.80 (0-22.20)	-
Behavioral Group 1	954	1.72 \pm 2.40 (0.01-19.71)	1.68 \pm 2.39 (0-20.38)	1.81 \pm 2.57 (0-22.20)	-
Behavioral Group 2	664	1.69 \pm 2.47 (0.02-19.7)	1.65 \pm 2.48 (0-20.38)	1.76 \pm 2.63 (0-22.20)	-
VS Neurons in Group 0	186	2.28 \pm 2.90 (0.05-23.68)	2.22 \pm 2.94 (0.01-26.19)	2.40 \pm 3.00 (0.02-21.63)	0.001
MS Neurons in Group 0	87	2.35 \pm 3.09 (0.03-19.71)	2.35 \pm 3.15 (0.03-20.38)	2.40 \pm 3.14 (0.03-18.81)	0.003
VS Neurons in Group 1	168	2.14 \pm 2.28 (0.05-11.80)	2.07 \pm 2.20 (0.01-12.04)	2.26 \pm 2.53 (0.02-13.90)	0.001*
MS Neurons in Group 1	81	2.44 \pm 3.18 (0.03-19.71)	2.44 \pm 3.24 (0.03-20.38)	2.48 \pm 3.24 (0.03-18.81)	0.001
VS Neurons in Group 2	128	1.95 \pm 2.09 (0.05-10.66)	1.90 \pm 2.00 (0.01-10.46)	2.06 \pm 2.35 (0.03-13.90)	0.001*
MS Neurons in Group 2	65	2.36 \pm 3.30 (0.10-19.71)	2.37 \pm 3.36 (0.06-20.38)	2.38 \pm 3.31 (0.08-18.81)	0.001*

Table S3: Comparison of VS and MS neurons. Here, only the subgroup of MS and VS neurons used for the comparison of extracellular waveforms are used (see results). All errors are \pm s.d.

	MS neurons	VS neurons	p-value
Mean firing rate	2.00 \pm 2.51 Hz	1.87 \pm 2.09 Hz	ns
Proportion of small ISIs	0.25 \pm 0.37	0.20 \pm 0.35	ns
CV2	0.95 \pm 0.13	vs 0.93 \pm 0.17	ns
Peak SNR	5.80 \pm 4.46	6.90 \pm 5.43	ns
Burst index	0.02 \pm 0.02	0.03 \pm 0.05	ns

Table S4: Total number of neurons recorded in each area and hemisphere. Numbers show total number recorded in all sessions (Group 0). Numbers in brackets are those recorded from pathological tissue. Neurons were counted if the patient was diagnosed with uni-or bilateral temporal seizure onset, regardless of whether the focus was medial or lateral.

	Hippocampus	Amygdala
Left	207 (62)	304 (94)
Right	212 (124)	342 (121)
Total	419	646