

Case Number	Age	Gender	GAS	PMI (hr)	Mode of Death	Figure
Control 1	21	Male	90	8	Homicide - Stabbing	1,2
Control 2	30	Male	100	6	MVA-driver (Accident)	1,2
Control 3	31	Male	82	10	MVA-driver (Accident)	1,2
Control 4	37	Male	70	15	Cardiovascular (natural)	1,2
Control 5	39	Male	90	14	Cardiovascular (natural)	1,2
Control 6	41	Female	85	15	Gun Shot Wound (homicide)	1
Control 7	43	Male	90	23	Cardiovascular (natural)	1,2
Control 8	51	Female	80	11	Strangle (homicide)	1
Control 9	56	Female	86	19	MVA-pedestrian (accident)	1

Supplementary Data Table 1: Healthy control subject clinical data. Control subjects belonged to an age group of 21-56 years, and had no neurologic or psychiatric diagnoses, no pathological or traumatic conditions affecting the brain, clear toxicology reports, and were free of psychiatric treatments and cognitive impairment. GAS: global assessment score of mental health, PMI: post-mortem interval, MVA: motor vehicle accident.

Case Number	Disease Duration (yr.)	Age at surgery (yr.)	Age of onset (yr.)	Gender	Side	MEA activity in DG (Fig 4, 5)	Regions with Inter-ictal activity	Applications	Figure
MTLE 1	3	28	25	male	right	Whole DG NI	N.D	IHC, <i>in vitro</i> , MEA	1,2,3,4,5
MTLE 2	3	31	28	female	right			IHC	1,2,4
MTLE 3	7	20	13	female	right			IHC	1,2,4
MTLE 4	7	37	30	female	left	Whole DG NI	CA, Subiculum	IHC, <i>in vitro</i> , MEA	1,2,3,4,5
MTLE 5	7	56	49	female	right			IHC	1,2
MTLE 6	8	38	30	male	left	Whole DG NI	N.D	IHC, MEA	1,2,4,5
MTLE 7	17	30	13	male	right			<i>in vitro</i>	3
MTLE 8	18	43	25	female	left	DG-I	DG, CA	IHC, <i>in vitro</i> , MEA	1,2,3,4,5
MTLE 9	19	29	10	male	right	Whole DG NI	N.D	IHC, <i>in vitro</i>	1,2,3,4
MTLE 10	21	38	17	female	left	DG-I	DG, Subiculum	IHC, MEA	1,2,4,5
MTLE 11	26	54	28	female	right	Whole DG NI	CA, Subiculum	IHC, <i>in vitro</i> , MEA	1,2,3,4,5
MTLE 12	27	39	12	male	right	Whole DG NI	Subiculum	IHC, MEA	1,2,4,5
MTLE 13	29	41	12	female	left	DG-I	DG, Subiculum	IHC, MEA	1,2,4,5
MTLE 14	31	39	8	male	right			IHC	1,2
MTLE 15	36	50	14	female	right			<i>in vitro</i>	3
MTLE 16	38	45	7	female	right	DG-I	DG, CA	IHC, MEA	1,2,4,5
MTLE 17	42	48	6	female	left	DG-I	DG, Subiculum	IHC, MEA	1,2,4,5
MTLE 18	52	53	1	male	left	Whole DG NI	N.D	IHC, MEA	1,2,4,5
MTLE 19	53	56	3	female	right			IHC	1,2

Supplementary Data Table 2: Mesial temporal lobe epilepsy (MTLE) patient clinical data. Patients belonged to an age group of 20-56 years, with disease duration of 3-53 years, and presented lateralized seizure activity. Multi-electrode arrays (MEA) performed on hippocampal surgical resections localized activity to either the dentate gyrus (DG-I), or CA (Cornu Ammonis regions 1-3) and subiculum structures outside the dentate gyrus (Whole DG-III). Hippocampal tissue was additionally processed for immunohistochemistry (IHC) and primary cell culture (*in vitro*) experiments presented in figures as denoted. N.D: Not detected.

Primary Antibodies				
Antibodies	Species	Dilution	Company	Catalog No:
Arc	Rabbit	1 in 100 (IHC)	Proteintech	16290-1-AP
Doublecortin (Dcx)	Mouse	3 in 100 (IHC)	Santa Cruz	sc-390645
c-Fos	Rabbit	1 in 100 (IHC)	CST	#2250
Ki-67	Rabbit	1 in 200 (IHC)	Abcam	Ab15580
Gad 65+67	Rabbit	1 in 100 (IHC)	Abcam	ab11070
GFAP	Rabbit	1 in 2000 (IHC)	Millipore	AB5804
GFAP	Rabbit	1 in 200 (IHC)	DAKO	Z0334
		1 in 1000 (IF)	DAKO	Z0334
Glut Receptor 2/3	Rabbit	1 in 200 (IHC)	Millipore	AB1506
Iba 1	Rabbit	1 in 200 (IHC)	Wako	#019-19741
Prox1	Rabbit	1 in 200 (IHC)	Abcam	ab101851
		1 in 500 (IF)	Abcam	ab101851
Prox1	Mouse	1 in 100 (IHC)	Millipore	MAB5654
PSA-NCAM	Mouse	1 in 200 (IHC)	Millipore	MAB5324
S100 β	Goat	1 in 50 (IHC)	R & D Systems	AF1820
Tuj1 (β -III Tubulin)	Mouse	1 in 1000 (IF)	Biolegend	#801201
Secondary Antibodies				
Antibodies	Species	Dilution	Company	Catalog No:
Anti-mouse Alexa Fluor 488	Donkey	1 in 200 (IHC), 1 in 500 (IF)	Jackson Immunoresearch	715-546-151
Anti-rabbit Alexa Fluor 488	Donkey	1 in 200 (IHC)	Jackson Immunoresearch	711-546-152
Anti-goat Alexa Fluor 488	Donkey	1 in 200 (IHC)	Jackson Immunoresearch	705-546-147
Anti-mouse Cy3	Donkey	1 in 200 (IHC)	Jackson Immunoresearch	715-166-150
Anti-rabbit Cy3	Donkey	1 in 200 (IHC), 1 in 500 (IF)	Jackson Immunoresearch	711-166-152
Anti-goat Cy3	Donkey	1 in 200 (IHC)	Jackson Immunoresearch	705-166-147
Anti-mouse IgM Cy3	Goat	1 in 200 (IHC)	Jackson Immunoresearch	115-165-075
Anti-rabbit Alexa Fluor 647	Donkey	1 in 200 (IHC)	Jackson Immunoresearch	711-606-152
Anti-goat Alexa Fluor 647	Donkey	1 in 200 (IHC)	Jackson Immunoresearch	705-606-147

Supplementary Data Table 3: Antibodies used in this study. IHC: Immunohistochemistry on tissue. IF: Immunofluorescence on cell culture.

	R^2	RMSE
Linear	0.561	353.9
Logarithmic decay	0.706	281.1
Exponential one-phase decay	0.755	264.2

Supplementary Data Table 4: Parameter fits for regression analyses. A comparison of fits between linear regression, logarithmic, and exponential one phase decay was performed in Figure 1h. R^2 : Coefficient of determination. RMSE: root-mean square error.