SPINE DENSITIES [μm-1]

Brain region	Stratum	Culture condition	Genotype	Construct	Treatment	Mice (n)	Dendritic segments (n)	Mean ± s.e.m	One way ANOVA (All culture time, both genotype)	Post hoc (I) p values (n.tg versus APP.tg)	Post hoc (I) p values (versus P7DIV20, same genotype)	Post hoc (I) p values (versus P14DIV20 same genotype)
CA1	rad.	P7DIV15	n.tg	EGFP-Tau	/	≥4	13	1.24 ± 0.09	**F (5,73) = 14.70** **p < 0.0001**	p = 0.0063	p = 0.9910	p = 0.9872
			APP.tg	EGFP-Tau	/	≥4	15	0.9 ± 0.08			p = 0.6842	p = 0.2757
		P7DIV20	n.tg	EGFP-Tau		≥4	11	1.18 ± 0.09		p = 0.0015		p = 0.8211
			APP.tg	EGFP-Tau		≥4	12	0.76 ± 0.05				p = 0.9900
		P14DIV20	n.tg	EGFP-Tau	/	≥4	15	1.3 ± 0.04		p < 0.0001		
			APP.tg	EGFP-Tau	/	≥4	13	0.7 ± 0.04				
	or.	P7DIV15	n.tg	EGFP-Tau	/	≥4	6	0.94 ± 0.15	**F (5,46) = 8.131** **p < 0.0001**	p = 0.9988	p = 0.9984	p = 0.0601
			APP.tg	EGFP-Tau	/	≥4	6	0.88 ± 0.08			p = 0.7244	p = 0.9302
		P7DIV20	n.tg	EGFP-Tau	/	≥4	8	1 ± 0.12		p = 0.1876		p = 0.0978
			APP.tg	EGFP-Tau	/	≥4	7	0.67 ± 0.05				p = 0.9894
		P14DIV20	n.tg	EGFP-Tau	/	≥4	14	1.32 ± 0.06		p < 0.0001		
			APP.tg	EGFP-Tau	/	≥4	11	0.75 ± 0.09				
CA3	rad.	P7DIV15	n.tg	EGFP-Tau	/	≥4	15	1.29 ± 0.08	**F (5,94) = 19.28** **p < 0.0001**	p = 0.0003	p = 0.9971	p = 0.9974
			APP.tg	EGFP-Tau	/	≥4	11	0.85 ± 0.1			p = 0.9933	p = 0.6738
		P7DIV20	n.tg	EGFP-Tau	/	≥4	19	1.25 ± 0.06		p < 0.0001		p > 0.9999
			APP.tg	EGFP-Tau	/	≥4	25	0.8 ± 0.04				p = 0.8420
		P14DIV20	n.tg	EGFP-Tau	/	≥4	17	1.25 ± 0.05		p < 0.0001		
			APP.tg	EGFP-Tau	/	≥4	13	0.7 ± 0.05				
	or.	P7DIV15	n.tg	EGFP-Tau	/	≥4	6	1.15 ± 0.08	**F (5,57) = 7.545** **p < 0.0001**	p = 0.2689	p = 0.5664	p = 0.9003
			APP.tg	EGFP-Tau	/	≥4	6	0.8 ± 0.15			p = 0.9954	p = 0.9718
		P7DIV20	n.tg	EGFP-Tau	/	≥4	8	1.4 ± 0.04		p = 0.0085		p = 0.9428
			APP.tg	EGFP-Tau	/	≥4	7	0.88 ± 0.07				p > 0.9999
		P14DIV20	n.tg	EGFP-Tau	/	≥4	16	1.29 ± 0.06		p = 0.0015		
			APP.tg	EGFP-Tau	/	≥4	20	0.9 ± 0.08				

Brain region	Stratum	Culture condition	Genotype	Construct	Treatment	Mice (n)	Dendritic segments (n)	Mean ± s.e.m	One way ANOVA (Untreated both genotypes together with DAPT treated both genotypes)	Post hoc (I) p values (n.tg versus APP.tg)	Post hoc (I) p values (versus Tau-EGFP DAPT treated, same genotype)
CA1	rad. + or.	P7DIV20	n.tg	EGFP-Tau	/	≥4	10	1.18 ± 0.09	**F (3,49) = 11.64** **p < 0.0001**	p < 0.0001	p = 0.7260
			APP.tg	EGFP-Tau	/	≥4	12	0.76 ± 0.05			p = 0.0001
			n.tg	EGFP-Tau	DAPT	≥4	16	1.10 ± 0.04		p = 0.9989	
			APP.tg	EGFP-Tau	DAPT	≥4	15	1.11 ± 0.04			
CA3	rad. + or.	P7DIV20	n.tg	EGFP-Tau	/	≥4	33	1.29 ± 0.06	**F (3,101) = 19.50** **p < 0.0001**	p < 0.0001	p = 0.6999
			APP.tg	EGFP-Tau	/	≥4	40	0.83 ± 0.04			p = 0.0002
			n.tg	EGFP-Tau	DAPT	≥4	16	1.20 ± 0.05		p = 0.9968	
			APP.tg	EGFP-Tau	DAPT	≥4	16	1.18 ± 0.05			

Brain region	Stratum	Culture condition	Genotype	Construct	Treatment	Mice (n)	Dendritic segments (n)	Mean ± s.e.m	One way ANOVA (EGFP-Tau treated both genotypes together with EGFP treated both genotypes)	Post hoc (I) p values (n.tg versus APP.tg)	Post hoc (I) p values (versus EpoD treated EGFP, same genotype)	One way ANOVA (EGFP-Tau treated both genotypes together with EGFP-Tau untreated both genotypes, same culture time from Fig 1C)	Post hoc (I) p values (versus EGFT-Tau untreated)
CA1	rad.	P7DIV15	n.tg	EGFP-Tau	EpoD	5	31	1.23 ± 0.05	**F (3,83) = 3.073** **p = 0.0322**	p = 0.9509	p = 0.1714	**F (3,73) = 5.871** **p = 0.0012**	p = 0.9997
			APP.tg	EGFP-Tau	EpoD	5	18	1.27 ± 0.07			p = 0.2809		p = 0.0021
			n.tg	EGFP	EpoD	5	13	1.43 ± 0.11		p = 0.9998			
			APP.tg	EGFP	EpoD	6	25	1.443 ± 0.06					
CA3	rad.	P7DIV15	n.tg	EGFP-Tau	EpoD	5	18	1.419 ± 0.07	F (3,79) = 1.824 p = 0.1496	p = 0.2007	p = 0.2235	**F (3,61) = 10.920** **p < 0.0001**	p = 0.5087
			APP.tg	EGFP-Tau	EpoD	5	21	1.20 ± 0.06			p = 0.6170		p = 0.0040
			n.tg	EGFP	EpoD	5	22	1.21 ± 0.09		p = 0.6604			
			APP.tg	EGFP	EpoD	5	22	1.32 ± 0.08					

Brain region	Stratum	Culture condition	Genotype	Construct	Treatment	Mice (n)	Dendritic segments (n)	Mean ± s.e.m (fold change of untreated same genotype)	One way ANOVA (All treatment, both genotype)	Post hoc (I) p values (versus APP.tg, smae treatment)	Post hoc (I) p values (versus treated DAPT, same genotype)	One way ANOVA (EGFP-Tau Nocodazol together with untreated P7DIV20 same genotype from Fig.1C)	Post hoc (I) p values	One way ANOVA (EGFP-Tau DAPT together with untreated P7DIV20 same genotype from Fig.1C)	Post hoc (I) p values	One way ANOVA (EGFP-Tau DAPT+Noc. together with untreated P7DIV20 same genotype from Fig.1C)	Post hoc (I) p values
CA1	rad. + or.	P7DIV20	n.tg	EGFP-Tau	Nocodazole	3	25	-21.24 ± 4.003	**F (5,233) = 58.53** **p < 0.0001**	p < 0.0001	p = 0.0400	**F (3,87) = 6.685** **p = 0.0004**	p = 0.0032	**F (3,128) = 9.207** **p < 0.0001**	p = 0.6000	**F (3,75) = 8.361** **p < 0.0001**	p = 0.0002
			n.tg	EGFP-Tau	DAPT	6	76	-3.988 ± 2.771		p < 0.0001							
			n.tg	EGFP-Tau	DAPT+Noc.	5	34	-24.38 ± 2.829		p < 0.0001	p = 0.0017						
		P7DIV20	APP.tg	EGFP-Tau	Nocodazole	4	46	22.61 ± 4.089			p < 0.0001		p = 0.0182				
			APP.tg	EGFP-Tau	DAPT	3	35	61.50 ± 5.549							p < 0.0001		
			APP.tg	EGFP-Tau	DAPT+Noc.	3	23	29.14 ± 5.614			p < 0.0001						p = 0.0039

Brain region	Stratum	Culture condition	Genotype	Construct	Treatment	Mice (n)	Dendritic segments (n)	Mean ± s.e.m	One way ANOVA (EGFP-Tau treated both genotypes together with untreated P7DIV20 both genotypes from Fig 1C)	Post hoc (I) p values (n.tg versus APP.tg)	Post hoc (I) p values (versus untreated P7DIV20, same genotype)

CA1	rad.	P7DIV20	n.tg	EGFP-Tau	EpoD	7	16	1.33 ± 0.07	**F (3,54) = 14.71** **p < 0.0001**	p = 0.9394	p = 0.4831
			APP.tg	EGFP-Tau	EpoD	7	19	1.39 ± 0.07			p < 0.0001
	or.	P7DIV20	n.tg	EGFP-Tau	EpoD	7	14	1.34 ± 0.09	**F (3,42) = 14.87** **p < 0.0001**	p = 0.8581	p = 0.0367
			APP.tg	EGFP-Tau	EpoD	7	17	1.42 ± 0.06			p < 0.0001
CA3	rad.	P7DIV20	n.tg	EGFP-Tau	EpoD	6	20	1.21 ± 0.04	**F (3,81) = 26.95** **p < 0.0001**	p = 0.1432	p = 0.9268
			APP.tg	EGFP-Tau	EpoD	5	21	1.36 ± 0.06			p < 0.0001
	or.	P7DIV20	n.tg	EGFP-Tau	EpoD	6	10	1.22 ± 0.06	**F (3,32) = 9.547** **p = 0.0001**	p = 0.4907	p = 0.3063
			APP.tg	EGFP-Tau	EpoD	5	11	1.35 ± 0.09			p = 0.0003

(I) Tukey's multiple comparisons test   **rad.** stratum radiatum (apical dendrites)

or. stratum oriens (basal dendrites)

SPINE LENGTH [µm]

Brain region	Stratum	Culture condition	Genotype	Construct	Treatment	Mice (n)	Dendritic segments (n)	Mean ± s.e.m	One way ANOVA (All culture time, both genotype)	Post hoc (I) p values (n.tg versus APP.tg)	Post hoc (I) p values (versus P7DIV20, same genotype)	Post hoc (I) p values (versus P14DIV20, same genotype)
CA1	rad.	P7DIV15	n.tg	EGFP-Tau	/	≥4	13	0.94 ± 0.05	$F_{(5,73)} = 6.304$ $p < 0.0001$	p = 0.1934	p = 0.9648	p = 0.9511
			APP.tg	EGFP-Tau	/	≥4	15	0.78 ± 0.04			p = 0.9926	p = 0.8505
		P7DIV20	n.tg	EGFP-Tau	/	≥4	11	1.0 ± 0.09		p = 0.1750		p > 0.9999
			APP.tg	EGFP-Tau	/	≥4	12	0.82 ± 0.05				p = 0.5634
		P14DIV20	n.tg	EGFP-Tau	/	≥4	15	1.0 ± 0.03		p = 0.0005		
			APP.tg	EGFP-Tau	/	≥4	13	0.7 ± 0.04				
	or.	P7DIV15	n.tg	EGFP-Tau	/	≥4	6	0.83 ± 0.06	$F_{(5,46)} = 5.821$ $p = 0.0003$	p > 0.9999	p = 0.9993	p = 0.1252
			APP.tg	EGFP-Tau	/	≥4	6	0.81 ± 0.09			p = 0.8083	p = 0.6876
		P7DIV20	n.tg	EGFP-Tau	/	≥4	8	0.87 ± 0.1		p = 0.9646		p = 0.1736
			APP.tg	EGFP-Tau	/	≥4	7	0.96 ± 0.06				p = 0.0492
		P14DIV20	n.tg	EGFP-Tau	/	≥4	14	1.1 ± 0.07		p < 0.0001		
			APP.tg	EGFP-Tau	/	≥4	11	0.65 ± 0.04				
CA3	rad.	P7DIV15	n.tg	EGFP-Tau	/	≥4	15	0.88 ± 0.04	$F_{(5,94)} = 13.47$ $p < 0.0001$	p = 0.6539	p = 0.9266	p = 0.0123
			APP.tg	EGFP-Tau	/	≥4	11	0.79 ± 0.09			p = 0.7871	p = 0.9637
		P7DIV20	n.tg	EGFP-Tau	/	≥4	19	0.93 ± 0.02		p = 0.0002		p = 0.1058
			APP.tg	EGFP-Tau	/	≥4	25	0.72 ± 0.02				p = 0.9988
		P14DIV20	n.tg	EGFP-Tau	/	≥4	17	1.06 ± 0.03		p < 0.0001		
			APP.tg	EGFP-Tau	/	≥4	13	0.74 ± 0.04				
	or.	P7DIV15	n.tg	EGFP-Tau	/	≥4	6	0.94 ± 0.06	$F_{(5,57)} = 7.729$ $p < 0.0001$	p = 0.1461	p = 0.9877	p = 0.9967
			APP.tg	EGFP-Tau	/	≥4	6	0.69 ± 0.07			p = 0.9954	p > 0.9999
		P7DIV20	n.tg	EGFP-Tau	/	≥4	8	1.0 ± 0.06		p = 0.0590		p = 0.9998
			APP.tg	EGFP-Tau	/	≥4	7	0.74 ± 0.04				p = 0.9951
		P14DIV20	n.tg	EGFP-Tau	/	≥4	16	0.98 ± 0.05		p = 0.0002		
			APP.tg	EGFP-Tau	/	≥4	20	0.70 ± 0.04				

Brain region	Stratum	Culture condition	Genotype	Construct	Treatment	Mice (n)	Dendritic segments (n)	Mean ± s.e.m	One way ANOVA (Untreated both genotypes together with DAPT treated both genotypes)	Post hoc (I) p values (n.tg versus APP.tg)	Post hoc (I) p values (versus DAPT treated, same genotype)
CA1	rad. + or.	P7DIV20	n.tg	EGFP-Tau	/	≥4	10	0.94 ± 0.07	$F_{(3,49)} = 0.7622$ $p = 0.5207$	p = 0.8226	p = 0.4382
			APP.tg	EGFP-Tau	/	≥4	12	0.88 ± 0.04			p > 0.9999
		P7DIV20	n.tg	EGFP-Tau	DAPT	≥4	16	0.84 ± 0.04		p = 0.9097	
			APP.tg	EGFP-Tau	DAPT	≥4	15	0.88 ± 0.04			
CA3	rad. + or.	P7DIV20	n.tg	EGFP-Tau	/	≥4	33	0.95 ± 0.04	$F_{(3,101)} = 11.14$ $p < 0.0001$	p < 0.0001	p = 0.6382
			APP.tg	EGFP-Tau	/	≥4	40	0.73 ± 0.02			p = 0.1829
		P7DIV20	n.tg	EGFP-Tau	DAPT	≥4	16	0.89 ± 0.02		p = 0.7379	
			APP.tg	EGFP-Tau	DAPT	≥4	16	0.83 ± 0.04			

Brain region	Stratum	Culture condition	Genotype	Construct	Treatment	Mice (n)	Dendritic segments (n)	Mean ± s.e.m	One way ANOVA (EGFP-Tau treated both genotypes together with EGFP treated both genotypes)	Post hoc (I) p values (n.tg versus APP.tg)	Post hoc (I) p values (versus EGFP, same genotype)	One way ANOVA (EGFP-Tau treated both genotypes together with EGFP-Tau untreated both genotypes, same culture time from Fig 2B)	Post hoc (I) p values (versus EGFT-Tau untreated)
CA1	rad.	P7DIV15	n.tg	EGFP-Tau	EpoD	5	31	0.87 ± 0.02	$F_{(3,83)} = 7.203$ $p = 0.0002$	p = 0.3861	p = 0.0236	$F_{(3,73)} = 3.545$ $p = 0.0186$	p = 0.4570
			APP.tg	EGFP-Tau	EpoD	5	18	0.81 ± 0.03			p = 0.1073		p = 0.9475
			n.tg	EGFP	EpoD	5	13	0.74 ± 0.02		p = 0.9160			
			APP.tg	EGFP	EpoD	6	25	0.71 ± 0.03					
CA3	rad.	P7DIV15	n.tg	EGFP-Tau	EpoD	5	18	0.73 ± 0.03	$F_{(3,79)} = 6.475$ $p = 0.0006$	p = 0.7343	p = 0.0222	$F_{(3,73)} = 1.507$ $p = 0.2216$	p = 0.1616
			APP.tg	EGFP-Tau	EpoD	5	21	0.79 ± 0.05			p = 0.0488		p > 0.9999
			n.tg	EGFP	EpoD	5	22	0.59 ± 0.02		p = 0.4288			
			APP.tg	EGFP	EpoD	5	22	0.66 ± 0.03					

Brain region	Stratum	Culture condition	Genotype	Construct	Treatment	Mice (n)	Dendritic segments (n)	Mean ± s.e.m	One way ANOVA (EGFP-Tau treated both genotypes together with untreated P7DIV20 both genotypes from Fig 2B)	Post hoc (I) p values (n.tg versus APP.tg)	Post hoc (I) p values (versus untreated P7DIV20, same genotype)
CA1	rad.	P7DIV20	n.tg	EGFP-Tau	EpoD	7	16	0.85 ± 0.04	$F_{(3,54)} = 3.248$ $p = 0.0288$	p = 0.7117	p = 0.1905
			APP.tg	EGFP-Tau	EpoD	7	19	0.78 ± 0.02			p = 0.9490
	or.	P7DIV20	n.tg	EGFP-Tau	EpoD	7	14	0.67 ± 0.03	$F_{(3,42)} = 4.055$ $p = 0.0128$	p = 0.6809	p = 0.1225
			APP.tg	EGFP-Tau	EpoD	7	17	0.75 ± 0.05			p = 0.0980
	rad.	P7DIV20	n.tg	EGFP-Tau	EpoD	6	20	0.6633 ± 0.02	$F_{(3,81)} = 24.32$	p = 0.1775	p < 0.0001

CA3	rad.	P7DIV20	APP.tg	EGFP-Tau	EpoD	5	21	0.730 ± 0.03	**p < 0.0001**	p = 0.1773	p = 0.9875
	or.	P7DIV20	n.tg	EGFP-Tau	EpoD	6	10	0.63 ± 0.03	**F (3,32) = 20.650** **p < 0.0001**	p = 0.9894	**p < 0.0001**
			APP.tg	EGFP-Tau	EpoD	5	11	0.62 ± 0.02	**p < 0.0001**		p = 0.1416

(I) Tukey's multiple comparisons test

rad. stratum radiatum (APICAL DENDRITES)
or. stratum oriens (BASAL DENDRITES)

										FRACTION OF SPINE [%]			
Brain region	Stratum	Spine type	Culture condition	Genotype	Construct	Treatment	Mice (n)	Dendritic segments (n)	Mean ± s.e.m	One way ANOVA All culture time, both genotype	Post hoc (I) p values (n.tg versus APP.tg)	Post hoc (I) p values (versus P7DIV20, same genotype)	Post hoc (I) p values (versus P14DIV20, same genotype)
CA1	rad.	MUSH.	P7DIV15	n.tg	EGFP-Tau	/	≥4	13	50 ± 3.5	$F_{(5,73)} = 6.115$ $p < 0.0001$	p = 0.5816	p = 0.9959	p = 0.9941
				APP.tg	EGFP-Tau	/	≥4	15	41 ± 2.8			p = 0.7162	p = 0.0334
			P7DIV20	n.tg	EGFP-Tau	/	≥4	11	47 ± 4.4		p = 0.2066		p > 0.9999
				APP.tg	EGFP-Tau	/	≥4	12	33 ± 5.1				p = 0.6379
			P14DIV20	n.tg	EGFP-Tau	/	≥4	15	47 ± 1.9		p = 0.0011		
				APP.tg	EGFP-Tau	/	≥4	13	24 ± 6.0				
		Stubby	P7DIV15	n.tg	EGFP-Tau	/	≥4	13	38 ± 2.7	$F_{(5,73)} = 3.910$ $p = 0.0034$	p = 0.7290	p > 0.9999	p > 0.9999
				APP.tg	EGFP-Tau	/	≥4	15	45 ± 3.8			p = 0.9241	p = 0.2530
			P7DIV20	n.tg	EGFP-Tau	/	≥4	11	39 ± 3.9		p = 0.3569		p > 0.9999
				APP.tg	EGFP-Tau	/	≥4	12	50 ± 4.6				p = 0.8660
			P14DIV20	n.tg	EGFP-Tau	/	≥4	15	39 ± 2.9		p = 0.0138		
				APP.tg	EGFP-Tau	/	≥4	13	56 ± 3.9				
		Thin	P7DIV15	n.tg	EGFP-Tau	/	≥4	13	12 ± 2.7	$F_{(5,73)} = 2.370$ $p = 0.0475$	p = 0.9809	p = 0.9866	p = 0.1490
				APP.tg	EGFP-Tau	/	≥4	15	14 ± 2.0			p = 0.9054	p = 0.2932
			P7DIV20	n.tg	EGFP-Tau	/	≥4	11	14 ± 2.0		p = 0.9295		p = 0.5497
				APP.tg	EGFP-Tau	/	≥4	12	17 ± 2.0				p = 0.9168
			P14DIV20	n.tg	EGFP-Tau	/	≥4	15	19 ± 1.6		p = 0.9993		
				APP.tg	EGFP-Tau	/	≥4	13	20 ± 2.0				
	or.	MUSH.	P7DIV15	n.tg	EGFP-Tau	/	≥4	6	45 ± 3.0	$F_{(5,46)} = 4.559$ $p = 0.0018$	p = 0.9672	p = 0.8403	p > 0.9999
				APP.tg	EGFP-Tau	/	≥4	6	40 ± 2.0			p = 0.6767	p = 0.1371
			P7DIV20	n.tg	EGFP-Tau	/	≥4	8	38 ± 5.6		p = 0.8151		p = 0.8151
				APP.tg	EGFP-Tau	/	≥4	7	31 ± 3.7				p = 0.9316
			P14DIV20	n.tg	EGFP-Tau	/	≥4	14	44 ± 2.6		p = 0.0022		
				APP.tg	EGFP-Tau	/	≥4	11	26 ± 3.6				
		Stubby	P7DIV15	n.tg	EGFP-Tau	/	≥4	6	42 ± 2.5	$F_{(5,46)} = 4.477$ $p = 0.0021$	p = 0.9864	p > 0.9999	p = 0.6423
				APP.tg	EGFP-Tau	/	≥4	6	46 ± 2.6			p > 0.9999	p = 0.6794
			P7DIV20	n.tg	EGFP-Tau	/	≥4	8	43 ± 6.0		p = 0.9991		p = 0.4125
				APP.tg	EGFP-Tau	/	≥4	7	45 ± 3.7				p = 0.5097
			P14DIV20	n.tg	EGFP-Tau	/	≥4	14	34 ± 1.3		p = 0.0004		
				APP.tg	EGFP-Tau	/	≥4	11	54 ± 4.2				
		Thin	P7DIV15	n.tg	EGFP-Tau	/	≥4	6	12 ± 2.0	$F_{(5,46)} = 2.990$ $p = 0.0203$	p > 0.9999	p = 0.7203	p = 0.1985
				APP.tg	EGFP-Tau	/	≥4	6	11 ± 2.0			p = 0.0507	p = 0.8093
			P7DIV20	n.tg	EGFP-Tau	/	≥4	8	18 ± 2.0		p = 0.6832		p = 0.9541
				APP.tg	EGFP-Tau	/	≥4	7	24 ± 2.0				p = 0.3047
			P14DIV20	n.tg	EGFP-Tau	/	≥4	14	21 ± 2.6		p = 0.6181		
				APP.tg	EGFP-Tau	/	≥4	11	16 ± 3.0				
CA3	rad.	MUSH.	P7DIV15	n.tg	EGFP-Tau	/	≥4	15	50 ± 3.1	$F_{(5,94)} = 15.49$ $p < 0.0001$	p = 0.2231	p = 0.9043	p = 0.9959
				APP.tg	EGFP-Tau	/	≥4	11	40 ± 4.1			p = 0.1424	p = 0.0334
			P7DIV20	n.tg	EGFP-Tau	/	≥4	19	46 ± 1.8		p = 0.0001		p = 0.5948
				APP.tg	EGFP-Tau	/	≥4	25	30 ± 2.6				p = 0.9005
			P14DIV20	n.tg	EGFP-Tau	/	≥4	17	52 ± 2.1		p < 0.0001		
				APP.tg	EGFP-Tau	/	≥4	13	26 ± 3.1				
		Stubby	P7DIV15	n.tg	EGFP-Tau	/	≥4	15	38 ± 3.5	$F_{(5,94)} = 10.77$ $p < 0.0001$	p = 0.2459	p = 0.9826	p = 0.9844
				APP.tg	EGFP-Tau	/	≥4	11	49 ± 4.8			p = 0.7740	p = 0.1928
			P7DIV20	n.tg	EGFP-Tau	/	≥4	19	41 ± 3.5		p = 0.0055		p = 0.7092
				APP.tg	EGFP-Tau	/	≥4	25	55 ± 2.4				p = 0.7297
			P14DIV20	n.tg	EGFP-Tau	/	≥4	17	35 ± 1.5		p < 0.0001		
				APP.tg	EGFP-Tau	/	≥4	13	61 ± 3.1				
		Thin	P7DIV15	n.tg	EGFP-Tau	/	≥4	15	14 ± 1.6	$F_{(5,94)} = 0.9665$ $p = 0.4425$	p = 0.9167	p = 0.9989	p = 0.9990
				APP.tg	EGFP-Tau	/	≥4	11	11 ± 2.0			p = 0.6882	p = 0.9995
			P7DIV20	n.tg	EGFP-Tau	/	≥4	19	13 ± 1.3		p = 0.9528		p > 0.9999
				APP.tg	EGFP-Tau	/	≥4	25	15 ± 2.0				p = 0.3875
			P14DIV20	n.tg	EGFP-Tau	/	≥4	17	13 ± 1.7		p = 0.8891		
				APP.tg	EGFP-Tau	/	≥4	13	10 ± 2.0				
	or.	MUSH.	P7DIV15	n.tg	EGFP-Tau	/	≥4	6	49 ± 4.0	$F_{(5,57)} = 12.58$ $p < 0.0001$	p = 0.8164	p = 0.6727	p = 0.9932
				APP.tg	EGFP-Tau	/	≥4	6	41 ± 4.7			p = 0.9659	p = 0.0219
			P7DIV20	n.tg	EGFP-Tau	/	≥4	8	40 ± 2.4		p = 0.9823		p = 0.1488
				APP.tg	EGFP-Tau	/	≥4	7	36 ± 3.0				p = 0.1598
			P14DIV20	n.tg	EGFP-Tau	/	≥4	16	52 ± 2.2		p < 0.0001		
				APP.tg	EGFP-Tau	/	≥4	20	24 ± 3.3				
		Stubby	P7DIV15	n.tg	EGFP-Tau	/	≥4	6	42 ± 3.3	$F_{(5,57)} = 7.448$	p = 0.9986	p = 0.9997	p = 0.7951
				APP.tg	EGFP-Tau	/	≥4	6	45 ± 3.0			p = 0.9937	p = 0.1516
			P7DIV20	n.tg	EGFP-Tau	/	≥4	8	44 ± 2.9		p = 0.9761		p = 0.4944

Continuation of table (top, partial):

Brain region	Stratum	Spine type	Culture condition	Genotype	Construct	Treatment	Mice (n)	Dendritic segments (n)	Mean ± s.e.m	One way ANOVA	Post hoc (I) p values	Post hoc (I)	
	or.	Stubby	P7DIV20	APP.tg	EGFP-Tau	/	≥4	7	49 ± 2.7	**p < 0.0001**	p = 0.9781		p = 0.4027
			P14DIV20	n.tg	EGFP-Tau	/	≥4	16	34 ± 2.0		**p < 0.0001**		
				APP.tg	EGFP-Tau	/	≥4	20	60 ± 4.4				
		Thin	P7DIV15	n.tg	EGFP-Tau	/	≥4	6	10 ± 2.0	$F_{(5,57)} = 0.5680$ p = 0.7241	p = 0.9753	p = 0.9175	p = 0.7573
				APP.tg	EGFP-Tau	/	≥4	6	14 ± 2.1			p > 0.9999	p = 0.9820
			P7DIV20	n.tg	EGFP-Tau	/	≥4	8	15 ± 1.3		p > 0.9999		p = 0.9999
				APP.tg	EGFP-Tau	/	≥4	7	15 ± 2.2				p = 0.9964
			P14DIV20	n.tg	EGFP-Tau	/	≥4	16	16 ± 2.0		p = 0.9995		
				APP.tg	EGFP-Tau	/	≥4	20	17 ± 3.0				

Second table:

Brain region	Stratum	Spine type	Culture condition	Genotype	Construct	Treatment	Mice (n)	Dendritic segments (n)	Mean ± s.e.m	One way ANOVA (Untreated both genotypes together with DAPT treated both genotypes)	Post hoc (I) p values (n.tg versus APP.tg)	Post hoc (I) p values (versus DAPT treated, same genotype)
CA1	rad. + or.	Mush.	P7DIV20	n.tg	EGFP-Tau	/	≥4	10	43 ± 3	**$F_{(3,49)} = 8.255$ p = 0.0002**	p = 0.2520	p = 0.2807
				APP.tg	EGFP-Tau	/	≥4	12	32 ± 3			p = 0.0002
			P7DIV20	n.tg	EGFP-Tau	DAPT	≥4	16	53 ± 4		p = 0.9287	
				APP.tg	EGFP-Tau	DAPT	≥4	15	56 ± 4			
		Stubby	P7DIV20	n.tg	EGFP-Tau	/	≥4	10	40 ± 4	$F_{(3,49)} = 2.600$ p = 0.0627	p = 0.5316	p = 0.8042
				APP.tg	EGFP-Tau	/	≥4	12	48 ± 4			p = 0.0830
			P7DIV20	n.tg	EGFP-Tau	DAPT	≥4	16	35 ± 4		p > 0.9999	
				APP.tg	EGFP-Tau	DAPT	≥4	15	35 ± 3			
		Thin	P7DIV20	n.tg	EGFP-Tau	/	≥4	10	16 ± 3	$F_{(3,49)} = 1.838$ p = 0.1526	p = 0.9512	p = 0.7837
				APP.tg	EGFP-Tau	/	≥4	12	19 ± 2			p = 0.1514
			P7DIV20	n.tg	EGFP-Tau	DAPT	≥4	16	11 ± 4		p = 0.9211	
				APP.tg	EGFP-Tau	DAPT	≥4	15	8 ± 4			
CA3	rad. + or.	Mush.	P7DIV20	n.tg	EGFP-Tau	/	≥4	33	44 ± 2	**$F_{(3,101)} = 5.603$ p = 0.0014**	p = 0.0366	p = 0.8155
				APP.tg	EGFP-Tau	/	≥4	40	32 ± 4			p = 0.0081
			P7DIV20	n.tg	EGFP-Tau	DAPT	≥4	16	49 ± 4		p = 0.9988	
				APP.tg	EGFP-Tau	DAPT	≥4	16	50 ± 3			
		Stubby	P7DIV20	n.tg	EGFP-Tau	/	≥4	33	43 ± 3	**$F_{(3,101)} = 6.965$ p = 0.0003**	p = 0.0235	p = 0.6790
				APP.tg	EGFP-Tau	/	≥4	40	53 ± 2			p = 0.0021
			P7DIV20	n.tg	EGFP-Tau	DAPT	≥4	16	38 ± 4		p = 0.9974	
				APP.tg	EGFP-Tau	DAPT	≥4	16	37 ± 3			
		Thin	P7DIV20	n.tg	EGFP-Tau	/	≥4	33	13 ± 2	$F_{(3,101)} = 0.3395$ p = 0.7968	p = 0.8835	p > 0.9999
				APP.tg	EGFP-Tau	/	≥4	40	15 ± 2			p = 0.8180
			P7DIV20	n.tg	EGFP-Tau	DAPT	≥4	16	13 ± 3		p = 0.9949	
				APP.tg	EGFP-Tau	DAPT	≥4	16	12 ± 2			

Third table:

Brain region	Stratum	Spine type	Culture condition	Genotype	Construct	Treatment	Mice (n)	Dendritic segments (n)	Mean ± s.e.m	One way ANOVA (EGFP-Tau treated both genotypes together with EGFP treated both genotypes)	Post hoc (I) p values (n.tg versus APP.tg)	Post hoc (I) p values (versus EGFP, same genotype)	One way ANOVA (EGFP-Tau treated both genotypes together both genotypes, same culture time from Fig 2C)	Post hoc (I) p values (versus EGFT-Tau untreated)
CA1	rad.	Mush.	P7DIV15	n.tg	EGFP-Tau	EpoD	5	31	38.02 ± 1.88	$F_{(3,83)} = 1.124$ p = 0.3442	p = 0.8412	p = 0.9767	**$F_{(3,73)} = 4.960$ p = 0.0035**	p = 0.0075
				APP.tg	EGFP-Tau	EpoD	5	18	35.68 ± 2.46			p = 0.8634		p = 0.5069
				n.tg	EGFP	EpoD	5	13	36.73 ± 2.21		p = 0.7342			
				APP.tg	EGFP	EpoD	6	25	33.38 ± 1.66					
		Stubby	P7DIV15	n.tg	EGFP-Tau	EpoD	5	31	36.76 ± 1.86	$F_{(3,83)} = 0.6276$ p = 0.5992	p = 0.9763	p = 0.9819	$F_{(3,73)} = 2.028$ p = 0.1174	p = 0.9859
				APP.tg	EGFP-Tau	EpoD	5	18	38.01 ± 2.08			p = 0.9465		p = 0.2669
				n.tg	EGFP	EpoD	5	13	35.50 ± 1.77		p = 0.6186			
				APP.tg	EGFP	EpoD	6	25	39.75 ± 2.48					
		Thin	P7DIV15	n.tg	EGFP-Tau	EpoD	5	31	25.22 ± 1.46	$F_{(3,83)} = 0.4465$ p = 0.7204	p = 0.9583	p = 0.7191	**$F_{(3,73)} = 14.060$ p < 0.0001**	p < 0.0001
				APP.tg	EGFP-Tau	EpoD	5	18	26.32 ± 1.78			p = 0.9951		p = 0.0003
				n.tg	EGFP	EpoD	5	13	27.79 ± 1.64		p = 0.9834			
				APP.tg	EGFP	EpoD	6	25	26.87 ± 1.39					
CA3	rad.	Mush.	P7DIV15	n.tg	EGFP-Tau	EpoD	5	18	37.33 ± 2.51	**$F_{(3,79)} = 3.845$ p = 0.0127**	p = 0.9605	p = 0.0180	**$F_{(3,61)} = 4.160$ p = 0.0095**	p = 0.0333
				APP.tg	EGFP-Tau	EpoD	5	21	35.34 ± 3.23			p = 0.4885		p = 0.7675
				n.tg	EGFP	EpoD	5	22	25.30 ± 1.96		p = 0.6234			
				APP.tg	EGFP	EpoD	5	22	29.88 ± 3.08					
		Stubby	P7DIV15	n.tg	EGFP-Tau	EpoD	5	18	36.66 ± 2.68	**$F_{(3,79)} = 3.992$ p = 0.0106**	p = 0.2036	p = 0.0056	$F_{(3,61)} = 2.536$ p = 0.0650	p = 0.9927
				APP.tg	EGFP-Tau	EpoD	5	21	45.02 ± 3.29			p = 0.9417		p = 0.8691
				n.tg	EGFP	EpoD	5	22	50.88 ± 2.51		p = 0.1777			
				APP.tg	EGFP	EpoD	5	22	42.75 ± 2.92					
		Thin	P7DIV15	n.tg	EGFP-Tau	EpoD	5	18	26.01 ± 1.69	**$F_{(3,79)} = 3.630$ p = 0.0164**	p = 0.0780	p = 0.8315	**$F_{(3,61)} = 13.490$ p < 0.0001**	p < 0.0001
				APP.tg	EGFP-Tau	EpoD	5	21	19.64 ± 1.63			p = 0.0133		p = 0.0078
				n.tg	EGFP	EpoD	5	22	23.82 ± 1.86		p = 0.4735			

| | | | | APP.tg | EGFP | EpoD | 5 | 22 | 27.37 ± 1.88 | | | |

Brain region	Stratum	Spine type	Culture condition	Genotype	Construct	Treatment	Mice (n)	Dendritic segments (n)	Mean ± s.e.m	One way ANOVA (EGFP-Tau treated both genotypes together with untreated P7DIV20 both genotypes from Fig.3E)	Post hoc (I) p values (n.tg versus APP.tg)	Post hoc (I) p values (versus untreated P7DIV20, same genotype)
CA1	**rad. + or.**	Mush.	P7DIV20	n.tg	EGFP-Tau	Nocodazole	3	25	49.60 ± 2.38	**F (3,89) = 7.824 p = 0.0001**	p = 0.0329	p = 0.0922
				APP.tg	EGFP-Tau	Nocodazole	4	46	44.02 ± 1.42			p = 0.0006
		Stubby	P7DIV20	n.tg	EGFP-Tau	Nocodazole	3	25	39.32 ± 2.69	F (3,89) = 1.536 p = 0.2108	p = 0.4133	p = 0.8784
				APP.tg	EGFP-Tau	Nocodazole	4	46	41.74 ± 1.49			p = 0.1067
		Thin	P7DIV20	n.tg	EGFP-Tau	Nocodazole	3	25	11.20 ± 0.95	**F (3,89) = 3.484 p = 0.0191**	p = 0.0863	p = 0.0761
				APP.tg	EGFP-Tau	Nocodazole	4	46	14.28 ± 1.40			p = 0.0446

Brain region	Stratum	Spine type	Culture condition	Genotype	Construct	Treatment	Mice (n)	Dendritic segments (n)	Mean ± s.e.m	One way ANOVA (EpoD treated both genotypes together with untreated P7DIV20 both genotypes from Fig.2C)	Post hoc (I) p values (n.tg versus APP.tg)	Post hoc (I) p values (versus untreated P7DIV20, same genotype)
CA1	**rad.**	Mush.	P7DIV20	n.tg	EGFP-Tau	EpoD	7	16	33.15 ± 2.86	**F (3,54) = 3.032 p = 0.0370**	p = 0.9792	p = 0.0468
				APP.tg	EGFP-Tau	EpoD	7	19	34.91 ± 2.35			p = 0.9793
		Stubby	P7DIV20	n.tg	EGFP-Tau	EpoD	7	16	40.01 ± 2.36	**F (3,54) = 3.036 p = 0.0368**	p = 0.9853	p = 0.9955
				APP.tg	EGFP-Tau	EpoD	7	19	38.70 ± 1.57			p = 0.0379
		Thin	P7DIV20	n.tg	EGFP-Tau	EpoD	7	16	26.84 ± 2.29	**F (3,54) = 9.302 p < 0.0001**	p = 0.9984	p = 0.0007
				APP.tg	EGFP-Tau	EpoD	7	19	26.40 ± 1.82			p = 0.0112
	or.	Mush.	P7DIV20	n.tg	EGFP-Tau	EpoD	7	14	30.89 ± 2.62	F (3,42) = 0.7877 p = 0.5076	p = 0.9790	p = 0.4798
				APP.tg	EGFP-Tau	EpoD	7	17	32.47 ± 2.43			p = 0.9910
		Stubby	P7DIV20	n.tg	EGFP-Tau	EpoD	7	14	44.20 ± 2.99	F (3,42) = 0.2330 p = 0.8728	p = 0.9043	p = 0.9954
				APP.tg	EGFP-Tau	EpoD	7	17	41.37 ± 2.24			p = 0.8963
		Thin	P7DIV20	n.tg	EGFP-Tau	EpoD	7	14	24.91 ± 1.73	**F (3,42) = 3.460 p = 0.0246**	p = 0.9395	p = 0.0622
				APP.tg	EGFP-Tau	EpoD	7	17	26.16 ± 1.48			p = 0.8558
CA3	**rad.**	Mush.	P7DIV20	n.tg	EGFP-Tau	EpoD	6	20	31.34 ± 1.51	**F (3,81) = 11.17 p < 0.0001**	p = 0.9889	p = 0.0002
				APP.tg	EGFP-Tau	EpoD	5	21	30.32 ± 2.48			p = 0.9996
		Stubby	P7DIV20	n.tg	EGFP-Tau	EpoD	6	20	48.28 ± 1.98	**F (3,81) = 6.514 p = 0.0005**	p = 0.4080	p = 0.2275
				APP.tg	EGFP-Tau	EpoD	5	21	42.52 ± 2.29			p = 0.0034
		Thin	P7DIV20	n.tg	EGFP-Tau	EpoD	6	20	20.38 ± 1.51	**F (3,81) = 13.33 p < 0.0001**	p = 0.0375	p = 0.0242
				APP.tg	EGFP-Tau	EpoD	5	21	27.17 ± 1.73			p < 0.0001
	or.	Mush.	P7DIV20	n.tg	EGFP-Tau	EpoD	6	10	25.14 ± 2.09	**F (3,32) = 11.18 p < 0.0001**	p = 0.7787	p = 0.0016
				APP.tg	EGFP-Tau	EpoD	5	11	21.94 ± 2.72			p = 0.0035
		Stubby	P7DIV20	n.tg	EGFP-Tau	EpoD	6	10	52.46 ± 3.36	F (3,32) = 1.380 p = 0.2665	p = 0.9995	p = 0.2827
				APP.tg	EGFP-Tau	EpoD	5	11	52.00 ± 3.41			p = 0.9205
		Thin	P7DIV20	n.tg	EGFP-Tau	EpoD	6	10	22.40 ± 2.59	**F (3,32) = 6.929 p = 0.0010**	p = 0.5538	p = 0.0844
				APP.tg	EGFP-Tau	EpoD	5	11	26.06 ± 1.85			p = 0.0053

(I) Tukey's multiple comparisons test

rad. stratum radiatum (APICAL DENDRITES)
or. stratum oriens (BASAL DENDRITES)