

Supplementary information: Comparing basal dendrite branches in human and mouse hippocampal CA1 pyramidal neurons with Bayesian networks

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ABSTRACT

1 Morphometrics' conditional distributions

Branch type	Species	Tortuosity	Diameter	Distance	Length	RBA	RTA	Taper
non-terminal	human	0.00	0.00	0.00	0.00	0.16	0.03	0.00
non-terminal	mouse	0.00	0.00	0.00	0.00	0.53	0.08	0.00
terminal	human	0.00	0.08	0.00	0.04			0.00
terminal	mouse	0.00	0.32	0.03	0.92			0.00

Table 1. p-values for the Kolmogorov-Smirnov test of normality. Columns 1-2 indicate the groups and columns 3-9 show the p-values. RBA = remote bifurcation angle. RTA = remote tilt angle. Missing entries indicate that there were no observations for a given group.

Branch type	Species	BO	Tortuosity	Diameter	Distance	Length	RBA	RTA	Taper
non-terminal	human	1	0.00	0.00	0.96	0.00	0.25	0.35	0.02
non-terminal	human	2	0.00	0.01	0.06	0.00	0.30	0.15	0.10
non-terminal	human	3	0.00	0.07	0.26	0.00	0.31	0.51	0.08
non-terminal	human	4	0.00	0.25	0.57	0.00	0.33	0.14	0.11
non-terminal	human	5	0.51	0.29	0.88	0.16	0.60	0.76	0.33
non-terminal	mouse	1	0.20	0.12	0.90	0.01	0.77	0.77	0.01
non-terminal	mouse	2	0.48	0.02	0.09	0.00	0.60	0.29	0.21
non-terminal	mouse	3	0.05	0.19	0.01	0.00	0.59	0.82	0.36
non-terminal	mouse	4	0.04	0.14	0.36	0.04	0.94	0.75	0.71
non-terminal	mouse	5	0.29	0.13	0.45	0.40	0.66	0.99	0.71
terminal	human	2	0.08	0.36	0.25	0.56			0.01
terminal	human	3	0.00	0.28	0.00	0.31			0.00
terminal	human	4	0.00	0.30	0.00	0.40			0.00
terminal	human	5	0.00	0.83	0.00	0.58			0.17
terminal	mouse	2	0.09	0.76	0.52	0.42			0.18
terminal	mouse	3	0.71	0.20	0.08	0.85			0.01
terminal	mouse	4	0.11	0.64	0.14	0.86			0.01
terminal	mouse	5	0.04	0.36	0.79	0.95			0.09

Table 2. p-values for the Kolmogorov-Smirnov test of normality. Columns 1-3 indicate the groups and columns 4-10 show the p-values. RBA = remote bifurcation angle. RTA = remote tilt angle. Missing entries indicate that there were no observations for a given group.

2 Non-terminal branches: correlations

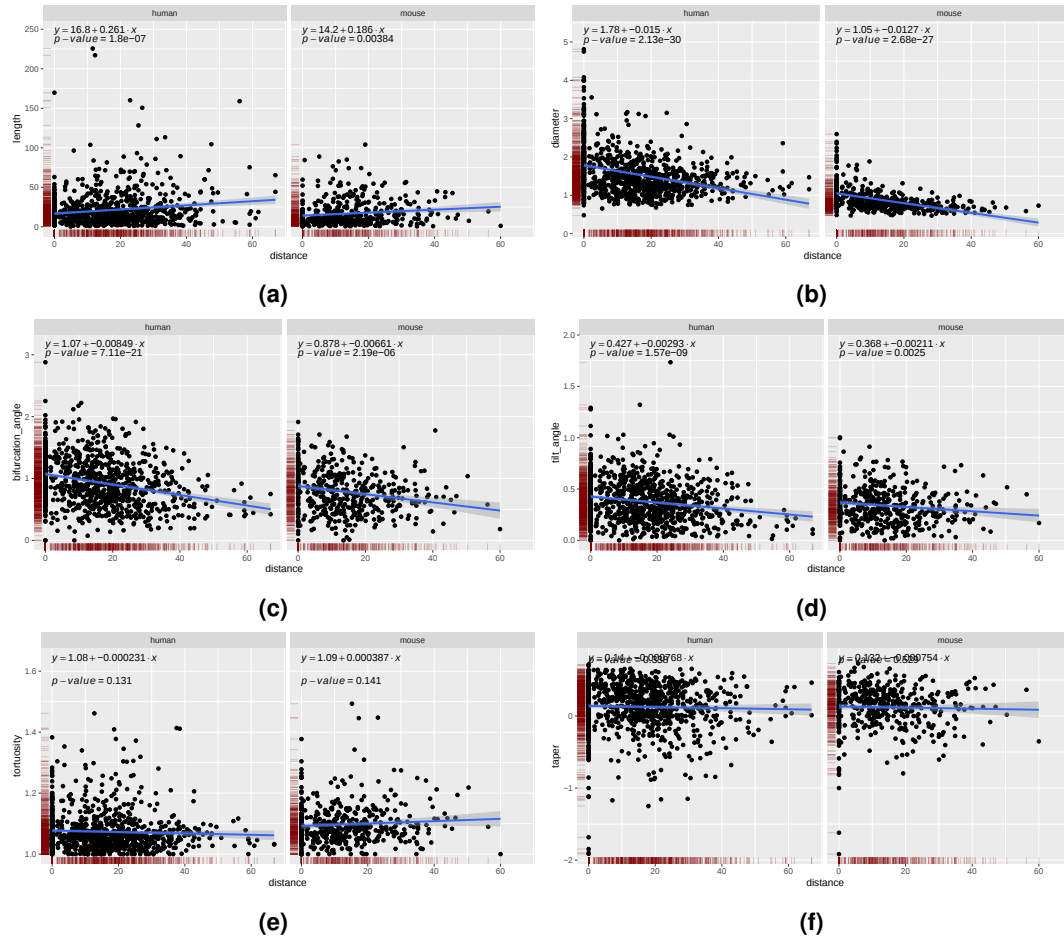


Figure 1. Non-terminal branches. Linear correlation of distance and length, diameter, bifurcation_angle, tilt_angle, tortuosity and taper. The sign of the correlation coefficient was the same for both species in all cases, with the regression lines roughly parallel.

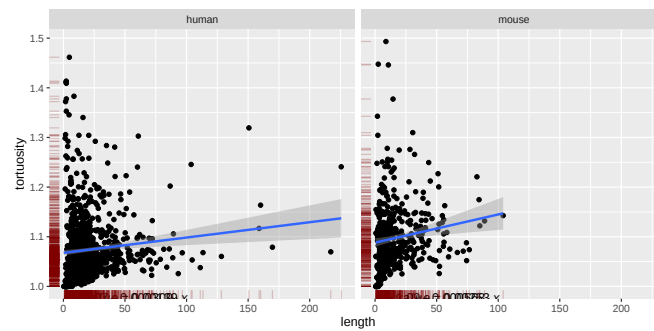


Figure 2. Non-terminal branches. tortuosity as a function of length.

3 Complete and incomplete branches

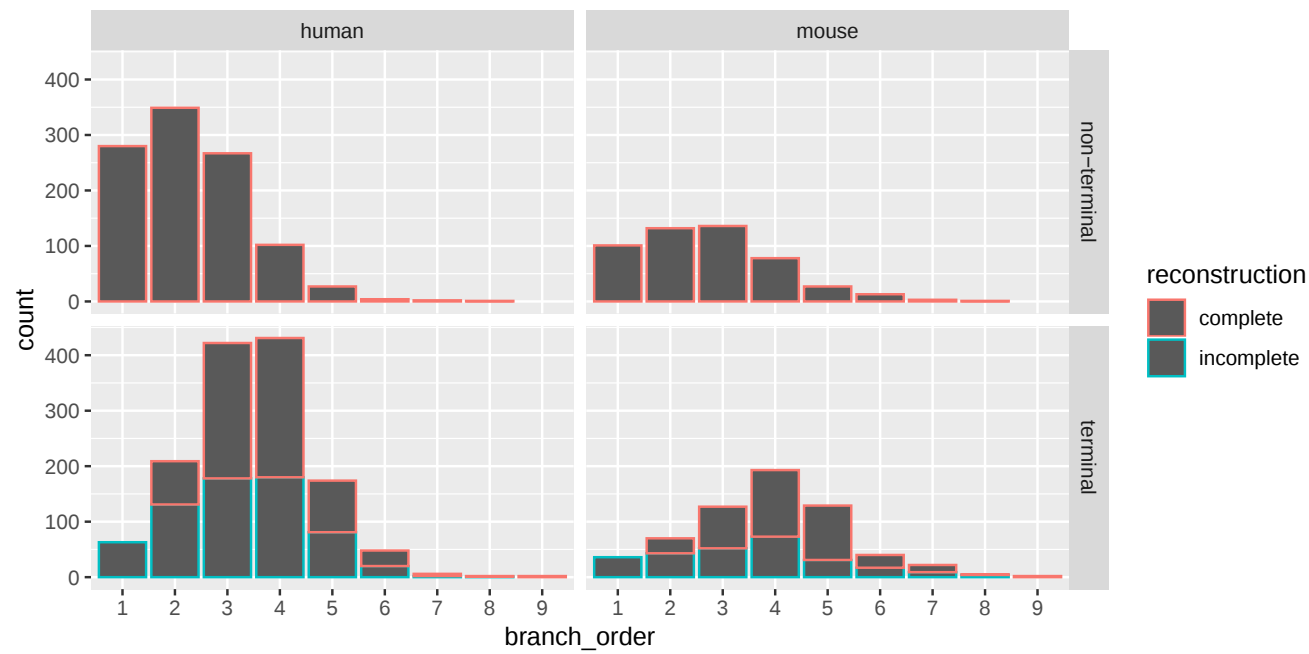
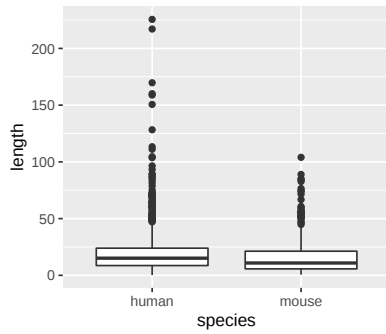
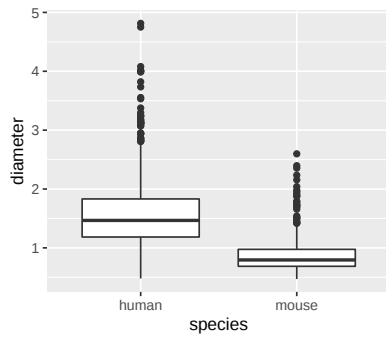


Figure 3. Complete and incomplete branch frequencies per species, branch type, and branching order.

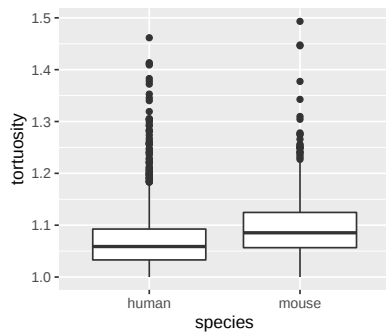
4 Non-terminal branches: inter-species differences when conditioning on branch order



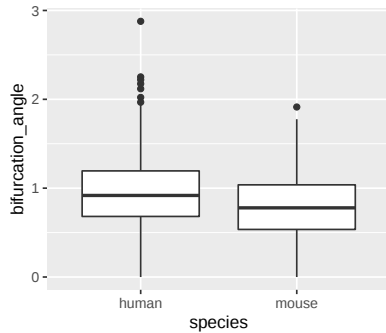
(a)



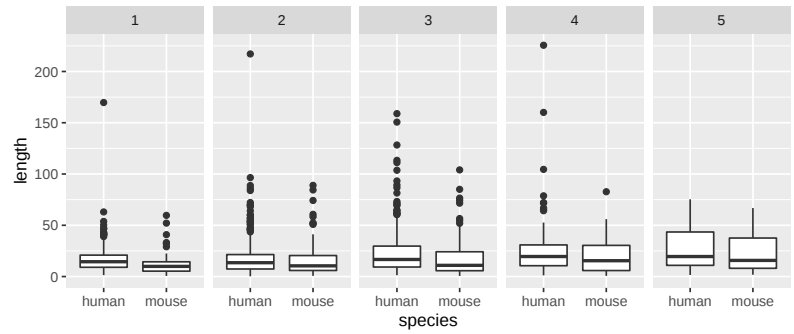
(c)



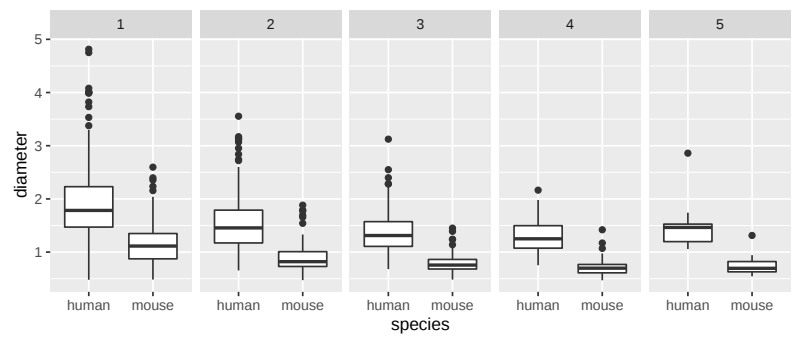
(e)



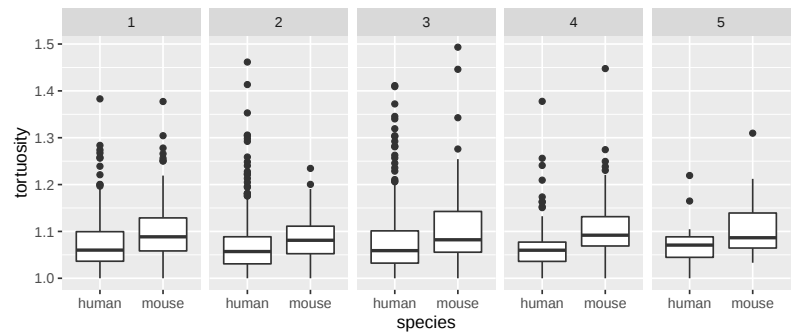
(g)



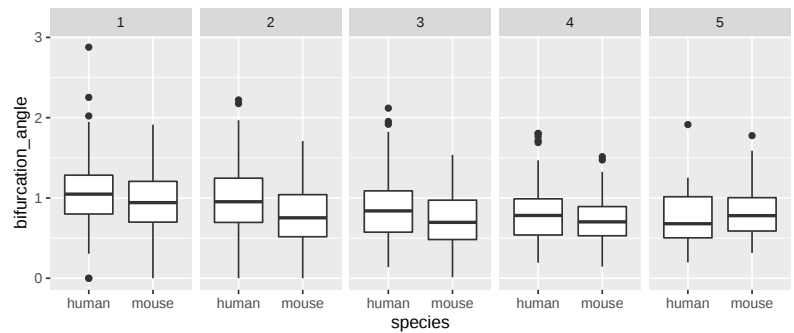
(b)



(d)



(f)



(h)

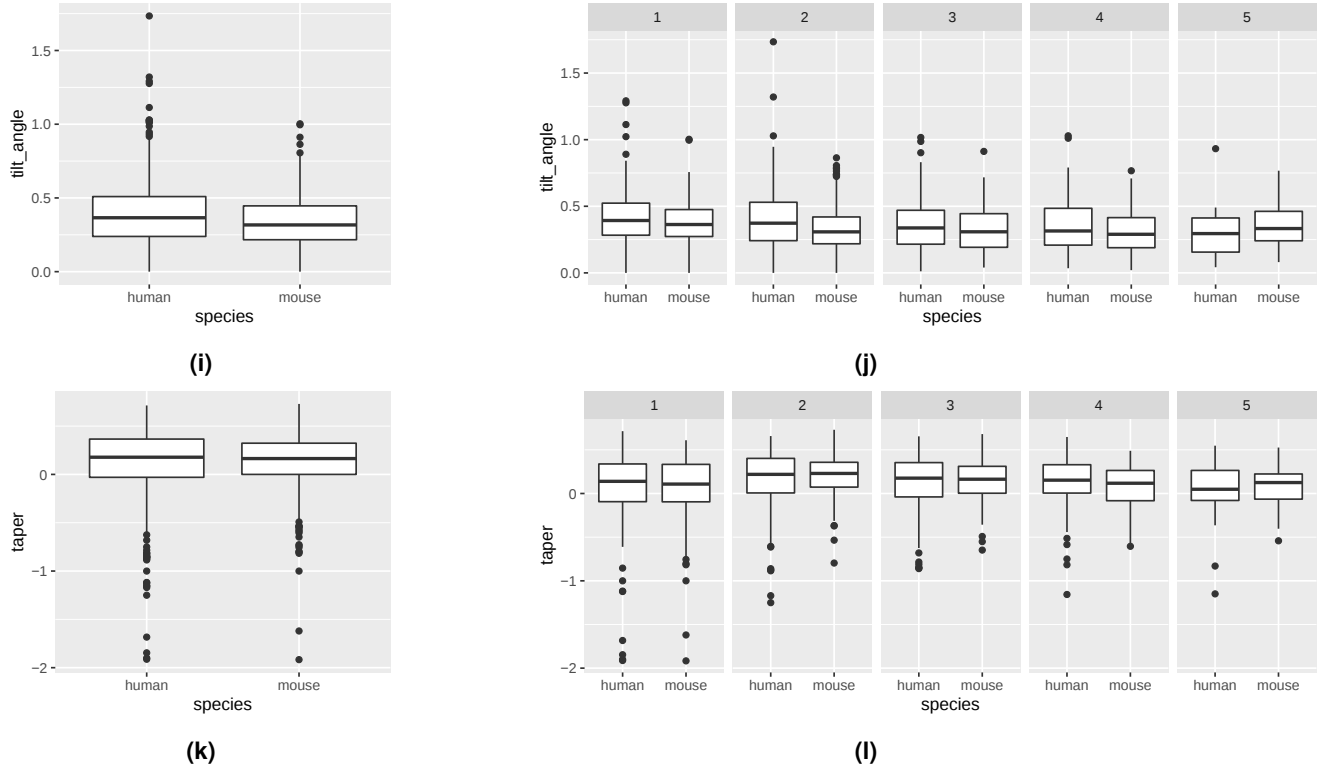


Figure 4. Differences in magnitude of variables of non-terminal branches between the species. (a)-(b) length: Marginal KW p-value $1.793\text{e-}07$. KW p-values $6.71\text{e-}07$, 0.08872 , 0.0004447 , 0.05116 , and 0.4398 for branch orders 1 to 5, respectively; (c)-(d) diameter: Marginal KW p-value $6.408687\text{e-}136$. KW p-values below $2.94\text{e-}09$ for every branch order; (e)-(f) tortuosity: Marginal KW p-value 0.004082 . KW p-values $2.27\text{e-}06$, $1.562\text{e-}05$, $8.54\text{e-}07$, 0.05703 for branch orders 1 to 5, respectively; (g)-(h) bifurcation_angle: Marginal KW p-value $6.841\text{e-}13$. KW p-values 0.02463 , $1.653\text{e-}06$, 0.0004749 , 0.142 , and 0.5848 for branch orders 1 to 5, respectively; (i)-(j) tilt_angle: Marginal KW p-value 0.000121 . KW p-values 0.1185 , 0.003194 , 0.3144 , 0.1535 , and 0.3001 for branch orders 1 to 5, respectively; (k)-(l) taper Marginal KW p-value 0.296145 . KW p-values 0.597 , 0.8745 , 0.8758 , 0.1096 , and 0.5848 for branch orders 1 to 5, respectively.

5 Terminal branches: Hillman's taper rate

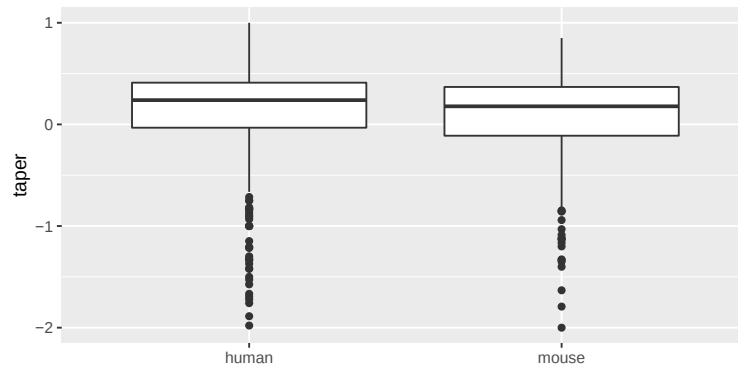


Figure 5. Differences in magnitude of `taper` for terminal branches between the species. KW p-value 0.026.

6 All branches: Hillman's taper rate

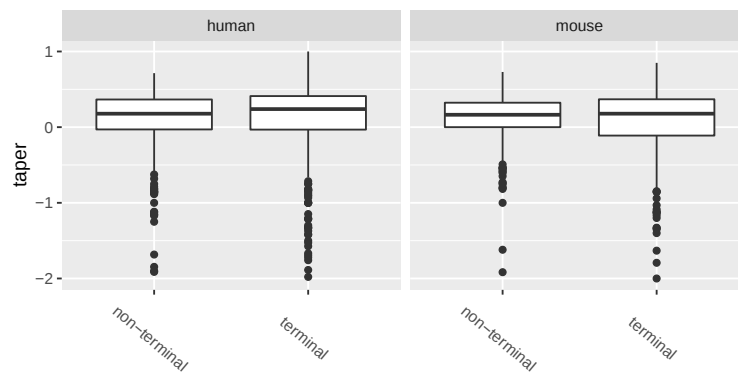


Figure 6. Differences in the magnitude of `taper` between terminal and non-terminal branches across species. KW p-values 0.018 and 0.810 for the human and mouse, respectively.