

Experimental Condition	Animal	Spine/Bouton/Puncta	Branch	Branch Length (µm)	Density (/ 100µm)	Experimental Condition	Animal	Spine/Bouton/Puncta	Branch	Branch Length (µm)	Density (/ 100µm)	
Apical Dendrites – Forelimb (spine)	1	70	6	147.89	47.33	SOM-Cre;Thy1-EGFP, Flex-ChR2, training with stimulation (spine)	1	28	4	146.24	19.15	
	2	42	4	83.34	50.40		2	67	10	298.31	22.46	
	3	37	3	76.01	48.68		3	61	10	190.45	32.03	
	4	43	3	101.73	42.27		4	74	9	278.84	26.54	
	5	59	5	117.48	50.22		5	25	5	124.89	20.02	
<b>Total</b>	<b>251</b>	<b>21</b>	<b>526.44</b>	<b>47.68</b>	<b>Total</b>	<b>255</b>	<b>38</b>	<b>1038.73</b>	<b>24.55</b>			
Basal Dendrites – Forelimb (spine)	1	21	3	43.61	48.16	SOM-Cre;Thy1-EGFP, Flex-ChR2, no training with stimulation (spine)	1	32	4	112.40	28.47	
	2	58	4	114.92	50.47		2	45	4	135.70	33.16	
	3	61	4	126.01	48.41		3	29	5	128.71	22.53	
	4	21	3	42.29	49.66		4	31	5	150.95	20.54	
	5	45	4	69.87	64.40		5	43	5	146.16	29.42	
<b>Total</b>	<b>206</b>	<b>18</b>	<b>396.70</b>	<b>51.93</b>	<b>Total</b>	<b>180</b>	<b>23</b>	<b>673.93</b>	<b>26.71</b>			
PV boutons – Forelimb	1	68	4	321.24	36.59	SOM-Cre;Thy1-EGFP, Flex-ChR2, training with no stimulation (spine)	1	57	6	232.29	24.54	
	2	56	4	239.34	38.35		2	89	8	293.46	30.33	
	3	111	9	247.62	37.07		3	35	3	143.78	24.34	
	4	57	6	275.91	34.39		4	72	7	278.03	25.90	
	5	104	8	332.71	31.92		5	63	7	157.61	39.97	
<b>Total</b>	<b>433</b>	<b>39</b>	<b>1416.82</b>	<b>30.56</b>	<b>Total</b>	<b>316</b>	<b>31</b>	<b>1105.18</b>	<b>28.59</b>			
SOM boutons - Forelimb	1	108	10	185.84	33.62	SOM-Cre;Thy1-EGFP, Flex-eNpHR, training with stimulation (spine)	1	61	7	190.20	32.07	
	2	94	7	146.01	39.27		2	82	7	320.30	25.60	
	3	72	7	299.44	29.08		3	68	13	186.60	36.44	
	4	84	8	165.75	30.44		4	53	9	178.50	29.69	
	5	75	7	325.83	22.54		5	64	8	387.61	16.51	
<b>Total</b>	<b>396</b>	<b>31</b>	<b>1122.86</b>	<b>35.27</b>	<b>Total</b>	<b>397</b>	<b>52</b>	<b>1595.94</b>	<b>24.88</b>			
Som-Cre;Thy1-EGFP, baseline (spine)	1	31	4	129.37	23.96	SOM-Cre;Thy1-EGFP, Flex-eNpHR, no training with stimulation (spine)	1	32	4	139.56	22.93	
	2	41	4	239.07	17.15		2	37	6	141.59	26.13	
	3	48	4	197.19	24.34		3	51	4	184.64	27.62	
	4	38	5	168.12	22.60		4	72	5	233.46	30.84	
	5	33	5	212.09	15.56		<b>Total</b>	<b>192</b>	<b>19</b>	<b>699.25</b>	<b>27.46</b>	
<b>Total</b>	<b>191</b>	<b>22</b>	<b>945.84</b>	<b>20.19</b>	<b>Total</b>	<b>316</b>	<b>31</b>	<b>1105.18</b>	<b>28.59</b>			
SOM-Cre;Thy1-EGFP, Flex-TdTomato, training with stimulation (spine)	1	37	4	125.26	27.14	PV-Cre;Thy1-EGFP, Flex-ChR2, training with stimulation (spine)	1	40	3	185.23	21.59	
	2	41	4	123.09	28.43		2	28	3	79.88	35.05	
	3	55	8	266.96	20.60		3	44	7	159.74	27.54	
	4	39	6	158.03	24.68		4	58	7	186.14	31.16	
	5	50	8	222.20	22.50		5	28	3	112.66	24.85	
	6	22	3	98.31	22.38	<b>Total</b>	<b>198</b>	<b>23</b>	<b>723.66</b>	<b>27.36</b>		
	7	53	8	164.85	32.15	PV-Cre;Thy1-EGFP, Flex-ChR2, no training with stimulation (spine)	1	65	6	249.27	26.08	
	8	72	4	263.90	27.28		2	73	7	287.50	25.39	
	9	86	9	205.33	41.88		3	52	7	164.22	31.66	
	10	67	8	359.21	18.65		4	57	6	140.95	40.44	
	11	68	9	183.08	37.14		5	30	5	141.80	21.16	
	12	75	11	209.88	35.73	<b>Total</b>	<b>277</b>	<b>31</b>	<b>983.73</b>	<b>28.16</b>		
<b>Total</b>	<b>665</b>	<b>82</b>	<b>2380.08</b>	<b>27.94</b>	<b>Total</b>	<b>316</b>	<b>31</b>	<b>1105.18</b>	<b>28.59</b>			
Distal Spine - Forelimb Baseline	1	65	7	245.66	26.46	Gephyrin puncta – Baseline		1	42	10	240.64	17.45
	2	47	5	115.87	40.56	2	33	6	206.14	16.01		
	3	52	6	133.15	39.05	3	63	8	324.88	19.39		
	4	21	1	63.46	33.09	Gephyrin puncta - Training		1	54	9	458.30	11.78
	5	19	2	86.48	21.97	2	95	11	458.91	20.70		
	6	33	2	89.93	36.69	3	80	10	408.90	19.56		
	7	20	3	104.50	19.13	4	110	14	771.74	14.25		
<b>Total</b>	<b>257</b>	<b>26</b>	<b>839.05</b>	<b>30.99</b>	<b>Total</b>	<b>339</b>	<b>44</b>	<b>2097.85</b>	<b>16.16</b>			
Perisomatic Spine - Forelimb Baseline	1	34	4	129.41	26.27	<b>Total Animals</b>		<b>107</b>				
	2	21	3	108.11	19.42	<b>Total Spine/Bouton/Puncta Scored</b>		<b>6082</b>				
	3	36	5	108.17	33.28	<b>Total Branch Covered (mm)</b>		<b>23.82</b>				
	4	22	2	107.03	20.55							
<b>Total</b>	<b>113</b>	<b>14</b>	<b>452.72</b>	<b>24.88</b>								
SOM boutons - Forelimb Baseline	1	83	9	345.39	24.03							
	2	61	9	232.06	26.29							
	3	63	6	154.30	40.83							
	4	86	4	251.85	34.15							
	5	81	4	240.09	33.74							
	6	90	6	392.30	22.94							
<b>Total</b>	<b>464</b>	<b>38</b>	<b>1615.99</b>	<b>28.71</b>								
PV boutons - Forelimb Baseline	1	85	7	205.12	41.44							
	2	139	12	469.61	29.60							
	3	89	8	246.93	36.04							
	4	52	6	209.43	24.83							
	5	65	4	210.52	30.88							
	6	58	5	251.16	23.09							
<b>Total</b>	<b>488</b>	<b>42</b>	<b>1592.77</b>	<b>30.64</b>								
Apical Dendrites – Hindlimb (spine)	1	35	3	164.23	21.31							
	2	36	4	206.80	17.41							
	3	28	4	131.43	21.30							
	4	26	3	145.78	17.84							
	5	41	3	153.39	26.73							
<b>Total</b>	<b>166</b>	<b>17</b>	<b>801.62</b>	<b>20.71</b>								
SOM boutons – Hindlimb (spine)	1	56	3	210.53	26.60							
	2	85	6	221.94	38.30							
	3	68	4	233.16	29.16							
	4	64	6	207.29	30.87							
<b>Total</b>	<b>273</b>	<b>19</b>	<b>872.91</b>	<b>31.27</b>								

Supplementary Table 1

Summary of number of mice, spines/boutons/puncta, branch number, branch length, and density in all experimental conditions