

Volume electron microscopy of the distribution of synapses in the juvenile rat somatosensory cortex.

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Supplementary Table1

| Layer | Sample | Animal | No. of sections | Resolution (nm/pixel) | Total volume (μm^3) | CF volume (μm^3) | No. of AS | No. of SS | No. of all synapses | AS ($\text{syn}/\mu\text{m}^3$) | SS ($\text{syn}/\mu\text{m}^3$) | AS+SS ($\text{syn}/\mu\text{m}^3$) |
|--------|--------|--------|-----------------|-----------------------|----------------------------------|-------------------------------|-----------|-----------|---------------------|-----------------------------------|-----------------------------------|--------------------------------------|
| I | 1 | w33 | 267 | 3.69 | 312.93 | 210.62 | 161 | 19 | 180 | 0.7644 | 0.0902 | 0.8546 |
| | 2 | w35 | 301 | 3.72 | 358.54 | 177.20 | 111 | 17 | 128 | 0.6264 | 0.0959 | 0.7224 |
| | 3 | w31 | 202 | 3.72 | 240.61 | 167.38 | 136 | 19 | 155 | 0.8125 | 0.1135 | 0.9260 |
| II | 1 | w33 | 263 | 3.69 | 308.24 | 224.35 | 211 | 19 | 230 | 0.9405 | 0.0847 | 1.0252 |
| | 2 | w35 | 189 | 3.72 | 225.13 | 139.51 | 117 | 10 | 127 | 0.8387 | 0.0717 | 0.9103 |
| | 3 | w35 | 237 | 3.72 | 282.30 | 149.03 | 195 | 11 | 206 | 1.3085 | 0.0738 | 1.3823 |
| | 4 | w31 | 239 | 3.72 | 284.68 | 213.91 | 239 | 18 | 257 | 1.1173 | 0.0841 | 1.2014 |
| III | 1 | w31 | 223 | 3.69 | 261.36 | 149.13 | 135 | 12 | 147 | 0.9053 | 0.0805 | 0.9857 |
| | 2 | w31 | 210 | 3.69 | 246.12 | 157.15 | 101 | 8 | 109 | 0.6427 | 0.0509 | 0.6936 |
| | 3 | w33 | 214 | 3.69 | 250.81 | 186.45 | 158 | 15 | 173 | 0.8474 | 0.0805 | 0.9279 |
| | 4 | w33 | 213 | 3.69 | 249.64 | 176.44 | 157 | 21 | 178 | 0.8898 | 0.1190 | 1.0088 |
| | 5 | w33 | 324 | 3.69 | 379.73 | 176.28 | 148 | 19 | 167 | 0.8396 | 0.1078 | 0.9474 |
| | 6 | w33 | 219 | 3.69 | 256.67 | 175.55 | 156 | 9 | 165 | 0.8886 | 0.0513 | 0.9399 |
| | 7 | w33 | 219 | 3.69 | 256.67 | 191.28 | 171 | 18 | 189 | 0.8940 | 0.0941 | 0.9881 |
| | 8 | w35 | 363 | 3.72 | 432.39 | 247.58 | 186 | 12 | 198 | 0.7513 | 0.0485 | 0.7997 |
| | 9 | w35 | 247 | 3.72 | 294.21 | 178.40 | 191 | 10 | 201 | 1.0706 | 0.0561 | 1.1267 |
| | 10 | w35 | 258 | 3.72 | 307.32 | 165.06 | 152 | 16 | 168 | 0.9209 | 0.0969 | 1.0178 |
| IV | 1 | w33 | 235 | 3.69 | 275.42 | 154.59 | 148 | 24 | 172 | 0.9574 | 0.1552 | 1.1126 |
| | 2 | w35 | 211 | 3.72 | 251.33 | 158.38 | 190 | 15 | 205 | 1.1996 | 0.0947 | 1.2943 |
| | 3 | w35 | 224 | 3.72 | 266.82 | 183.65 | 151 | 17 | 168 | 0.8222 | 0.0926 | 0.9148 |
| | 4 | w35 | 253 | 3.72 | 301.36 | 140.63 | 143 | 35 | 178 | 1.0168 | 0.2489 | 1.2657 |
| | 5 | w35 | 263 | 3.72 | 313.27 | 123.81 | 144 | 18 | 162 | 1.1631 | 0.1454 | 1.3084 |
| V | 1 | w33 | 319 | 3.69 | 373.87 | 165.62 | 108 | 9 | 117 | 0.6521 | 0.0543 | 0.7064 |
| | 2 | w33 | 282 | 3.69 | 330.51 | 218.01 | 181 | 17 | 198 | 0.8302 | 0.0780 | 0.9082 |
| | 3 | w33 | 310 | 3.69 | 363.32 | 207.95 | 162 | 13 | 175 | 0.7790 | 0.0625 | 0.8416 |
| VI | 1 | w33 | 253 | 3.69 | 296.52 | 185.32 | 84 | 8 | 92 | 0.4533 | 0.0432 | 0.4964 |
| | 2 | w35 | 285 | 3.72 | 339.48 | 183.55 | 70 | 15 | 85 | 0.3814 | 0.0817 | 0.4631 |
| | 3 | w31 | 270 | 3.72 | 321.61 | 179.97 | 88 | 14 | 102 | 0.4890 | 0.0778 | 0.5668 |
| | 4 | w31 | 292 | 4.50 | 508.96 | 280.09 | 92 | 15 | 107 | 0.3285 | 0.0536 | 0.3820 |
| Totals | | | Layer I | | 912.07 | 555.19 | 408 | 55 | 463 | 0.7349 | 0.0991 | 0.8339 |
| | | | Layer II | | 1100.35 | 726.80 | 762 | 58 | 820 | 1.0484 | 0.0798 | 1.1282 |
| | | | Layer III | | 2934.92 | 1803.32 | 1555 | 140 | 1695 | 0.8623 | 0.0776 | 0.9399 |
| | | | Layer IV | | 1408.20 | 761.07 | 776 | 109 | 885 | 1.0196 | 0.1432 | 1.1628 |
| | | | Layer V | | 1067.70 | 591.58 | 451 | 39 | 490 | 0.7624 | 0.0659 | 0.8283 |
| | | | Layer VI | | 1466.57 | 828.92 | 334 | 52 | 386 | 0.4029 | 0.0627 | 0.4657 |

Supplementary Table2

| Layer I | | Type of postsynaptic target | | |
|-----------------|----|-----------------------------|-------------------|--------|
| | | Spine | Shaft | Totals |
| Type of synapse | AS | 432 (398.9) | 92 (125.1) | 524 |
| | SS | 24 (57.1) | 51 (17.9) | 75 |
| Totals | | 456 | 143 | 599 |

| Layer II | | Type of postsynaptic target | | |
|-----------------|----|-----------------------------|--------------------|--------|
| | | Spine | Shaft | Totals |
| Type of synapse | AS | 825 (788.65) | 86 (122.35) | 911 |
| | SS | 13 (49.35) | 44 (7.65) | 57 |
| Totals | | 838 | 130 | 968 |

| Layer III | | Type of postsynaptic target | | |
|-----------------|----|-----------------------------|---------------------|--------|
| | | Spine | Shaft | Totals |
| Type of synapse | AS | 1714 (1602.72) | 300 (411.28) | 2014 |
| | SS | 24 (135.28) | 146 (34.72) | 170 |
| Totals | | 1738 | 446 | 2184 |

| Layer IV | | Type of postsynaptic target | | |
|-----------------|----|-----------------------------|---------------------|--------|
| | | Spine | Shaft | Totals |
| Type of synapse | AS | 885 (823.98) | 186 (247.02) | 1071 |
| | SS | 59 (120.02) | 97 (35.98) | 156 |
| Totals | | 944 | 283 | 1227 |

| Layer V | | Type of postsynaptic target | | |
|-----------------|----|-----------------------------|---------------------|--------|
| | | Spine | Shaft | Totals |
| Type of synapse | AS | 487 (453.66) | 113 (146.34) | 600 |
| | SS | 9 (42.34) | 47 (13.66) | 56 |
| Totals | | 496 | 160 | 656 |

| Layer VI | | Type of postsynaptic target | | |
|-----------------|----|-----------------------------|--------------------|--------|
| | | Spine | Shaft | Totals |
| Type of synapse | AS | 391 (364.38) | 99 (125.62) | 490 |
| | SS | 18 (44.62) | 42 (15.38) | 60 |
| Totals | | 409 | 141 | 550 |

Supplementary Table 1. Densities of asymmetric and symmetric synapses in the six cortical layers.

Cortical layer (I–VI), number of samples per layer and animal ID are indicated in the three leftmost columns. Image acquisition details such as the number of sections per sample and image resolution are shown next. In all cases image sizes were 2048 x 1536 pixels and section thickness was 20 nm. The rest of the columns indicate the total volume of each image stack corrected for tissue shrinkage, the volume of the unbiased counting frame (CF volume), counts of asymmetric (AS) and symmetric (SS) synapses, and density of AS, SS and all synaptic junctions per sample.

Supplementary Table 2. Contingency tables showing the type of synapse against the type of postsynaptic target in all cortical layers.

The observed counts of synapses in each subcategory were taken from Table 1 and are shown in bold. The expected counts (in parentheses) are calculated from the marginal totals assuming the null hypothesis that there is no association between the type of synapse and the type of postsynaptic target. Chi-square tests of association were applied to these tables indicating that the null hypothesis must be rejected in all cases ($p < 0.0001$).