



Gradients of neurotransmitter receptor expression in the macaque cortex

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Gradients of receptor expression in the macaque cortex

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SUPPLEMENTARY MATERIAL

Figure S1. Consistent receptor labelling within brain regions. A) within subjects, across sections and B) across subjects

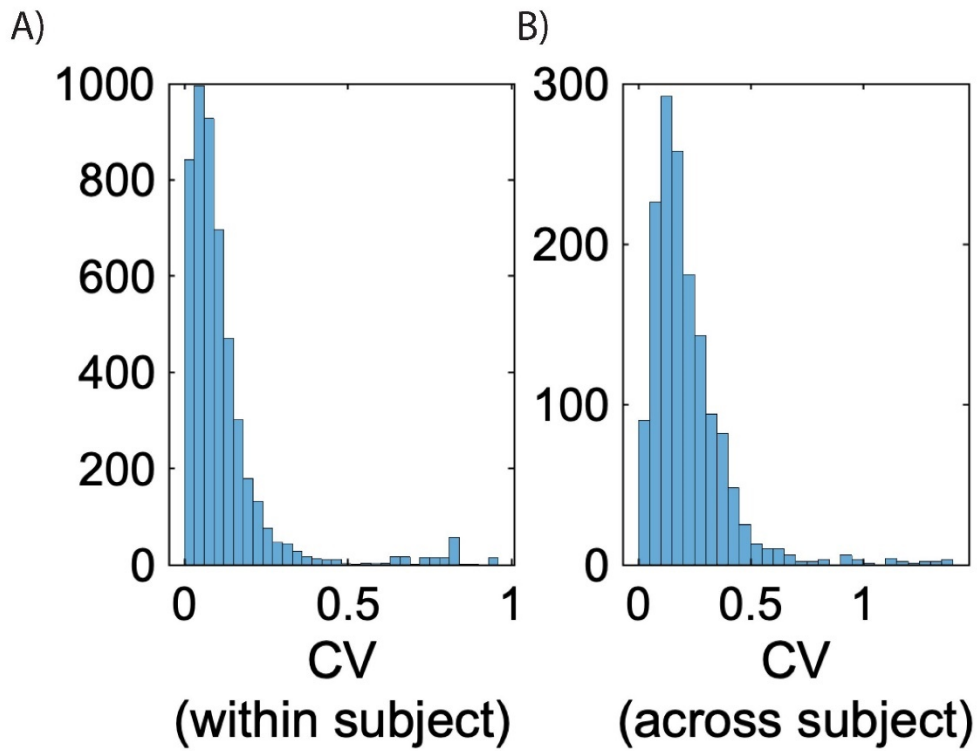


Figure S2. Algorithm-based detection of areal borders of LIPd in exemplary receptor autoradiographs. A) The receptor α_1 is shown as an example. **i)** This shows automatic labeling of the position of the statistically defined borders of LIPd (at positions 28 and 101). **ii)** The Mahalanobis distances between neighboring blocks of 22 profiles; significant maxima occurred at profile positions 28 and 101, which identify the Opt/LIPd and LIPd/LIPv borders, respectively. **iii)** The significant maxima of varying block sizes (ranging from 12 to 24). This indicates consistently occurring borders between cortical areas at profile positions 28 and 101. **iv)** The position of borders as defined by visual inspection is indicated by white bold line in the corresponding pseudocolor coded autoradiograph. The same border is shown below on corresponding sections of B) α_2 and C) 5-HT_{1A} receptors. Note the close resemblance of the position of the borders in different receptor sections.

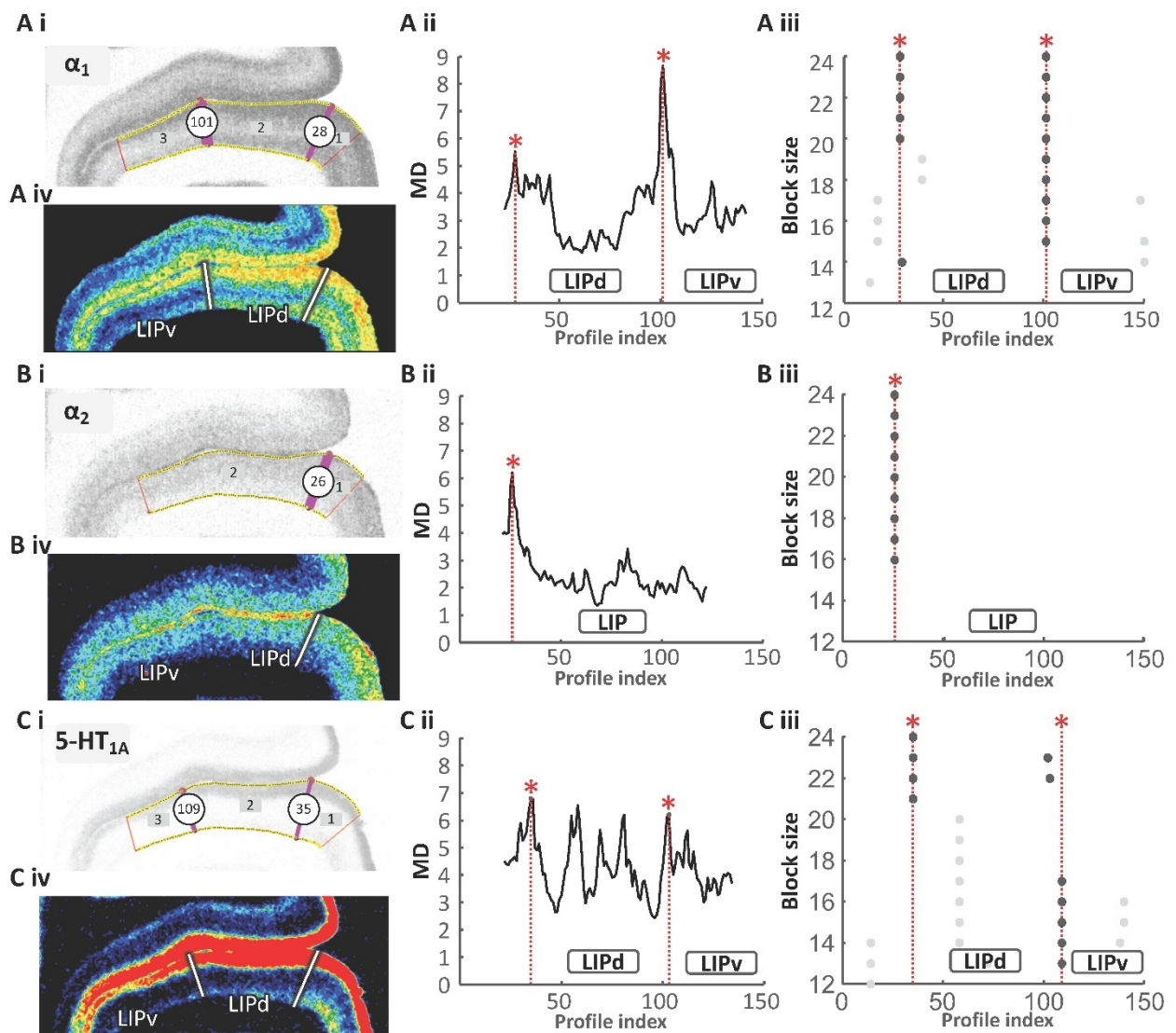


Figure S3. The density of 14 receptors across macaque cortex. A) The raw receptor density of 14 receptor types assessed with in-vitro receptor autoradiography. B) The ratio of densities for neurons and each receptor type, formed by the area with maximum density divided by the area with minimal density.

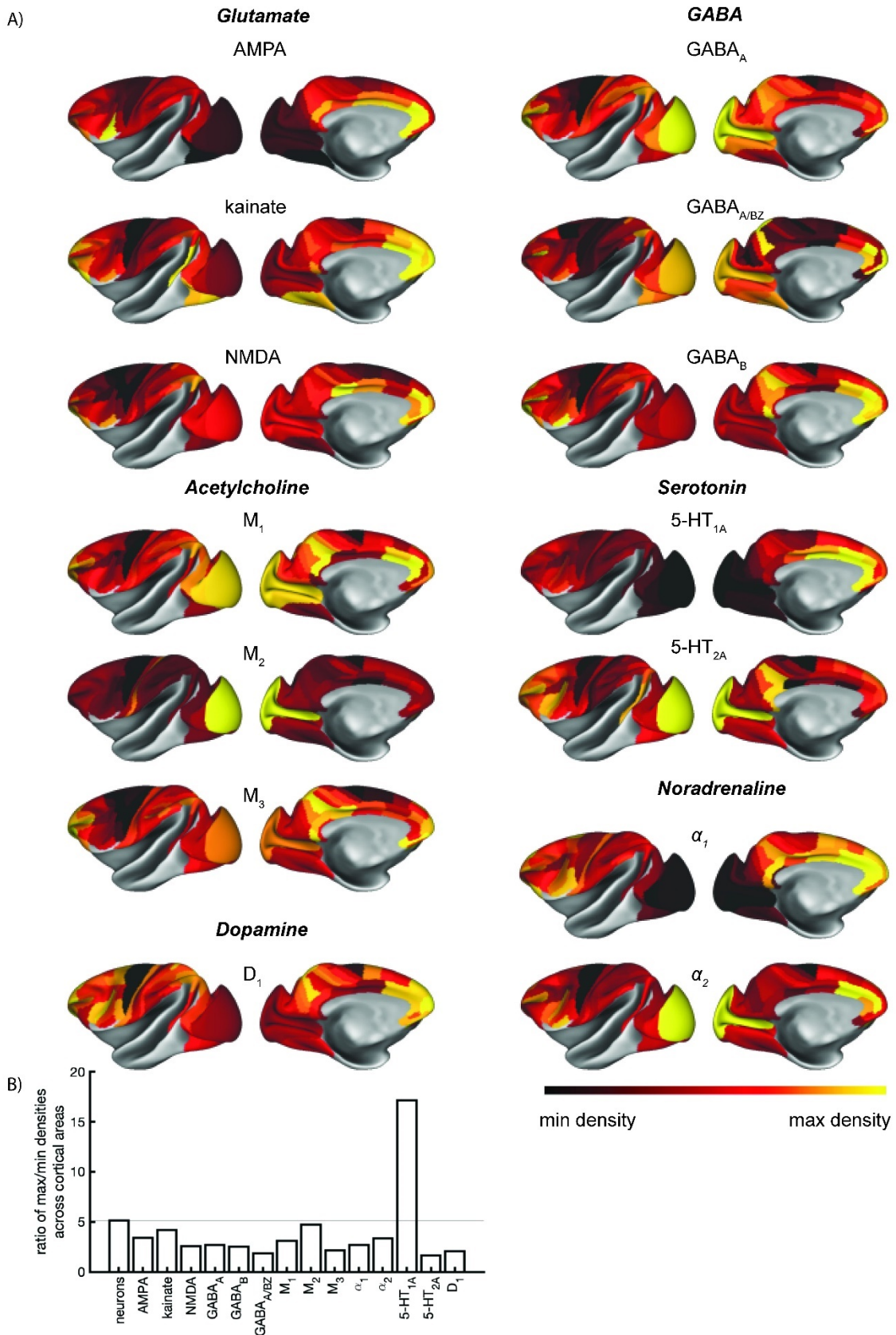


Figure S4. Polar plots of receptor expression per neuron across cortical areas. Mean expression of a given receptor within an area is shown by the thick continuous line. Mean plus standard deviation is shown by the dashed line, and average expression across all areas is shown by the thin continuous colored line. Colors code for different receptor types.

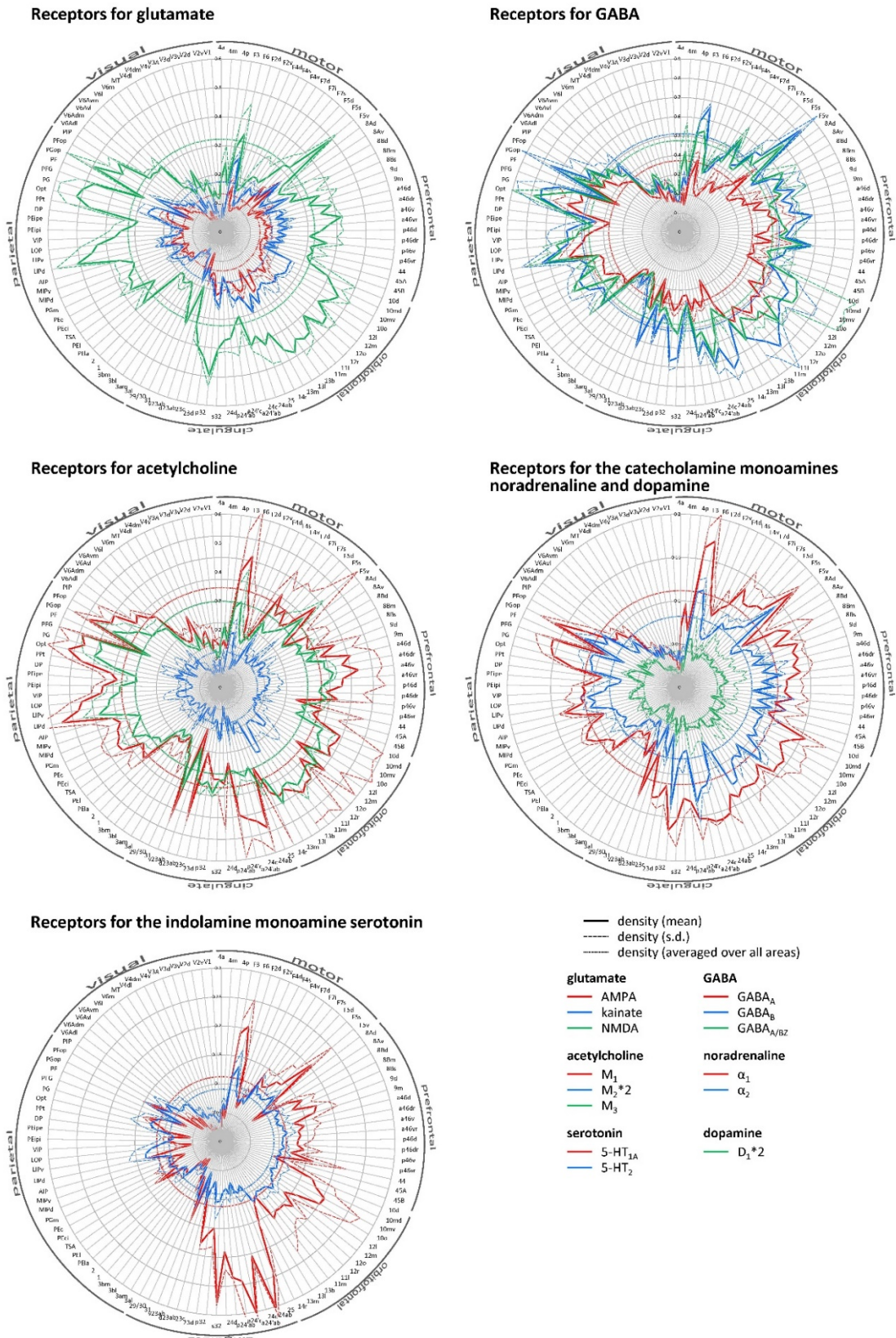


Figure S5. Principal components of the raw receptor data. A) The first five principal components of the raw receptor data. B) The strength of correlation between each of the top 5 principal components in the raw and neuron-density corrected data. The absolute value of the Pearson correlation coefficient is shown, as the sign of principal components is arbitrary. Note that each principal component of the raw receptor data is most strongly correlated with the corresponding principal component of the neuron-density corrected data. C) The projection of brain regions onto the first two principal components of the raw receptor data ('raw receptor space'). Brain regions clustered into rough anatomic-functional groups in receptor space. D) The principal component coefficients for each receptor type contributing to principal components 1-5 of the raw receptor data.

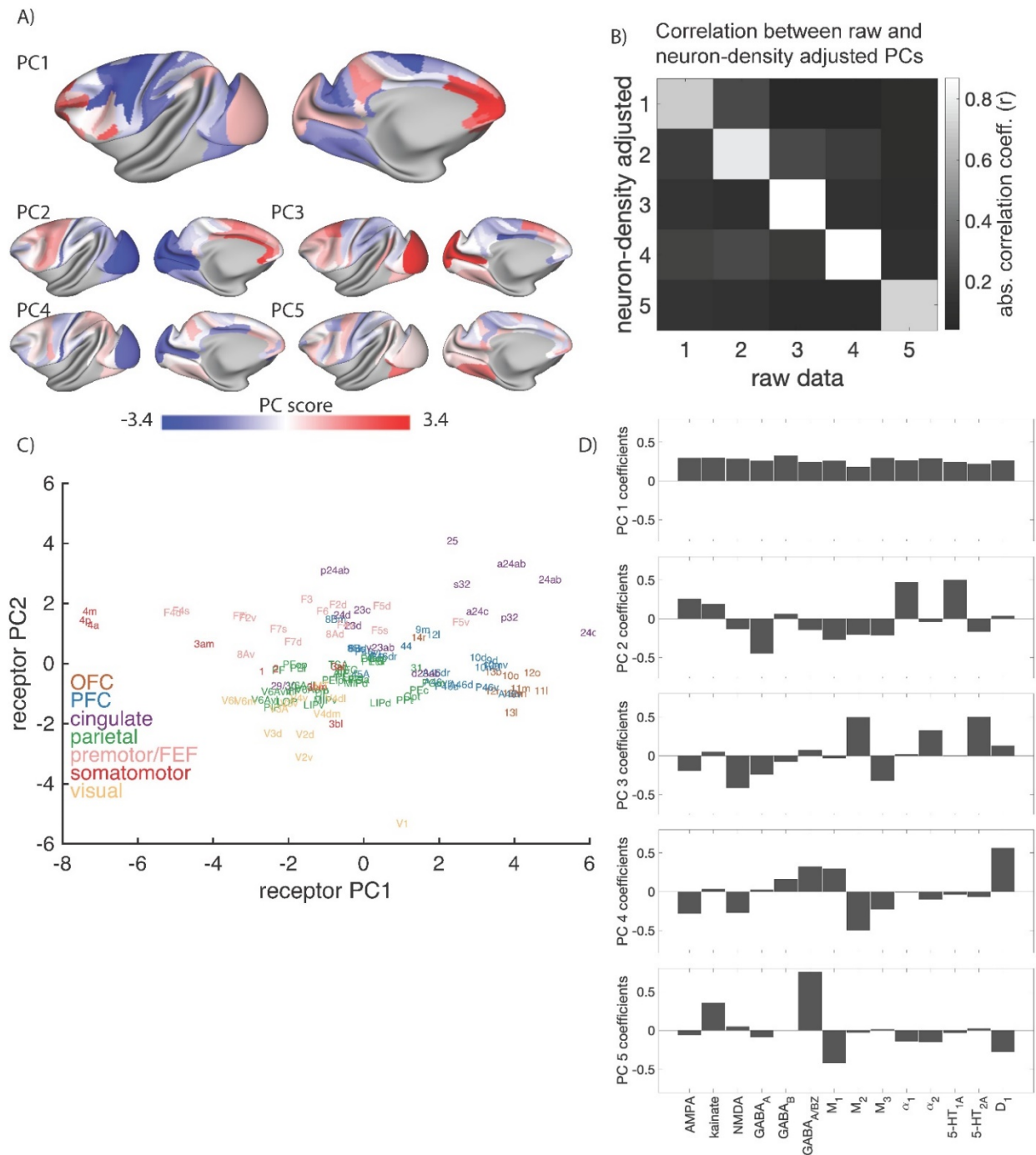


Figure S6. Principal components of the receptor data. A) The variance explained, and B) cumulative variance explained of each principal component. The top five principal components explained 95% of the variance in the data. C-G) The principal component coefficients for each receptor type contributing to principal components 1-5. H) The Pearson's r for correlations between each principal component of the receptor data and each of the structural and functional maps of brain organization. Thresholded at $p < 0.05$. FC = functional connectivity gradient. Note that different numbers of data points were available for different maps.

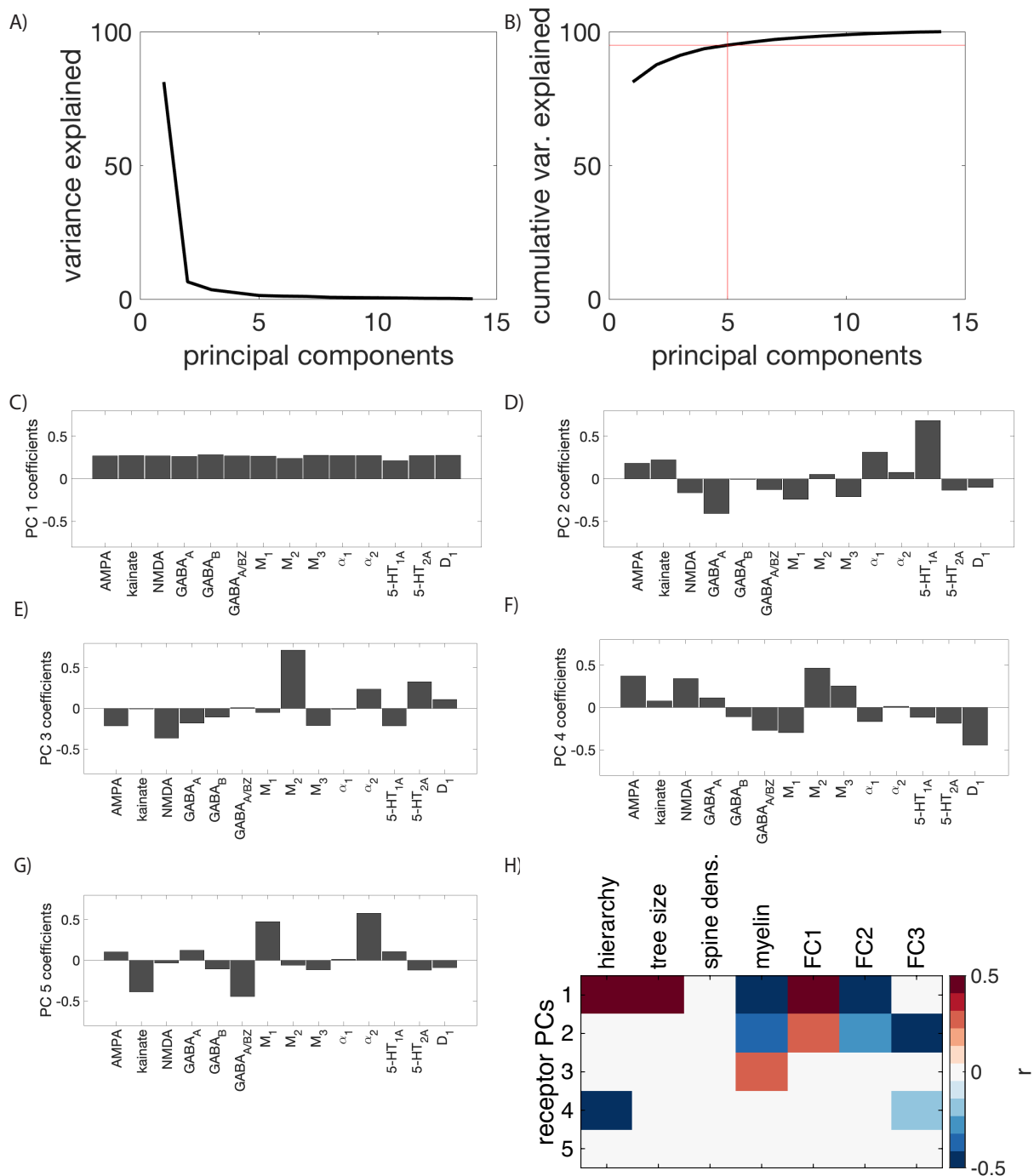


Figure S7. The spatial pattern of receptor gradients 2-5 depends on individual receptor types. The gradient dependence assesses how much the spatial pattern of a gradient changes if one receptor type is removed. The spatial pattern of PC1 is not strongly dependent on any one individual receptor, indicating that the principal receptor gradient captures strong underlying spatial trends across all receptor types. In contrast, the spatial patterns of PCs 2-5 are more dependent on individual receptor types.

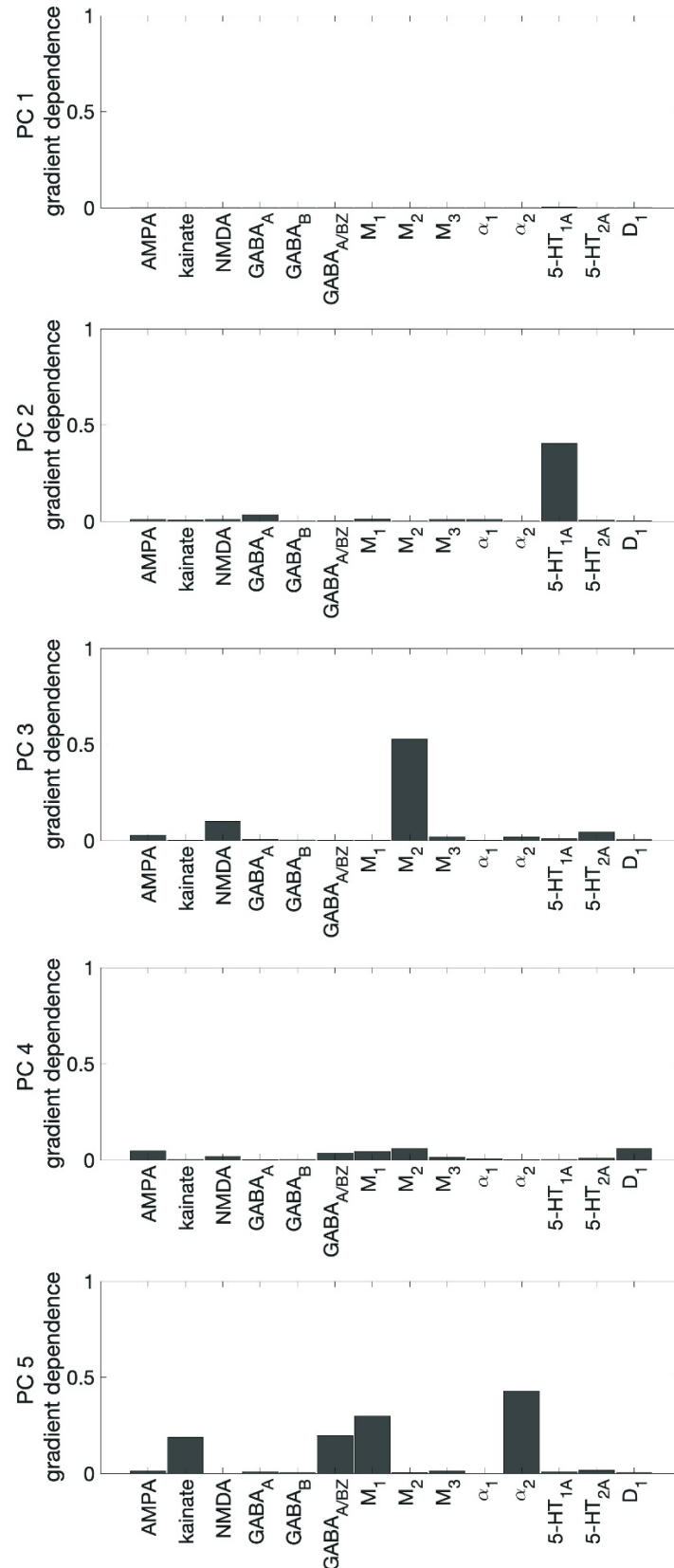


Figure S8. Principal components of raw receptor data correlate with gradients of anatomical and functional cortical organization. A) The Pearson's r for correlations between each principal component of the raw receptor data and each of the structural and functional maps of brain organization. Thresholded at p (two-sided) <0.05 , uncorrected. FC = functional connectivity gradient. Note that different numbers of data points were available for different maps. B) Significant (uncorrected) relationships between receptor PC1 of the raw receptor data and gradients of i) dendritic tree size ($r(19) = 0.59$, $p = 0.005$), ii) T1w/T2w ratio (proposed myelin marker, ($r(107) = -0.80$, $p = 1 \times 10^{-25}$) and iii) functional connectivity gradient 2 ($r(107) = -0.70$, $p = 2 \times 10^{-17}$). C) Significant (uncorrected) relationships between receptor PC2 of the raw receptor data and i) the cortical hierarchy calculated via inter-areal connectivity patterns ($r(39)=0.80$, $p = 3 \times 10^{-8}$), ii) dendritic tree size ($r(19) = 0.66$, $p = 0.001$), iii) peak spine density ($r(20) = 0.51$, $p = 0.0156$) and iv) functional connectivity gradient 1 (model: $X^2(107) = 46.5$, $r^2 = 0.44$, $p = 9 \times 10^{-12}$, coefficient: estimate = 2.55 [SE 0.64], $t = 3.93$, $p = 8.5 \times 10^{-5}$).

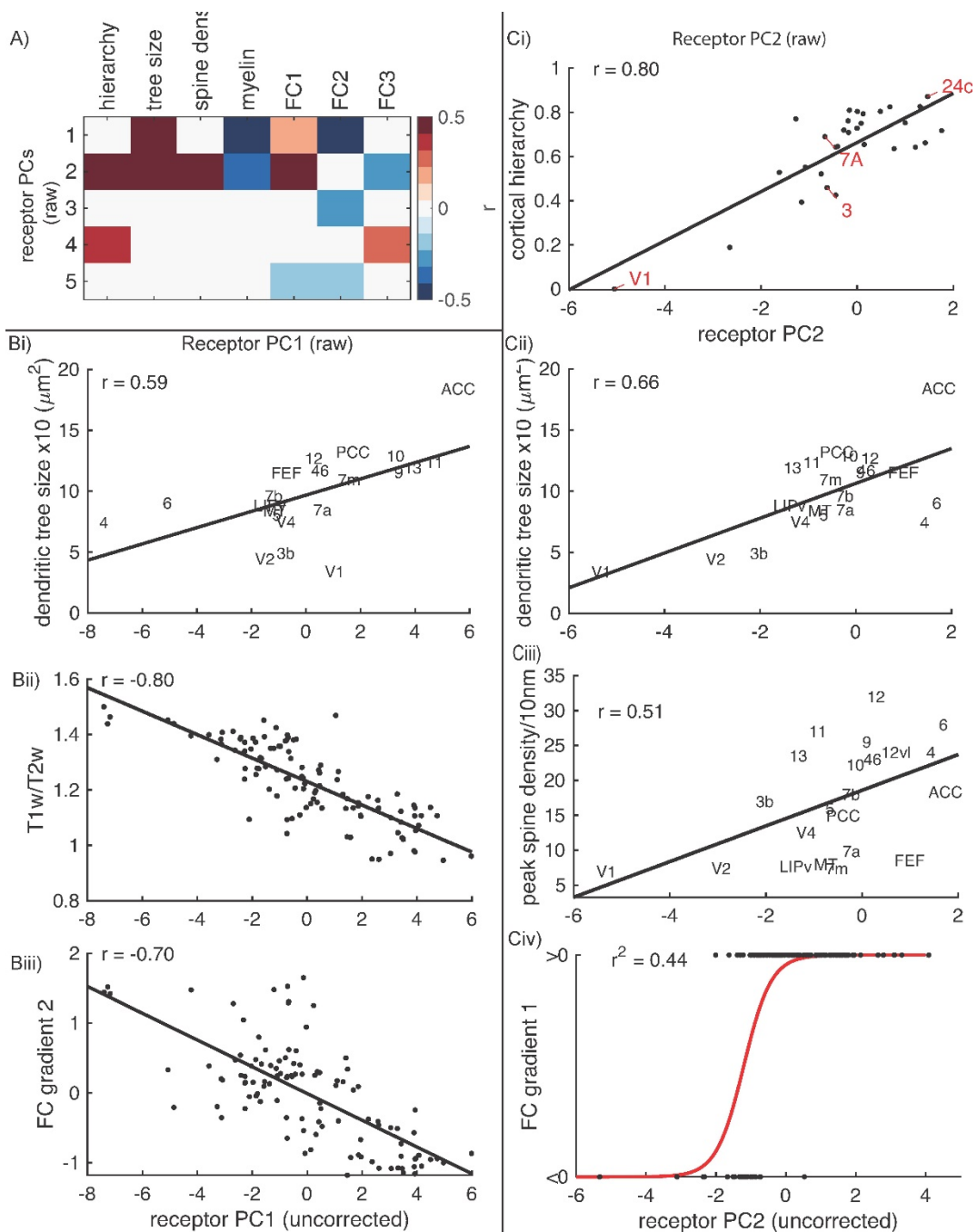


Figure S9. An inverse relationship between cortical myelin and receptor density in the primary motor and parietal association cortex. Receptor-, cyto-, and myeloarchitecture of the macaque primary motor cortex (area 4a) and of parietal association area PEip. Changes in Grey Level Index, which represents a measure of the volume fraction of cell bodies, in myelin density and in receptor concentration (in fmol/mg protein) throughout the cortical depth are provided by the profile curve overlaid onto each section. Note that the scale has been optimized for each profile to provide the best visualization of changes in receptor densities throughout the cortical ribbon. Roman and Arabic numerals indicate cyto- and myeloarchitectonic layers, respectively. Positions of cytoarchitectonic layers were transferred to the neighboring receptor images.

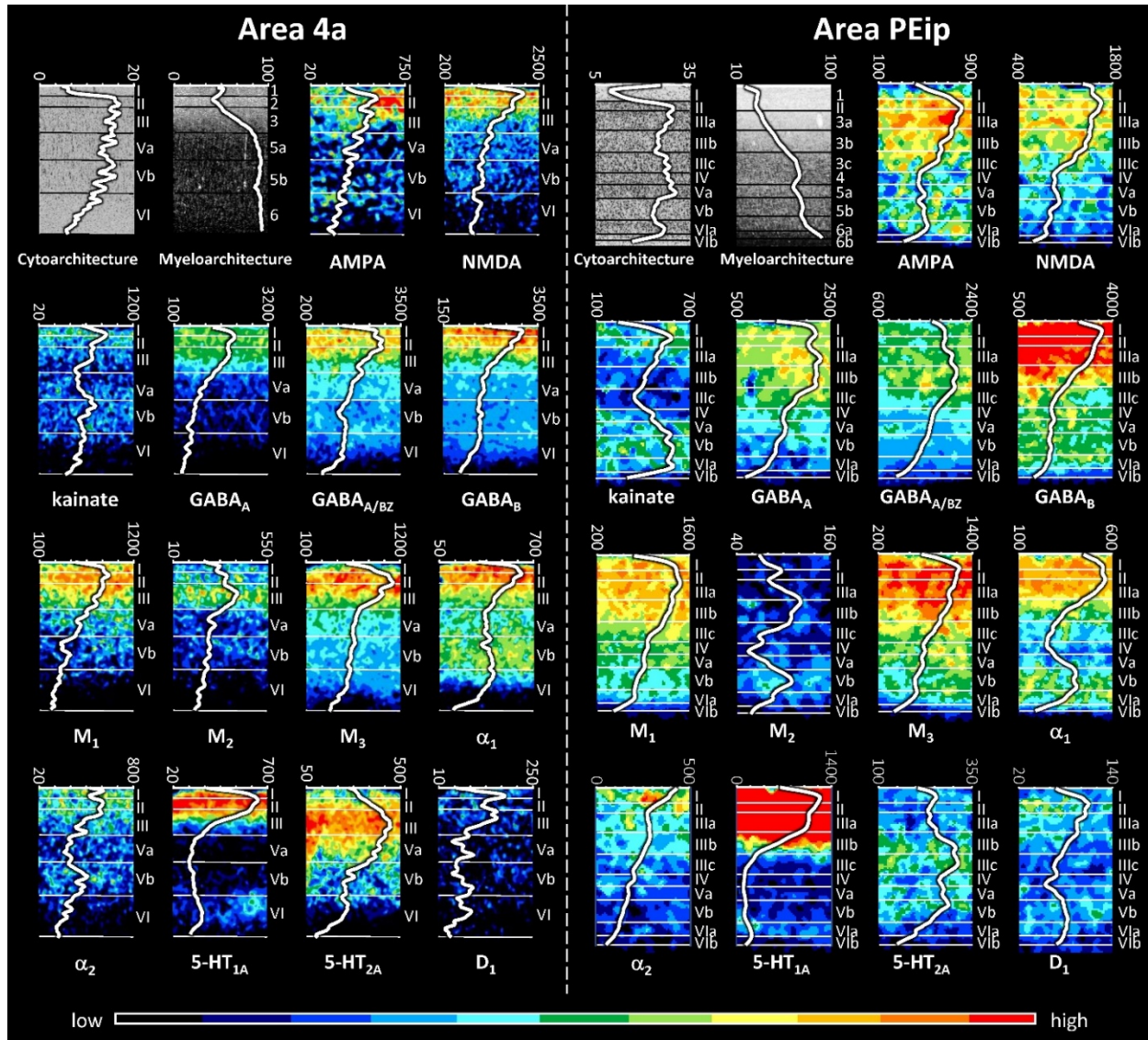


Figure S10. The serotonin 5-HT_{1A} and 5-HT_{2A} receptor density in higher cognitive networks. Top-left. The Yeo, Krienen et al. cognitive networks in macaque cortex. Right. The mean receptor density for 5-HT_{1A} receptors and 5-HT_{2A} receptors in the higher cognitive networks. Note, both receptor types were weakly expressed (per neuron) in the sensory networks. Bottom-left. There was no significant correlation between 5-HT_{2A} expression and receptor PC2.

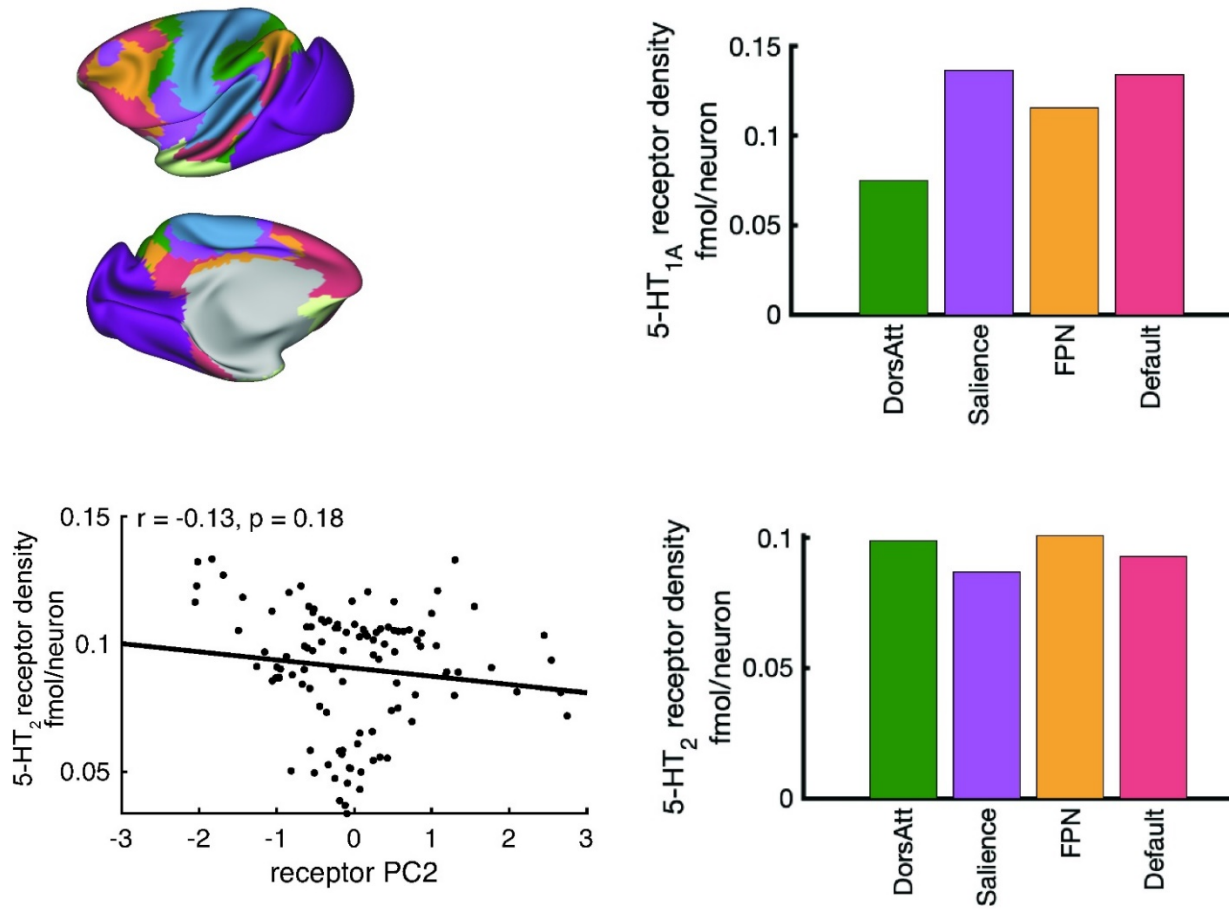
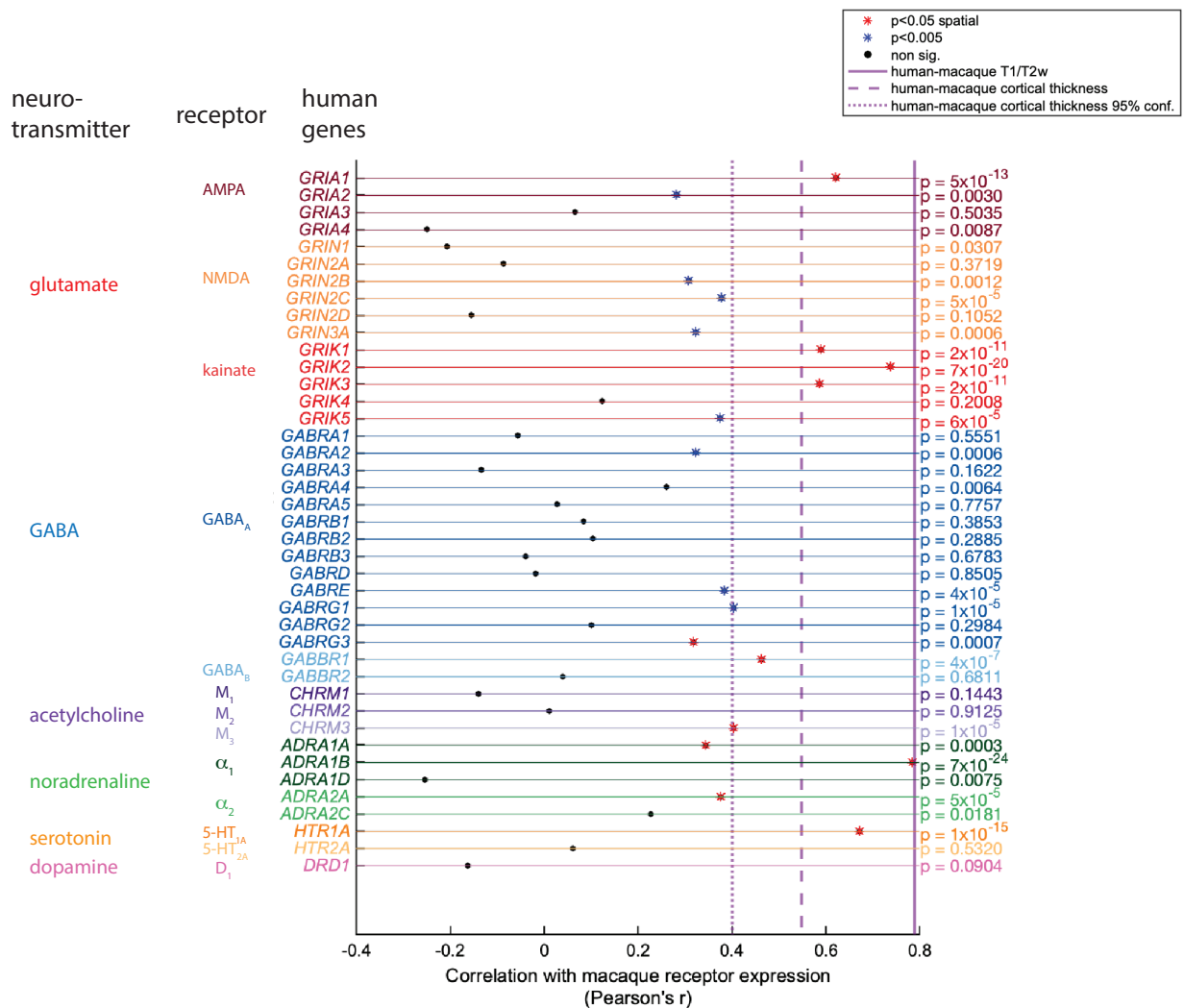


Figure S11. Variable relationships between gene and receptor expression across receptors. Human gene expression mapped onto the macaque cortex was correlated with macaque receptor expression, for 41 genes corresponding to 14 receptors. Pearson's r correlations, two-sided p-values, uncorrected for multiple comparisons. Exact p-values are shown on right. Genes are coloured according to their corresponding neurotransmitter and receptor. Correlations that pass the spatial correction are shown in a red star. Correlations that pass a less stringent threshold ($p < 0.005$, uncorrected) are shown in a blue star. Non-significant correlations are shown in black. We additionally performed Pearson's r correlations of two measures (T1w/T2w ratio – purple line and cortical thickness – purple dashed line) that were acquired in the similar ways in both species. This gives an estimate of the maximum correlation to be expected for cross-species comparisons. The lower bound of the 95% confidence interval of the human-macaque cortical thickness correlation is additionally shown.



Supplementary Table 1. Mean receptor density per neuron (fmol/neuron).

	AMPA	kainate	NMDA	GABA _A	GABA _B	GABA _{A/BZ}	M ₁	M ₂	M ₃	α ₁	α ₂	5HT _{1A}	5HT _{2A}	D ₁
10d	0.1424	0.2609	0.3967	0.4683	0.5365	0.6476	0.295	0.0415	0.2521	0.1554	0.0963	0.1705	0.1032	0.0276
10md	0.1503	0.2572	0.4248	0.4734	0.5794	0.667	0.2916	0.0452	0.245	0.1398	0.0969	0.1805	0.1057	0.027
10mv	0.1611	0.2595	0.4621	0.4888	0.6374	0.6897	0.2816	0.0429	0.2563	0.1304	0.0955	0.2029	0.0958	0.0253
10o	0.1523	0.2609	0.4391	0.5064	0.6314	0.6843	0.2955	0.0449	0.268	0.1373	0.104	0.2009	0.1043	0.0247
11l	0.1793	0.2361	0.4604	0.5579	0.786	0.603	0.2929	0.0496	0.2788	0.136	0.1058	0.1529	0.1067	0.029
11m	0.1724	0.2201	0.4652	0.5149	0.7178	0.5714	0.3065	0.0497	0.2846	0.1393	0.0996	0.1521	0.1067	0.0277
12l	0.1785	0.2486	0.4103	0.429	0.6239	0.5675	0.2114	0.0457	0.2346	0.1458	0.0936	0.1583	0.1055	0.0201
12m	0.1807	0.2363	0.4656	0.528	0.6554	0.5506	0.3046	0.065	0.2811	0.143	0.1163	0.1389	0.1124	0.0294
12o	0.2057	0.2514	0.4713	0.4946	0.6828	0.6882	0.2432	0.0659	0.2642	0.1442	0.1244	0.1664	0.1206	0.0278
12r	0.1733	0.2436	0.4029	0.5198	0.7237	0.573	0.2939	0.0558	0.2711	0.1238	0.0912	0.153	0.1087	0.0246
13b	0.156	0.2336	0.4482	0.4666	0.6761	0.5377	0.2887	0.0506	0.2651	0.1373	0.1026	0.1606	0.1046	0.0276
13l	0.2257	0.2358	0.4864	0.541	0.6367	0.6545	0.2745	0.0857	0.2689	0.135	0.1253	0.1099	0.1138	0.0207
13m	0.2343	0.2802	0.4612	0.505	0.5289	0.5041	0.2837	0.0845	0.3031	0.1427	0.1266	0.1204	0.1168	0.0221
14r	0.1458	0.233	0.3831	0.4163	0.717	0.4703	0.266	0.0429	0.2296	0.1353	0.0793	0.154	0.0941	0.0259
44	0.1418	0.1586	0.3236	0.3859	0.5456	0.4576	0.238	0.0415	0.1891	0.1238	0.1073	0.1618	0.1054	0.0246
45A	0.1371	0.1986	0.3071	0.3945	0.5073	0.4888	0.2179	0.0465	0.2004	0.1048	0.0842	0.094	0.0974	0.0182
45B	0.1439	0.153	0.3247	0.3629	0.4713	0.4798	0.2391	0.0382	0.1808	0.114	0.0997	0.1209	0.1029	0.0236
4a	0.0596	0.0578	0.1852	0.1545	0.2208	0.3178	0.0966	0.0168	0.1114	0.0696	0.0279	0.0384	0.0544	0.0097
4m	0.0878	0.0852	0.2429	0.209	0.285	0.4199	0.1096	0.0231	0.1404	0.0944	0.0371	0.0565	0.0657	0.0139
4p	0.0571	0.0504	0.1643	0.143	0.2478	0.294	0.091	0.0164	0.1066	0.066	0.0328	0.0403	0.0557	0.0099
8Ad	0.1236	0.1876	0.261	0.2993	0.5294	0.4557	0.2198	0.0449	0.1812	0.1178	0.074	0.1139	0.097	0.0211
8Av	0.1076	0.1562	0.237	0.296	0.4368	0.4692	0.1669	0.0422	0.1669	0.0848	0.0688	0.0646	0.0853	0.021
8Bd	0.1294	0.198	0.2571	0.347	0.5461	0.6155	0.2315	0.0572	0.1977	0.13	0.0856	0.1308	0.1067	0.023
8Bm	0.162	0.2574	0.2933	0.3738	0.5988	0.5739	0.2225	0.0563	0.2077	0.1419	0.0919	0.1561	0.112	0.0239
8Bs	0.1267	0.1567	0.2585	0.3467	0.5342	0.524	0.2155	0.0452	0.1882	0.1168	0.0898	0.1339	0.1	0.0222
9d	0.1468	0.212	0.3604	0.4507	0.6315	0.56	0.2778	0.0489	0.2332	0.1438	0.103	0.1751	0.106	0.0261
9m	0.1484	0.2235	0.3149	0.3905	0.5464	0.4774	0.2384	0.0442	0.2038	0.1351	0.086	0.1681	0.0991	0.0242
A46d	0.1577	0.1913	0.3899	0.4763	0.5993	0.5041	0.3058	0.054	0.2435	0.1395	0.112	0.1287	0.1097	0.0264
A46dr	0.1472	0.235	0.349	0.4595	0.5706	0.5112	0.2822	0.0566	0.2416	0.1316	0.0952	0.1455	0.1077	0.0253
A46v	0.1748	0.1947	0.4169	0.505	0.6871	0.5189	0.3177	0.0554	0.26	0.1392	0.1162	0.1341	0.1148	0.0276

A46vr	0.152	0.231	0.372	0.4612	0.5908	0.5283	0.2805	0.0546	0.2509	0.1222	0.0932	0.137	0.1063	0.0244
F2d	0.0904	0.1649	0.2027	0.2295	0.4693	0.4433	0.2155	0.0435	0.1433	0.1258	0.089	0.1489	0.089	0.0219
F2v	0.0785	0.1309	0.1532	0.2095	0.3283	0.3253	0.184	0.0389	0.1216	0.102	0.0647	0.0895	0.0801	0.0198
F3	0.1265	0.2379	0.3007	0.297	0.5869	0.5215	0.2735	0.0631	0.1893	0.1641	0.1117	0.1899	0.1148	0.0285
F4d	0.0803	0.099	0.1655	0.2027	0.3446	0.3827	0.1312	0.0233	0.1102	0.0901	0.0602	0.0637	0.074	0.0168
F4s	0.0923	0.1144	0.1965	0.2378	0.4108	0.4404	0.1231	0.0359	0.1328	0.1017	0.0634	0.0864	0.0847	0.0216
F4v	0.0976	0.1439	0.2219	0.2932	0.4554	0.4197	0.1624	0.0293	0.1256	0.1091	0.0709	0.0917	0.075	0.0189
F5d	0.2144	0.1885	0.3181	0.3306	0.5698	0.5472	0.1945	0.0403	0.1782	0.1289	0.096	0.1407	0.0993	0.0223
F5s	0.1559	0.1839	0.3257	0.3578	0.5755	0.4991	0.2121	0.0404	0.1958	0.1299	0.1005	0.1421	0.105	0.0227
F5v	0.2506	0.26	0.4874	0.4553	0.8208	0.6992	0.2844	0.0563	0.2466	0.1688	0.1407	0.2047	0.1209	0.0251
F6	0.1591	0.2614	0.3492	0.3868	0.6648	0.5393	0.3112	0.0651	0.2035	0.1732	0.1153	0.2042	0.133	0.0286
F7d	0.1043	0.1843	0.2232	0.3133	0.5482	0.584	0.2565	0.0636	0.18	0.1358	0.0886	0.1327	0.1167	0.0241
F7i	0.0979	0.1685	0.2132	0.2525	0.4339	0.4233	0.206	0.0459	0.1564	0.1208	0.0838	0.1177	0.1016	0.023
F7s	0.1174	0.163	0.2456	0.2936	0.4534	0.4218	0.2316	0.0474	0.1662	0.1211	0.0881	0.122	0.105	0.0244
P46d	0.1549	0.1922	0.3438	0.4502	0.5685	0.5546	0.2779	0.0502	0.2307	0.1227	0.1077	0.132	0.1063	0.0221
P46dr	0.1481	0.2242	0.3048	0.3829	0.5429	0.51	0.2418	0.053	0.2248	0.1196	0.0825	0.1316	0.1046	0.0223
P46v	0.1611	0.189	0.3667	0.4823	0.6785	0.6379	0.2681	0.0467	0.2443	0.1293	0.1117	0.1429	0.1092	0.0238
P46vr	0.1423	0.2126	0.3112	0.3807	0.5537	0.5244	0.173	0.0468	0.2257	0.1102	0.0892	0.1215	0.1016	0.0227
1	0.0798	0.0941	0.1936	0.2564	0.2926	0.2803	0.1487	0.0287	0.1269	0.067	0.0515	0.04	0.0515	0.0131
2	0.0894	0.0934	0.1957	0.2695	0.3248	0.3112	0.1578	0.0258	0.1424	0.0701	0.0509	0.0491	0.0568	0.0154
3al	0.0877	0.0832	0.2179	0.29	0.3763	0.2975	0.1667	0.0333	0.1522	0.0892	0.0534	0.0773	0.0651	0.0164
3am	0.086	0.0854	0.1985	0.2654	0.3302	0.2779	0.1315	0.0267	0.1309	0.0729	0.0434	0.0535	0.0499	0.0141
3bl	0.0728	0.0674	0.2126	0.2477	0.2701	0.2506	0.1521	0.0466	0.13	0.062	0.0543	0.0363	0.0581	0.0116
3bm	0.0818	0.0936	0.2178	0.2851	0.3474	0.2868	0.1579	0.0354	0.1455	0.071	0.0504	0.0554	0.0584	0.0146
AIP	0.1456	0.1526	0.3622	0.4372	0.5385	0.4415	0.2606	0.0361	0.231	0.1154	0.0863	0.0984	0.09	0.0217
DP	0.1121	0.1749	0.2917	0.3736	0.4456	0.5317	0.2565	0.0379	0.199	0.0917	0.0689	0.0543	0.0866	0.0225
LIPd	0.1772	0.2167	0.5106	0.5924	0.7353	0.7086	0.3757	0.0501	0.2884	0.1367	0.1067	0.118	0.1334	0.03
LIPv	0.1619	0.2014	0.4535	0.5515	0.6516	0.6271	0.3333	0.0523	0.2639	0.1137	0.0994	0.0764	0.1323	0.0285
LOP	0.1323	0.2094	0.432	0.5102	0.5866	0.6483	0.3234	0.0512	0.2584	0.1159	0.1082	0.0523	0.1228	0.0278
MIPd	0.1293	0.1527	0.3291	0.4342	0.5489	0.4791	0.2587	0.0342	0.2068	0.1103	0.0788	0.0834	0.0951	0.0234
MIPv	0.1184	0.1407	0.3195	0.4216	0.5106	0.5247	0.246	0.0359	0.1968	0.0934	0.0784	0.067	0.0969	0.0215
Opt	0.1906	0.263	0.5161	0.6066	0.7483	0.786	0.3634	0.0559	0.302	0.1516	0.1055	0.1103	0.1271	0.0318
PEc	0.1394	0.1878	0.3511	0.4511	0.5804	0.6301	0.2739	0.0418	0.2342	0.1242	0.0712	0.0853	0.0902	0.0247

PEci	0.137	0.1665	0.3719	0.4009	0.559	0.4781	0.2696	0.033	0.2044	0.1159	0.0782	0.1226	0.0901	0.023
PEipe	0.1336	0.1348	0.3078	0.4017	0.5283	0.4588	0.2415	0.0343	0.196	0.0998	0.0714	0.0911	0.0826	0.021
PEipi	0.1413	0.1451	0.348	0.453	0.5922	0.527	0.2729	0.0336	0.234	0.1138	0.0842	0.0912	0.091	0.0231
PEI	0.1264	0.1446	0.3234	0.3753	0.503	0.4859	0.231	0.0329	0.1837	0.0976	0.0693	0.0753	0.0842	0.0223
PEIa	0.1283	0.146	0.3664	0.3922	0.538	0.5574	0.2424	0.0369	0.1877	0.106	0.0669	0.0826	0.0879	0.0239
PF	0.1077	0.1272	0.2918	0.3473	0.4247	0.387	0.2004	0.0308	0.1792	0.0922	0.0712	0.0656	0.0757	0.017
PFG	0.1984	0.2405	0.4729	0.5555	0.6655	0.5928	0.3432	0.0526	0.2993	0.1571	0.1078	0.1067	0.1129	0.0274
PFop	0.1619	0.1924	0.3949	0.4551	0.5411	0.4698	0.2935	0.0478	0.247	0.1276	0.0972	0.1004	0.0985	0.0222
PG	0.1955	0.258	0.5021	0.5328	0.7554	0.6776	0.3304	0.0464	0.2894	0.1564	0.1093	0.1308	0.1202	0.0303
PGm	0.1533	0.1941	0.3566	0.4405	0.5828	0.5981	0.2614	0.0405	0.222	0.119	0.0759	0.1011	0.0992	0.0244
PGop	0.1897	0.2544	0.4981	0.5445	0.7565	0.6209	0.3428	0.0424	0.2818	0.1626	0.1239	0.1385	0.1228	0.0281
PIP	0.121	0.1716	0.4301	0.4856	0.5899	0.5649	0.2974	0.0496	0.2308	0.1012	0.1078	0.0385	0.1165	0.0253
PPt	0.158	0.205	0.4655	0.516	0.6302	0.6416	0.3297	0.04	0.2535	0.1276	0.1041	0.0993	0.1184	0.027
TSA	0.1176	0.1404	0.2826	0.3751	0.4911	0.3896	0.2209	0.0307	0.1992	0.103	0.0787	0.0814	0.0733	0.0204
V6AdI	0.1209	0.1516	0.3087	0.4008	0.4785	0.4614	0.2448	0.0351	0.1975	0.0916	0.0696	0.0658	0.087	0.0226
V6Adm	0.108	0.156	0.3129	0.3958	0.4978	0.5018	0.2573	0.0381	0.1976	0.098	0.0618	0.0626	0.0856	0.0227
V6AvI	0.1012	0.1307	0.303	0.3771	0.4318	0.4177	0.2319	0.0371	0.1913	0.0825	0.0774	0.0371	0.0912	0.0206
V6Avm	0.0896	0.1405	0.3091	0.3576	0.4861	0.4103	0.2235	0.0437	0.1871	0.0827	0.062	0.0562	0.0867	0.022
V6I	0.0589	0.086	0.2009	0.2409	0.2937	0.2834	0.1558	0.0266	0.1259	0.0498	0.052	0.0198	0.0584	0.0135
V6m	0.052	0.0857	0.1916	0.2264	0.2615	0.2424	0.1331	0.0272	0.1142	0.0476	0.0434	0.0215	0.0527	0.0123
VIP	0.1369	0.1469	0.3685	0.4958	0.5863	0.5431	0.277	0.0387	0.2355	0.1098	0.0879	0.0776	0.1053	0.0251
V1	0.0256	0.0424	0.117	0.165	0.1634	0.1953	0.0981	0.0315	0.0736	0.0212	0.0408	0.0062	0.0368	0.006
V2d	0.0394	0.0738	0.1461	0.1944	0.2172	0.2411	0.1131	0.0211	0.0847	0.0326	0.0361	0.0123	0.0386	0.0084
V2v	0.0289	0.0538	0.1233	0.1586	0.167	0.2026	0.107	0.0178	0.0703	0.0229	0.0317	0.0103	0.0336	0.0068
V3A	0.0537	0.0699	0.1687	0.2068	0.2349	0.2341	0.1249	0.0189	0.1055	0.0418	0.0415	0.0206	0.0473	0.0105
V3d	0.0476	0.0677	0.1817	0.2211	0.2462	0.2437	0.1358	0.0268	0.109	0.0374	0.0442	0.0132	0.0495	0.0112
V3v	0.0301	0.1039	0.1234	0.162	0.2112	0.2563	0.0869	0.0191	0.0894	0.033	0.0375	0.0139	0.043	0.0092
V4dl	0.0662	0.0956	0.1707	0.2047	0.2362	0.2588	0.1384	0.0197	0.0981	0.0466	0.0385	0.0227	0.0455	0.0111
V4dm	0.0822	0.1136	0.2404	0.3142	0.31	0.3398	0.1833	0.0133	0.1391	0.0546	0.0541	0.0251	0.0503	0.0139
V4v	0.0346	0.1164	0.1523	0.1744	0.2565	0.3069	0.1005	0.0218	0.1087	0.0418	0.0428	0.0185	0.0513	0.0111
23c	0.1415	0.1629	0.4016	0.3069	0.4326	0.3947	0.1527	0.0428	0.2293	0.1285	0.0814	0.1784	0.0799	0.0188
23d	0.1505	0.1868	0.4338	0.3556	0.4679	0.4407	0.1804	0.0369	0.2188	0.1144	0.0534	0.1604	0.0696	0.0175
24ab	0.2166	0.254	0.3764	0.3629	0.6288	0.5772	0.3393	0.0432	0.1927	0.159	0.1053	0.3014	0.0937	0.0237

24c	0.2021	0.2276	0.4057	0.4034	0.702	0.6669	0.3188	0.0557	0.2116	0.1595	0.1156	0.2042	0.089	0.0235
24d	0.1648	0.1529	0.3731	0.3312	0.4583	0.4153	0.2224	0.0364	0.2123	0.1277	0.0756	0.1906	0.0878	0.0167
25	0.2047	0.2949	0.4187	0.2667	0.7594	0.4242	0.1989	0.0447	0.2474	0.1556	0.0662	0.2449	0.0811	0.0243
29/30	0.1403	0.1274	0.2675	0.3421	0.44	0.4167	0.1706	0.0337	0.1842	0.0672	0.0632	0.0667	0.0974	0.0161
31	0.1519	0.1747	0.3378	0.4319	0.6351	0.4289	0.3041	0.0345	0.245	0.1321	0.0757	0.1386	0.1077	0.0203
a24'ab	0.1796	0.2444	0.2957	0.3498	0.5752	0.5249	0.3092	0.0333	0.2033	0.154	0.1184	0.3011	0.0719	0.0229
a24'c	0.1723	0.2242	0.3234	0.4135	0.6459	0.5509	0.2977	0.0539	0.1941	0.1525	0.1332	0.2435	0.0908	0.0251
d23ab	0.1681	0.1642	0.3369	0.3929	0.5589	0.4247	0.2966	0.0412	0.2175	0.1309	0.0675	0.0881	0.1008	0.0204
p24'ab	0.1738	0.1773	0.3676	0.3265	0.3628	0.3765	0.1748	0.0221	0.1928	0.1319	0.0724	0.236	0.0813	0.0163
p32	0.2185	0.2353	0.4962	0.4092	0.6687	0.495	0.2117	0.0477	0.2444	0.1648	0.1358	0.15	0.1043	0.0273
s32	0.2092	0.2586	0.4024	0.3799	0.6505	0.526	0.2114	0.0605	0.2157	0.1526	0.0872	0.2742	0.1034	0.0233
v23ab	0.0738	0.1262	0.194	0.2518	0.3913	0.314	0.1001	0.0224	0.1452	0.0783	0.0436	0.0662	0.0553	0.0123
MT	0.0582	0.1363	0.1601	0.2132	0.2697	0.2645	0.1262	0.025	0.1091	0.0521	0.0512	0.0262	0.0609	0.0124

Supplementary Table 2. Standard deviation of receptor density per neuron (fmol/neuron).

	AMPA	kainate	NMDA	GABA _A	GABA _B	GABA _{A/BZ}	M ₁	M ₂	M ₃	α ₁	α ₂	5HT _{1A}	5HT _{2A}	D ₁
10d	0.0034	0.0122	0.1046	0.0526	0.1123	0.3322	0.1074	0.0145	0.0332	0.0259	0.0156	0.0409	0.0236	0.0077
10md	0.0162	0.0145	0.0367	0.0227	0.1270	0.2708	0.0961	0.0134	0.0296	0.0156	0.0117	0.0389	0.0156	0.0074
10mv	0.0358	0.0136	0.0472	0.0469	0.1699	0.2782	0.1145	0.0117	0.0227	0.0355	0.0131	0.0702	0.0205	0.0060
10o	0.0278	0.0099	0.0136	0.0165	0.1805	0.2654	0.1148	0.0134	0.0242	0.0256	0.0119	0.0614	0.0159	0.0034
11l	0.0227	0.0427	0.0244	0.0422	0.1486	0.0536	0.0826	0.0172	0.0186	0.0123	0.0092	0.0393	0.0161	0.0100
11m	0.0200	0.0168	0.0391	0.0223	0.1133	0.0551	0.0731	0.0211	0.0420	0.0106	0.0103	0.0608	0.0188	0.0091
12l	0.0335	0.0193	0.0054	0.0712	0.0403	0.1146	0.1226	0.0247	0.0153	0.0241	0.0113	0.0488	0.0133	0.0017
12m	0.0212	0.0062	0.0436	0.0739	0.0536	0.1227	0.0898	0.0197	0.0109	0.0135	0.0135	0.0177	0.0129	0.0097
12o	0.0573	0.0098	0.0225	0.1117	0.0260	0.0310	0.0260	0.0242	0.0106	0.0109	0.0095	0.0325	0.0121	0.0071
12r	0.0383	0.0420	0.0126	0.0849	0.0732	0.0452	0.1015	0.0254	0.0212	0.0100	0.0109	0.0320	0.0114	0.0023
13b	0.0290	0.0355	0.0691	0.0330	0.0966	0.1199	0.0921	0.0168	0.0142	0.0239	0.0236	0.0719	0.0159	0.0054
13l	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
13m	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
14r	0.0546	0.0296	0.1080	0.0509	0.0637	0.1034	0.1307	0.0151	0.0290	0.0375	0.0344	0.0455	0.0068	0.0023
44	0.0324	0.0185	0.0527	0.0353	0.0514	0.0567	0.0992	0.0053	0.0511	0.0249	0.0198	0.0591	0.0179	0.0088
45A	0.0108	0.0092	0.0127	0.0798	0.0552	0.1291	0.0607	0.0169	0.0042	0.0187	0.0079	0.0285	0.0127	0.0053
45B	0.0345	0.0111	0.0628	0.0419	0.0824	0.0546	0.0930	0.0037	0.0382	0.0191	0.0244	0.0353	0.0156	0.0101
4a	0.0138	0.0148	0.0508	0.0352	0.0036	0.1229	0.0174	0.0142	0.0103	0.0034	0.0105	0.0101	0.0113	0.0026
4m	0.0158	0.0226	0.0634	0.0389	0.0350	0.1528	0.0352	0.0218	0.0105	0.0042	0.0142	0.0066	0.0126	0.0037
4p	0.0160	0.0150	0.0450	0.0468	0.0073	0.0853	0.0344	0.0118	0.0030	0.0036	0.0103	0.0049	0.0105	0.0014
8Ad	0.0148	0.0153	0.0779	0.0214	0.0240	0.0859	0.0713	0.0095	0.0478	0.0180	0.0045	0.0127	0.0108	0.0100
8Av	0.0175	0.0332	0.0175	0.0462	0.0667	0.1246	0.0685	0.0072	0.0638	0.0321	0.0178	0.0329	0.0218	0.0082
8Bd	0.0233	0.0119	0.1013	0.0438	0.0310	0.0811	0.0466	0.0148	0.0293	0.0245	0.0119	0.0208	0.0111	0.0102
8Bm	0.0431	0.0091	0.1290	0.0972	0.1016	0.0733	0.0582	0.0138	0.0340	0.0293	0.0101	0.0258	0.0094	0.0110
8Bs	0.0150	0.0083	0.0978	0.0615	0.1246	0.0305	0.0217	0.0110	0.0262	0.0206	0.0048	0.0356	0.0128	0.0075
9d	0.0294	0.0141	0.0693	0.1095	0.0658	0.1468	0.0644	0.0109	0.0103	0.0101	0.0125	0.0212	0.0196	0.0082
9m	0.0160	0.0168	0.0730	0.1183	0.0589	0.1223	0.0765	0.0101	0.0077	0.0107	0.0080	0.0426	0.0139	0.0069
A46d	0.0185	0.0108	0.0091	0.0739	0.0253	0.1262	0.0551	0.0131	0.0105	0.0105	0.0165	0.0332	0.0182	0.0128
A46dr	0.0227	0.0250	0.0577	0.0753	0.0281	0.1140	0.0878	0.0094	0.0247	0.0233	0.0173	0.0298	0.0131	0.0108
A46v	0.0054	0.0247	0.0060	0.0963	0.0020	0.1157	0.0554	0.0134	0.0080	0.0105	0.0057	0.0278	0.0162	0.0111

A46vr	0.0156	0.0179	0.0406	0.0867	0.0563	0.1159	0.0781	0.0176	0.0097	0.0159	0.0045	0.0250	0.0082	0.0060
F2d	0.0125	0.0199	0.0479	0.0619	0.0192	0.0165	0.0533	0.0108	0.0354	0.0143	0.0106	0.0216	0.0184	0.0084
F2v	0.0100	0.0116	0.0351	0.0462	0.0100	0.0296	0.0503	0.0068	0.0278	0.0159	0.0114	0.0137	0.0198	0.0075
F3	0.0470	0.0141	0.1030	0.1141	0.0336	0.0859	0.0889	0.0117	0.0510	0.0228	0.0144	0.0238	0.0211	0.0134
F4d	0.0089	0.0096	0.0145	0.0311	0.0616	0.1004	0.0462	0.0056	0.0161	0.0040	0.0086	0.0016	0.0208	0.0056
F4s	0.0221	0.0046	0.0416	0.0278	0.0367	0.0831	0.0089	0.0103	0.0232	0.0246	0.0022	0.0197	0.0173	0.0078
F4v	0.0256	0.0480	0.0733	0.0798	0.0211	0.0528	0.0930	0.0107	0.0070	0.0004	0.0209	0.0026	0.0122	0.0046
F5d	0.0000	0.0119	0.0458	0.0378	0.0822	0.0742	0.1073	0.0160	0.0602	0.0116	0.0077	0.0403	0.0097	0.0063
F5s	0.0662	0.0061	0.0712	0.0194	0.1141	0.0831	0.1219	0.0091	0.0595	0.0216	0.0147	0.0388	0.0186	0.0078
F5v	0.0245	0.0168	0.0405	0.0670	0.1099	0.0670	0.1276	0.0322	0.0660	0.0114	0.0057	0.0482	0.0161	0.0027
F6	0.0372	0.0286	0.1092	0.0463	0.0242	0.0625	0.1099	0.0159	0.0766	0.0311	0.0148	0.0484	0.0300	0.0134
F7d	0.0250	0.0290	0.0923	0.0435	0.0417	0.0744	0.0664	0.0136	0.0531	0.0235	0.0130	0.0185	0.0235	0.0136
F7i	0.0290	0.0189	0.0689	0.0204	0.0456	0.0732	0.0700	0.0103	0.0557	0.0224	0.0098	0.0258	0.0253	0.0100
F7s	0.0181	0.0218	0.0829	0.0184	0.0649	0.0425	0.0815	0.0092	0.0514	0.0247	0.0158	0.0258	0.0215	0.0106
P46d	0.0215	0.0060	0.0785	0.0864	0.0308	0.0515	0.1003	0.0139	0.0044	0.0191	0.0098	0.0245	0.0082	0.0095
P46dr	0.0156	0.0039	0.0937	0.0772	0.0262	0.0722	0.0845	0.0156	0.0223	0.0192	0.0042	0.0092	0.0078	0.0109
P46v	0.0276	0.0149	0.0580	0.1028	0.0171	0.0459	0.0826	0.0127	0.0127	0.0196	0.0221	0.0326	0.0102	0.0091
P46vr	0.0089	0.0102	0.0227	0.0856	0.0357	0.0595	0.0111	0.0105	0.0172	0.0230	0.0141	0.0174	0.0114	0.0080
1	0.0166	0.0210	0.0278	0.0228	0.0314	0.0108	0.0188	0.0089	0.0190	0.0088	0.0060	0.0058	0.0099	0.0038
2	0.0066	0.0197	0.0158	0.0387	0.0541	0.0697	0.0260	0.0110	0.0222	0.0123	0.0067	0.0173	0.0102	0.0013
3al	0.0156	0.0135	0.0019	0.0345	0.0383	0.0000	0.0567	0.0146	0.0239	0.0029	0.0131	0.0214	0.0056	0.0004
3am	0.0133	0.0097	0.0172	0.0273	0.0246	0.0487	0.0392	0.0099	0.0099	0.0057	0.0085	0.0103	0.0109	0.0010
3bl	0.0108	0.0061	0.0290	0.0502	0.0360	0.0168	0.0401	0.0160	0.0159	0.0080	0.0013	0.0052	0.0111	0.0002
3bm	0.0109	0.0095	0.0265	0.0345	0.0258	0.0174	0.0382	0.0093	0.0080	0.0030	0.0128	0.0100	0.0122	0.0009
AIP	0.0214	0.0274	0.0220	0.0719	0.0801	0.0688	0.0513	0.0124	0.0276	0.0138	0.0164	0.0065	0.0231	0.0011
DP	0.0318	0.0106	0.0445	0.0623	0.0530	0.0278	0.0318	0.0127	0.0223	0.0087	0.0106	0.0117	0.0244	0.0021
LIPd	0.0241	0.0197	0.0764	0.0581	0.1122	0.1089	0.0771	0.0168	0.0384	0.0069	0.0095	0.0190	0.0307	0.0015
LIPv	0.0161	0.0088	0.0767	0.0577	0.0961	0.0534	0.0556	0.0153	0.0373	0.0095	0.0095	0.0062	0.0259	0.0011
LOP	0.0223	0.0216	0.0548	0.0607	0.0841	0.0724	0.0274	0.0132	0.0398	0.0194	0.0091	0.0238	0.0274	0.0022
MIPd	0.0174	0.0247	0.0508	0.0446	0.0823	0.0318	0.0266	0.0109	0.0228	0.0114	0.0136	0.0215	0.0201	0.0016
MIPv	0.0177	0.0158	0.0659	0.0493	0.0705	0.0498	0.0283	0.0103	0.0259	0.0073	0.0122	0.0169	0.0158	0.0016
Opt	0.0296	0.0373	0.0672	0.0782	0.1176	0.1165	0.0500	0.0179	0.0256	0.0128	0.0095	0.0157	0.0351	0.0037
PEc	0.0139	0.0174	0.0168	0.0312	0.0853	0.0168	0.0348	0.0130	0.0280	0.0062	0.0155	0.0269	0.0177	0.0033

PEci	0.0157	0.0244	0.0455	0.0796	0.1061	0.0260	0.0298	0.0143	0.0460	0.0089	0.0181	0.0149	0.0133	0.0005
PEipe	0.0033	0.0220	0.0637	0.0624	0.0704	0.0281	0.0248	0.0136	0.0205	0.0077	0.0154	0.0107	0.0217	0.0015
PEipi	0.0167	0.0307	0.0374	0.0541	0.0895	0.0360	0.0213	0.0126	0.0290	0.0117	0.0167	0.0091	0.0175	0.0015
PEI	0.0141	0.0329	0.0386	0.0484	0.1152	0.0660	0.0457	0.0139	0.0353	0.0155	0.0139	0.0155	0.0207	0.0038
PEIa	0.0226	0.0196	0.0369	0.0497	0.0773	0.0839	0.0374	0.0157	0.0258	0.0077	0.0165	0.0104	0.0183	0.0021
PF	0.0071	0.0197	0.0195	0.0905	0.0695	0.0002	0.0308	0.0113	0.0246	0.0158	0.0182	0.0071	0.0170	0.0017
PFG	0.0146	0.0417	0.0515	0.1169	0.0837	0.0479	0.0556	0.0230	0.0428	0.0212	0.0172	0.0106	0.0278	0.0026
PFop	0.0278	0.0445	0.0530	0.0730	0.1086	0.0200	0.0232	0.0147	0.0370	0.0196	0.0209	0.0128	0.0203	0.0013
PG	0.0249	0.0351	0.0804	0.0910	0.1334	0.0566	0.0365	0.0183	0.0486	0.0168	0.0139	0.0117	0.0274	0.0015
PGm	0.0281	0.0172	0.0359	0.0512	0.0668	0.0029	0.0461	0.0110	0.0231	0.0075	0.0067	0.0281	0.0217	0.0032
PGop	0.0183	0.0292	0.1049	0.0651	0.1714	0.0859	0.0413	0.0132	0.0453	0.0197	0.0135	0.0150	0.0285	0.0022
PIP	0.0204	0.0211	0.0412	0.0565	0.1054	0.0433	0.0464	0.0146	0.0360	0.0225	0.0094	0.0191	0.0260	0.0028
PPt	0.0305	0.0187	0.0793	0.0704	0.1130	0.0362	0.0305	0.0060	0.0279	0.0095	0.0114	0.0225	0.0213	0.0019
TSA	0.0123	0.0251	0.0394	0.0433	0.0455	0.0128	0.0295	0.0118	0.0175	0.0047	0.0049	0.0155	0.0148	0.0012
V6AdI	0.0204	0.0255	0.0288	0.0538	0.0872	0.0057	0.0190	0.0122	0.0245	0.0109	0.0101	0.0114	0.0190	0.0022
V6Adm	0.0324	0.0181	0.0229	0.0686	0.0605	0.0135	0.0186	0.0108	0.0235	0.0086	0.0097	0.0165	0.0224	0.0030
V6AvI	0.0160	0.0049	0.0154	0.0547	0.0771	0.0363	0.0160	0.0100	0.0252	0.0076	0.0057	0.0106	0.0149	0.0011
V6Avm	0.0156	0.0201	0.0480	0.0930	0.0761	0.0000	0.0045	0.0167	0.0318	0.0159	0.0125	0.0085	0.0201	0.0011
V6I	0.0075	0.0060	0.0243	0.0492	0.0801	0.0000	0.0137	0.0092	0.0204	0.0101	0.0065	0.0088	0.0155	0.0013
V6m	0.0119	0.0124	0.0182	0.0421	0.0549	0.0138	0.0146	0.0094	0.0184	0.0099	0.0030	0.0078	0.0123	0.0007
VIP	0.0148	0.0325	0.0583	0.0503	0.1095	0.0168	0.0238	0.0151	0.0306	0.0161	0.0161	0.0071	0.0197	0.0019
V1	0.0045	0.0038	0.0131	0.0399	0.0345	0.0253	0.0186	0.0066	0.0148	0.0067	0.0034	0.0019	0.0094	0.0004
V2d	0.0094	0.0040	0.0153	0.0504	0.0182	0.0162	0.0335	0.0064	0.0119	0.0071	0.0017	0.0029	0.0116	0.0006
V2v	0.0032	0.0039	0.0061	0.0297	0.0236	0.0136	0.0031	0.0062	0.0077	0.0061	0.0051	0.0035	0.0088	0.0006
V3A	0.0050	0.0082	0.0050	0.0441	0.0452	0.0007	0.0193	0.0038	0.0159	0.0098	0.0075	0.0072	0.0115	0.0017
V3d	0.0079	0.0066	0.0141	0.0654	0.0442	0.0039	0.0159	0.0103	0.0120	0.0072	0.0045	0.0058	0.0124	0.0009
V3v	0.0052	0.0461	0.0477	0.0891	0.0078	0.0339	0.0515	0.0063	0.0094	0.0101	0.0052	0.0069	0.0132	0.0033
V4dl	0.0122	0.0164	0.0129	0.0438	0.0319	0.0270	0.0136	0.0066	0.0111	0.0051	0.0048	0.0048	0.0125	0.0008
V4dm	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
V4v	0.0090	0.0441	0.0395	0.0955	0.0284	0.0411	0.0658	0.0085	0.0069	0.0108	0.0111	0.0066	0.0142	0.0029
23c	0.0079	0.0056	0.0056	0.0211	0.0150	0.0023	0.0214	0.0043	0.0232	0.0135	0.0122	0.0112	0.0025	0.0041
23d	0.0236	0.0132	0.0262	0.0381	0.0158	0.0356	0.0000	0.0066	0.0132	0.0216	0.0015	0.0267	0.0071	0.0041
24ab	0.0282	0.0055	0.0737	0.0416	0.1105	0.0621	0.0582	0.0092	0.0321	0.0008	0.0084	0.0163	0.0161	0.0087

24c	0.0059	0.0072	0.0201	0.0196	0.0625	0.0617	0.0490	0.0008	0.0116	0.0052	0.0093	0.0181	0.0067	0.0101
24d	0.0387	0.0247	0.0401	0.0374	0.0470	0.1478	0.1040	0.0157	0.0133	0.0194	0.0234	0.0300	0.0141	0.0037
25	0.0132	0.0061	0.0684	0.0028	0.0632	0.0419	0.0188	0.0110	0.0207	0.0006	0.0094	0.0215	0.0234	0.0099
29/30	0.0067	0.0097	0.0293	0.0627	0.0265	0.0516	0.0146	0.0047	0.0139	0.0084	0.0146	0.0094	0.0161	0.0027
31	0.0073	0.0163	0.0087	0.0016	0.0138	0.0165	0.0304	0.0062	0.0217	0.0041	0.0035	0.0149	0.0155	0.0033
a24'ab	0.0262	0.0003	0.0480	0.0579	0.0528	0.0020	0.0457	0.0015	0.0130	0.0015	0.0061	0.0109	0.0084	0.0145
a24'c	0.0489	0.0408	0.1078	0.0628	0.0528	0.0944	0.0986	0.0151	0.0631	0.0257	0.0262	0.0740	0.0159	0.0145
d23ab	0.0255	0.0112	0.0435	0.0644	0.0512	0.0104	0.0311	0.0074	0.0196	0.0041	0.0120	0.0209	0.0171	0.0043
p24'ab	0.0231	0.0201	0.0483	0.0267	0.0361	0.0386	0.0013	0.0025	0.0267	0.0076	0.0086	0.0043	0.0150	0.0020
p32	0.0230	0.0134	0.0398	0.0298	0.0480	0.0017	0.0372	0.0080	0.0091	0.0028	0.0091	0.0318	0.0318	0.0074
s32	0.0193	0.0111	0.0142	0.0350	0.0486	0.0088	0.0347	0.0031	0.0230	0.0310	0.0040	0.0094	0.0151	0.0034
v23ab	0.0079	0.0114	0.0099	0.0459	0.0402	0.0582	0.0049	0.0037	0.0154	0.0029	0.0068	0.0110	0.0183	0.0023
MT	0.0058	0.0969	0.0601	0.0251	0.0267	0.0148	0.0383	0.0091	0.0041	0.0121	0.0086	0.0133	0.0121	0.0022

N/A: Note that due to artifacts of sectioning, receptor values were only available for one brain for areas V4dm, 13l and 13m, which prevented estimates of standard deviation.

Supplementary Table 3. Overlap of regions of the Julich Macaque Brain Atlas with the 7 cognitive networks of Yeo, Krienen et al in the macaque cortex. Overlap is expressed as a fraction.

	Visual	SomMot	DorsAtt	Salience	Limbic	FPN	Default
10d	0	0	0	0	0.34	0	0.66
10md	0	0	0	0	0	0	1
10mv	0	0	0	0	0.11	0	0.89
10o	0	0	0	0	0.28	0	0.72
11l	0	0	0	0	0.83	0.17	0
11m	0	0	0	0	0.9	0	0.1
12l	0	0	0	0	0	0	1
12m	0	0	0	0.05	0	0.7	0.25
12o	0	0	0	0.02	0.24	0.03	0.7
12r	0	0	0	0	0.26	0.14	0.6
13b	0	0	0	0	0.99	0	0.01
13l	0	0	0	0	1	0	0
13m	0	0	0	0	1	0	0
14r	0	0	0	0	0.78	0	0.22
44	0	0	0.45	0	0	0.34	0.21
45A	0	0	0	0	0	0.25	0.75
45B	0	0	0	0	0	0.62	0.38
4a	0	0.87	0.1	0.03	0	0	0
4m	0	1	0	0	0	0	0
4p	0	0.99	0	0.01	0	0	0
8Ad	0	0	0	0.27	0	0.72	0.01
8Av	0	0	0.01	0	0	0.98	0.01
8Bd	0	0	0	0	0	0	1
8Bm	0	0	0	0	0	0	1
8Bs	0	0	0	0.25	0	0.35	0.4
9d	0	0	0	0.14	0	0.08	0.78
9m	0	0	0	0	0	0	1
a46d	0	0	0	0	0	0.53	0.47
a46dr	0	0	0	0	0.05	0.27	0.67
a46v	0	0	0	0	0	0.79	0.21
a46vr	0	0	0	0	0.07	0.25	0.68
F2d	0	0.21	0.48	0.07	0	0.24	0
F2v	0	0.02	0.5	0	0	0.18	0.3
F3	0	0.3	0	0.42	0	0.06	0.22
F4d	0	0.36	0.63	0.02	0	0	0
F4s	0	0	0.68	0	0	0.32	0
F4v	0	0.1	0	0.9	0	0	0
F5d	0	0	0	0.67	0	0.22	0.12
F5s	0	0	0.44	0.12	0	0.13	0.31
F5v	0	0	0	0.35	0	0.08	0.57
F6	0	0	0	0	0	0.23	0.77
F7d	0	0	0	0	0	0.18	0.82
F7i	0	0	0	0	0	0.11	0.89
F7s	0	0	0	0	0	0.08	0.92
p46d	0	0	0	0	0	1	0
p46dr	0	0	0	0.58	0	0.42	0
p46v	0	0	0	0	0	1	0
p46vr	0	0	0	0	0	0.67	0.33
1	0	0.92	0	0.08	0	0	0
2	0	0.98	0	0.02	0	0	0
3al	0	0.81	0	0.17	0	0.01	0.02
3am	0	1	0	0	0	0	0
3bl	0	0.93	0	0.06	0	0	0
3bm	0	1	0	0	0	0	0
AIP	0	0.05	0.95	0	0	0	0
DP	0.42	0	0.55	0	0	0.03	0

LIPd	0	0	0.82	0	0	0.18	0
LIPv	0	0	1	0	0	0	0
LOP	0	0	1	0	0	0	0
MIPd	0	0.47	0.53	0	0	0	0
MIPv	0	0.06	0.94	0	0	0	0
Opt	0	0	0.29	0	0	0.71	0
PEc	0	0.31	0.69	0	0	0	0
PEci	0	1	0	0	0	0	0
PEipe	0	0.79	0.21	0	0	0	0
PEipi	0	0.08	0.92	0	0	0	0
PEI	0	0.92	0.08	0	0	0	0
PEIa	0	1	0	0	0	0	0
PF	0	0.23	0.43	0.34	0	0	0
PFg	0	0	1	0	0	0	0
PFop	0	0.36	0.06	0.58	0	0	0
PG	0	0	0.75	0	0	0.25	0
PGm	0	0	0.3	0.5	0	0.02	0.18
PGop	0	0	0.65	0.31	0	0.04	0
PIP	0.02	0	0.98	0	0	0	0
PPt	0	0	0.02	0	0	0.98	0
TSA	0	1	0	0	0	0	0
V6Adl	0	0	1	0	0	0	0
V6Adm	0	0	0.31	0	0	0.4	0.29
V6Avl	0	0	0.95	0	0	0.05	0
V6Avm	0.01	0	0.01	0	0	0.53	0.45
V6I	0.57	0	0.43	0	0	0	0
V6m	0.72	0	0.04	0	0	0.23	0
VIP	0	0.02	0.98	0	0	0	0
V1	1	0	0	0	0	0	0
V2d	0.92	0	0	0	0	0	0.08
V2v	0.99	0	0	0	0	0	0
V3A	0.95	0	0.05	0	0	0	0
V3d	0.92	0	0.08	0	0	0	0
V3v	1	0	0	0	0	0	0
V4dl	0.96	0	0.04	0	0	0	0
V4dm	0.24	0	0.76	0	0	0	0
V4v	0.92	0	0	0	0	0	0.06
23c	0	0.96	0	0.04	0	0	0
23d	0	0.33	0	0.55	0	0.06	0.06
24ab	0	0	0	0	0	0	1
24c	0	0	0	0	0	0	1
24d	0	0.26	0	0.68	0	0.06	0
25	0	0	0	0	0.74	0	0.26
29/30	0	0	0	0.02	0	0	0.5
31	0	0.63	0.04	0.33	0	0	0
a24ab	0	0	0	0.29	0	0.17	0.54
a24c	0	0	0	0.06	0	0.38	0.56
d23ab	0	0	0	0.51	0	0.02	0.48
p24ab	0	0.01	0	0.94	0	0.06	0
p32	0	0	0	0	0	0	1
s32	0	0	0	0	0.08	0	0.92
v23ab	0	0	0	0	0	0	0.96
MT	0.07	0.09	0.21	0.11	0	0.09	0.44

Supplementary Table 4: Incubation protocols.

Transmitter	Receptor	Ligand (nM)	K _D (nM)	Displacer	Incubation buffer	Pre-incubation	Main incubation	Final rinsing
Glutamate	AMPA	[³ H] AMPA (10.0)	10	Quisqualate (10 μM)	50 mM Tris-acetate (pH 7.2) + 100 mM KSCN*	3x10 min, 4°C	45 min, 4°C	1) 4x4 sec 2) Acetone/glutaraldehyde (100 ml + 2,5 ml), 2x2 sec.
	NMDA	[³ H] MK801 (3.3)	5	(+)MK-801 (100 μM)	50 mM Tris-acetate (pH 7.2) + 50 μM glutmate + 30 μM glycine* + 50 μM spermidine*	15 min, 4°C	60 min, 22°C	1) 2x5 min, 4°C 2) Distilled water, 1x22°C
	Kainate	[³ H] Kainate (9.4)	12	SYM 2081 (100 μM)	50 mM Tris-acetate (pH 7.2) + 10 mM Ca ²⁺ -acetate*	3x10 min, 4°C	45 min, 4°C	1) 3x4 sec 2) Acetone/glutaraldehyde (100 ml + 2,5 ml), 2x2 sec. 22°C
GABA	GABA _A	[³ H] Muscimol (7.7)	6	GABA (10 μM)	50 mM Tris-citrate (pH 7.0)	3x5 min, 4°C	40 min, 4°C	1) 3x3 sec, 4°C 2) Distilled water, 1x22°C
	GABA _B	[³ H] CGP 54626 (2.0)	1.48	CGP 55845 (100 μM)	50 mM Tris-HCl (pH 7.2) + 2.5 mM CaCl ₂	3x5 min, 4°C	60 min, 4°C	1) 3x2 sec, 4°C 2) Distilled water, 1x22°C
	BZ	[³ H] Flumazenil (1.0)	2	Clonazepam (2 μM)	170 mM Tris-HCl (pH 7.4)	15 min, 4°C	60 min, 4°C	1) 2x1 min, 4°C 2) Distilled water, 1x22°C
Acetylcholine	M ₁	[³ H] Pirenzepine (1.0)	3	Pirenzepine (2 μM)	Modified Krebs buffer (pH 7.4)	15 min, 4°C	60 min, 4°C	1) 2x1 min, 4°C 2) Distilled water, 1x22°C
	M ₂	[³ H] Oxotremorine-M (1.7)	0.8	Carbacol (10 μM)	20 mM HEPES-Tris (pH 7.5) + 10 mM MgCl ₂ + 300 nM Pirenzepine	20 min, 22°C	60 min, 22°C	1) 2x2 min, 4°C 2) Distilled water, 1x22°C
	M ₃	[³ H] 4-DAMP (1.0)	0.2	Atropine sulfate (10 μM)	50 mM Tris-HCl (pH 7.4) + 0.1 mM PSMF + 1mM EDTA	15 min, 22° C	45 min, 22° C	1) 2x5 min, 4° C 2) distilled water, 1x22°C
Noradrenaline	α ₁	[³ H]-Prazosin (0.2)	0.2	Phentolamine Mesylate (10 μM)	50 mM Na/K-phosphate buffer (pH 7.4)	15 min, 22°C	60 min, 22°C	1) 2x5 min, 4°C 2) Distilled water, 1x22°C
	α ₂	[³ H] UK 14,304 (0,64)	1.4	Phentolamine Mesylate (10 μM)	50 mM Tris-HCl (pH 7.7) + 100 μM MnCl ₂	15 min, 22°C	90 min, 22°C	1) 5 min, 4°C 2) Distilled water, 1x22°C
Serotonin	5-HT _{1A}	[³ H] 8-OH-DPAT (1.0)	2	5-Hydroxy-tryptamine (1 μM)	170 mM Tris-HCl (pH 7.4) + 4 mM CaCl ₂ * + 0.01% ascorbate*	30 min, 22°C	60 min, 22°C	1) 5 min, 4°C 2) Distilled water, 3x22°C
	5-HT _{2A}	[³ H] Ketanserin (1.14)	0.5	Mianserin (10 μM)	170 mM Tris-HCl (pH 7.7)	30 min, 22°C	120 min, 22°C	1) 2x10 min, 4°C 2) Distilled water, 3x22°C

Dopamine	D ₁	[³ H] SCH 23390 (1.67)	0.14	SKF 83566 (1 μM)	50 mM Tris-HCl (pH 7.4) + 120 mM NaCl + 5 mM KCl + 2 mM CaCl ₂ + 1 mM MgCl ₂	20 min, 22°C	90 min, 22°C	1) 2x20 min, 4°C 2) Distilled water, 1x22°C
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* Compound only included in buffer solution for the in the main incubation. Note, that although 4-DAMP is classified as a selective M₃ receptor antagonist, it shows a comparable affinity to the M₄ receptor and a slightly lower affinity for the M₁ and M₅ subtypes^{1,2}. On a similar note, the quinazoline derivative ketanserin is considered a *preferential* 5-HT_{2A} antagonist, because it also has a weak antagonistic effect on the noradrenergic α₁ receptor and the histamine H₁ receptor³. Finally, SCH-23390 is classified as a highly selective D₁ receptor antagonist, although it also binds to the D₅ receptor, albeit with a considerably lower affinity⁴.

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