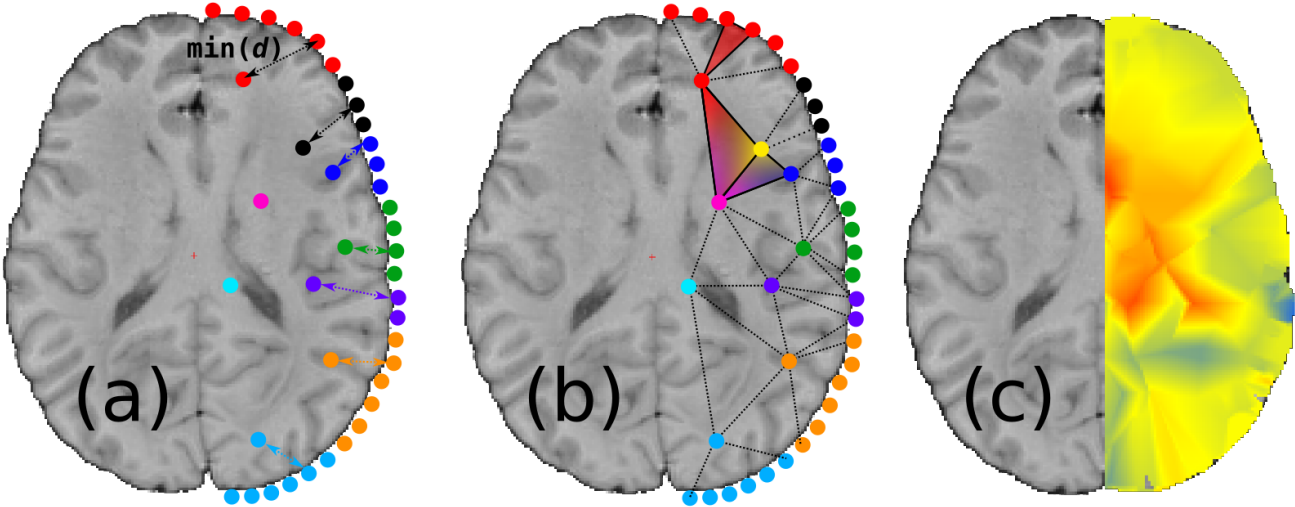
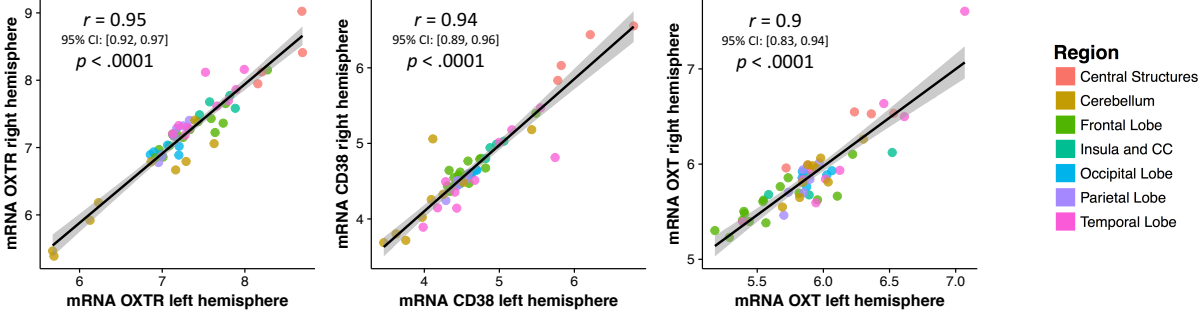


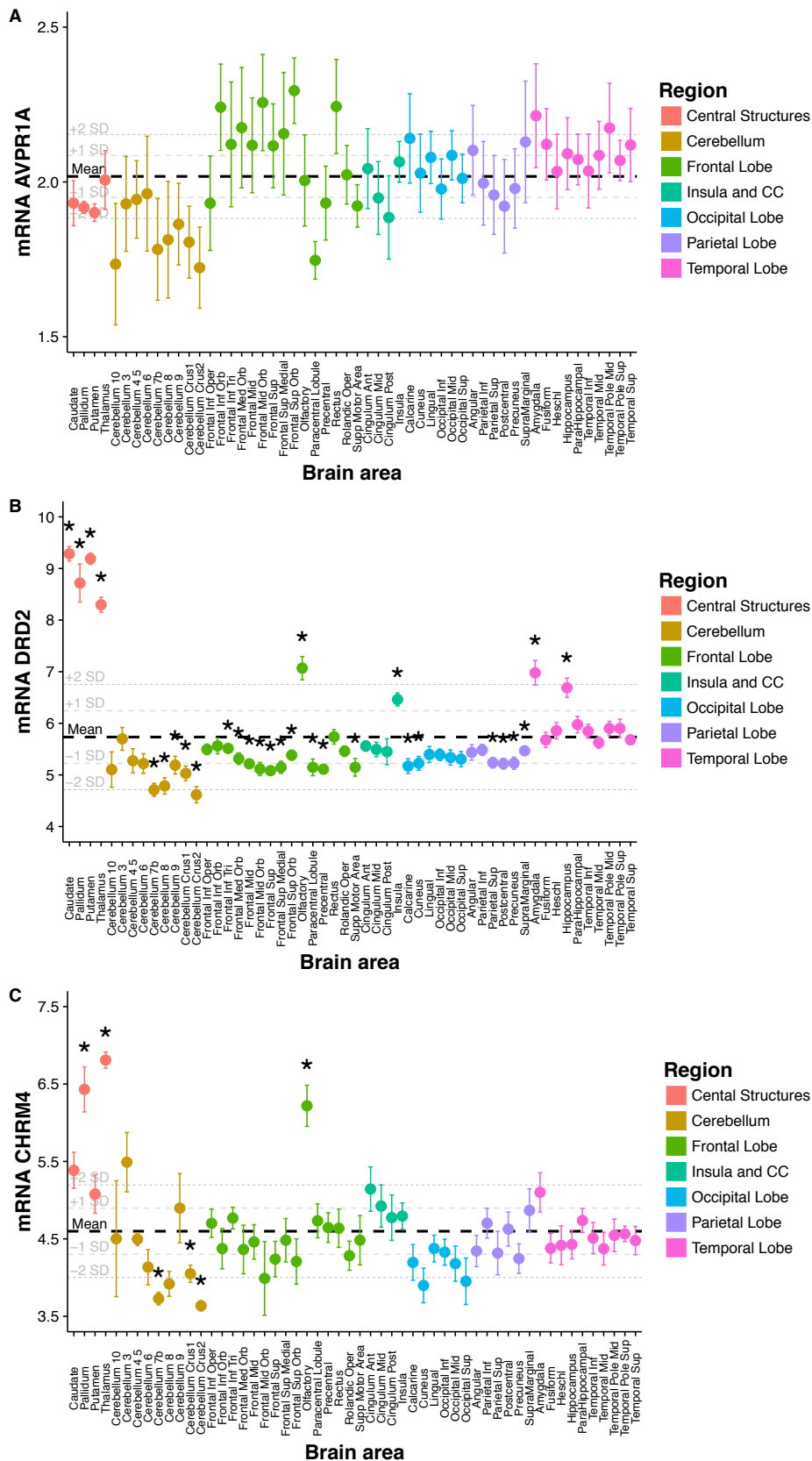
Supplementary Figure S1. Creation of expression maps, labeling brain boundary (a) dividing the space into simplices (triangles in two-dimensional cases), note that not all possible triangles are marked in the image (b) linearly interpolating within each simplex (c)



Supplementary Figure S2. The correlation between left and right hemisphere mRNA expression for OXTR (a), CD38 (b), and OXT (c). A line of best fit with 95% confidence region was overlaid on the scatterplots to illustrate data trends.



Supplementary Figure S3. The expression of central gene expression for AVPR1A (A), DRD2 (B), and CHRM4 (C). Means and standard errors are presented. * > 0.05 (FDR corrected).



Supplementary Table S1. Detailed donor profiles

ID	Ethnicity	Gender	Age	Post-mortem interval (hours)	Number of brain samples	Hemisphere
1	Caucasian	Male	57	25.5	363	Left
2	Caucasian	Male	31	17.5	529	Left
3	Hispanic	Female	49	30.0	470	Left
4	Caucasian	Male	55	18.0	501	Left
5	African American	Male	24	25.0	946	Both
6	African American	Male	39	18.0	946	Both

Supplementary Table S2. Expression values (mean and standard deviation) for each probe.

Probes with the least amount of spatial variability (mean/standard deviation), are highlighted in bold.

Gene	Probe	Mean	SD	Mean/SD
AVPR1A	A_23_P25246	2.09	0.70	2.96
AVPR1A	CUST_102_P1416408490	2.00	0.50	3.98
AVPR1A	CUST_12833_P1416261804	2.01	0.45	4.44
CD38	CUST_14657_P1416261804	4.45	0.76	5.85
CD38	A_23_P167328	4.80	1.13	4.25
CHRM4	A_23_P104845	2.03	0.51	3.99
CHRM4	CUST_163_P1416408490	2.01	0.44	4.60
CHRM4	CUST_10874_P1416261804	4.99	0.90	5.52
DRD2	CUST_240_P1416408490	5.80	0.65	8.91
DRD2	CUST_1807_P1417557136	1.66	0.49	3.35
DRD2	CUST_16111_P1416261804	2.43	0.53	4.56
DRD2	A_24_P283834	4.84	0.62	7.79
OXT	CUST_15240_P1416261804	5.58	0.79	7.09
OXT	CUST_497_P1416408490	3.57	0.77	4.63
OXT	A_24_P382579	4.80	1.13	4.25
OXTR	A_24_P337104	3.01	0.64	4.68
OXTR	A_23_P132619	7.20	0.53	13.55

Supplementary Table 3. Cognitive correlates of oxytocin signaling pathway genes

	OXTR			CD38			OXT		
	Gene	Probe	<i>r</i>	Gene	Probe	<i>r</i>	Gene	Probe	<i>r</i>
Top 10 positive	LUZP2	<i>CUST_11002_P1416261804</i>	0.804	CD38	<i>A_23_P167328</i>	0.891	OXT	<i>A_24_P382579</i>	0.866
	NTSR2	<i>A_23_P315212</i>	0.797	NTSR2	<i>A_23_P315212</i>	0.837	OXT	<i>CUST_497_P1416408490</i>	0.778
	THBS4	<i>A_24_P260443</i>	0.794	LIX1 (Probe 1)	<i>A_24_P226241</i>	0.830	AVP	<i>A_23_P109133</i>	0.773
	GLUD2	<i>CUST_287_P1416408490</i>	0.793	SLC14A1	<i>A_23_P55616</i>	0.829	AVP	<i>CUST_16470_P1416261804</i>	0.765
	GLUD1	<i>A_23_P138665</i>	0.782	PSAT1	<i>CUST_8157_P1416261804</i>	0.806	SIM1	<i>A_23_P214743</i>	0.513
	HEYL	<i>A_23_P430658</i>	0.776	C12orf39	<i>CUST_15484_P1416261804</i>	0.806	OTP	<i>A_23_P84230</i>	0.482
	LUZP2	<i>A_24_P649282</i>	0.752	AQP4	<i>A_24_P202522</i>	0.804	FEZF1	<i>CUST_1423_P1416379584</i>	0.467
	ZC3HAV1	<i>A_23_P425224</i>	0.748	GLUD1	<i>A_23_P138665</i>	0.799	TMEM114	<i>A_24_P728604</i>	0.444
	A_32_P232413	<i>A_32_P232413</i>	0.741	LIX1 (Probe 2)	<i>A_32_P116606</i>	0.798	ECEL1	<i>CUST_5650_P1416261804</i>	0.442
	ISOC1	<i>A_23_P250982</i>	0.738	RARRES3	<i>A_23_P1962</i>	0.796	<i>CUST_1286_P1416379584</i>	<i>CUST_1286_P1416379584</i>	0.433
Top 10 negative	RTN4R	<i>A_23_P132175</i>	0.632	ATP4A	<i>A_23_P430728</i>	0.689	<i>A_24_P554040</i>	<i>A_32_P171571</i>	0.323
	PAK7	<i>CUST_7963_P1416261804</i>	0.634	KCNJ3	<i>CUST_388_P1416408490</i>	0.697	ITPKA	<i>CUST_9080_P1416261804</i>	0.323
	SLC6A7	<i>CUST_1075_P1416261804</i>	0.640	MICAL2	<i>A_23_P13442</i>	0.698	KCNK1	<i>A_23_P126075</i>	0.324
	KIAA1456	<i>A_24_P59643</i>	0.641	MICAL2	<i>A_23_P24843</i>	0.705	GPR22	<i>A_23_P20172</i>	0.324
	KCNJ3	<i>CUST_388_P1416408490</i>	0.646	NEUROD1	<i>CUST_14143_P1416261804</i>	0.708	CAMKK2	<i>A_32_P210390</i>	0.330
	CAMKK2	<i>A_23_P408830</i>	0.651	ZNF238	<i>A_24_P299663</i>	0.710	CA7	<i>A_23_P106656</i>	0.333
	CHRD	<i>A_23_P502047</i>	0.659	<i>A_32_P203232</i>	<i>A_32_P203232</i>	0.718	ZNF385B	<i>A_32_P196438</i>	0.335
	<i>A_32_P98423</i>	<i>A_32_P98423</i>	0.663	NEUROD1	<i>A_23_P209484</i>	0.718	CAMKK2	<i>A_23_P408830</i>	0.344
	ZNF238	<i>A_24_P299663</i>	0.668	<i>A_32_P85131</i>	<i>A_32_P85131</i>	0.720	ADCY1	<i>A_24_P577694</i>	0.351
	GABRD	<i>A_23_P309720</i>	0.679	CHRD	<i>A_23_P502047</i>	0.727	GABRD	<i>A_23_P309720</i>	0.351

Note: Some genes had more than one probe feature in top 10 positive of negative correlations (e.g., OXT).

Supplementary Table 4. Cognitive correlates of oxytocin signaling pathway mRNA

Keyword	mRNA		
	OXTR	CD38	OXT
Reward	0.349	0.319	0.246
Monetary	0.277	0.261	0.234
Anticipation	0.257	0.253	0.193
Motivation	0.236	0.205	0.249
Incentive	0.234	0.214	0.186
Dopaminergic	0.192	0.218	0.205
Losses	0.158	0.152	0.092
Pain	0.11	0.15	0.091
Punishment	0.151	0.144	0.158
Unpleasant	0.136	0.079	0.229
Seeking	0.121	0.125	0.083
Sexual	0.137	0.109	0.258
Fearful	0.121	0.068	0.257
Neutral	0.108	0.058	0.25
Facial	0.104	0.027	0.232

Note. Top 5 topic correlations for OXTR, CD38, and OXT brain mRNA maps submitted to NeuroSynth. Values represent Pearson's *r*.