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Corresponding Author:	Scott Soderling	# Main Figures:	6
Manuscript Number:	NN-A49048	# Supplementary Figures:	10
Manuscript Type:	Article	# Supplementary Tables:	1
		# Supplementary Videos:	1

Reporting Checklist for Nature Neuroscience

This checklist is used to ensure good reporting standards and to improve the reproducibility of published results. For more information, please read Reporting Life Sciences Research.

Please note that in the event of publication, it is mandatory that authors include all relevant methodological and statistical information in the manuscript.

Statistics reporting, by figure

- Please specify the following information for each panel reporting quantitative data, and where each item is reported (section, e.g. Results, & paragraph number).
- Each figure legend should ideally contain an exact sample size (n) for each experimental group/condition, where n is an exact number and not a range, a clear definition of how n is defined (for example x cells from x slices from x animals from x litters, collected over x days), a description of the statistical test used, the results of the tests, any descriptive statistics and clearly defined error bars if applicable.
- For any experiments using custom statistics, please indicate the test used and stats obtained for each experiment.
- Each figure legend should include a statement of how many times the experiment shown was replicated in the lab; the details of sample collection should be sufficiently clear so that the replicability of the experiment is obvious to the reader.
- For experiments reported in the text but not in the figures, please use the paragraph number instead of the figure number.

Note: Mean and standard deviation are not appropriate on small samples, and plotting independent data points is usually more informative. When technical replicates are reported, error and significance measures reflect the experimental variability and not the variability of the biological process; it is misleading not to state this clearly.

		TEST USED		n			DESCRIPTIVE STATS (AVERAGE, VARIANCE)		P VALUE		DEGREES OF FREEDOM & F/t/z/R/ETC VALUE	
	FIGURE NUMBER	WHICH TEST?	SECTION & PARAGRAPH #	EXACT VALUE	DEFINED?	SECTION & PARAGRAPH #	REPORTED?	SECTION & PARAGRAPH #	EXACT VALUE	SECTION & PARAGRAPH #	VALUE	SECTION & PARAGRAPH #
example	1a	one-way ANOVA	Fig. legend	9, 9, 10, 15	mice from at least 3 litters/group	Methods para 8	error bars are mean +/- SEM	Fig. legend	p = 0.044	Fig. legend	F(3, 36) = 2.97	Fig. legend
example	results, para 6	unpaired t-test	Results para 6	15	slices from 10 mice	Results para 6	error bars are mean +/- SEM	Results para 6	p = 0.0006	Results para 6	t(28) = 2.808	Results para 6

		TEST USED		n			DESCRIPTIVE STATS (AVERAGE, VARIANCE)		P VALUE		DEGREES OF FREEDOM & F/t/z/R/ETC VALUE	
	FIGURE NUMBER	WHICH TEST?	SECTION & PARAGRAPH #	EXACT VALUE	DEFINED?	SECTION & PARAGRAPH #	REPORTED?	SECTION & PARAGRAPH #	EXACT VALUE	SECTION & PARAGRAPH #	VALUE	SECTION & PARAGRAPH #
+ -	1b	two-way ANOVA with repeated measure followed by Bonferroni pair-wise comparison	Figure legend 1	15, 21, 15, 21, 12, 20, 14, 12	Figure legend 1 and Supplementary Table 1	Figure legend 1 and Supplementary Table 1	error bars are mean +/- SEM	Figure legend 1	Posthoc tests for KO. p=0.001(Hour 2;Haloperidol; 0.2mg/kg), p<0.0001 (Hour2; Clozapine). p<0.0001 (Hour 3;Haloperidol; 0.1mg/kg), p<0.0001 (Hour 3;Haloperidol; 0.2mg/kg), and p<0.0001 (Hour3; Clozapine) Vs. Vehicle group.	Figure legend 1 and Supplementary Table 1	There are effects of hours (F(2, 244)=114.212, p<0.0001), hours*genotype (F(2,244)=41.386, p<0.0001), hours*treatment (F(6,244)=7.550, p<0.0001), and hours*genotype *treatment (F(6,244)=6.500, p<0.0001)	Supplementary Table 1
+ -	1c	Independent-t-test	Figure legend 1	6, 7	Figure legend 1 and Supplementary Table 1	Figure legend 1	error bars are mean +/- SEM	Figure legend 1	p=0.023 (DA) p=0.017 (DOPAC) p=0.049 (HVA)	Figure legend 1 and Supplementary Table 1	t(11)=2.637 t(11)=2.780 t(11)=2.212	Supplementary Table 1
+ -	1g	Independent-t-test	Figure legend 1	3, 3	Figure legend 1 and Supplementary Table 1	Figure legend 1	error bars are mean +/- SEM	Figure legend 1	p=0.000343	Figure legend 1 and Supplementary Table 1	t(4)=11.355	Supplementary Table 1
+ -	2d	one-way ANOVA followed by Bonferroni pair-wise comparison	Figure legend 2	18, 11, 15	Figure legend 2 and Supplementary Table 1	Figure legend 2	error bars are mean +/- SEM	Figure legend 2	Posthoc tests. p=0.0001 (between Con and KO-vehicle) P=0.002 (between KO-vehicle and KO-rescue) P=0.001 (between Con and KO-rescue)	Figure legend 2 and Supplementary Table 1	Overall effect: F(2.41)=46.681, P<0.0001	Supplementary Table 1
+ -	2e	one-way ANOVA followed by Bonferroni pair-wise comparison	Figure legend 2	18, 11, 15	Figure legend 2 and Supplementary Table 1	Figure legend 2	error bars are mean +/- SEM	Figure legend 2	Posthoc tests. p=0.0001 (between Con and KO-vehicle) P=0.021 (between KO-vehicle and KO-rescue) P=0.034 (between Con and KO-rescue)	Figure legend 2 and Supplementary Table 1	Overall effect: F(2.41)=15.235, P<0.0001	Supplementary Table 1

+ -	2f	one-way ANOVA followed by Bonferroni pair-wise comparison	Figure legend 2	18, 11, 15	Figure legend 2 and Supplementary Table 1	Figure legend 2	error bars are mean +/- SEM	Figure legend 2	Posthoc tests. p=0.01 (between Con and KO-vehicle) P=0.025 (between KO-vehicle and KO-rescue)	Figure legend 2 and Supplementary Table 1	Overall effect: F(2.41)=8.524, P=0.001	Supplementary Table 1
+ -	2h	one-way ANOVA followed by Bonferroni pair-wise comparison	Figure legend 2	6, 6, 6	Figure legend 2 and Supplementary Table 1	Figure legend 2	error bars are mean +/- SEM	Figure legend 2	Posthoc tests. p=0.006 (between Con and KO-vehicle) p=0.041 (between KO-vehicle and KO-rescue)	Figure legend 2 and Supplementary Table 1	Overall effect: F(2.15)=7.462, P=0.006	Supplementary Table 1
+ -	2i	Independent t-test	Supplementary Table 1	7, 7	Figure legend 2 and Supplementary Table 1	Figure legend 2	error bars are mean +/- SEM	Figure legend 2	P=0.004 (baseline) P=0.0000039 (30min) P=0.0000035 (60min)	Figure legend 2 and Supplementary Table 1	t(12)=3.590 t(12)=7.955 t(12)=8.051	Supplementary Table 1
+ -	4b	Independent t-test	Figure legend 4	70, 75	Figure legend 4 and Supplementary Table 1	Figure legend 4	error bars are mean +/- SEM	Figure legend 4	p<0.00000001 (axo-spinous) p=000006 (axo-dendritic) p=0.00000007 (double axonal)		t(143)=14.239 t(143)=4.702 t(143)=5.703	Supplementary Table 1
+ -	5c	two-way ANOVA followed by Bonferroni pair-wise comparison	Figure legend 5 and Supplementary Table 1	16, 14, 19, 13	Figure legend 5 and Supplementary Table 1	Figure legend 5	error bars are mean +/- SEM	Figure legend 5	Posthoc tests. P<0.0001 between control and rescue within 30DAI group P<0.0001 between 10DAI and 30DAI within control group	Figure legend 5 and Supplementary Table 1	There is overall effect (F(3.58)=36.530; P<0.0001), and are effects of DAI (F(1, 58)=47.095; P<0.0001), treatment (F(1, 58)=30.264; P<0.0001), DAI*treatment interaction (F(1, 58)=17.626; P<0.0001)	Supplementary Table 1
+ -	5f	two-way ANOVA followed by Bonferroni pair-wise comparison	Figure legend 5 and Supplementary Table 1	8, 8, 15, 15	Figure legend 5 and Supplementary Table 1	Figure legend 5	error bars are mean +/- SEM	Figure legend 5	Posthoc tests. Ps<0.0001 between 30DAI-control and others	Figure legend 5 and Supplementary Table 1	There is overall effect (F(3, 43)=16.448; P<0.0001), and are effects of DAI (F(1, 58)=9.766; P=0.003), treatment (F(1, 58)=15.411; P<0.0001), DAI*treatment interaction (F(1, 58)=13.120; P=0.001)	Supplementary Table 1

+ -	5g	two-way ANOVA followed by Bonferroni pair-wise comparison	Figure legend 5 and Supplementary Table 1	8, 8, 15, 15	Figure legend 5 and Supplementary Table 1	Figure legend 5	error bars are mean +/- SEM	Figure legend 5	Posthoc tests. P<0.005 (Vs. 10DAI-control) P<0.001 (Vs. 10DAI-rescue) P<0.0001 (Vs. 30DAI-rescue)	Figure legend 5 and Supplementary Table 1	There is overall effect (F(3.43)=10.534), and are effects of DAI (F(1, 58)=6.416; P=0.015), treatment (F(1, 58)=11.374; P=0.002), DAI*treatment interaction (F(1, 58)=6.838; P=0.012)	Supplementary Table 1
+ -	6d	Independent t-test	Figure legend 6 and Supplementary Table 1	4, 10	Figure legend 6 and Supplementary Table 1	Figure legend 6	error bars are mean +/- SEM	Figure legend 6	P=0.0288	Figure legend 6 and Supplementary Table 1	t(12)=2.483	Supplementary Table 1
+ -	6f	Independent t-test	Figure legend 6 and Supplementary Table 1	7, 7	Figure legend 6 and Supplementary Table 1	Figure legend 6	error bars are mean +/- SEM	Figure legend 6	p=0.0112	Figure legend 6 and Supplementary Table 1	t(12)=2.992	Supplementary Table 1
+ -	6i	Independent t-test	Figure legend 6 and Supplementary Table 1	10, 13	Figure legend 6 and Supplementary Table 1	Figure legend 6	error bars are mean +/- SEM	Figure legend 6	DA: p=0.0196 DOPAC: p=0.0187 HVA: p=0.0213	Figure legend 6 and Supplementary Table 1	DA: t(21)=2.527 DOPAC: t(21)=2.549 HVA: t(21)=2.488	Supplementary Table 1
+ -	Supplementary Figure 1b	two-way ANOVA with repeated measure followed by Bonferroni pair-wise comparison	Supplementary Figure legend 1 and Supplementary Table 1	15, 21, 15, 21, 12, 20, 14, 12	Supplementary Figure legend 1 and Supplementary Table 1	Supplementary Figure legend 1	error bars are mean +/- SEM	Supplementary Figure legend 1	Posthoc tests for KO. p<0.0001(Hour 2;Haloperidol; 0.2mg/kg), p<0.0001 (Hour 2; Clozapine). p=0.003 (Hour 3;Haloperidol; 0.1mg/kg), p<0.0001 (Hour 3;Haloperidol; 0.2mg/kg), and p=0.012 (Hour 3; Clozapine) Vs. Vehicle group.	Supplementary Figure legend 1 and Supplementary Table 1	There are effects of hours (F(2, 244)=63.247, p<0.0001), hours*treatment (F(6,244)=4.541, p<0.001), and hours*genotype *treatment (F(6,244)=2.336, p=0.033). but no hours*genotype effect was found (F(2,244)=0.700, p=0.498	Supplementary Table 1

+ -	Supplementary Figure 1d	two-way ANOVA with repeated measure followed by Bonferroni pair-wise comparison	Supplementary Figure legend 1 and Supplementary Table 1	15, 21, 15, 21, 12, 20, 14, 12	Supplementary Figure legend 1 and Supplementary Table 1	Supplementary Figure legend 1	error bars are mean +/- SEM	Supplementary Figure legend 1	Posthoc tests for KO. p=0.001(Hour 2;Haloperidol; 0.2mg/kg), p=0.002 (Hour 2; Clozapine). p<0.0001 (Hour 3;Haloperidol; 0.1mg/kg), p<0.0001 (Hour 3;Haloperidol; 0.2mg/kg), and p=0.001 (Hour 3; Clozapine) Vs. Vehicle group	Supplementary Figure legend 1 and Supplementary Table 1	There are effects of hours (F(2, 244)=215.571, p<0.0001), hours*genotype (F(2,244)=15.466, p<0.0001), hours*treatment (F(6,244)=12.801, p<0.0001), and hours*genotype *treatment (F(6,244)=4.948, p<0.0001).	Supplementary Table 1
+ -	Supplementary Figure 1e	One-way ANOVA with repeated measure followed by Bonferroni pair-wise comparison	Supplementary Figure legend 1 and Supplementary Table 1	15, 15, 12, 14	Supplementary Figure legend 1 and Supplementary Table 1	Supplementary Figure legend 1	error bars are mean +/- SEM	Supplementary Figure legend 1	Detailed statistical results can be found in Supplementary Table 1	Supplementary Figure legend 1 and Supplementary Table 1	There are effects of time (F(35, 1820)=93.274, p<0.0001), time*treatment (F(105,1196)=4.405, p<0.0001).	Supplementary Table 1
+ -	Supplementary Figure 1f	One-way ANOVA with repeated measure followed by Bonferroni pair-wise comparison	Supplementary Figure legend 1 and Supplementary Table 1	15, 15, 12, 14	Supplementary Figure legend 1 and Supplementary Table 1	Supplementary Figure legend 1	error bars are mean +/- SEM	Supplementary Figure legend 1	Detailed statistical results can be found in Supplementary Table 1	Supplementary Figure legend 1 and Supplementary Table 1	There are effects of time (F(35, 1820)=38.200, p<0.0001), time*treatment (F(105,1820)=1.931, p<0.0001).	Supplementary Table 1
+ -	Supplementary Figure 1g	One-way ANOVA with repeated measure followed by Bonferroni pair-wise comparison	Supplementary Figure legend 1 and Supplementary Table 1	15, 15, 12, 14	Supplementary Figure legend 1 and Supplementary Table 1	Supplementary Figure legend 1	error bars are mean +/- SEM	Supplementary Figure legend 1	Detailed statistical results can be found in Supplementary Table 1	Supplementary Figure legend 1 and Supplementary Table 1	There are effects of time (F(35, 1820)=102.157, p<0.0001), time*treatment (F(105,1820)=7.723, p<0.0001).	Supplementary Table 1
+ -	Supplementary Figure 2e	One-way ANOVA followed by Bonferroni pair-wise comparison	Supplementary Table 1	8, 5, 5	Supplementary Figure legend 2	Supplementary Figure legend 2	error bars are mean +/- SEM	Supplementary Figure legend 2	Posthoc tests. p<0.0001 (WT Vs. KO-Vehicle), p<0.0001 (WT Vs. KO-Haloperidol). However, there is no difference between KO-Vehicle and KO-Haloperidol (p=1.0).	Supplementary Table 1	Overall effect is F(2, 15)=56.013, p<0.0001.	Supplementary Table 1

+ -	Supplementary Figure 4c	One-way ANOVA followed by Bonferroni pair-wise comparison	Supplementary Figure legend 4 and Supplementary Table 1	16, 20, 15	Supplementary Figure legend 4 and Supplementary Table 1	Supplementary Figure legend 4	error bars are mean +/- SEM	Supplementary Figure legend 4	Posthoc tests. 4dB group: p=0.064 (WT Vs. KO-control), p=0.013 (WT Vs. KO-rescue), p=1.0 (KO-control Vs. KO-rescue). 8dB group: p<0.0001 (WT Vs. KO-control), p=0.006 (WT Vs. KO-rescue), p=1.0 (KO-control Vs. KO-rescue). 12dB group: p=0.021 (WT Vs. KO-control), p=0.036 (WT Vs. KO-rescue), p=1.0 (KO-control Vs. KO-rescue).	Supplementary Figure legend 4 and Supplementary Table 1	Overall effects are [F(2, 44)=4.989, p=0.011] for 4dB group, [F(2, 44)=9.510, <0.0001] for 8dB group, and [F(2, 44)=4.864, p=0.012] for 12dB group.	Supplementary Table 1
+ -	Supplementary Figure 5d	One-way ANOVA followed by Bonferroni pair-wise comparison	Supplementary Table 1	14, 12, 12	Supplementary Figure legend 5	Supplementary Figure legend 5	error bars are mean +/- SEM	Supplementary Figure legend 5	Posthoc tests. p<0.0001 (WT Vs. KO-control), p<0.0001 (WT Vs. KO-rescue), p=1.0 (KO-control Vs. KO-rescue).	Supplementary Table 1	Overall effect is F(2, 35)=14.043, p<0.0001.	Supplementary Table 1
+ -	Supplementary Figure 5f	One-way ANOVA followed by Bonferroni pair-wise comparison	Supplementary Table 1	14, 12, 12	Supplementary Figure legend 5	Supplementary Figure legend 5	error bars are mean +/- SEM	Supplementary Figure legend 5	Posthoc tests. p<0.0001 (WT Vs. KO-control), p=0.001 (WT Vs. KO-rescue), p=1.0 (KO-control Vs. KO-rescue).	Supplementary Table 1	Overall effect is F(2, 35)=12.239, p<0.0001.	Supplementary Table 1
+ -	Supplementary Figure 5h	One-way ANOVA followed by Bonferroni pair-wise comparison	Supplementary Table 1	16, 20, 15	Supplementary Figure legend 5	Supplementary Figure legend 5	error bars are mean +/- SEM	Supplementary Figure legend 5	Posthoc tests. P=0.004 (WT Vs. KO-control), p<0.0001 (WT Vs. KO-rescue), p=1.0 (KO-control Vs. KO-rescue).	Supplementary Table 1	Overall effect is F(2, 35)=11.443, p<0.0001.	Supplementary Table 1

+ -	Supplementary Figure 6b	one-way ANOVA with repeated measure followed by Bonferroni pair-wise comparison	Supplementary Figure legend 6 and Supplementary Table 1	16, 14	Supplementary Figure legend 6 and Supplementary Table 1	Supplementary Figure legend 6	error bars are mean +/- SEM	Supplementary Figure legend 6	Posthoc tests. 25min: p<0.0001 30min: p=0.004 35min: p=0.053 35min: p=0.006 45min: p=0.005 50min: p=0.004 55min: p=0.011 60min: p=0.002	Supplementary Figure legend 6 and Supplementary Table 1	There is effect of time [F(11, 308)=34.219, p<0.0001]. However no time*genotype interaction is found (F(11,308)=1.128, p=0.338).	Supplementary Table 1
+ -	Supplementary Figure 8c	Independent t-test	Supplementary Figure legend 8 and Supplementary Table 1	43, 46	Supplementary Figure legend 8 and Supplementary Table 1	Supplementary Figure legend 8	error bars are mean +/- SEM	Supplementary Figure legend 8	p=0.00072	Supplementary Figure legend 8 and Supplementary Table 1	t(87)=3.507	Supplementary Table 1
+ -	Supplementary Figure 9a	Dunn's multiple comparison test	Supplementary Table 1	9, 10, 10, 15, 15	Supplementary Figure legend 9 and Supplementary Table 1	Supplementary Figure legend 9		Supplementary Figure legend 9	ps<0.05 for 30DAI-GFP Vs. WT (difference in rank sum=157.7), 30DAI-GFP Vs. 10DAI-GFP (difference in rank sum=157.6), 30DAI-GFP Vs. 10DAI-ArpC3 (difference in rank sum=148.9), 30DAI-GFP Vs. 30DAI-ArpC3 (differences in rank sum=160.9). The other comparisons are not significant.	Supplementary Table 1	Kruskal-Wallis statistic=119.1. p<0.0001	Supplementary Table 1

+ -	Supplementary Figure 9b	Dunn's multiple comparison test	Supplementary Table 1	9, 10, 10, 15, 15	Supplementary Figure legend 9 and Supplementary Table 1	Supplementary Figure legend 9		Supplementary Figure legend 9	ps<0.05 for 30DAI-GFP Vs. WT (difference in rank sum=-181.5), 30DAI-GFP Vs. 10DAI-GFP (difference in rank sum=-185.7), 30DAI-GFP Vs. 10DAI-ArpC3 (difference in rank sum=-164.6), 30DAI-GFP Vs. 30DAI-ArpC3 (differences in rank sum=-195.2). The other comparisons are not significant.	Supplementary Table 1	Kruskal-Wallis statistic=165.3. p<0.0001	Supplementary Table 1

Representative figures

1. Are any representative images shown (including Western blots and immunohistochemistry/staining) in the paper?

   If so, what figure(s)?

   Figure 1, Figure 2, Figure 3, Figure 5, Figure 5, Figure 6, Supplementary Figure 2, Supplementary Figure 3, Supplementary Figure 5, and Supplementary Figure 8.

2. For each representative image, is there a clear statement of how many times this experiment was successfully repeated and a discussion of any limitations in repeatability?

   If so, where is this reported (section, paragraph #)?

   All representative images were from at least 3 samples.
   This information was stated in Imaging section of Methods part.

Statistics and general methods

1. Is there a justification of the sample size?

   If so, how was it justified?

   Where (section, paragraph #)?

   Even if no sample size calculation was performed, authors should report why the sample size is adequate to measure their effect size.

   Our sample sizes are similar to the size in previous publications. But no further statistical analyses were carried out for justifying sample sizes.

2. Are statistical tests justified as appropriate for every figure?

   Where (section, paragraph #)?

   Appropriate tests, such as independent t-test, ANOVA, one-way ANOVA with repeated measure, two-way ANOVA with repeated measure, and Kruskal-Wallis test for each data set were carried out.

   a. If there is a section summarizing the statistical methods in the methods, is the statistical test for each experiment clearly defined?

   Each statistical method was described in figure legends and Supplementary Table 1.

b. Do the data meet the assumptions of the specific statistical test you chose (e.g. normality for a parametric test)? Where is this described (section, paragraph #)?	Data distribution was assumed to be normal but this was not formally tested
c. Is there any estimate of variance within each group of data? Is the variance similar between groups that are being statistically compared? Where is this described (section, paragraph #)?	Our data are presented as mean ±SEM as described in figure legends. But no further analyses were performed for variance estimation.
d. Are tests specified as one- or two-sided?	Two-sided
e. Are there adjustments for multiple comparisons?	Yes. we used appropriate post-hoc tests.
3. Are criteria for excluding data points reported? Was this criterion established prior to data collection? Where is this described (section, paragraph #)?	Mice showing seizure behaviors were excluded from all behavioral tests, but data from tested animals were not excluded from analyses. We described this in Behavioral tests section of Methods part.
4. Define the method of randomization used to assign subjects (or samples) to the experimental groups and to collect and process data. If no randomization was used, state so. Where does this appear (section, paragraph #)?	Animal groups were randomly assigned from the animal number (toe number), and were given treatments such as viruses before testing. This information was stated in Animal part of Methods section.
5. Is a statement of the extent to which investigator knew the group allocation during the experiment and in assessing outcome included? If no blinding was done, state so. Where (section, paragraph #)?	All tests were done by blind-manner. This was described in Method part.
6. For experiments in live vertebrates, is a statement of compliance with ethical guidelines/regulations included? Where (section, paragraph #)?	Yes. This information was stated in Animal part of the Method section.
7. Is the species of the animals used reported? Where (section, paragraph #)?	Yes. This information was stated in Animal part of the Method section.
8. Is the strain of the animals (including background strains of KO/ transgenic animals used) reported? Where (section, paragraph #)?	Yes. This information was stated in Animal part of the Method section.
9. Is the sex of the animals/subjects used reported? Where (section, paragraph #)?	We stated the sex information in Animals section of Methods part. No gender difference was detected throughout the tests.
10. Is the age of the animals/subjects reported? Where (section, paragraph #)?	Yes. Detailed age information is described in Method part.

11. For animals housed in a vivarium, is the light/dark cycle reported? Where (section, paragraph #)?	Light on at 7:00AM, light off at 7:00PM. Described in Animal part of the Method section.
12. For animals housed in a vivarium, is the housing group (i.e. number of animals per cage) reported? Where (section, paragraph #)?	Described in Animal part of the Method section.
13. For behavioral experiments, is the time of day reported (e.g. light or dark cycle)? Where (section, paragraph #)?	Light cycle. This was described in Animal part of the Method section.
14. Is the previous history of the animals/subjects (e.g. prior drug administration, surgery, behavioral testing) reported? Where (section, paragraph #)?	When behavior was performed after surgery or drug treatment it is clearly indicated in the results and figures.
a. If multiple behavioral tests were conducted in the same group of animals, is this reported? Where (section, paragraph #)?	Not applicable.
15. If any animals/subjects were excluded from analysis, is this reported? Where (section, paragraph #)?	Nothing was excluded from the raw data.
a. How were the criteria for exclusion defined? Where is this described (section, paragraph #)?	Not applicable.
b. Specify reasons for any discrepancy between the number of animals at the beginning and end of the study. Where is this described (section, paragraph #)?	Not applicable.

Reagents

1. Have antibodies been validated for use in the system under study (assay and species)?	Yes.
a. Is antibody catalog number given? Where does this appear (section, paragraph #)?	Yes. Described in imaging part of the Method section.
b. Where were the validation data reported (citation, supplementary information, Antibodypedia)? Where does this appear (section, paragraph #)?	Immunostainings for Tyrosine hydroxylase, GABA, and Vglut are well-established methods for marking dopamine producing neurons, GABAergic synapses, and excitatory synapses. So we did not provide citations.

2. If cell lines were used to reflect the properties of a particular tissue or disease state, is their source identified?

   Where (section, paragraph #)?

   Not applicable.

   a. Were they recently authenticated?

      Where is this information reported (section, paragraph #)?

      Not applicable.

Data deposition

Data deposition in a public repository is mandatory for:

a. Protein, DNA and RNA sequences
b. Macromolecular structures
c. Crystallographic data for small molecules
d. Microarray data

Deposition is strongly recommended for many other datasets for which structured public repositories exist; more details on our data policy are available here. We encourage the provision of other source data in supplementary information or in unstructured repositories such as Figshare and Dryad.

1. Are accession codes for deposit dates provided?

   Where (section, paragraph #)?

   Not applicable.

Computer code/software

Any custom algorithm/software that is central to the methods must be supplied by the authors in a usable and readable form for readers at the time of publication. However, referees may ask for this information at any time during the review process.

1. Identify all custom software or scripts that were required to conduct the study and where in the procedures each was used.

   Yes.
   The information can be found in each section of the Methods.

2. Is computer source code/software provided with the paper or deposited in a public repository? Indicate in what form this is provided or how it can be obtained.

   Not applicable.

Human subjects

1. Which IRB approved the protocol?

   Where is this stated (section, paragraph #)?

   Not applicable.

2. Is demographic information on all subjects provided?

   Where (section, paragraph #)?

   Not applicable.

3. Is the number of human subjects, their age and sex clearly defined?

   Where (section, paragraph #)?

   Not applicable.

4. Are the inclusion and exclusion criteria (if any) clearly specified? Where (section, paragraph #)?	Not applicable.
5. How well were the groups matched? Where is this information described (section, paragraph #)?	Not applicable.
6. Is a statement included confirming that informed consent was obtained from all subjects? Where (section, paragraph #)?	Not applicable.
7. For publication of patient photos, is a statement included confirming that consent to publish was obtained? Where (section, paragraph #)?	Not applicable.

fMRI studies

For papers reporting functional imaging (fMRI) results please ensure that these minimal reporting guidelines are met and that all this information is clearly provided in the methods:

1. Were any subjects scanned but then rejected for the analysis after the data was collected?	Not applicable.
a. If yes, is the number rejected and reasons for rejection described? Where (section, paragraph #)?	Not applicable.
2. Is the number of blocks, trials or experimental units per session and/or subjects specified? Where (section, paragraph #)?	Not applicable.
3. Is the length of each trial and interval between trials specified?	Not applicable.
4. Is a blocked, event-related, or mixed design being used? If applicable, please specify the block length or how the event-related or mixed design was optimized.	Not applicable.
5. Is the task design clearly described? Where (section, paragraph #)?	Not applicable.
6. How was behavioral performance measured?	Not applicable.
7. Is an ANOVA or factorial design being used?	Not applicable.
8. For data acquisition, is a whole brain scan used? If not, state area of acquisition.	Not applicable.

a. How was this region determined?	Not applicable.
9. Is the field strength (in Tesla) of the MRI system stated?	Not applicable.
a. Is the pulse sequence type (gradient/spin echo, EPI/spiral) stated?	Not applicable.
b. Are the field-of-view, matrix size, slice thickness, and TE/TR/ flip angle clearly stated?	Not applicable.
10. Are the software and specific parameters (model/functions, smoothing kernel size if applicable, etc.) used for data processing and pre-processing clearly stated?	Not applicable.
11. Is the coordinate space for the anatomical/functional imaging data clearly defined as subject/native space or standardized stereotaxic space, e.g., original Talairach, MNI305, ICBM152, etc? Where (section, paragraph #)?	Not applicable.
12. If there was data normalization/standardization to a specific space template, are the type of transformation (linear vs. nonlinear) used and image types being transformed clearly described? Where (section, paragraph #)?	Not applicable.
13. How were anatomical locations determined, e.g., via an automated labeling algorithm (AAL), standardized coordinate database (Talairach daemon), probabilistic atlases, etc.?	Not applicable.
14. Were any additional regressors (behavioral covariates, motion etc) used?	Not applicable.
15. Is the contrast construction clearly defined?	Not applicable.
16. Is a mixed/random effects or fixed inference used?	Not applicable.
a. If fixed effects inference used, is this justified?	Not applicable.
17. Were repeated measures used (multiple measurements per subject)?	Not applicable.
a. If so, are the method to account for within subject correlation and the assumptions made about variance clearly stated?	Not applicable.
18. If the threshold used for inference and visualization in figures varies, is this clearly stated?	Not applicable.
19. Are statistical inferences corrected for multiple comparisons?	Not applicable.
a. If not, is this labeled as uncorrected?	Not applicable.

20. Are the results based on an ROI (region of interest) analysis?	Not applicable.
a. If so, is the rationale clearly described?	Not applicable.
b. How were the ROI's defined (functional vs anatomical localization)?	Not applicable.
21. Is there correction for multiple comparisons within each voxel?	Not applicable.
22. For cluster-wise significance, is the cluster-defining threshold and the corrected significance level defined?	Not applicable.

Additional comments

Additional Comments	