

Supplementary Table 1. Statistical analysis

Figure	Sample size (from left to right)	Statistical test	P values	F and DF
1d	16 males (Pre)	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are with the pre-satiety group.	p < 0.0001 (0 days)	F = 32.4
	14 males (0 days)		p < 0.0001 (1 day)	DF = 6
	20 males (1 day)		p = 0.013 (3 days)	
	14 males (3 days)			
	14 males (5 days)			
	11 males (7 days)			
1e	7 males (9 days)	Two-tailed Fisher's exact test with Bonferroni correction. Comparisons are with the pre-satiety group.	p < 0.0001 (0 days)	DF = 6
	30 trials (Pre)		p < 0.0001 (1 day)	
	18 trials (0 days)		p = 0.031 (3 days)	
	20 trials (1 day)			
	18 trials (3 days)			
	18 trials (5 days)			
1f	12 trials (7 days)	Two-tailed one-way ANOVA with Sidak post hoc test. Two-tailed test. Comparisons are with the pre-satiety group.	p > 0.05 for all tests	F = 0.73
	11 trials (9 days)			DF = 6
	16 males (Pre)			
	14 males (0 days)			
	20 males (1 day)			
	14 males (3 days)			
1h	14 males (5 days)	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are with the pre-priming group and are made pair-wise per mouse.	p = 0.023 (10 min)	F = 4.88
	11 males (7 days)		p = 0.039 (30 min)	DF = 4
	7 males (9 days)			
	7 males (Pre)			
	7 males (10 min)			
	7 males (30 min)			
1i	7 males (60 min)	Two-tailed Fisher's exact test with Bonferroni correction. Comparisons are with the pre-priming group.	p > 0.05 for all tests	DF = 4
	7 males (120 min)			
	13 trials (Pre)			
	13 trials (10 min)			
	10 trials (30 min)			
	8 trials (60 min)			
1j	8 trials (120 min)	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are with the pre-priming group and are made pair-wise per mouse.	p = 0.043 (10 min)	F = 7.29
	7 males (Pre)		p = 0.009 (30 min)	DF = 4
	7 males (10 min)			
	7 males (30 min)			
	7 males (60 min)			
	7 males (120 min)			
2d	8 males (AVPV Baseline with females, a)	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are within each anatomical region. Hypothesis testing was done together with Extended Data Fig. 4d.	p < 0.0001 (a, b)	F = 28.2
	8 males (AVPV Satiated with females, b)		p = 0.0014 (a, c)	DF = 20
	8 males (AVPV Baseline without females, c)		p = 0.0010 (b, c)	
	8 males (PVpo Baseline with females, d)		p < 0.0001 (d, e)	
	8 males (PVpo Satiated with females, e)		p < 0.0001 (e, f)	
	8 males (PVpo Baseline without females, f)			
2g	7 males (DREADD Saline, a)	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are within DREADD and control groups. Comparisons are also made pair-wise per mouse.	p < 0.0001 (a, b)	F = 17.0
	7 males (DREADD C21, b)		p < 0.0001 (b, c)	DF = 5
	7 males (DREADD 24 hours after C21, c)			
	7 males (Control Saline, d)			
	7 males (Control C2, e)			
	7 males (Control 24 hours after C21, f)			
2h	21 trials (DREADD Saline, a)	Two-tailed Fisher's exact test with Bonferroni correction. Comparisons are within DREADD and control groups.	p < 0.0001 (a, b)	DF = 5
	21 trials (DREADD C21, b)		p < 0.0001 (b, c)	
	21 trials (DREADD 24 hours after C21, c)			
	21 trials (Control Saline, d)			
	21 trials (Control C2, e)			
	21 trials (Control 24 hours after C21, f)			
3b left	7 males (Pre)	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are with the pre-stim. group and are made pair-wise per mouse.	p = 0.021 (10 min)	F = 11.5
	7 males (0 min)		p = 0.008 (30 min)	DF = 8.3
	7 males (10 min)			
	7 males (30 min)			
	7 males (60 min)			
	7 males (120 min)			
3b right	7 males (Pre)	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are with the pre-stim. group and are made pair-wise per mouse.	p = 0.006 (10 min)	F = 8.3
	7 males (0 min)		p = 0.004 (30 min)	DF = 5
	7 males (10 min)			
	7 males (30 min)			
	7 males (60 min)			
	7 males (120 min)			
3c left	6 males (Pre)	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are with the pre-stim. group and are made pair-wise per mouse.	p = 0.003 (10 min)	F = 21.0
	6 males (0 min)		p = 0.001 (30 min)	DF = 5
	6 males (10 min)		p = 0.029 (60 min)	
	6 males (30 min)			
	6 males (60 min)			
	6 males (120 min)			
3c right	6 males (Pre)	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are with the pre-stim. group and are made pair-wise per mouse.	p = 0.017 (10 min)	F = 6.3
	6 males (0 min)		p = 0.023 (30 min)	DF = 5
	6 males (10 min)			
	6 males (30 min)			
	6 males (60 min)			
	6 males (120 min)			

Figure	Sample size (from left to right)	Statistical test	P values	F and DF
3e	5 males (Pre)	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are with the pre-stim. group and are made pair-wise per mouse.	p = 0.015 (10 min)	F = 11.8
	5 males (10 min)		p = 0.004 (30 min)	DF = 3
	5 males (30 min)			
	5 males (60 min)			
3f	5 males (Pre)	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are with the pre-stim. group and are made pair-wise per mouse.	p = 0.001	F = 79.5
	5 males (10 min)		p < 0.0001	DF = 3
	5 males (30 min)		p = 0.003	
	5 males (60 min)			
3g	7 males (Female, a) 7 males (Stim., b) 5 males (Female + stim., c)	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are between every pair of groups.	p < 0.0001 (a, c) p < 0.0001 (b, c)	F = 12.3 DF = 3
4c	9 fields of view from 3 males (Stim.) 8 fields of view from 3 males (No stim.)	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are made pair-wise per field of view within each time point.	p < 0.0001 (30 min) p = 0.0032 (60 min)	F = 13.3 DF = 5
4d	9 fields of view from 3 males (Prime) 9 fields of view from 3 males (Sham prime)	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are made pair-wise per field of view within prime and sham prime groups.	p < 0.0001 (Prime)	F = 16.2 DF = 3
4e	9 fields of view from 3 males (Satiety) 9 fields of view from 3 males (Sham satiety)	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are made pair-wise per field of view within satiety and sham satiety groups.	p < 0.0001 (Satiety)	F = 10.5 DF = 3
4i left	4 slices from 3 males	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are between groups within each time point.	p = 0.041 (5 stims.)	F = 57.7
			p < 0.0001 (10 stims.)	DF = 9
			p < 0.0001 (15 stims.)	
			p < 0.0001 (20 stims.)	
4i right	4 slices from 3 males	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are within pre- and post-agonist groups.	p < 0.0001 (post)	F = 90.6 DF = 3
4j left	4 slices from 3 males	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are within pre- and post-stim. groups.	p < 0.0001 (post)	F = 71.1 DF = 3
4j right	4 slices from 3 males	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are within pre- and post-agonist groups.	p > 0.05 for all tests	F = 1.9 DF = 9
4l right	8 slices from 3 males	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are within light and no light groups. Comparisons also made pair-wise per slice.	p < 0.0001 (Light)	F = 47.1 DF = 3
4m right	12 slices from 3 males	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are within light and no light groups. Comparisons also made pair-wise per slice.	p > 0.05 for all tests	F = 0.12 DF = 3
4n left	12 males (No stim.) 12 males (Stim.)	Paired two-tailed t-test.	p < 0.0001	DF = 11
4n right	12 males (No stim.) 12 males (Stim.)	Paired two-tailed t-test.	p < 0.0001	DF = 11
4p right	11 slices from 3 males	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are within light and no light groups. Comparisons also made pair-wise per slice.	p > 0.05 for all tests	F = 0.94 DF = 3
4q middle	6 males (Pre)	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are with the pre-priming group and are made pair-wise per mouse.	p > 0.05 for all tests	F = 0.36
	6 males (10 min)		DF = 4	
	6 males (30 min)			
	6 males (60 min)			
4q right	18 trials (Pre)	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are with the pre-priming group.	p > 0.05 for all tests	DF = 4
	18 trials (10 min)			
	18 trials (30 min)			
	18 trials (60 min)			
Extended Data 1a	7 males (Pre, a)	Two-tailed Fisher's exact test with Bonferroni correction. Comparisons are between every pair of groups.	p < 0.0001 (a, b)	DF = 5
	6 males (Mating with intromission, b)		p < 0.0001 (b, c)	
	5 males (Mating no intromission, c)		p < 0.0001 (b, d)	
	6 males (Post, d)			
Extended Data 1b	47 trials from 20 males	Pearson correlation.	p > 0.05 from the no-correlation null hypothesis	
Extended Data 2b	6 males (No stim.) 6 males (Stim.)	Paired two-tailed t-test.	p = 0.011	DF = 5
Extended Data 2c	6 males (No stim.) 6 males (Stim.)	Paired two-tailed t-test.	p < 0.0001	DF = 5
Extended Data 2d	6 trials (No stim.) 6 trials (Stim.)	Two-tailed Fisher's exact test.		DF = 1
Extended Data 2k	8 males (Baseline, a)	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are within all-sniff and onsets-matched groups. Comparisons are also made pair-wise per mouse.	p < 0.0001 (a, b)	F = 8.7
	6 males (Satiated, b)		p < 0.0001 (c, d)	DF = 2
	8 males (Baseline matched, c)			
	6 males (Satiated matched, d)			
Extended Data 2l	8 males (Baseline, a)	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are within all-sniff and onsets-matched groups. Comparisons are also made pair-wise per mouse.	p < 0.0001 (a, b)	F = 21.4
	6 males (Satiated, b)		p < 0.0001 (c, d)	DF = 2
	8 males (Baseline matched, c)			
	6 males (Satiated matched, d)			
Extended Data 2p	80 trials	Pearson correlation.	p < 0.0001 from the no-correlation null hypothesis	
Extended Data 2q	50 trials	Pearson correlation.	p < 0.0001 from the no-correlation null hypothesis	

Figure	Sample size (from left to right)	Statistical test	P values	F and DF
Extended Data 2t	80 trials	Pearson correlation.	p < 0.0001 from the no-correlation null hypothesis	
Extended Data 2u	50 trials	Pearson correlation.	p < 0.0001 from the no-correlation null hypothesis	
Extended Data 2d	8 males (ADP Baseline with females, g) 8 males (ADP Satiated with females, h) 8 males (ADP Baseline without females, i) 4 males (PVa Baseline with females, j) 5 males (PVa Satiated with females, k) 4 males (PVi Baseline with females, l) 4 males (PVi Satiated with females, m) 4 males (Arc Baseline with females, n) 5 males (Arc Satiated with females, o) 4 males (Zl Baseline with females, p) 5 males (Zl Satiated with females, q) 4 males (SNc Baseline with females, r) 4 males (SNc Satiated with females, s) 4 males (VTA Baseline with females, t) 5 males (VTA Satiated with females, u)	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are within each anatomical region. Hypothesis testing was done together with Fig. 2d.	p > 0.05	F = 28.2 DF = 20
Extended Data 5g	5 males (Saline) 5 males (C21)	Paired two-tailed t-test.	p = 0.013	DF = 5
Extended Data 5h	5 males (Saline) 5 males (C21)	Paired two-tailed t-test.	p = 0.014	DF = 5
Extended Data 5i	10 males (Saline) 10 males (C21)	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are between groups within each time point.	p > 0.05 for all tests	F = 37.7 DF = 5
Extended Data 5j	10 males (Saline) 10 males (C21)	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are between groups within each time point.	p > 0.05 for all tests	F = 6.5 DF = 5
Extended Data 5k	7 males (No stim., a) 9 males (Soma stim., b) 9 males (Axon stim., c)	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are between every pair of groups.	p = 0.003 (a, b) p = 0.036 (a, c)	F = 7.7 DF = 2
Extended Data 5l	7 trials (No stim., a) 9 trials (Soma stim., b) 9 trials (Axon stim., c)	Two-tailed Fisher's exact test with Bonferroni correction. Comparisons are between every pair of groups.	p = 0.005 (a, b) p = 0.009 (a, c)	DF = 2
Extended Data 5m	10 trials (Pre) 8 trials (0 min) 10 trials (10 min) 9 trials (30 min) 12 trials (60 min) 12 trials (120 min)	Two-tailed Fisher's exact test with Bonferroni correction. Comparisons are with the pre-priming group.	p > 0.05 for all tests	DF = 4
Extended Data 5n	6 males (Pre) 6 males (0 min) 6 males (10 min) 6 males (30 min) 6 males (60 min) 6 males (120 min)	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are with the pre-stim. group and are made pair-wise per mouse.	p = 0.004 (10 min) p = 0.02 (30 min)	F = 7.8 DF = 5
Extended Data 5o	6 males (Pre) 6 males (0 min) 6 males (10 min) 6 males (30 min) 6 males (60 min) 6 males (120 min)	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are with the pre-stim. group and are made pair-wise per mouse.	p = 0.004 (10 min) p = 0.005 (30 min)	F = 13.1 DF = 5
Extended Data 5p	13 trials (Pre) 14 trials (0 min) 14 trials (10 min) 14 trials (30 min) 14 trials (60 min) 14 trials (120 min)	Two-tailed Fisher's exact test with Bonferroni correction. Comparisons are with the pre-priming group.	p > 0.05 for all tests	DF = 5
Extended Data 5q	6 males (Pre) 6 males (0 min) 6 males (10 min) 6 males (30 min)	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are with the pre-stim. group and are made pair-wise per mouse.	p = 0.0006 (0 min) p = 0.006 (10min)	F = 8.4 DF = 3
Extended Data 5r	9 trials (Pre) 8 trials (0 mn) 7 trials (10 min) 6 trials (30 min)	Two-tailed Fisher's exact test with Bonferroni correction. Comparisons are with the pre-priming group.	p > 0.05 for all tests	DF = 3
Extended Data 5s	6 males (Pre) 6 males (0 min) 6 males (10 min) 6 males (30 min)	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are with the pre-stim. group and are made pair-wise per mouse.	p = 0.012 (10 min) p = 0.014 (30min)	F = 16.7 DF = 3
Extended Data 5t	22 trials (Pre) 12 trials (0 min) 18 trials (10 min) 18 trials (30 min) 18 trials (60 min) 18 trials (120 min)	Two-tailed Fisher's exact test with Bonferroni correction. Comparisons are with the pre-priming group.	p > 0.05 for all tests	DF = 5
Extended Data 5u	10 trials (Pre) 7 trials (0 min) 7 trials (10 min) 8 trials (30 min)	Two-tailed Fisher's exact test with Bonferroni correction. Comparisons are with the pre-priming group.	p > 0.05 for all tests	DF = 3

Figure	Sample size (from left to right)	Statistical test	P values	F and DF
Extended Data 6h	7 males (No stim.) 7 males (Stim.)	Paired two-tailed t-test.	$p = 0.017$	DF = 6
Extended Data 6i	7 males (No stim.) 7 males (Stim.)	Paired two-tailed t-test.	$p = 0.009$	DF = 6
Extended Data 6j	14 trials (No Chrimson) 14 trials (Chrimson)	Two-tailed Fisher's exact test.	$p > 0.05$ for all tests	DF = 1
Extended Data 7k	43 cells from 3 males (Responsive) 78 cells from 3 males (Unresponsive)	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are between groups within each time point.	$p < 0.0001$ (30 min) $p < 0.0001$ (60 min)	F = 34.2 DF = 7
Extended Data 7l	43 cells from 3 males	Pearson correlation.	$p = 0.03$ from the no-correlation null hypothesis	
Extended Data 8e	6 fields of view from 3 males (Prime) 6 fields of view from 3 males (Sham prime)	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are made pair-wise per field of view within prime and sham prime groups.	$p < 0.0001$ (Prime)	F = 18.9 DF = 3
Extended Data 9f	4 slices from 3 males	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are between groups within each time point.	$p = 0.009$ (10 stims.) $p < 0.0001$ (15 stims.) $p < 0.0001$ (20 stims.)	F = 10.4 DF = 9
Extended Data 9g	4 slices from 3 males	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are within pre- and post-agonist groups.	$p = 0.002$ (post)	F = 71.6 DF = 3
Extended Data 9i	4 slices from 3 males	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are within pre- and post-stim. groups.	$p < 0.0001$ (post)	F = 39.3 DF = 3
Extended Data 9j	4 slices from 3 males	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are between groups within each time point.	$p > 0.05$ for all tests	F = 0.31 DF = 9
Extended Data 9l	4 slices from 3 males	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are between groups within each time point.	$p > 0.05$ for all tests	F = 1.82 DF = 9
Extended Data 9m	4 slices from 3 males	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are within pre- and post-agonist groups.	$p = 0.004$ (post)	F = 66.5 DF = 3
Extended Data 9n	4 slices from 3 males	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are between groups within each time point.	$p > 0.05$ for all tests	F = 0.81 DF = 9
Extended Data 9o	4 slices from 3 males	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are within pre- and post-agonist groups.	$p = 0.017$ (post)	F = 34.4 DF = 3
Extended Data 9u left	4 slices from 3 males	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are between groups within each time point.	$p < 0.0001$ (5 stims.) $p < 0.0001$ (10 stims.) $p < 0.0001$ (15 stims.) $p < 0.0001$ (20 stims.)	F = 52.3 DF = 9
Extended Data 9u right	4 slices from 3 males	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are within pre- and post-agonist groups.	$p < 0.0001$ (post)	F = 38.4 DF = 3
Extended Data 9v left	4 slices from 3 males	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are within pre- and post-stim. groups.	$p < 0.0001$ (post)	F = 55.1 DF = 3
Extended Data 9v right	4 slices from 3 males	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are between groups within each time point.	$p > 0.05$ for all tests	F = 3.16 DF = 9
Extended Data 9w left	4 slices from 3 males	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are between groups within each time point.	$p > 0.05$ for all tests	F = 2.25 DF = 9
Extended Data 9w right	4 slices from 3 males	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are within pre- and post-agonist groups.	$p = 0.004$ (post)	F = 44.3 DF = 3
Extended Data 10b	3 groups of 5 oocytes (Control, a) 3 groups of 5 oocytes (bPAC dark, b) 3 groups of 5 oocytes (bPAC light, c) 3 groups of 5 oocytes (biPAC dark, d) 3 groups of 5 oocytes (biPAC light, e)	Two-tailed one-way ANOVA with Sidak post hoc test. Comparisons are between every pair of groups.	$p < 0.0001$ (a, c) $p = 0.0005$ (a, e) $p < 0.0001$ (b, c) $p = 0.0008$ (b, e) $p < 0.0001$ (c, d) $p = 0.0005$ (d, e)	F = 91.1 DF = 4
Extended Data 10g	35 trials from 12 males (No stim.) 36 trials from 12 males (Stim.)	Two-tailed Fisher's exact test.	$p > 0.05$	DF = 1
Extended Data 10h	6 males (No stim.) 6 males (Stim.)	Paired two-tailed t-test.	$p > 0.05$	DF = 5
Extended Data 10i	6 males (No stim.) 6 males (Stim.)	Paired two-tailed t-test.	$p > 0.05$	DF = 5
Extended Data 10j	18 trials (No stim.) 18 trials (Stim.)	Two-tailed Fisher's exact test.	$p > 0.05$	DF = 1