Figure number	Sample	Sample size (n)	Animal number (N)	mean ± s.e.m.	Test	*P* value	Defrees of freedom & F/t/W value
1d_Velocity	*130 Hz Pre vs Stim*	12	12	0.8502 ± 0.2008; 1.8250 ± 0.2403	Wilcoxon matched-pairs signed rank test	0.0005	W = 78
	20 Hz Pre vs Stim	12	12	0.5939 ± 0.1319; 0.8426 ± 0.2569	Wilcoxon matched-pairs signed rank test	0.4697	W = 20
1h_total charge	*130 Hz vs 20 Hz, 0 - 1*	9	4	149.4 ± 30.13; 26.83 ± 6.142	Paired *t* test	0.0013	t (8) = 4.815
	130 Hz vs 20 Hz, 1 - 2	9	4	102.8 ± 17.23; 20.16 ± 4.657	Wilcoxon matched-pairs signed rank test	0.0039	W = -45
	130 Hz vs 20 Hz, 2 - 3	9	4	87.09 ± 16.22; 20.20 ± 4.534	Paired *t* test	0.0013	t (8) = 4.810
	130 Hz vs 20 Hz, 3 - 4	9	4	78.47 ± 10.08; 19.98 ± 4.019	Paired *t* test	0.0001	t (8) = 7.065
	130 Hz vs 20 Hz, 4 - 5	9	4	61.73 ± 10.25; 20.30 ± 4.371	Paired *t* test	0.0019	t (8) = 4.530
	130 Hz vs 20 Hz, 5 - 6	9	4	56.15 ± 10.93; 19.97 ± 4.093	Paired *t* test	0.0044	t (8) = 3.918
	130 Hz vs 20 Hz, 6 - 7	9	4	52.50 ± 10.88; 19.81 ± 4.334	Wilcoxon matched-pairs signed rank test	0.0039	W = -45
	130 Hz vs 20 Hz, 7 - 8	9	4	52.83 ± 9.180; 19.70 ± 4.055	Paired *t* test	0.0090	t (8) = 3.425
	130 Hz vs 20 Hz, 8 - 9	9	4	42.53 ± 7.636; 20.33 ± 4.470	Paired *t* test	0.0086	t (8) = 3.456
1i_SR charge	*130 Hz vs 20 Hz, 0 - 1*	9	4	76.76 ± 16.81; 21.45 ± 5.4920	Wilcoxon matched-pairs signed rank test	0.0039	W = -45
	130 Hz vs 20 Hz, 1 - 2	9	4	49.93 ± 10.77; 15.48 ± 4.196	Wilcoxon matched-pairs signed rank test	0.0078	W = -43
	130 Hz vs 20 Hz, 2 - 3	9	4	39.94 ± 9.661; 15.29 ± 4.044	Wilcoxon matched-pairs signed rank test	0.0195	W = -39
	130 Hz vs 20 Hz, 3 - 4	9	4	34.57 ± 6.177; 14.81 ± 3.510	Paired *t* test	0.0017	t (8) = 4.642
	130 Hz vs 20 Hz, 4 - 5	9	4	26.21 ± 5.590; 15.16 ± 3.898	Wilcoxon matched-pairs signed rank test	0.0391	W = -35
1j_AR ratio	*130 Hz vs 20 Hz*	9	4	0.5541 ± 0.0440; 0.3204 ± 0.0327	2way ANOVA	0.0022	F (1, 16) = 13.19
ik_Basal current	*130 Hz vs 20 Hz*	9	4	27.98 ± 4.785; 6.220 ± 2.300	2way ANOVA	0.0008	F (1, 16) = 16.80
1l_AR ratio	*Ctrl 130 vs Ctrl 20*	11	4	0.6863 ± 0.0330; 0.3890 ± 0.0474	Paired *t* test	<0.0001	t (10) = 7.950
	DD 130 vs DD 20	9	4	0.5541 ± 0.0440; 0.3204 ± 0.0327	Paired *t* test	0.0006	t (8) = 5.535
	Ctrl 130 vs DD 130	11, 9	4, 4	0.6863 ± 0.0330; 0.5541 ± 0.0440	Unpaired t test	0.0247	t (18) = 2.451
	Ctrl 20 vs DD 20	11, 9	4, 4	0.3890 ± 0.0474; 0.3204 ± 0.0327	Unpaired t test	0.2706	t (18) = 1.137

1m_Velocity	*130 Hz Pre vs Stim*	7	7	0.4329 ± 0.1199; 1.458 ± 0.3018	Paired *t* test	0.0032	t (6) = 4.752
	20 Hz Pre vs Stim	7	7	0.4016 ± 0.1317; 0.5146 ± 0.1803	Wilcoxon matched-pairs signed rank test	0.1094	W = 20
1n_Total charge	*130 Hz vs 20 Hz*	10	4	14.21 ± 2.571; 29.33 ± 4.7940	2way ANOVA	0.0124	F (1, 18) = 7.728
1o_SR charge	*130 Hz vs 20 Hz*	10	4	7.1310 ± 1.152; 22.73 ± 4.086	2way ANOVA	0.0017	F (1, 18) = 13.51
1p_AR ratio	*130 Hz vs 20 Hz*	10	4	0.4779 ± 0.470; 0.1972 ± 0.0592	2way ANOVA	0.0024	F (1, 18) = 12.45
1q_Basal current	*130 Hz vs 20 Hz*	10	4	31.22 ± 7.060; 3.505 ± 0.7876	2way ANOVA	0.0010	F (1, 18) = 15.22
2d_Firing rate	*130 Hz vs 20 Hz, 0 - 1*	8	5	1.5630 ± 0.4057; 10.25 ± 2.542	Paired *t* test	0.0085	t (7) = 3.618
	130 Hz vs 20 Hz, 1 - 2	8	5	2.500 ± 0.9590; 11.06 ± 2.399	Paired *t* test	0.0080	t (18) = 3.671
	130 Hz vs 20 Hz, 2 - 3	8	5	3.00 ± 0.8864; 10.88 ± 2.551	Paired *t* test	0.0088	t (18) = 3..597
	130 Hz vs 20 Hz, 3 - 4	8	5	5.250 ± 0.6478; 10.69 ± 2.500	Wilcoxon matched-pairs signed rank test	0.0078	W = 36
	130 Hz vs 20 Hz, 4 - 5	8	5	5.6250 ± 0.7055; 11.31 ± 2.4460	Wilcoxon matched-pairs signed rank test	0.0156	W = 34
	130 Hz vs 20 Hz, 5 - 6	8	5	7.250 ± 1.126; 11.56 ± 2.613	Wilcoxon matched-pairs signed rank test	0.0469	W = 28
2e_Firing rate	*130 Hz Pre vs Stim*	8	5	10.20 ± 2.3820; 6.275 ± 0.9029	Wilcoxon matched-pairs signed rank test	0.0156	W = -34
	20 Hz Pre vs Stim	8	5	9.6250 ± 2.4840; 11.24 ± 2.4330	Paired *t* test	0.4060	t (7) = 0.8841
2f_SD	*130 Hz Base vs Intra-1*	8	5	1.982 ± 0.3966; 3.618 ± 0.6257	Wilcoxon matched-pairs signed rank test	0.0078	W = 36
	130 Hz Base vs Intra-2	8	5	1.982 ± 0.3966; 3.732 ± 0.6101	Wilcoxon matched-pairs signed rank test	0.0078	W = 36
	20 Hz Base vs Intra-1	8	5	2.3010 ± 0.2607; 2.893 ± 0.3247	Paired *t* test	0.2391	t (7) = 1.287
	20 Hz Base vs Intra-2	8	5	2.3010 ± 0.2607; 2.863 ± 0.3862	Paired *t* test	0.3164	t (7) = 1.079
2i_Velocity	*Ctrl 130 Pre vs Stim*	5	5	0.6248 ± 0.4016; 1.529 ± 0.5450	Paired *t* test	0.0052	t (4) = 5.543
	Vehicle-after 130 Pre vs Stim	5	5	0.4339 ± 0.2817; 1.2180 ± 0.2820	Paired *t* test	0.0011	t (4) = 8.309
	Ctrl 20 Pre vs Stim	5	5	0.3412 ± 0.1258; 0.4398 ± 0.1775	Wilcoxon matched-pairs signed rank test	0.1875	W = 11
	Vehicle-after 20 Pre vs Stim	5	5	0.3236 ± 0.1485; 0.2826 ±0.1152	Wilcoxon matched-pairs signed rank test	0.4375	W = -7
2j_Velocity	*Ctrl 130 Pre vs Stim*	5	5	0.3125 ± 0.0878; 1.141 ± 0.1950	Paired *t* test	0.0052	t (4) = 5.547

2j_Velocity	*BCC-after 130 Pre vs Stim*	5	5	0.3822 ± 0.1317; 0.3940 ± 0.0996	Paired *t* test	0.8127	t (4) = 0.2530
	Ctrl 20 Pre vs Stim	5	5	0.1685 ± 0.0249; 0.1858 ± 0.0284	Paired *t* test	0.0685	t (4) = 2.476
	BCC-after 20 Pre vs Stim	5	5	0.2274 ± 0.0435; 0.3778 ± 0.0738	Wilcoxon matched-pairs signed rank test	0.3125	W = 9
3c_Velocity	*oChIEF-130 Hz Pre vs Stim*	6	6	0.4717 ± 0.1926; 1.753 ± 0.1978	Wilcoxon matched-pairs signed rank test	0.0313	W = 21
	tdTomato-130 Hz Pre vs Stim	6	6	0.5179 ± 0.1626; 0.5032 ± 0.1559	Wilcoxon matched-pairs signed rank test	0.8438	W = -3
3f_Velocity	*oChIEF-130 Hz Pre vs Stim*	12	12	0.5617 ± 0.0857; 1.690 ± 0.3264	Wilcoxon matched-pairs signed rank test	0.0005	W = 78
	mCherry-130 Hz Pre vs Stim	8	8	0.2965 ± 0.0775; 0.3133; 0.0736	Wilcoxon matched-pairs signed rank test	0.5469	W = 10
3i_Velocity	*oChIEF-130 Hz Pre vs Stim*	7	7	0.2756 ± 0.0436; 0.2742 ± 0.0438	Paired *t* test	0.9543	t (6) = 0.05973
	oChIEF-20 Hz Pre vs Stim	7	7	0.2989 ± 0.0605; 0.2471 ± 0.0317	Paired *t* test	0.2290	t (6) = 1.339
3k_percentage	*DIO*	25	5	75.15 ± 17.57%	/	/	/
	DO	27	6	78.15 ± 2.63%	/	/	/
3o_Velocity	*130 Hz Pre vs Stim*	12	12	0.5074 ± 0.0963; 0.3906 ± 0.0506	Paired *t* test	0.2925	t (11) = 1.106
	20 Hz Pre vs Stim	12	12	0.275 ± 0.0503; 0.2612 ± 0.0192	Wilcoxon matched-pairs signed rank test	0.5186	W = 18
4g_frequency	*130 Hz Pre vs Stim*	12	8	27.86 ± 6.017; 13.63 ± 3.442	Wilcoxon matched-pairs signed rank test	0.0005	W = -78
	130 Hz Stim vs Post	12	8	13.63 ± 3.442; 24.07 ± 5.521	Wilcoxon matched-pairs signed rank test	0.0005	W = 78
	130 Hz Pre vs Post	12	8	27.86 ± 6.017; 24.07 ± 5.521	Wilcoxon matched-pairs signed rank test	0.0205	W = -58
	20 Hz Pre vs Stim	12	8	23.30 ± 5.4930; 22.35 ± 5.2350	Paired *t* test	0.5770	t (11) = 0.5770
	20 Hz Stim vs Post	12	8	22.35 ± 5.2350; 24.84 ± 6.0860	Paired *t* test	0.1664	t (11) = 1.482
	20 Hz Pre vs Post	12	8	23.30 ± 5.4930; 24.84 ± 6.0860	Paired *t* test	0.1976	t (11) = 1.371
4i_CV of ISI	*130 Hz Pre vs Stim*	12	8	0.0713 ± 0.0143; 0.2703 ± 0.0374	Wilcoxon matched-pairs signed rank test	0.0005	W = 78
	130 Hz Stim vs Post	12	8	0.2703 ± 0.0374; 0.1485 ± 0.0280	Paired *t* test	0.0082	t (11) = 3.216
	130 Hz Pre vs Post	12	8	0.2703 ± 0.0374; 0.2703 ± 0.0374	Wilcoxon matched-pairs signed rank test	0.0161	W = 60
	20 Hz Pre vs Stim	12	8	0.1058 ± 0.0132; 0.1570 ± 0.0732	Wilcoxon matched-pairs signed rank test	0.6772	W = -12

4i_CV of ISI	*20 Hz Stim vs Post*	12	8	0.1570 ± 0.0732; 0.1025 ± 0.00207	Wilcoxon matched-pairs signed rank test	0.8501	W = -6
	20 Hz Pre vs Post	12	8	0.1570 ± 0.0732; 0.1570 ± 0.0732	Wilcoxon matched-pairs signed rank test	0.6221	W = -14
4j_CV of ICUI	*130 Hz Pre vs Stim*	82	8	1.097 ± 0.0161; 1.3370 ± 0.0307	Wilcoxon matched-pairs signed rank test	<0.0001	W = 2399
	130 Hz Stim vs Post	82	8	1.3370 ± 0.0307; 1.1660 ± 0.0160	Wilcoxon matched-pairs signed rank test	<0.0001	W = -2737
	130 Hz Pre vs Post	82	8	1.097 ± 0.0161; 1.1660 ± 0.0160	Wilcoxon matched-pairs signed rank test	0.0079	W = 1141
	20 Hz Pre vs Stim	82	8	1.030 ± 0.0110; 1.043 ± 0.0141	Wilcoxon matched-pairs signed rank test	0.2455	W = 505
	20 Hz Stim vs Post	82	8	1.043 ± 0.0141; 1.023 ± 0.0109	Wilcoxon matched-pairs signed rank test	0.2789	W = -471
	20 Hz Pre vs Post	82	8	1.030 ± 0.0110; 1.023 ± 0.0109	Wilcoxon matched-pairs signed rank test	0.7862	W = -119
5c_Total charge	*130 Hz vs 20 Hz, 0 - 1*	15	8	115.6 ± 24.72; 37.28 ± 9.493	Wilcoxon matched-pairs signed rank test	<0.0001	W = -120
	130 Hz vs 20 Hz, 1 - 2	15	8	83.12 ± 17.31; 30.63 ± 7.297	Wilcoxon matched-pairs signed rank test	0.0003	W = -114
	130 Hz vs 20 Hz, 2 - 3	15	8	66.10 ± 13.47; 29.46 ± 6.632	Wilcoxon matched-pairs signed rank test	0.0020	W = -102
	130 Hz vs 20 Hz, 3 - 4	15	8	52.27 ± 9.225; 28.20 ± 6.088	Wilcoxon matched-pairs signed rank test	0.0012	W = -106
	130 Hz vs 20 Hz, 4 - 5	15	8	47.70 ± 8.022; 29.50 ± 6.199	Wilcoxon matched-pairs signed rank test	0.0084	W = -90
	130 Hz vs 20 Hz, 5 - 6	15	8	40.31 ± 7.258; 27.79 ± 5.971	Wilcoxon matched-pairs signed rank test	0.0302	W = -76
	130 Hz vs 20 Hz, 6 - 7	15	8	35.63 ± 6.438; 26.91 ± 5.809	Wilcoxon matched-pairs signed rank test	0.0256	W = -78
5d_SR charge	*130 Hz vs 20 Hz, 0 - 1*	15	8	51.42 ± 11.28; 32.13 ± 8.153	Wilcoxon matched-pairs signed rank test	0.0103	W = -88
	130 Hz vs 20 Hz, 1 - 2	15	8	31.05 ± 6.479; 24.69 ± 6.118	Wilcoxon matched-pairs signed rank test	0.0479	W = -70
5e_AR ratio	*130 Hz vs 20 Hz*	15	8	0.6365 ± 0.258; 0.3065 ± 0.0466	2way ANOVA	<0.0001	F (1, 28) = 30.19
5f_Basal current	*130 Hz vs 20 Hz*	15	8	54.01 ± 8.986; 10.22 ± 2.012	2way ANOVA	<0.0001	F (1, 28) = 22.61
5k_Firing rate	*130 Hz vs 20 Hz, 0 - 1*	5	3	1.133 ± 0.4667; 6.567; 1.845	Paired *t* test	0.0324	t (4) = 3.216
	130 Hz vs 20 Hz, 1 - 2	5	3	3.067 ± 1.380; 7.167 ± 1.579	Paired *t* test	0.0082	t (4) = 4.866
	130 Hz vs 20 Hz, 2 - 3	5	3	4.533 ± 1.775; 8.033 ± 1.698	Paired *t* test	0.0438	t (4) = 2.907
5l_Firing rate	*130 Hz Pre vs Stim*	5	3	15.65 ± 1.791; 5.881 ± 0.7856	Paired *t* test	0.0058	t (4) = 5.370

5l_Firing rate	*20 Hz Pre vs Stim*	5	3	12.27 ± 1.825; 7.767 ± 1.695	Paired *t* test	0.0301	t (4) = 3.296
5m_SD	*130 Hz Base vs Intra-1*	5	3	2.643 ± 0.3895; 3.762 ± 1.367	Paired *t* test	0.0143	t (4) = 4.143
	130 Hz Base vs Intra-2	5	3	2.643 ± 0.3895; 4.136 ± 0.6033	Paired *t* test	0.0032	t (4) = 6.300
	20 Hz Base vs Intra-1	5	3	2.867 ± 0.3325; 3.337 ± 0.4113	Paired *t* test	0.0626	t (4) = 2.560
	20 Hz Base vs Intra-2	5	3	2.867 ± 0.3325; 3.158 ± 0.4696	Paired *t* test	0.3301	t (4) = 1.108
6b_Total charge	*130 Hz Pre vs Post*	6	4	982.4 ± 112.2; 441.1 ± 73.51	Paired *t* test	0.0149	t (5) = 3.639
6c_AR charge	*130 Hz Pre vs Post*	6	4	633.9 ± 85.37; 281.4 ± 54.62	Paired *t* test	0.0258	t (5) = 3.135
6d_Basal current	*130 Hz Pre vs Post*	6	4	27.90 ± 3.782; 12.60 ± 2.084	2way ANOVA	0.0053	F (1, 10) = 12.55
6g_Velocity	*Ctrl 130 Pre vs Stim*	7	7	0.4063 ± 0.0748; 1.732 ± 0.2979	Wilcoxon matched-pairs signed rank test	0.0156	W = 28
	Vehicle-after 130 Pre vs Stim	7	7	0.2482 ± 0.0651; 1.357 ± 0.5605	Wilcoxon matched-pairs signed rank test	0.0156	W = 28
	Ctrl 20 Pre vs Stim	7	7	0.3755 ± 0.1045; 0.4010 ± 0.0697	Wilcoxon matched-pairs signed rank test	0.4688	W = 10
	Vehicle-after 20 Pre vs Stim	7	7	0.2867 ± 0.0574; 0.3797 ± 0.0756	Paired *t* test	0.1831	t (6) = 1.505
6h_Velocity	*Ctrl 130 Pre vs Stim*	7	7	0.3748 ± 0.0895; 1.787 ± 0.3074	Paired *t* test	0.0040	t (6) = 4.521
	BCC-after 130 Pre vs Stim	7	7	0.2336 ± 0.0232; 0.5751 ± 0.1065	Paired *t* test	0.0178	t (6) = 3.235
	Ctrl 20 Pre vs Stim	7	7	0.3793 ± 0.982; 0.6423 ± 0.1940	Paired *t* test	0.2051	t (6) = 1.421
	BCC-after 20 Pre vs Stim	7	7	0.1972 ± 0.0239; 0.2437 ± 0.0404	Paired *t* test	0.2485	t (6) = 1.278
7c_total charge	*130 Hz vs 20 Hz, 0 - 1*	9	4	75.45 ± 18.05; 23.88 ± 6.224	Paired *t* test	0.0082	t (8) = 3.494
	130 Hz vs 20 Hz, 1 - 2	9	4	49.18 ± 11.53; 21.61 ± 4.899	Wilcoxon matched-pairs signed rank test	0.0195	W = -39
	130 Hz vs 20 Hz, 2 - 3	9	4	39.26 ± 8.740; 20.59 ± 4.496	Wilcoxon matched-pairs signed rank test	0.0078	W = -43
	130 Hz vs 20 Hz, 3 - 4	9	4	33.35 ± 8.183; 20.53 ± 4.490	Wilcoxon matched-pairs signed rank test	0.0195	W = -39
7d_SR charge	*130 Hz vs 20 Hz, 0 - 1*	9	4	25.16 ± 4.810; 14.47 ± 4.953	Wilcoxon matched-pairs signed rank test	0.0039	W = -45
7e_AR ratio	*130 Hz vs 20 Hz*	9	4	0.6498 ± 0.0429; 0.5003 ± 0.0759	2way ANOVA	0.1415	F (1, 16) = 2.392
7f_Basal current	*130 Hz vs 20 Hz*	9	4	18.12 ± 3.954; 6.605 1.020	2way ANOVA	0.0094	F (1, 16) = 8.712

7g_AR ratio	*Ctrl 130 vs Ctrl 20*	15	8	0.6365 ± 0.258; 0.3065 ± 0.0466	Paired *t* test	<0.0001	t (14) = 6.579
	KD 130 vs KD 20	9	4	0.6498 ± 0.0429; 0.5003 ± 0.0759	Paired *t* test	0.2267	t (8) = 1.310
	Ctrl 130 vs KD 130	15, 9	8, 4	0.6365 ± 0.258; 0.6498 ± 0.0429	Unpaired *t* test	0.7797	t (22) = 0.2832
	Ctrl 20 vs KD 20	15, 9	8, 4	0.3065 ± 0.0466; 0.5003 ± 0.0759	Unpaired *t* test	0.0306	t (22) = 2.312
7k_Velocity	*130 Hz Pre vs Stim*	8	8	0.4374 ± 0.0613; 0.9090 ± 0.1204	Paired *t* test	0.0039	t (7) = 4.231
	20 Hz Pre vs Stim	8	8	0.4542 ± 0.0828; 0.4878 ± 0.1041	Paired *t* test	0.2747	t (7) = 1.185
7l_Velocity	*130 Hz Pre vs Stim*	10	10	0.6699 ± 0.0784; 1.539 ± 0.1475	Paired *t* test	0.0001	t (9) = 6.452
	20 Hz Pre vs Stim	10	10	0.7940 ± 0.1548;1.426; 0.1518	Paired *t* test	0.0001	t (9) = 4.813
7m_Ratio	*NC 130 vs NC 20*	8	8	2.163 ± 0.2928; 1.037 ± 0.0664	Paired *t* test	0.0092	t (7) = 3.562
	KD 130 vs KD 20	8	8	2.448 ± 0.2456; 2.557 ± 0.5127	Paired *t* test	0.8695	t (9) = 0.1690
	NC 130 vs KD 130	8, 10	8, 10	2.163 ± 0.2928; 2.448 ± 0.2456	Unpaired *t* test	0.4627	t (16) = 0.7525
	NC 20 vs KD 20	8, 10	8, 10	1.037 ± 0.0664; 1.037 ± 0.0664	Unpaired *t* test	0.0185	t (16) = 2.623
Extend Data 1h_Total charge	*130 Hz vs 20 Hz, 0 - 1*	11	4	238.2 ± 48.07; 39.60 ± 9.821	Wilcoxon matched-pairs signed rank test	0.0010	W = -66
	130 Hz vs 20 Hz, 1 - 2	11	4	141.9 ± 22.20; 39.02 ± 10.03	Wilcoxon matched-pairs signed rank test	0.0010	W = -66
	130 Hz vs 20 Hz, 2 - 3	11	4	109.5 ± 15.37; 38.17 ± 9.364	Wilcoxon matched-pairs signed rank test	0.0010	W = -66
	130 Hz vs 20 Hz, 3 - 4	11	4	96.38 ± 39.01; 37.49 ± 9.182	Wilcoxon matched-pairs signed rank test	0.0010	W = -66
	130 Hz vs 20 Hz, 4 - 5	11	4	77.60 ± 9.778; 37.07 ± 8.547	Wilcoxon matched-pairs signed rank test	0.0010	W = -66
	130 Hz vs 20 Hz, 5 - 6	11	4	67.46 ± 7.869; 37.07 ± 8.721	Wilcoxon matched-pairs signed rank test	0.0098	W = -56
	130 Hz vs 20 Hz, 6 - 7	11	4	68.10 ± 9.246; 37.02 ± 8.442	Wilcoxon matched-pairs signed rank test	0.0049	W = -60
	130 Hz vs 20 Hz, 7 - 8	11	4	58.25 ± 6.372; 35.67 ± 8.083	Wilcoxon matched-pairs signed rank test	0.0068	W = -58
	130 Hz vs 20 Hz, 8 - 9	11	4	51.21 ± 5.721; 36.82 ± 8.174	Paired *t* test	0.0473	t (10) = 2.261
Extend Data 1i_SR charge	*130 Hz vs 20 Hz, 0 - 1*	11	4	65.24 ± 7.800; 25.54 ± 5.548	Paired *t* test	<0.0001	t (10) = 6.24
Extend Data 1j_AR ratio	*130 Hz vs 20 Hz*	11	4	0.6836 ± 0.0330; 0.3890 ± 0.0474	2way ANOVA	<0.0001	F (1, 20) = 25.82

Extend Data 1k_Basal current	*130 Hz vs 20 Hz*	11	4	42.57 ± 5.757; 9.972 ± 2.598	2way ANOVA	<0.0001	F (1, 20) = 26.64
Extend Data 2c_Total charge	*130 Hz vs 20 Hz, 0 - 1*	11	5	31.31 ± 5.451; 9.302 ± 1.909	Wilcoxon matched-pairs signed rank test	0.001	W = -66
	130 Hz vs 20 Hz, 1 - 2	11	5	24.55 ± 4.065; 9.879 ± 1.988	Paired *t* test	0.0009	t (10) = 4.623
	130 Hz vs 20 Hz, 2 - 3	11	5	21.94 ± 3.434; 9.186 ± 1.964	Paired *t* test	0.0008	t (10) = 4.697
	130 Hz vs 20 Hz, 3 - 4	11	5	20.05 ± 2.891; 8.730 ± 1.785	Paired *t* test	0.0012	t (10) = 4.663
	130 Hz vs 20 Hz, 4 - 5	11	5	19.35 ± 2.651; 9.356 ± 1.785	Paired *t* test	0.0022	t (10) = 4.097
	130 Hz vs 20 Hz, 5 - 6	11	5	18.25 ± 2.515; 9.772 ± 1.843	Paired *t* test	0.002	t (10) = 4.151
	130 Hz vs 20 Hz, 6 - 7	11	5	16.98 ± 2.434; 9.598 ± 1.732	Paired *t* test	0.0028	t (10) = 3.943
	130 Hz vs 20 Hz, 7 - 8	11	5	16.03 ± 2.412; 9.569 ± 1.801	Paired *t* test	0.0108	t (10) = 3.123
	130 Hz vs 20 Hz, 8 - 9	11	5	15.13 ± 2.346; 9.952 ± 1.983	Paired *t* test	0.0316	t (10) = 2.498
Extend Data 2d_SR charge	*130 Hz vs 20 Hz, 0 - 1*	11	5	8.630 ± 1.401; 5.165 ± 1.294	Wilcoxon matched-pairs signed rank test	0.0068	W = -58
Extend Data 2e_AR ratio	*130 Hz vs 20 Hz*	11	5	0.6422 ± 0.0457; 0.6000 ± 0.2201	2way ANOVA	0.7985	F (1, 20) = 0.06692
Extend Data 2f_Basal current	*130 Hz vs 20 Hz*	11	5	9.544 ± 1.593; 5.789 ± 1.130	2way ANOVA	0.0689	F (1, 20) = 3.697
Extend Data 2g_AR ratio	*Ctrl 130 vs Ctrl 20*	5	4	0.6450 ± 0.0611; 0.6565 ± 0.0360	Paired *t* test	0.8953	t (4) = 0.1401
	DD 130 vs DD 20	11	5	0.6422 ± 0.0457; 0.6000 ± 0.2201	Paired *t* test	0.4488	t (10) = 0.7883
	Ctrl 130 vs DD 130	5, 11	4, 5	0.6450 ± 0.0611; 0.6422 ± 0.0457	Unpaired *t* test	0.9723	t (14) = 0.0354
	Ctrl 20 vs DD 20	5, 11	4, 5	0.6565 ± 0.0360; 0.6000 ± 0.2201	Unpaired *t* test	0.1850	t (14) = 1.394
Extend Data 2i_Firing rate	*CA vs WC*	9, 33	3, 14	14.12 ± 1.550; 26.73 ± 4.266	Mann-Whitney test	0.1453	U = 100.5
Extend Data 2i_CV	*CA vs WC*	9, 33	3, 14	14.13 ± 1.586; 14.21 ± 1.095	Mann-Whitney test	0.9760	U = 147
Extend Data 2j_Firing rate	*Ctrl vs DD*	33, 19	14, 9	22.61 ± 3.373; 22.07 ± 4.198	Mann-Whitney test	0.6143	U = 286.5
Extend Data 2j_CV	*Ctrl vs DD*	33, 19	14, 9	13.26 ± 2.419; 17.39 ± 1.427	Mann-Whitney test	0.0569	U = 213
Extend Data 3a_Total charge	*130 Hz vs 20 Hz, 0 - 1*	10	3	85.21; ± 20.66; 14.04 ± 2.847	Wilcoxon matched-pairs signed rank test	0.0020	W = -55
	130 Hz vs 20 Hz, 1 - 2	10	3	57.87 ± 10.45; 14.73 ± 2.544	Wilcoxon matched-pairs signed rank test	0.0020	W = -55

Extend Data 3a_Total charge	*130 Hz vs 20 Hz, 2 - 3*	10	3	46.78 ± 7.916; 14.64 ± 2.554	Paired *t* test	0.0003	t (9) = 5.629
	130 Hz vs 20 Hz, 3 - 4	10	3	41.25 ± 6.828; 14.75 ± 2.389	Paired *t* test	0.0004	t (9) = 5.555
	130 Hz vs 20 Hz, 4 - 5	10	3	35.07 ± 6.151; 14.98 ± 2.520	Paired *t* test	0.0008	t (9) = 4.961
	130 Hz vs 20 Hz, 5 - 6	10	3	30.72 ± 5.233; 15.17 ± 2.203	Wilcoxon matched-pairs signed rank test	0.0039	W = -53
	130 Hz vs 20 Hz, 6 - 7	10	3	28.62 ± 5.306; 14.41 ± 2.198	Wilcoxon matched-pairs signed rank test	0.0039	W = -53
	130 Hz vs 20 Hz, 7 - 8	10	3	28.90 ± 4.769; 15.14 ± 2.534	Wilcoxon matched-pairs signed rank test	0.0039	W = -53
	130 Hz vs 20 Hz, 8 - 9	10	3	27.38 ± 4.167; 15.59 ± 2.857	Wilcoxon matched-pairs signed rank test	0.002	W = -55
	130 Hz vs 20 Hz, 9 - 10	10	3	25.47 ± 4.160; 15.61 ± 2.817	Wilcoxon matched-pairs signed rank test	0.0098	W = -49
	130 Hz vs 20 Hz, 10 - 11	10	3	24.14 ± 4.078; 15.90 ± 2.916	Wilcoxon matched-pairs signed rank test	0.0059	W = -51
	130 Hz vs 20 Hz, 11 - 12	10	3	22.69 ± 3.661; 16.89 ± 2.507	Wilcoxon matched-pairs signed rank test	0.0371	W = -41
	130 Hz vs 20 Hz, 12 - 13	10	3	21.35 ± 3.644; 16.43 ± 3.099	Wilcoxon matched-pairs signed rank test	0.0371	W = -41
Extend Data 3b_SR charge	*130 Hz vs 20 Hz, 0 - 1*	10	3	30.84 ± 4.895; 10.39 ± 2.098	Wilcoxon matched-pairs signed rank test	0.0020	W = -55
	130 Hz vs 20 Hz, 1 - 2	10	3	20.41 ± 2.922; 10.16 ± 1.762	Wilcoxon matched-pairs signed rank test	0.0020	W = -55
	130 Hz vs 20 Hz, 2 - 3	10	3	16.91 ± 2.140; 10.38 ± 1.902	Wilcoxon matched-pairs signed rank test	0.0273	W = -43
	130 Hz vs 20 Hz, 3 - 4	10	3	15.29 ± 1.939; 10.14 ± 1.703	Paired *t* test	0.0333	t (9) = 2.510
Extend Data 3c_AR ratio	*130 Hz vs 20 Hz*	10	3	0.5452 ± 0.0544; 0.3554 ± 0.0252	2way ANOVA	0.0184	F (1, 18) = 6.722
Extend Data 3d_Basal current	*130 Hz vs 20 Hz*	10	3	19.48 ± 4.916; 4.135 ± 0.6343	2way ANOVA	0.0062	F (1, 18) = 9.585
Extend Data 3e_AR ratio	*Normal 130 Hz vs Normal 20 Hz*	9	4	0.5541 ± 0.0440; 0.3204 ± 0.0327	Paired *t* test	0.0006	t (8) = 5.535
	Low Ca/Mg 130 Hz vs Low Ca/Mg 20 Hz	10	3	0.5452 ± 0.0544; 0.3554 ± 0.0252	Paired *t* test	0.0057	t (9) = 3.608
	Normal 130 Hz vs Low Ca/Mg 130 Hz	9, 10	4, 3	0.5541 ± 0.0440; 0.5452 ± 0.0544	Unpaired *t* test	0.9017	t (17) = 0.1253
	Normal 20 Hz vs Low Ca/Mg 20 Hz	9, 10	4, 3	0.3204 ± 0.0327; 0.3554 ± 0.0252	Unpaired *t* test	0.4047	t (17) = 0.8545
Extend Data 3f_Firing rate	*Normal vs Low*	19, 24	9, 6	20.07 ± 4.198; 23.24 ± 2.566	Mann-Whitney test	0.0771	U = 155.5
Extend Data 3f_CV	*Normal vs Low*	19, 24	9, 6	17.39 ± 1.427; 12.95 ± 1.588	Unpaired *t* test	0.0492	t (41) = 2.027

Extend Data 3h_Firing rate	*130 Hz vs 20 Hz, 0 - 1*	6	2	1.956 ± 0.7539; 15.56 ± 4.776	Paired *t* test	0.0330	t (5) = 2.920
Extend Data 3h_SD	*130 Hz Base vs Intra-1*	6	2	2.403 ± 0.5377; 5.724 ± 0.7786	Paired *t* test	0.0052	t (5) = 4.732
	130 Hz Base vs Intra-2	6	2	2.403 ± 0.5377; 5.528 ± 0.9318	Paired *t* test	0.0027	t (5) = 5.528
	20 Hz Base vs Intra-1	6	2	2.869 ± 0.9805; 3.886 ± 1.124	Wilcoxon matched-pairs signed rank test	0.3125	W = 11
	20 Hz Base vs Intra-2	6	2	2.869 ± 0.9805; 3.732± 1.053	Wilcoxon matched-pairs signed rank test	0.3125	W = 11
Extend Data 4c_proboality	*130 Hz*	13	2	99.90 ± 0.0517; 100 ± 0	/	/	/
	20 Hz	13	2	100 ± 0	/	/	/
Extend Data 4d_number	*130 Hz*	13	2	1.044 ± 0.0260	/	/	/
	20 Hz	13	2	1.802 ± 0.1989	/	/	/
Extend Data 4e_frequency	*130 Hz*	13	2	135.8 ± 3.384	/	/	/
	20 Hz	13	2	36.04 ± 3.979	/	/	/
Extend Data 4h_Velocity	*oChIEF-20 Hz Pre vs Stim*	6	6	0.6816 ± 0.2489; 0.7414 ± 0.1270;	Paired *t* test	0.7593	t (5) = 0.3236
	tdTomato-2 Hz Pre vs Stim	6	6	0.3020 ± 0.1305; 0.3383 ± 0.1958	Paired *t* test	0.7411	t (5) = 0.3493
Extend Data 4k_Velocity	*oChIEF-20 Hz Pre vs Stim*	10	10	0.3530 ± 0.0608; 0.4244 ± 0.0749	Paired *t* test	0.0756	t (9) = 2.008
	mCherry-20 Hz Pre vs Stim	8	8	0.03364 ± 0.0927; 0.4198 ± 0.1436	Wilcoxon matched-pairs signed rank test	0.1953	W = 20
Extend Data 4o_Total time	*Ctrl vs Casapse*	7	7	85.38 ± 3.350; 62.27 ± 3.647	Paired *t* test	0.0110	t (6) = 3.630
Extend Data 4o_Total distance	*Ctrl vs Casapse*	7	7	34.02 ± 2.755; 18.99 ± 2.020	Paired *t* test	0.0102	t (6) = 3.687
Extend Data 4o_Velocity	*Ctrl vs Casapse*	7	7	5.686 ± 0.4585; 3.171 ± 0.3393	Paired *t* test	0.0099	t (6) = 3.720
Extend Data 4p_latency	*Ctrl Day1 vs Day2*	7	7	251.2 ± 18.92; 320.1 ± 17.57	Paired *t* test	0.0084	t (6) = 3.853
	Caspase Day1 vs Day2	7	7	275.6 ± 30.29; 336.5 ± 21.80	Paired *t* test	0.0271	t (6) = 2.905
	Ctrl Day1 vs Caspase Day1	7	7	251.2 ± 18.92; 275.6 ± 30.29	Paired *t* test	0.3471	t (6) = 1.020
	Ctrl Day2 vs Caspase Day2	7	7	320.1 ± 17.57; 336.5 ± 21.80	Paired *t* test	0.5017	t (6) = 0.714