

SUPPLEMENTARY FIGURES

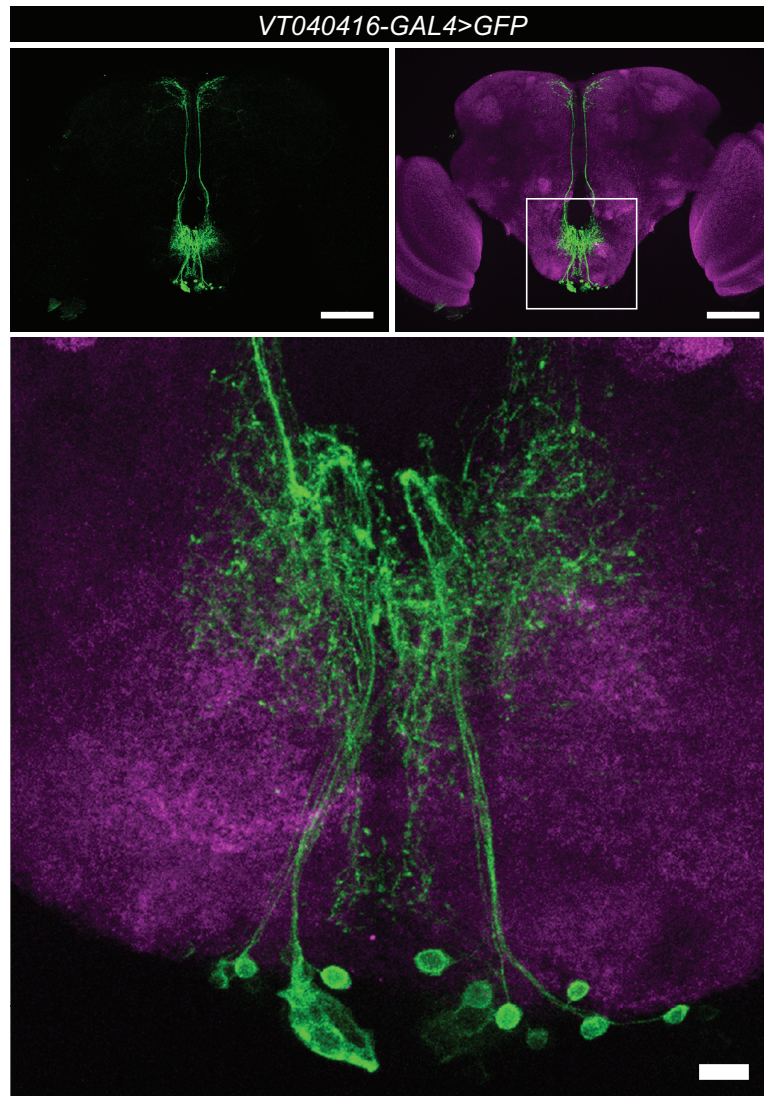


Fig. S1. Expression of *VT040416-GAL4* in the brain. (A) GFP expression in the adult *Drosophila* brain of *VT040416-GAL4>GFP* flies. Neuropil is stained with anti-nc82 (magenta). Scale bar: 100 μm (top), 10 μm (bottom).

SUPPLEMENTARY TABLE**Table S1. Summary of PER results in the thermogenetic activation screen with 194 selected *VT-GAL4* and *Janelia-GAL4* lines.**

Line number	Stock number	Inserted construct	PER (%)
1	BDSC 48723	GMR16D02-GAL4	0
2	BDSC 39332	GMR65A10-GAL4	0
3	BDSC 48522	GMR12G03-GAL4	0
4	BDSC 49238	GMR10G07-GAL4	0
5	BDSC 48891	GMR20D04-GAL4	0
6	BDSC 48755	GMR17B03-GAL4	0
7	BDSC 50020	GMR38G08-GAL4	0
8	BDSC 39898	GMR75F02-GAL4	0
9	BDSC 50326	GMR47G06-GAL4	0
10	BDSC 39288	GMR64A07-GAL4	0
11	BDSC 48527	GMR12G12-GAL4	0
12	BDSC 46435	GMR60F03-GAL4	0
13	BDSC 39316	GMR64G05-GAL4	0
14	BDSC 47335	GMR23F01-GAL4	0
15	BDSC 50039	GMR39C07-GAL4	0
16	BDSC 49700	GMR32B04-GAL4	0
17	BDSC 49004	GMR22H09-GAL4	0
18	BDSC 47839	GMR10A11-GAL4	0
19	BDSC 39885	GMR75B11-GAL4	0
20	BDSC 50296	GMR47B12-GAL4	0
21	BDSC 50034	GMR39A11-GAL4	0
22	BDSC 48367	GMR81E10-GAL4	0
23	BDSC 50291	GMR47A12-GAL4	0
24	BDSC 48515	GMR12F05-GAL4	0
25	BDSC 50297	GMR47C03-GAL4	0
26	BDSC 47253	GMR94C10-GAL4	0
27	BDSC 50207	GMR44D07-GAL4	0
28	VDRC 207671	VT057287	0
29	VDRC 206433	VT057286	0
30	VDRC 200916	VT057280	0
31	VDRC 200828	VT057294	0
32	VDRC 206712	VT043663	0
33	VDRC 205899	VT043688	0
34	VDRC 204490	VT043670	0
35	VDRC 202967	VT043685	0
36	VDRC 202712	VT043658	0
37	VDRC 201610	VT043686	0
38	VDRC 201134	VT043678	0
39	VDRC 200755	VT043699	0
40	VDRC 201193	VT043701	0
41	VDRC 200285	VT043698	0
42	VDRC 207582	VT046252	0

43	VDRC 205020	VT056866	0
44	VDRC 203856	VT023747	0
45	VDRC 206542	VT029749	0
46	VDRC 204934	VT043645	0
47	VDRC 206065	VT039485	0
48	VDRC 207679	VT063218	0
49	VDRC 207662	VT042573	0
50	VDRC 204287	VT043697	0
51	VDRC 201032	VT017247	0
52	VDRC 203341	VT031562	0
53	VDRC 203183	VT010262	0
54	VDRC 207777	VT021853	0
55	VDRC 207746	VT062774	0
56	VDRC 204334	VT037601	0
57	VDRC 207914	VT017745	0
58	VDRC 204710	VT048649	0
59	VDRC 202764	VT058427	0
60	VDRC 204652	VT023783	0
61	VDRC 204475	VT022100	0
62	VDRC 205316	VT041269	0
63	VDRC 201067	VT034804	0
64	VDRC 204569	VT026174	0
65	VDRC 201918	VT050226	0
66	VDRC 205643	VT063191	0
67	VDRC 200494	VT002857	0
68	VDRC 201761	VT014604	0
69	VDRC 203479	VT026020	0
70	VDRC 208182	VT038884	0
71	VDRC 202173	VT008279	0
72	VDRC 204924	VT032280	0
73	VDRC 203610	VT048140	0
74	VDRC 201756	VT002210	0
75	VDRC 201439	VT040540	0
76	VDRC 201230	VT015784	0
77	VDRC 205866	VT007768	0
78	VDRC 204711	VT048651	0
79	VDRC 204949	VT048656	0
80	VDRC 205136	VT039361	0
81	VDRC 207835	VT016057	0
82	VDRC 200076	VT012300	0
83	VDRC 205765	VT009667	0
84	VDRC 202860	VT027938	0
85	VDRC 200626	VT037726	0
86	VDRC 202148	VT049374	0
87	VDRC 201299	VT058699	0

88	VDRC 207526	VT022224	0
89	VDRC 206883	VT015971	0
90	VDRC 203133	VT007359	0
91	VDRC 206930	VT026759	0
92	VDRC 202180	VT008480	0
93	VDRC 202959	VT028872	0
94	VDRC 206202	VT026782	0
95	VDRC 204216	VT043928	0
96	VDRC 200348	VT038814	0
97	VDRC 205738	VT056808	0
98	VDRC 206660	VT013039	0
99	VDRC 202186	VT008489	0
100	VDRC 206852	VT041658	0
101	VDRC 208087	VT030526	0
102	VDRC 201715	VT017415	0
103	VDRC 206982	VT026753	0
104	VDRC 203106	VT016969	0
105	VDRC 203875	VT050233	0
106	VDRC 201792	VT025779	0
107	VDRC 203086	VT007709	0
108	VDRC 203039	VT014724	0
109	VDRC 202909	VT007767	0
110	VDRC 201324	VT049500	0
111	VDRC 201212	VT006395	0
112	VDRC 203757	VT007747	0
113	VDRC 200786	VT039997	0
114	VDRC 200755	VT043699	0
115	VDRC 204493	VT044843	0
116	VDRC 202191	VT003238	0
117	VDRC 203180	VT009835	0
118	VDRC 204287	VT043697	0
119	VDRC 201907	VT040033	0
120	VDRC 203008	VT010054	0
121	VDRC 206753	VT029822	0
122	VDRC 207897	VT015256	0
123	VDRC 207668	VT054815	0
124	VDRC 204630	VT044175	0
125	VDRC 202663	VT046307	0
126	VDRC 207554	VT058854	0
127	VDRC 206455	VT045791	0
128	VDRC 203935	VT016848	0
129	VDRC 202538	VT032907	0
130	VDRC 203984	VT062245	0
131	VDRC 205034	VT060196	0
132	VDRC 207789	VT041298	0

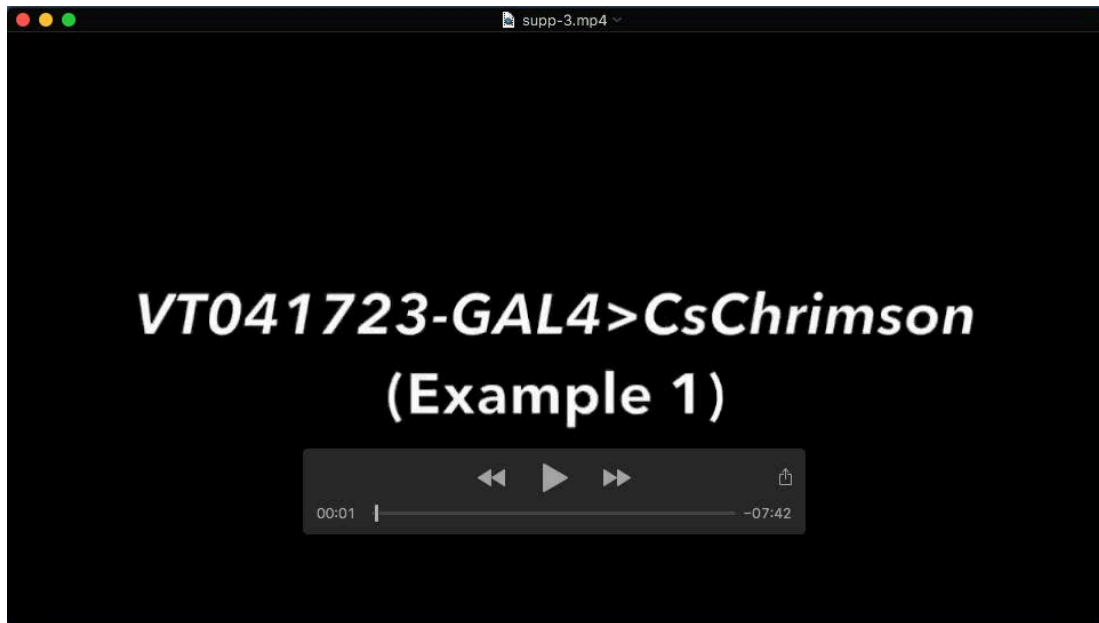
133	VDRC 206418	VT049371	0
134	VDRC 203267	VT029203	0
135	VDRC 203267	VT029203	1.5625
136	BDSC 26263	UAS-dTrpA1	3.84615
137	VDRC 206660	VT013039	4.6875
138	BDSC 49961	GMR37F05-GAL4	5
139	BDSC 50146	GMR42B10-GAL4	5
140	BDSC 38810	GMR52A06-GAL4	5
141	BDSC 39973	GMR77F07-GAL4	5
142	BDSC 40458	GMR86D08-GAL4	5
143	VDRC 201830	VT043635	5
144	VDRC 207088	VT050546	5
145	VDRC 207914	VT017745	5
146	VDRC 202842	VT059229	5
147	VDRC 206712	VT043663	5
148	VDRC 205377	VT049112	5
149	VDRC 203901	VT063556	5
150	VDRC 201617	VT049245	5
151	VDRC 206420	VT049570	5
152	VDRC 204187	VT062763	5
153	VDRC 204778	VT028452	5
154	VDRC 200252	VT034795	5
155	VDRC 201744	VT056509	5
156	VDRC 208860	VT030527	5
157	VDRC 204797	VT030528	5
158	VDRC 204931	VT038156	5
159	VDRC 202537	VT032906	5
160	VDRC 204703	VT046912	5
161	VDRC 200084	VT019428	5
162	VDRC 206523	VT020016	5
163	VDRC 203128	VT021366	5
164	VDRC 201412	VT045153	5
165	VDRC 207611	VT037802	5
166	VDRC 208087	VT030526	7.8125
167	VDRC 204949	VT048656	9.375
168	BDSC 47826	GMR88C04-GAL4	10
169	VDRC 202269	VT025803	10
170	VDRC 203052	VT017205	10
171	VDRC 200911	VT041424	10
172	VDRC 201230	VT015784	12.5
173	BDSC 49396	GMR53D04-GAL4	15
174	VDRC 205453	VT036779	15
175	VDRC 203966	VT040981	15
176	VDRC 205806	VT000456	15
177	VDRC 200309	VT050245	15

178	VDRC 206939	VT037470	15
179	VDRC 204317	VT030091	15
180	BDSC 50149	GMR42C05-GAL4	20
181	BDSC 50386	GMR48G07-GAL4	20
182	BDSC 48967	GMR22B01-GAL4	20
183	VDRC 204407	VT059796	20
184	VDRC 203800	VT038168	20
185	VDRC 206142	VT058927	20
186	VDRC 204139	VT017376	21.875
187	VDRC 204934	VT043645	25
188	VDRC 203186	VT013509	25
189	BDSC 48016	GMR9A03-GAL4	30
190	VDRC 20055	VT064520	30
191	VDRC 203984	VT062245	40.625
192	VDRC 204969	VT040416	42.85
193	VDRC 202699	VT041723	54.117
194	VDRC 203800	VT038168	55
195	BDSC 39951	GMR77B08-GAL4	65



Movie 1. Thermogenetic activation of *VT041723-GAL4* neurons induces proboscis holding.

Proboscis holding observed upon placing a *VT041723-GAL4>dTrpA1* fed female fly on a 31°C heated block. Note that the fly fully extended its proboscis and held it in that position for the whole 7-minute recording time.



Movie 2. Optogenetic activation of *VT041723-GAL4* neurons induces proboscis holding.

Proboscis holding observed upon activation red LED exposure (at time 0.15 seconds) on a *VT041723-GAL4>CsChrimson* fed female fly. Note that the fly partially extended its proboscis and held it in that position for the whole 7-minute recording time.



Movie 3. Thermogenetic activation of *VT041723-GAL4* neurons induces regurgitation after ingestion. Regurgitation observed upon placing a *VT041723-GAL4>dTrpA1* female fly pre-fed with 0.5 μ L of 100 mM sucrose on a 31°C heated block. Note that the fly held the proboscis with a bubble at the tip for the whole 7-minute recording time.