

line	genotype	source	yeast preference phenotype	note
Ir25a-GAL4	<i>w; IR25a-Gal4 #236.1/(CyO);</i>	BDSC	Yes	
Ir76b-GAL4	<i>w; IR76B-Gal4 #226.8/CyO;</i>	BDSC	Yes	
1B-GAL4	<i>d5-HT 1B-Gal4</i>	Amita Sehgal	No	
ato-GAL4	<i>y[1] w[*]; P{w[+mC]=ato-GAL4.3.6}10;</i>	BDSC	No	
ato-GAL4	<i>y[1] w[*]; P{w[+mC]=ato-GAL4.3.6}14a;</i>	BDSC	No	
c316-GAL4	<i>w[*]; P{w[+mW.hs]=GawB}c316</i>	BDSC	Yes	also expresses in taste pegs and other gustatory neurons
DCGLUT-GAL4	<i>DCGLUT-Gal4</i>	Aaron DiAntonio	Yes	severe secondary behavioral impairments
Ddc-GAL4	<i>w[1118]; P{w[+mC]=Ddc-GAL4.L}Lmpt[4.36];</i>	BDSC	No	
E409-GAL4	<i>w[*]; P{w[+mW.hs]=GawB}E409;</i>	BDSC	No	
ehups-GAL4	<i>w*; P{w+ Ehups-Gal4}C21;</i>	Elizabeth Gavis	No	
G0338-GAL4	<i>P{w[+mGT]=GT1}CG4004 [BG01793] w[1118];;</i>	BDSC	No	
G0431-GAL4		Ann-Shyn Chiang	No	
Gr2a-GAL4	<i>w[*]; P{w[+mC]=Gr2a-GAL4.2.2}3;</i>	BDSC	No	
Gr22c-GAL4	<i>w*; P{Gr22c-GAL4.D}2/CyO;</i>	BDSC	No	
Gr23a-GAL4 (III)	<i>w*;; P{Gr23a-GAL4.3.5}1</i>	BDSC	No	
Gr23a-GAL4 (II)	<i>w*; P{Gr23a-GAL4.3.5}5/CyO;</i>	BDSC	No	
Gr28a-GAL4	<i>P{w[+mC]=Gr28a-GAL4.T}E1/TM3, Sb[1]</i>	BDSC	No	
Gr39a.b-GAL4	<i>;;P{w[+mC]=Gr39a.b-GAL4.1}1D</i>	BDSC	No	
Gr57a-GAL4	<i>w[*]; P{w[+mC]=Gr57a-GAL4.6}1D/CyO</i>	BDSC	No	
Gr5a-GAL4	<i>;Gr5a-Gal4; Gr5a-Gal4</i>	Kristin Scott	No	
Gr64e-GAL4	<i>w[*]; P{w[+mC]=Gr64e-GAL4.8}5;</i>	BDSC	No	

Gr77a-GAL4 (III)	<i>w*;; P{Gr77a-GAL4.4}1L</i>	BDSC	No	
Gr77a-GAL4 (II)	<i>w*;; P{Gr77a-GAL4.4}10;</i>	BDSC	No	
Gr89a-GAL4	<i>w*;; P{Gr89a-GAL4.2}11/CyO</i>	BDSC	No	
Gr92a-GAL4 (II)	<i>w*;; P{Gr92a-GAL4.3.9}6;</i>	BDSC	No	
Gr92a-GAL4 (III)	<i>w*;; P{Gr92a-GAL4.3.9}1/TM3, Sb1</i>	BDSC	No	
Gr94a-GAL4	<i>w[*]; P{w[+mC]=Gr94a-GAL4.3.7}10;</i>	BDSC	No	
Gr98c-GAL4	<i>w*;; P{Gr98c-GAL4.4}3/CyO;</i>	BDSC	No	
Gr94a-GAL4	<i>w*;; P{Gr94a-GAL4.3.7}6</i>	BDSC	No	
Gr9a-GAL4 (II)	<i>w*;; P{Gr9a-GAL4.6.3}7;</i>	BDSC	No	
Gr9a-GAL4 (III)	<i>w*;; P{Gr9a-GAL4.6.3}1</i>	BDSC	No	
HugS3-GAL4	<i>w[*]; P{w[+mC]=Hug-GAL4.S3}3</i>	Michael Pankratz	No	
Ilp7-GAL4	<i>W* (I);; ILp7-Gal4/(TM6SbDfdYFP)</i>	Irene Miguel-Aliaga	No	
Ir20a-GAL4	<i>w[*];; P{w[+mC]=Ir20a-GAL4.K}2/TM6B, Tb[1]</i>	BDSC	No	
Ir40a-GAL4	<i>w; IR40a-Gal4 #214.1/(CyO);</i>	Richard Benton	No	
Ir41a-GAL4	<i>w; IR41a-Gal4 BT42.1/CyO;</i>	Richard Benton	No	
Ir52d-GAL4	<i>w[*];; P{y[+t7.7] w[+mC]=Ir52d-GAL4.K}attP2/TM6B, Tb[1]</i>	BDSC	No	
Ir56a-GAL4	<i>w[*];; P{w[+mC]=Ir56a-GAL4.K}3</i>	BDSC	No	
Ir56b-GAL4	<i>w[*]; P{y[+t7.7] w[+mC]=Ir56b-GAL4.K}attP40/CyO;</i>	BDSC	No	
Ir56d-GAL4 (III)	<i>; IR56d-Gal4 BT76.1 #3/TM6b</i>	Richard Benton	No	
Ir56d-GAL4 (II)	<i>w*;; P{Ir56d-GAL4.K}7-2/CyO;</i>	BDSC	No	
Ir60b-GAL4	<i>w[*]; P{y[+t7.7] w[+mC]=Ir60b-GAL4.K}attP40/CyO;</i>	BDSC	No	

Ir67c-GAL4	<i>w</i> [*]; <i>P</i> { <i>y</i> [+ <i>t</i> 7.7] <i>w</i> [+ <i>mC</i>]= <i>Ir67c</i> - <i>GAL4.Kb</i> } <i>attP40/CyO</i> ;	BDSC	No	
Ir75a-GAL4	<i>w</i> [*]; <i>P</i> { <i>w</i> [+ <i>mC</i>]= <i>Ir75a</i> - <i>GAL4.S</i> } <i>BT12.1/TM6B</i> , <i>Tb</i> [1]	BDSC	No	
Ir75a-GAL4	<i>w</i> ; <i>IR75a</i> (5'+3')- <i>Gal4</i> <i>BT12.1</i>	Richard Benton	No	
Ir76a-GAL4	<i>w</i> ; <i>IR76a-Gal4</i> #292.3B/ <i>CyO</i> ;	Richard Benton	No	
Ir8a-GAL4	<i>w</i> ; <i>IR8a-Gal4</i> #204.8/ <i>CyO</i> ;	Richard Benton	No	
Ir92a-GAL4	<i>w</i> ; <i>IR92a-Gal4</i> #288.3/ <i>TM2</i>	Richard Benton	No	
Ir94a-GAL4	<i>w</i> [*]; <i>P</i> { <i>w</i> [+ <i>mC</i>]= <i>Ir94a</i> - <i>GAL4.K</i> }4	BDSC	No	
Ir94c-GAL4	<i>w</i> [*]; <i>P</i> { <i>y</i> [+ <i>t</i> 7.7] <i>w</i> [+ <i>mC</i>]= <i>Ir94c</i> - <i>GAL4.Kb</i> } <i>attP40/CyO</i> ;	BDSC	No	
Ir94f-GAL4	<i>w</i> [*]; <i>P</i> { <i>y</i> [+ <i>t</i> 7.7] <i>w</i> [+ <i>mC</i>]= <i>Ir94f</i> - <i>GAL4.K</i> } <i>attP40/CyO</i> ;	BDSC	No	
Ir94h-GAL4	<i>w</i> [*]; <i>P</i> { <i>y</i> [+ <i>t</i> 7.7] <i>w</i> [+ <i>mC</i>]= <i>Ir94h</i> - <i>GAL4.K</i> } <i>attP40/CyO</i> ;	BDSC	No	
LEUC-GAL4	; <i>LEUC-GAL4/CyO</i> ;	Bader Al- Anzi	No	
npf-GAL4	; <i>npf-Gal4</i> ;	Ping Shen	No	
Poxn-GAL4 (II)	; <i>Poxn-Gal4 T2d</i> ;	Ribeiro lab	No	
Poxn-GAL4 (III)	; <i>Poxn-Gal4 T2a/TM3,Sb</i>	Ribeiro lab	No	
Tdc2-GAL4	<i>w</i> [*]; <i>P</i> { <i>w</i> [+ <i>mC</i>]= <i>Tdc2</i> - <i>GAL4.C</i> }2;	BDSC	No	
TH-GAL4	<i>w</i> *(<i>I</i>); <i>P</i> { <i>ple-GAL4.F</i> }3	BDSC	No	
VT30559- GAL4	<i>P</i> { <i>VT30559-GAL4</i> } <i>attP2</i>	VDRC	No	
VT61723- GAL4	<i>P</i> { <i>VT61723-GAL4</i> } <i>attP2</i>	VDRC	No	

Supplementary Table 1: GAL4 lines screened for yeast preference phenotypes using thermogenetic silencing.

Line	LSO (cluster 1)	LSO (cluster 2)	DCSO	VCSO
<i>1261-GAL4;UAS-CD8::GFP</i>	2	0	2	3
<i>1261-GAL4;Poxn-GAL80;UAS-CD8::GFP</i>	0	0	0	0
<i>Ir25a-GAL4;UAS-CD8::GFP</i>	6	2	6	3
<i>Ir25a-GAL4; Poxn-GAL80;UAS-CD8::GFP</i>	0	0	0	0
<i>Ir76b-GAL4;UAS-CD8::GFP</i>	6	2	6	3
<i>Ir76b-GAL4; Poxn-GAL80;UAS-CD8::GFP</i>	3	0	0	0

Supplementary Table 2: Number of cell bodies counted on either side of the internal sense organs in the depicted lines.

figure	line	full genotype	source
1,2,3,4,5,6,1S1,1S2,1S3,3S3,4S1,5S1,6S1	;lr76b-GAL4;	w; IR76B-Gal4 #226.8/CyO;	Richard Benton
1,2,S1,1S2,1S3,2S1	;lr25a-GAL4;	w; IR25a-Gal4 #236.1/(CyO);	Richard Benton
1,2,3,S1,1S2,1S3,2S1,3S3	;1261-GAL4;	w*;1261-GAL4;(CyO)	Ulrike Heberlein
1,2,1S2,2S1,2S2	;UAS-CD8::GFP;	;UAS-CD8::GFP/(CyO);	Barry Dickson
1,2,1S2,2S1	;UAS-shi[ts] (attP5);	pJFRC100-20xUAS-TTS-Shibire-ts1-p10 in su(Hw) attP5	Gerry Rubin
1,2,1S2,2S1	;attP5; control	y[1] w[*]; P{y[+t7.7]=CaryIP}su(Hw)attP5	BDSC
1,3,4,5,1S1,1S3,4S1,5S1	;UAS-GCaMP6s;	w[1118]; P{y[+t7.7]w[+mC]=20XUAS-IVS-GCaMP6s}attP40	BDSC
1,1S3	;lr76b-GAL80 (attP2)		Ribeiro lab, see methods
2	;tshirt-GAL80;		Gero Miesenboeck
2,3	;Poxn[ΔM22-B5];		Werner Boll
2,3	;Poxn[ΔM22-B5];ΔSfoBs105/ΔSfoBs127		Werner Boll
2	;VT033654-GAL4 (attP2)		VDRC
2	;Gr9a-GAL4;	w*; P{Gr9a-GAL4.6.3}7;	BDSC
2	;lr67c-GAL4;	w[*]; P{y[+t7.7]w[+mC]=lr67c-GAL4.Kb}attP40/CyO;	BDSC
2,3,1S1,1S2,1S3,2S1,2S2,3S3	;UAS-shi[ts] (VK00005)	pJFRC100-20xUAS-TTS-Shibire-ts1-p10 in VK00005	Janelia Research Campus
2,3,1S1,1S2,1S3,2S1,2S2,3S3	;VK00005 control	y[1] w[1118];; PBac{y[+]-attP-9A}VK00005	BDSC
2,2S1	;Poxn-GAL80 (attP2)		Ribeiro lab, see methods
2,3,2S2,3S3	;67E03-GAL4	w1118;; P{GMR67E03-GAL4}attP2	BDSC
2,3,2S2,3S3	;pBDP-GAL4U (attP2)		BDSC
3, 2S2,3S3	;57F03-Gal4	w1118;; P{GMR57F03-GAL4}attP2	BDSC
3,3S3	attP2	y[1] w[67c23];;P{CaryP}attP2	BDSC
3,3S3	; ;UAS-GtACR1	w[1118];; 20xUAS-GtACR1 (attP2)	Adam Claridge-Chang

3,2S2	::;Poxn-GAL4	w*;P{Poxn-Gal4.14}1-7/TM6B, Tb ¹	Markus Noll
3	;UAS-Kir2.1;	w*;P{UAS- HsapKCNJ2.EGFP}1;	BDSC
4,2S2,3S3,5S1	;Gr5a-GAL4;		Kristin Scott
1S1,3S3	E409-GAL4	w[*]; P{w[+mW.hs]=GawB}E409;	BDSC
1S1	Gr64e-GAL4	w[*]; P{w[+mC]=Gr64e- GAL4.8}5;	BDSC
1S2,3S3	w[1118];;		Barry Dickson
1S3	Ir76b[1]		Craig Montell
1S3	Ir76b[rev]		Craig Montell
1S3	Ir76b[MB00216]	y[1]w[67c23];;Mi{ET1}Ir76b[M B00216]	BDSC
1S3	Ir76b[05]	y[1]w[*];;P{UAST- YFP.Rab39.S23N}Ir76b[05]	BDSC
1S3	Ir25a[1]		Richard Benton
1S3	IR25a[2]		Richard Benton
2S1	Ir8a[-/-]	Ir8a[1];;	Richard Benton
2S1	Ir8a[+/+]	IR8a[1], IR8a-rescue # BT128.1;;	Richard Benton
2S1	Orco[1]		Sofia Lavista- Llanos
2S1	Orco[2]		Sofia Lavista- Llanos
2S1	::;Orco-GAL4	w[1118]; P{w[+mC]=Orco- GAL4.K}97.1	BDSC
2S1	;Ir8a-GAL4;	w; IR8a-Gal4 #204.8/CyO;	Richard Benton
2S1	atonal[-/-]	eyflp; FRT82B ato[1]/FRT82B, CL	Ilona Kadow
2S1	atonal[+/+]	eyflp; FRT82B/FRT82B, CL	Ilona Kadow
2S3	;Ir60b-GAL4;	w; IR60b-Gal4[B-P40-1]/CyO;	BDSC
2S3	::;Ir94f-GAL4	P{y[+t7.7] w[+mC]=Ir94f- GAL4.K}attP2	BDSC
2S3	;Ir94a-GAL4;	w[*]; P{w[+mC]=Ir94a- GAL4.K}5/CyO;	BDSC
2S3	;Gr2a-GAL4;	w[*]; P{w[+mC]=Gr2a- GAL4.2.2}3;	BDSC

2S3	;Gr23a-GAL4;	w [*] ; P{Gr23a-GAL4.3.5}5/CyO;	BDSC
2S3	;Gr77a-GAL4;	w [*] ; P{Gr77a-GAL4.4}10;	BDSC
2S3	;Gr92a-GAL4;	w [*] ; P{Gr92a-GAL4.3.9}6;	BDSC
2S3	;Gr22c-GAL4;	w [*] ; P{Gr22c-GAL4.D}2/CyO;	BDSC
2S3	;;Gr39a.b-GAL4	P{w[+mC]=Gr39a.b-GAL4.1}1D	BDSC
2S3	;Gr98c-GAL4;	w [*] ; P{Gr98c-GAL4.4}3/CyO;	BDSC
2S3	;;Gr28a-GAL4	P{w[+mC]=Gr28a-GAL4.T}E1/TM3, Sb[1]	BDSC
2S3	;Gr57a-GAL4;	w[[*]]; P{w[+mC]=Gr57a-GAL4.6}1D/CyO	BDSC
2S3	;Gr89a-GAL4;	w [*] ; P{Gr89a-GAL4.2}11/CyO	BDSC
3S3	83F01-Gal4	w[1118];; P{GMR83F01-GAL4}attP2	BDSC
6S1	UAS-SPR-IR1		Barry Dickson
6S1	;UAS-SPR-IR2;		Barry Dickson
6S1	UAS-Dcr2;;	w[1118], P{w[+mC]=UAS-Dcr-2};;	Barry Dickson

Supplementary Table 3: Genetic lines used in the manuscript.