

Supplementary Material

Dysregulation of Hypothalamic Gene Expression and the Oxytocinergic System by Soybean Oil Diets in Male Mice

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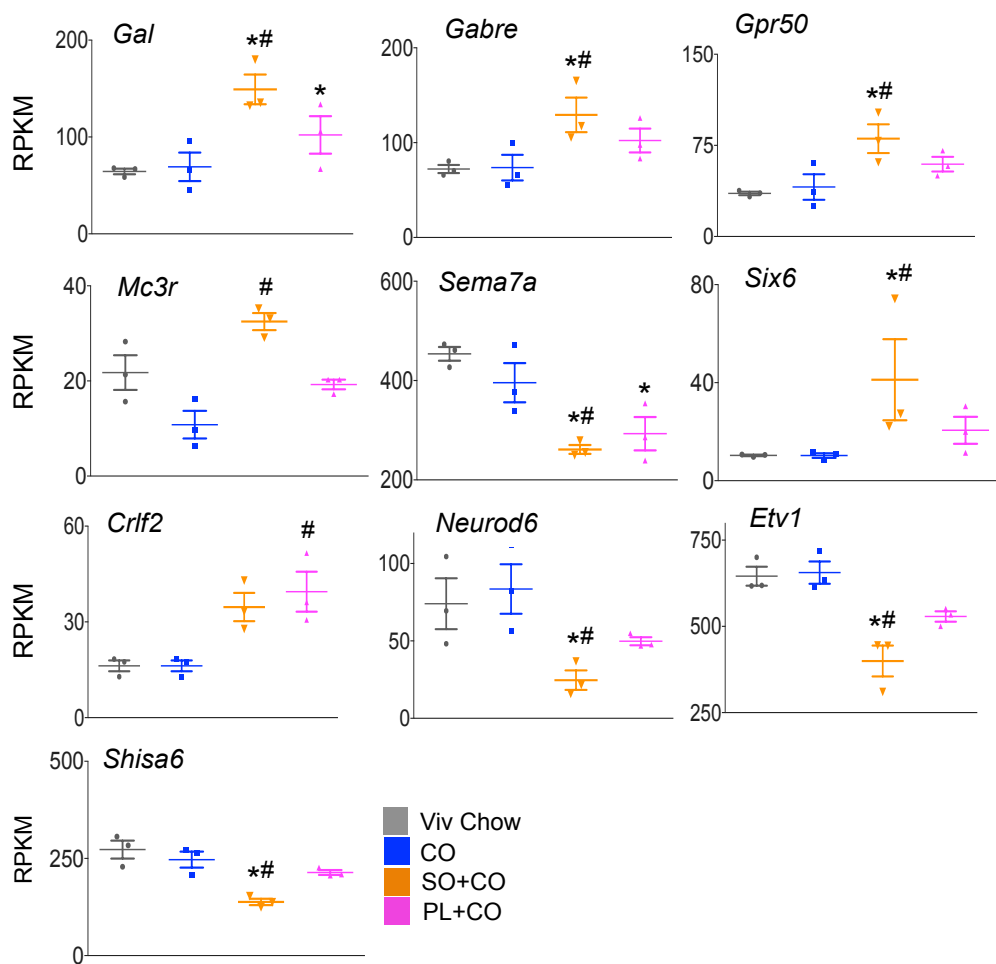
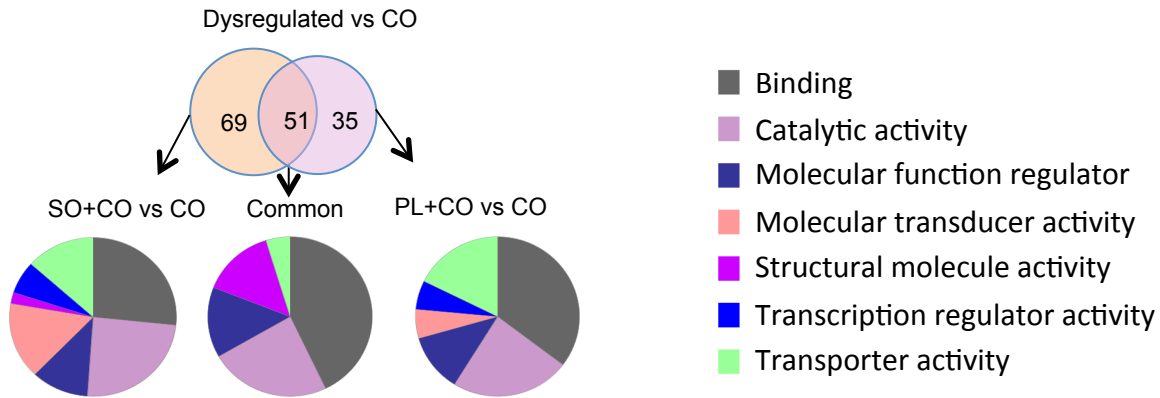
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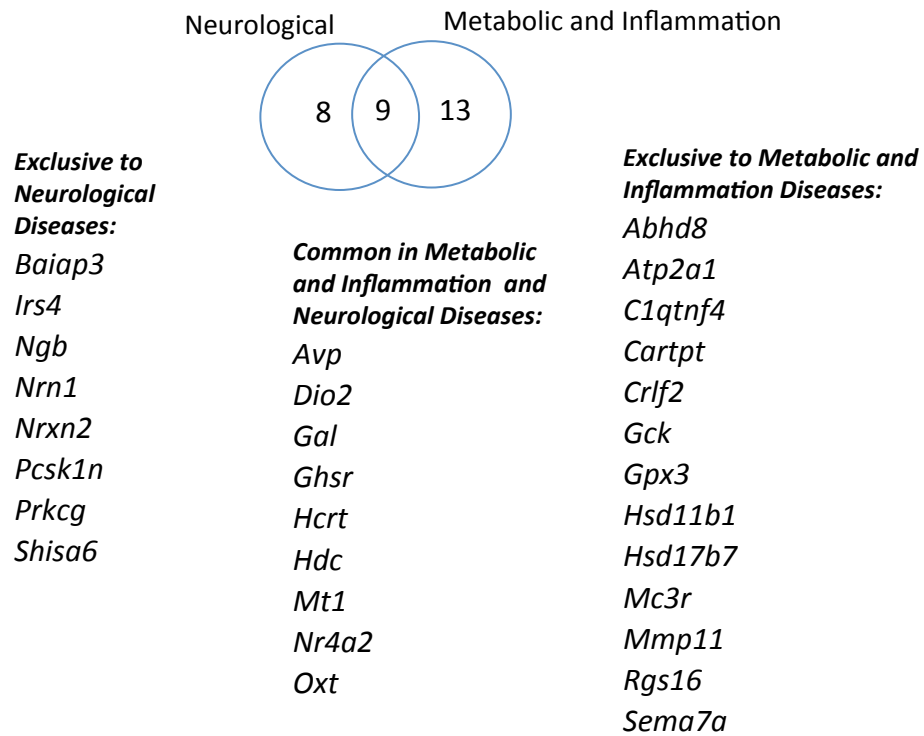
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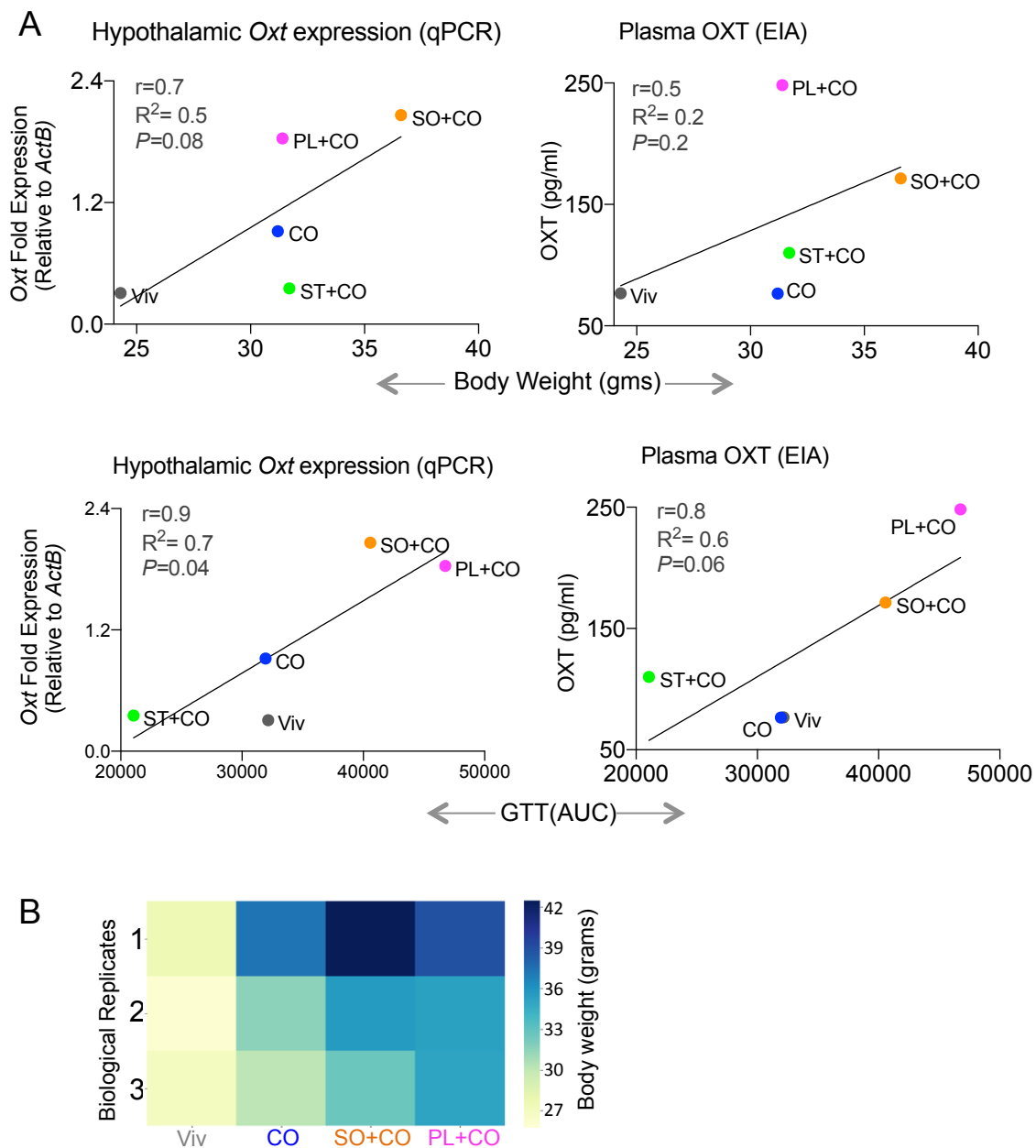
Gene Analysis-Molecular Function



Supplementary Figure 1. Venn diagram showing number of genes dysregulated (> 1.5 fold, P and Padj <.05) either exclusively or commonly by SO+CO and PL+CO versus CO. Gene ontology for molecular function categories altered in the different dietary comparisons is shown (*top*). Absolute expression levels are shown for differentially expressed genes that are mentioned in text (*bottom*). Significantly different from # CO; * Viv chow.



Supplementary Figure 2. Venn diagram as in Supplementary Fig. 1 showing genes dysregulated (≥ 1.5 fold, P and $P_{adj} \leq .05$) in SO+CO and PL+CO versus CO that are related to only neurological or metabolic diseases and those related to both diseases. See Figures 4B-C, 5B for gene expression graphs of each gene that common to both metabolic and neurological diseases.



Supplementary Figure 3. Oxytocin gene and peptide levels correlate with glucose intolerance but not with body weight. **A.** Correlation graphs between average body weight or GTT and hypothalamic *Oxt* levels determined by qPCR or plasma OXT levels determined by EIA of male mice on the indicated diets (see Figure 1A). Pearson correlation coefficient (r) and R^2 values and associated P values for linear regression are indicated on the graphs. Values for 3-10 mice were included in each group mean. **B.** Heatmap of body weight of mice used for RNA-seq analysis shown in Figure 2A. Biological replicates 1,2,3 are the same as shown from left to right in Figure 2A for each diet.

Supplementary Table 1. Fold change (FC) of all (5) genes dysregulated in the hypothalamus of male mice fed a coconut oil (CO) diet versus a vivarium chow (Viv) diet ($P \leq .05$; $q \leq .05$, $FC \geq 1.5$).

Gene Symbol	FC (CO/Viv)
<i>Col11a1</i>	1.5
<i>Rgs16</i>	0.6
<i>Gm43398</i>	0.3
<i>Atp2a1</i>	0.2
<i>Ppp1r3a</i>	0.1

Supplementary Table 2. Gene ontology (GO) of genes significantly up- or downregulated in the hypothalamus of vivarium chow fed (Viv chow) male mice compared to any of the three high fat diets (CO, SO+CO, PL+CO). Genes are listed in order of most to least dysregulated.

Up in Viv Chow	
Panther GO Category	Genes included
Antioxidant activity	<i>Mgst3</i>
Signal transducer activity	<i>Opn3, Shisa6</i>
Receptor activity	<i>Opn3, Ntn1, Shisa6, Net1</i>
Transporter activity	<i>Kcnab2, Gjc1, Kcng1, Kcnc2, Shisa6</i>
Binding	<i>Rasgrp3, Sema7a, Etv1, Cplx1, Hsd11b1, Adarb1, Neurod6, Shisa6, IL16, Lrrtm1, Wnt3, Rtn4rl1</i>
Catalytic activity	<i>Kcnab2, Rasgrp3, Gpd1, Rab37, Prkch, Hsd11b1, Adarb1, Mgst3, Rgs4, Neurod6, Peak1, Msra, Rgs16, Dio2</i>

Down in Viv Chow	
Panther GO Category	Genes included
Antioxidant activity	<i>Gpx3</i>
Structural molecule activity	<i>Rps13, Arhgap36</i>
Receptor activity	<i>Gpr50, Gabre</i>
Signal transducer activity	<i>Irs4, Gck, Gabre</i>
Transporter activity	<i>Cngb1, Scn9a, Gabre</i>
Catalytic activity	<i>Itih3, Gck, Dnah1, Pcsk1n, Gpx3</i>
Binding	<i>Rps13, Irs4, Gal, Cngb1, Six6, Itih3, Map1s, Gck, Dnah1, Trh, Avp, Hmcn2, Gabre, Asb4, Oxt, Sim1</i>

Supplementary Table 3. . Fold change (FC) of all 228 genes dysregulated in the hypothalamus of adult male mice (C57BL/6N) fed a conventional soybean oil (SO+CO) versus a vivarium chow (Viv) diet for 24 weeks ($P \leq 0.05$; $q \leq 0.05$; $FC \geq 1.5$).

Gene Symbol	FC (SO+CO/Viv)
<i>Six6</i>	4.0
<i>Gm11942</i>	3.2
<i>A730071L15Rik</i>	2.9
<i>Gm1673</i>	2.9
<i>Pcsk1n</i>	2.8
<i>Oxt</i>	2.7
<i>Hmcn2</i>	2.7
<i>Fezf1</i>	2.6
<i>Hcrt</i>	2.6
<i>Avp</i>	2.6
<i>Scand1</i>	2.5
<i>Cngb1</i>	2.5
<i>Gm24447</i>	2.4
<i>Sfta3-ps</i>	2.4
<i>Gm24245</i>	2.4
<i>H2-Aa</i>	2.4
<i>Uchl1os</i>	2.3
<i>Gal</i>	2.3
<i>Gm17509</i>	2.3
<i>Gpr50</i>	2.3
<i>BC037032</i>	2.3
<i>C130093G08Rik</i>	2.3
<i>C1qtnf4</i>	2.2
<i>Asb4</i>	2.2
<i>Gm11175</i>	2.2
<i>Gck</i>	2.2
<i>Irs4</i>	2.1
<i>Dnah10</i>	2.1
<i>Nespas</i>	2.0
<i>H2-Q2</i>	2.0
<i>Chodl</i>	2.0
<i>Hdc</i>	2.0
<i>Mmp11</i>	2.0
<i>Gpx3</i>	1.9
<i>Parp14</i>	1.9
<i>Sytl4</i>	1.9
<i>Itih3</i>	1.9
<i>Arhgap36</i>	1.9
<i>Gm23935</i>	1.9
<i>Sim1</i>	1.8
<i>Lyz2</i>	1.8
<i>Otp</i>	1.8
<i>Zim1</i>	1.8
<i>Gabre</i>	1.8
<i>Col9a2</i>	1.8
<i>Zfp783</i>	1.8
<i>Esr1</i>	1.8
<i>BC067074</i>	1.8

Gene Symbol	FC (SO+CO/Viv)
<i>Lrrc9</i>	1.7
<i>Nnat</i>	1.7
<i>Zfp92</i>	1.7
<i>Gabrq</i>	1.7
<i>Rps10-ps2</i>	1.7
<i>Nrarp</i>	1.7
<i>A230005M16Rik</i>	1.7
<i>Magel2</i>	1.7
<i>Nkx2-1</i>	1.7
<i>Col5a2</i>	1.7
<i>Ly6h</i>	1.7
<i>Peg10</i>	1.7
<i>A330076H08Rik</i>	1.6
<i>Ttll3</i>	1.6
<i>Gm23134</i>	1.6
<i>Scn9a</i>	1.6
<i>Cfap46</i>	1.6
<i>Gm42664</i>	1.6
<i>Gm5373</i>	1.6
<i>D130040H23Rik</i>	1.6
<i>Trh</i>	1.6
<i>0610039K10Rik</i>	1.6
<i>Dnah1</i>	1.6
<i>Gpr165</i>	1.6
<i>AW551984</i>	1.6
<i>A230006K03Rik</i>	1.6
<i>Megf6</i>	1.6
<i>Baiap3</i>	1.6
<i>Rps13</i>	1.6
<i>Ebf4</i>	1.6
<i>Slc16a11</i>	1.6
<i>Rtl1</i>	1.6
<i>Nts</i>	1.6
<i>Gm44644</i>	1.5
<i>Tmem176a</i>	1.5
<i>Igsf1</i>	1.5
<i>Romo1</i>	1.5
<i>4930447C04Rik</i>	1.5
<i>Parppb</i>	1.5
<i>Rplp2</i>	1.5
<i>Zkscan16</i>	1.5

Gene Symbol	FC (SO+CO/Viv)
<i>Serpina3n</i>	1.5
<i>Klhdc8b</i>	1.5
<i>Map1s</i>	1.5
<i>Malt1</i>	1.5
<i>Celf6</i>	1.5
<i>Syt10</i>	1.5
<i>Zfp219</i>	1.5
<i>Ngb</i>	1.5
<i>Spint2</i>	1.5
<i>Sned1</i>	1.5
<i>N4bp2</i>	1.5
<i>Traf3ip2</i>	1.5
<i>St8sia5</i>	0.7
<i>Nde1</i>	0.7
<i>Gm10874</i>	0.7
<i>Sh3bgrl2</i>	0.7
<i>Rasgef1b</i>	0.7
<i>Ankrd29</i>	0.7
<i>Kctd1</i>	0.7
<i>Aff1</i>	0.7
<i>Klhl34</i>	0.7
<i>Pcdhgc5</i>	0.7
<i>Adcy1</i>	0.7
<i>Adarb1</i>	0.7
<i>Grb14</i>	0.7
<i>Nrn1</i>	0.7
<i>Epha4</i>	0.7
<i>Rnf182</i>	0.7
<i>Ppard</i>	0.7
<i>Trnp1</i>	0.7
<i>Patj</i>	0.7
<i>Sh3d19</i>	0.7
<i>Kcnab2</i>	0.7
<i>Pdp1</i>	0.7
<i>Rgs4</i>	0.7
<i>Gcnt2</i>	0.7
<i>Litaf</i>	0.7
<i>Slc15a2</i>	0.7
<i>Raver2</i>	0.7
<i>Zfpm2</i>	0.7
<i>Rhog</i>	0.7
<i>Myrf</i>	0.7
<i>AI593442</i>	0.6

Supplementary Table 3 (cont.)

Gene Symbol	FC (SO+CO/Viv)
<i>Hs3st4</i>	0.6
<i>Gm26602</i>	0.6
<i>Slc24a2</i>	0.6
<i>Cplx1</i>	0.6
<i>Tgfb3</i>	0.6
<i>Mgst3</i>	0.6
<i>Lrrtm1</i>	0.6
<i>Iqgap2</i>	0.6
<i>Crym</i>	0.6
<i>Kcnc3</i>	0.6
<i>Kcnc2</i>	0.6
<i>Grm4</i>	0.6
<i>F2r</i>	0.6
<i>Gm12868</i>	0.6
<i>Hpca</i>	0.6
<i>Stum</i>	0.6
<i>Gm37335</i>	0.6
<i>Car4</i>	0.6
<i>Cryab</i>	0.6
<i>Etl4</i>	0.6
<i>Msra</i>	0.6
<i>Etv1</i>	0.6
<i>Sel1l3</i>	0.6
<i>Nsmf</i>	0.6
<i>Pdlim2</i>	0.6
<i>Galnt9</i>	0.6
<i>Stac2</i>	0.6
<i>Peak1</i>	0.6
<i>Gjb1</i>	0.6
<i>Scrt2</i>	0.6
<i>Kank4</i>	0.6
<i>Tsc22d3</i>	0.6
<i>Gpd1</i>	0.6
<i>Cpm</i>	0.6
<i>Gm44040</i>	0.6
<i>Cck</i>	0.6
<i>Rtn4r1</i>	0.6
<i>Pcp4l1</i>	0.6
<i>Rora</i>	0.6
<i>Prkch</i>	0.6
<i>Net1</i>	0.6
<i>Rasgrp3</i>	0.6
<i>Sema7a</i>	0.6
<i>Smco3</i>	0.6

Gene Symbol	FC (SO+CO/Viv)
<i>Rgs16</i>	0.64
<i>Gm44354</i>	0.64
<i>Lef1</i>	0.64
<i>Kcnab3</i>	0.64
<i>Kitl</i>	0.63
<i>Mreg</i>	0.61
<i>Dio2</i>	0.61
<i>Gm16537</i>	0.61
<i>Tanc1</i>	0.60
<i>Prkcg</i>	0.60
<i>Kcng1</i>	0.60
<i>Fhdc1</i>	0.59
<i>Plekhf1</i>	0.59
<i>Sptssb</i>	0.59
<i>Esrrg</i>	0.59
<i>Nefh</i>	0.59
<i>Cnksr3</i>	0.59
<i>Shisa6</i>	0.58
<i>A330015K06Rik</i>	0.58
<i>Pstpip2</i>	0.58
<i>Kcns3</i>	0.57
<i>Mctp2</i>	0.57
<i>Rasd1</i>	0.57
<i>Klk6</i>	0.57
<i>Plekhdl1</i>	0.57
<i>B230206H07Rik</i>	0.56
<i>Grid2ip</i>	0.56
<i>Gjc1</i>	0.56
<i>Ntng1</i>	0.56
<i>Edn1</i>	0.4
<i>Mvri1</i>	0.4
<i>Il16</i>	0.4
<i>Emilin2</i>	0.4
<i>Ptpn3</i>	0.4
<i>Fam163a</i>	0.4
<i>Nexn</i>	0.4
<i>Hsd11b1</i>	0.4
<i>Wnt3</i>	0.4
<i>Vav3</i>	0.4
<i>Epn3</i>	0.4
<i>Plekhg1</i>	0.3
<i>Neurod6</i>	0.3
<i>Otx2</i>	0.3
<i>1810049J17Rik</i>	0.3

Gene Symbol	FC (SO+CO/Viv)
<i>Synpo2</i>	0.3
<i>Tcf7l2</i>	0.3
<i>Gm43398</i>	0.2
<i>Rab37</i>	0.2
<i>Prkcd</i>	0.2
<i>Ramp3</i>	0.2
<i>Tnnt1</i>	0.1
<i>Abhd12b</i>	0.1

Supplementary Table 4. Fold change (FC) of all 138 genes dysregulated in the hypothalamus of adult male mice (C57BL/6N) fed a Plenish oil (PL+CO) versus a vivarium chow (Viv) diet for 24 weeks ($P \leq 0.05$; $q \leq 0.05$; $FC \geq 1.5$).

Gene Symbol	FC (PL+CO/Viv)	Gene Symbol	FC (PL+CO/Viv)	Gene Symbol	FC (PL+CO/Viv)
<i>Gm11942</i>	3.9	<i>Frs3</i>	1.5	<i>Gm44101</i>	0.6
<i>Hcrt</i>	3.6	<i>Trh</i>	1.5	<i>Osbpl3</i>	0.6
<i>Uchl1os</i>	3.3	<i>Adcyap1</i>	1.5	<i>Kitl</i>	0.6
<i>Pcsk1n</i>	3.1	<i>Itih3</i>	1.5	<i>Slitrk6</i>	0.6
<i>Gm24245</i>	2.7	<i>Gm16185</i>	1.5	<i>Gabra4</i>	0.6
<i>Oxt</i>	2.7	<i>Rplp2</i>	1.5	<i>Mrpl22</i>	0.6
<i>Gm12915</i>	2.5	<i>Bcam</i>	1.5	<i>Mppe1</i>	0.6
<i>Ppp1r3f</i>	2.4	<i>Ankk1</i>	0.1	<i>Klk6</i>	0.6
<i>Gm35240</i>	2.4	<i>1700018M17Rik</i>	0.1	<i>Vangl1</i>	0.6
<i>Fezf1</i>	2.4	<i>Abhd12b</i>	0.1	<i>Gm16537</i>	0.6
<i>Avp</i>	2.3	<i>Tnnt1</i>	0.1	<i>Dusp1</i>	0.6
<i>C1qtnf4</i>	2.3	<i>Gm43398</i>	0.1	<i>Nefh</i>	0.6
<i>Mmp11</i>	2.3	<i>Prkcd</i>	0.2	<i>Trpc3</i>	0.6
<i>Hmcn2</i>	2.3	<i>Ramp3</i>	0.2	<i>Rgs4</i>	0.6
<i>A230005M16Rik</i>	2.3	<i>Gbx2</i>	0.2	<i>Rora</i>	0.6
<i>Gm16499</i>	2.3	<i>Scn4b</i>	0.3	<i>Pdp1</i>	0.6
<i>Gm11175</i>	2.1	<i>Gabrd</i>	0.3	<i>Bok</i>	0.6
<i>Gm5453</i>	2.0	<i>Nexn</i>	0.3	<i>Acvr1c</i>	0.6
<i>Gm4419</i>	2.0	<i>Synpo2</i>	0.3	<i>Tesc</i>	0.6
<i>BC037032</i>	1.9	<i>Epn3</i>	0.4	<i>Smco3</i>	0.6
<i>Nespas</i>	1.9	<i>Rab37</i>	0.4	<i>Atp2b1</i>	0.6
<i>H2-Q2</i>	1.9	<i>Plekhg1</i>	0.4	<i>Slc16a6</i>	0.6
<i>Ly6h</i>	1.8	<i>Tcf7l2</i>	0.4	<i>Npas2</i>	0.6
<i>Sim1</i>	1.8	<i>Vav3</i>	0.4	<i>Rasgef1b</i>	0.6
<i>Gal</i>	1.8	<i>Slc35d3</i>	0.4	<i>Rgs7bp</i>	0.6
<i>Zfp783</i>	1.8	<i>Opn3</i>	0.4	<i>Sema7a</i>	0.6
<i>Pmch</i>	1.8	<i>Wnt3</i>	0.4	<i>Sel1l3</i>	0.6
<i>Parpbp</i>	1.8	<i>Mctp2</i>	0.4	<i>Capn1</i>	0.7
<i>Gm15849</i>	1.8	<i>Rem2</i>	0.4	<i>Trmp1</i>	0.7
<i>C230062I16Rik</i>	1.8	<i>Grid2ip</i>	0.4	<i>Chst15</i>	0.7
<i>Col9a2</i>	1.8	<i>Drd2</i>	0.4	<i>Elp6</i>	0.7
<i>Rps10-ps2</i>	1.7	<i>Rasd1</i>	0.4	<i>Zdhhc14</i>	0.7
<i>Gm23935</i>	1.7	<i>Sptssb</i>	0.4	<i>Pantr1</i>	0.7
<i>0610039K10Rik</i>	1.7	<i>Htr1d</i>	0.4	<i>Zic1</i>	0.7
<i>Romo1</i>	1.7	<i>Ptpn3</i>	0.5	<i>Kctd17</i>	0.7
<i>Gpx3</i>	1.7	<i>Dmp1</i>	0.5	<i>Cry1</i>	0.7
<i>Hdc</i>	1.7	<i>Mrv1</i>	0.5	<i>Apln</i>	0.7
<i>Pgr15l</i>	1.7	<i>Eps8l2</i>	0.5	<i>Mgst3</i>	0.7
<i>Otp</i>	1.7	<i>B230206H07Rik</i>	0.5	<i>Adarb1</i>	0.7
<i>Megf6</i>	1.7	<i>Cnksr3</i>	0.5		
<i>Gm42664</i>	1.7	<i>Pcp4l1</i>	0.5		
<i>Map1s</i>	1.6	<i>Rasgrp1</i>	0.5		
<i>Selenoh</i>	1.6	<i>Prkch</i>	0.5		
<i>A330076H08Rik</i>	1.6	<i>Gm44354</i>	0.5		
<i>Zim1</i>	1.6	<i>Plekhdl</i>	0.5		
<i>Slc16a11</i>	1.6	<i>Ntng1</i>	0.5		
<i>Gm44644</i>	1.6	<i>Lef1</i>	0.6		
<i>Cfap46</i>	1.5	<i>Rgs16</i>	0.6		
<i>Zfp219</i>	1.5	<i>Actn2</i>	0.6		
		<i>Inf2</i>	0.6		

Supplementary Table 5. Fold change (FC) of all 120 genes dysregulated in the hypothalamus of adult male mice (C57BL/6N) fed a conventional soybean oil (SO+CO) versus a coconut oil (CO) diet for 24 weeks ($P \leq 0.05$; $q \leq 0.05$; $FC \geq 1.5$).

Gene Symbol	FC (SO+CO/CO)	Gene Symbol	FC (SO+CO/CO)	Gene Symbol	FC (SO+CO/CO)
<i>Gm44367</i>	17.50	<i>Romo1</i>	1.98	<i>Zim1</i>	1.48
<i>Hist1h2ai</i>	10.85	<i>Gpr50</i>	1.98	<i>Krtcap2</i>	1.47
<i>Hmx3</i>	9.21	<i>Fezf1</i>	1.96	<i>Podxl2</i>	1.46
<i>Prr7</i>	5.32	<i>Rps13</i>	1.96	<i>Lrfn1</i>	1.46
<i>C1qtnf4</i>	5.25	<i>Sytl4</i>	1.91	<i>Etl4</i>	0.68
<i>Pcsk1n</i>	5.15	<i>Gm14205</i>	1.90	<i>Col6a1</i>	0.68
<i>A830012C17Rik</i>	4.95	<i>Irs4</i>	1.90	<i>Gpr161</i>	0.68
<i>B930094E09Rik</i>	4.83	<i>Gm4419</i>	1.89	<i>Car12</i>	0.68
<i>Gm1673</i>	4.61	<i>Megf6</i>	1.84	<i>Hsd17b7</i>	0.67
<i>Gm24245</i>	4.24	<i>Cited1</i>	1.84	<i>Galnt9</i>	0.67
<i>Six6</i>	4.01	<i>Sfta3-ps</i>	1.83	<i>Tmem178</i>	0.67
<i>BC037032</i>	3.67	<i>Rps10-ps2</i>	1.83	<i>Nrn1</i>	0.66
<i>Gm11508</i>	3.43	<i>Cartpt</i>	1.78	<i>Sema7a</i>	0.66
<i>Gm11942</i>	3.42	<i>Otp</i>	1.77	<i>Peak1</i>	0.66
<i>Oxt</i>	3.35	<i>Gabre</i>	1.75	<i>Gpd1</i>	0.65
<i>Krt90</i>	3.16	<i>Uqcrcq</i>	1.74	<i>St8sia5</i>	0.65
<i>Uchl1os</i>	3.10	<i>Mxra8</i>	1.71	<i>Dio2</i>	0.64
<i>Mc3r</i>	3.01	<i>Ccdc85b</i>	1.71	<i>Stac2</i>	0.61
<i>Hba-a1</i>	2.98	<i>Ly6h</i>	1.71	<i>Etv1</i>	0.61
<i>Gm24447</i>	2.94	<i>Sf3b5</i>	1.71	<i>Prkcz2</i>	0.61
<i>Gm11175</i>	2.92	<i>Gm26508</i>	1.70	<i>Nefh</i>	0.61
<i>Mmp11</i>	2.88	<i>Ssbp4</i>	1.70	<i>Rasgrp3</i>	0.60
<i>Gm9934</i>	2.85	<i>Gpx3</i>	1.69	<i>Gm16537</i>	0.59
<i>Hba-a2</i>	2.78	<i>Slc16a11</i>	1.67	<i>Iqgap2</i>	0.59
<i>Hcrt</i>	2.69	<i>Bmyc</i>	1.67	<i>Cpm</i>	0.58
<i>Avp</i>	2.61	<i>Col9a2</i>	1.65	<i>Prkcg</i>	0.57
<i>A230005M16Rik</i>	2.51	<i>Mrps12</i>	1.61	<i>Nr4a2</i>	0.57
<i>H1fx</i>	2.42	<i>Chpf</i>	1.60	<i>Shisa6</i>	0.56
<i>Gm17509</i>	2.34	<i>Rps26</i>	1.59	<i>Gm37811</i>	0.52
<i>Ghsr</i>	2.30	<i>Map1s</i>	1.58	<i>Kcng1</i>	0.50
<i>O610039K10Rik</i>	2.25	<i>Gpr165</i>	1.56	<i>Klk6</i>	0.43
<i>Asb4</i>	2.21	<i>Hist1h1c</i>	1.55	<i>Hsd11b1</i>	0.41
<i>Gal</i>	2.16	<i>C230062I16Rik</i>	1.55	<i>Slc26a4</i>	0.34
<i>Nespas</i>	2.14	<i>Zfp219</i>	1.55	<i>1810049J17Rik</i>	0.31
<i>Gm23935</i>	2.14	<i>Zfp92</i>	1.54	<i>Neurod6</i>	0.30
<i>Gm47283</i>	2.05	<i>Selenom</i>	1.53	<i>Slc9a4</i>	0.26
<i>Gck</i>	2.04	<i>Akt1s1</i>	1.53	<i>Aspn</i>	0.25
<i>Rplp2</i>	2.03	<i>Abhd8</i>	1.52		
<i>H2-Q2</i>	1.98	<i>Baiap3</i>	1.52		
<i>Hdc</i>	1.98	<i>Ngb</i>	1.52		
		<i>Whrn</i>	1.51		
		<i>Chchd10</i>	1.49		
		<i>Trh</i>	1.48		

Supplementary Table 6. Fold change (FC) of all 86 genes dysregulated in the hypothalamus of adult male mice (C57BL/6N) fed a Plenish oil (PL+CO) versus a coconut oil (CO) diet for 24 weeks ($P \leq 0.05$; $q \leq 0.05$; $FC \geq 1.5$).

Gene Symbol	FC (PL+CO/CO)	Gene Symbol	FC (PL+CO/CO)
<i>Gm44367</i>	18.13	<i>Uqcrq</i>	1.87
<i>Hmx3</i>	9.99	<i>Rps10-ps2</i>	1.86
<i>Pcsk1n</i>	5.84	<i>Bmyc</i>	1.86
<i>C1qtnf4</i>	5.50	<i>9430041J12Rik</i>	1.82
<i>Prr7</i>	5.19	<i>Cartpt</i>	1.81
<i>Gm24245</i>	4.90	<i>Rps13</i>	1.80
<i>Uchl1os</i>	4.40	<i>Sf3b5</i>	1.77
<i>Gm11942</i>	4.19	<i>Map1s</i>	1.74
<i>Hcrt</i>	3.74	<i>4932441J04Rik</i>	1.73
<i>Gm11508</i>	3.69	<i>Ssbp4</i>	1.71
<i>Gm1673</i>	3.49	<i>Slc16a11</i>	1.70
<i>A930012O16Rik</i>	3.48	<i>Thap3</i>	1.69
<i>Mmp11</i>	3.38	<i>2410006H16Rik</i>	1.68
<i>A230005M16Rik</i>	3.32	<i>Selenom</i>	1.63
<i>Ppp1r3f</i>	3.31	<i>Gm48309</i>	1.63
<i>Oxt</i>	3.25	<i>Chpf</i>	1.63
<i>BC037032</i>	3.15	<i>Parpbp</i>	1.62
<i>Hba-a1</i>	3.12	<i>Lrfr1</i>	1.62
<i>9330160F10Rik</i>	3.10	<i>Frs3</i>	1.60
<i>Hba-a2</i>	3.09	<i>Jph3</i>	1.60
<i>Gm9934</i>	2.94	<i>Zfp219</i>	1.59
<i>Gm49272</i>	2.89	<i>Chchd10</i>	1.58
<i>Gm4419</i>	2.81	<i>Rps26</i>	1.57
<i>Gm11175</i>	2.76	<i>Ppp2r3d</i>	1.56
<i>Gm3052</i>	2.68	<i>Abhd8</i>	1.55
<i>Gm35240</i>	2.65	<i>Lrrc4b</i>	1.55
<i>Gm16499</i>	2.57	<i>Jund</i>	1.54
<i>Gm15849</i>	2.52	<i>Prr12</i>	1.54
<i>Crlf2</i>	2.43	<i>Atp6v0c</i>	1.53
<i>0610039K10Rik</i>	2.41	<i>Mt1</i>	1.53
<i>Alas2</i>	2.39	<i>Podxl2</i>	1.52
<i>Avp</i>	2.38	<i>Mrps12</i>	1.51
<i>Gm5453</i>	2.26	<i>Ahdc1</i>	1.49
<i>Romo1</i>	2.20	<i>Atp13a2</i>	1.49
<i>H1fx</i>	2.20	<i>Nrxn2</i>	1.48
<i>Dpm3</i>	2.15	<i>Wdr89</i>	1.47
<i>Nespas</i>	2.02	<i>Shc4</i>	1.46
<i>C230062I16Rik</i>	2.01	<i>Whrn</i>	1.45
<i>Gm23935</i>	2.01	<i>Slc16a6</i>	0.66
<i>Rplp2</i>	1.94	<i>Klk6</i>	0.54
<i>Gm26596</i>	1.93	<i>Ankk1</i>	0.06
<i>Megf6</i>	1.92	<i>1700018M17Rik</i>	0.00
<i>H2-Q2</i>	1.90		
<i>Ly6h</i>	1.88		

Supplementary Table 7. Biological Pathway genes referred to in Figure 4 that are dysregulated exclusively in SO+CO vs CO, PL+CO vs CO or commonly dysregulated compared vs CO in the hypothalamus of adult male mice (C57BL/6N) on the respective diets for 24 weeks ($P \leq 0.05$; $q \leq 0.05$; FC ≥ 1.5). Genes are listed in alphabetical order.

SO+CO vs CO

Gene Symbol
1810049J17Rik
A830012C17Rik
Akt1s1
Asb4
Aspn
B930094E09Rik
Baiap3
Car12
Ccdc85b
Cited1
Col6a1
Col9a2
Cpm
Dio2
Etl4
Etv1
Fezf1
Gabre
Gal
Galnt9
Gck
Ghsr
Gm14205
Gm16537
Gm17509
Gm24447
Gm26508
Gm37811
Gm47283
Gpd1
Gpr161
Gpr165
Gpr50
Gpx3
Hdc
Hist1h1c
Hist1h2ai
Hsd11b1
Hsd17b7
Iqgap2
Irs4

PL+CO vs CO

Gene Symbol
1700018M17Rik
2410006H16Rik
4932441J04Rik
9330160F10Rik
9430041J12Rik
A930012O16Rik
Ahdc1
Alas2
Ankk1
Atp13a2
Atp6v0c
Crlf2
Dpm3
Frs3
Gm15849
Gm16499
Gm26596
Gm3052
Gm35240
Gm48309
Gm49272
Gm5453
Jph3
Jund
Lrrc4b
Mt1
Nrxn2
Parpbb
Ppp1r3f
Ppp2r3d
Prr12
Shc4
Slc16a6
Thap3
Wdr89

Common between SO+CO and PL+CO vs CO

Gene Symbol	Gene Symbol
0610039K10Rik	Rps10-ps2
A230005M16Rik	Rps13
Abhd8	Rps26
Avp	Selenom
BC037032	Sf3b5
Bmyc	Slc16a11
C1qtnf4	Ssbp4
C230062I16Rik	Uchl1os
Cartpt	Uqcrq
Chchd10	Whrn
Chpf	Zfp219
Gm11175	
Gm11508	
Gm11942	
Gm1673	
Gm23935	
Gm24245	
Gm4419	
Gm44367	
Gm9934	
H1fx	
H2-Q2	
Hba-a1	
Hba-a2	
Hcrt	
Hmx3	
Klk6	
Lrfr1	
Ly6h	
Map1s	
Megf6	
Mmp11	
Mrps12	
Nespas	
Oxt	
Pcsk1n	
Podxl2	
Prr7	
Romo1	
Rplp2	

Supplementary Table 8. Dysregulated hypothalamic genes in both soybean oil diets versus Viv chow related to metabolic disease and inflammation in male mice ($P \leq 0.05$; $q \leq 0.05$; $FC \geq 1.5$). Genes are listed in alphabetical order.

Diet	Metabolic Disease			Inflammation
	Diabetes	Lipid Metabolism	Obesity	
SO+CO vs Viv	<i>Avp, Cck, Edn1, Esr1, Gck, Hcrt, Hsd11b1, Hdc, Kitl, Mmp11, Oxt, Ppard, Prkcd, Tcf7l2</i>	<i>Esr1, Gck, Hsd11b1, Lef1, Ppard, Prkcd, Rora, Tcf7l2, Zfpn2</i>	<i>Cck, Dio2, Edn1, Esr1, Gal, Gck, Gpx3, Hcrt, Hsd11b1, Magel2, Nnat, Nts, Ppard, Prkcd, Rasd1, Rora, Sim1, Tcf7l2, Tsc22d3, Vav3, Zfpn2</i>	<i>C1qtnf4, Car4, Cryab, Dio2, Edn1, Esr1, F2r, Gjb1, Hsd11b1, Kitl, Litaf, Malt1, Oxt, Pdlim2, Ppard, Prkcd, Rgs16, Rora, Sema7a, Tgfb3, Traf3ip2, Tsc22d3</i>
PL+CO vs Viv	<i>Adcyap1, Apln, Avp, Hcrt, Hdc, Kitl, Prkcd, Mmp11, Oxt, Tcf7l2</i>	<i>Acvr1c, Adcyap1, Dusp1, Lef1, Osbp3, Prkcd, Rora, Tcf7l2,</i>	<i>Acvr1c, Apln, Cry1, Drd2, Gal, Gpx3, Hcrt, Pmch, Prkcd, Rasd1, Rora, Sim1, Tcf7l2, Vav3,</i>	<i>C1qtnf4, Adcyap1, Apln, Capn1, Cry1, Dusp1, Drd2, Kitl, Oxt, Prkcd, Pmch, Rgs16, Rora, Sema7a</i>

Supplementary Table 9. Dysregulated hypothalamic genes in both soybean oil diets versus Viv chow related to neurological diseases in male mice ($P \leq 0.05$; $q \leq 0.05$; $FC \geq 1.5$). Genes are listed in alphabetical order.

Diet	Alzheimer's	Anxiety	Autism	Depression	Pain	Parkinson's	Schizophrenia
SO+CO vs Viv	<i>Epha4, Gal, Irs4, Msra, Ngb, Nrn1, Pcsk1n,</i>	<i>Adarb1, Adcy1, Avp, Baiap3, Dio2, Edn1, Esr1, F2r, Gal, Grm4, Hdc, Hcrt, Lef1, Oxt,</i>	<i>Oxt</i>	<i>Avp, Adarb1, Dio2, Epha4, Esr1, Gal, Grid2ip, Hcrt, Oxt, Shisa6, Slc24a2, Wnt3</i>	<i>Adarb1, Adcy1, Cck, Edn1, Esr1, F2r, Gal, Hcrt, Oxt, Prkcd, Prkcg, Pstpip2, Rgs4, Scn9a, Serpina3n</i>	<i>Otx2</i>	<i>Grm4, Rgs4,</i>
PL+CO vs Viv	<i>Capn1, Gal, Pcsk1n</i>	<i>Adarb1, Adcyap1, Apln, Avp, Drd2, Gal, Hcrt, Hdc, Lef1, Oxt,</i>	<i>Oxt</i>	<i>Adarb1, Adcyap1, Avp, Drd2, Gal, Grid2ip, Hcrt, Oxt, Wnt3,</i>	<i>Adarb1, Adcyap1, Capn1, Drd2, Dusp1, Gal, Hcrt, Oxt, Prkcd, Rgs4</i>	<i>Adcyap1, Apln, Drd2</i>	<i>Drd2, Rgs4</i>