

Supplemental information

Lipolysis drives expression of the constitutively active receptor GPR3 to induce adipose thermogenesis

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Table S1. Relative cold induction of Gs-coupled GPCRs in BAT, Related to Figure 1.

Receptor	TN	3 hours cold	8 hours cold	24 hours cold	3 days cold	1 week cold
Adcyap1r1	1	0.886	0.789	1.226	1.320	1.083
Adora2a	1	1.218	1.367	1.475	0.677	0.676
Adora2b	1	0.642	0.635	0.700	0.779	1.119
Adrb1	1	1.349	1.297	1.164	1.399	0.910
Adrb2	1	0.279	0.316	0.173	0.125	0.137
Adrb3	1	0.202	0.425	0.440	1.509	1.003
Avpr2	1	1.024	0.734	1.629	0.817	2.172
Calcr1	1	0.617	1.063	1.537	1.089	1.598
Crhr1	1	0.559	0.817	1.594	1.208	1.414
Crhr2	1	0.951	1.255	2.091	1.599	2.407
Drd1a	1	2.673	13.384 [****]	10.043 [***]	4.394	18.786 [****]
Drd5	1	0.292	1.109	2.381	3.532	1.556
Fshr	1	1.999	1.157	1.478	1.508	1.495
Gcgr	1	1.014	1.325	1.313	0.515	1.182
Ghrhr	1	0.908	0.873	6.309	2.935	2.733
Gipr	1	0.526	0.538	0.763	1.057	0.479
Glp1r	1	1.359	1.795	1.562	1.375	1.426
Glp2r	1	2.905	1.897	1.654	1.175	2.377
Gpbar1	1	1.554	0.838	0.654	1.100	0.622
Gpr101	1	0.301	1.456	0.254	1.710	0.541
Gpr119	1	1.954	2.432	1.579	1.122	7.595 [*]
Gpr133	1	2.170	1.409	1.853	1.921	2.820
Gpr26	1	1.165	1.160	1.483	2.547	1.329
Gpr3	1	30.042 [****]	63.521 [****]	67.077 [****]	52.432 [****]	87.234 [****]
Gpr65	1	0.756	1.030	0.639	0.780	2.103
Htr7	1	0.675	0.846	0.604	0.898	1.070
Lhcgr	1	0.360	0.957	5.239	4.490	1.262
Mc1r	1	1.134	0.843	0.772	0.281	0.532
Mc2r	1	0.151	0.192	0.290	0.247	0.175
Mc3r	1	1.275	1.431	1.581	1.325	1.562
Mc4r	1	1.597	2.215	1.234	3.078	1.497
Mc5r	1	0.998	1.185	0.436	1.062	1.227
Ptgdr	1	2.598	1.458	3.189	2.545	1.350
Ptger2	1	1.079	0.970	2.589	0.325	2.045
Ptger4	1	0.697	0.910	0.902	0.354	0.812
Ptgir	1	0.685	0.984	0.737	0.731	1.350
Pth1r	1	0.414	0.707	0.725	0.667	0.492
Rxfp2	1	0.821	1.584	1.191	2.346	1.014
Sctr	1	0.649	0.265	0.113	0.252	0.252
Taar1	1	1.360	0.886	0.840	0.807	1.313
Taar4	1	2.854	2.207	2.455	2.444	1.569
Tshr	1	0.690	0.687	0.878	1.508	0.787
Vipr1	1	2.488	0.519	0.821	1.583	0.764
Vipr2	1	0.921	0.607	0.508	0.892	0.620

Table S2. Relative cold induction of Gs-coupled GPCRs in scWAT, Related to Figure 1.

Receptor	TN	1 week cold
Adcyap1r1	1	1.12435
Adora2a	1	1.015275
Adora2b	1	0.759228
Adrb1	1	2.319545 [*]
Adrb2	1	0.490304
Adrb3	1	0.877347
Avpr2	1	0.698586
Calcrl	1	0.74712
Crhr1	1	1.026174
Crhr2	1	0.551537
Drd1a	1	2.073623
Drd5	1	0.928179
Fshr	1	0.957577
Gcgr	1	0.517928
Ghrhr	1	1.421452
Gipr	1	0.552729
Glp1r	1	0.364139
Glp2r	1	0.593368
Gpbar1	1	0.706243
Gpr101	1	0.967332
Gpr119	1	0.942241
Gpr133	1	0.636265
Gpr26	1	0.548419
Gpr3	1	4.684511 [****]
Gpr65	1	0.660672
Htr7	1	1.04161
Lhcgr	1	1.09412
Mc1r	1	0.542785
Mc2r	1	0.570388
Mc3r	1	0.727088
Mc4r	1	1.197985
Mc5r	1	1.57169
Ptgdr	1	1.083403
Ptger2	1	0.405265
Ptger4	1	0.512577
Ptgir	1	0.742936
Pth1r	1	0.609481
Rxfp2	1	1.222464
Sctr	1	1.02965
Taar1	1	0.850346
Taar4	1	0.627048
Tshr	1	0.691152
Vipr1	1	0.593946
Vipr2	1	1.454639

Table S3. List of primers, Related to STAR Methods.

Transcript	Forward primer	Reverse primer
<i>Gpr3</i> (ORF)	ATGTTCTGCTGGTGGGTAG	GTGAGCCAATGCAGAAGTCA
<i>Gpr3</i> (UTR)	ATCACCTGAGCAACCGAGAA	AGATGGGGGTGCATTTTACA
<i>36b4</i>	TCATCCAGCAGGTGTTTGACA	GGCACCGAGGCAACAGTT
<i>Ucp1</i>	GGATTGGCCTCTACGACTCA	TAAGCCGGCTGAGATCTTGT
<i>Bmp8b</i>	AGCCTGACTTGAACCTGGAA	ACCCCAAGAGACAGGCTAT
<i>Dio2</i>	GCTTCCTCTAGATGCCTACAA	AGTCAAGAAGGTGGCATTTCG
<i>Lpl</i>	CCCTAAGGACCCCTGAAGAC	GGCCCGATACAACCAGTCTA
<i>Acadm</i>	GCCCAGAGAGCTCTAGACGA	GCGAGCAGAAATGAACTCC
<i>Elovl3</i>	ATGAATTTCTCACGCGGGTT	AGCTTACCCAGTACTCCTCCA
<i>Adcy3</i>	GGAAAAGGACTCTCCTATGGTGG	CTGTCAGTGCCATTGAGCCC
<i>Adrb1</i>	CTACAACGACCCCAAGTGCT	GGCACGTAGAAGGAGACGAC
<i>Adrb2</i>	CAGGAAGTCTGTGTGAGGA	CTTGGGAGTCAACGCTAAGG
<i>Adrb3</i>	AGGAAGCTTGCTTGATCCCC	GCATCCATAGCCGTTGCTTG
<i>Pparg</i>	AGAAGCTGCATCTCCACCTT	CCGGCAGTTAAGATCACACC
<i>Ppara</i>	AATTTGCTGTGGAGATCGGC	TTAAGCACGTGCACAATCCC
<i>Srebp1</i>	CTTACCCCTCCACCTCAGA	TGTCGGGCTCAGAGTCACTA
<i>Lxra</i>	TCGTGTCCGTGCAGGAGATT	TCTCCAGAAGCATGACCTCGAT
<i>Lxrb</i>	CCCCACCATTGAGTCTTCC	CTCCACTCAAGGTGCATGGT
<i>GPR3</i>	GTCCTGAGCGGTACCATGA	CCCACGCTGCTTACATTAC
<i>36B4</i>	TTTGTGTTACCAAGGAGGA	GTGACTTCACATGGGGCAAT
<i>UCP1</i>	AAGGCTTGACGGGTCTTTG	CGATAAGAGCCGACACCAAG
<i>PRDM16</i>	CGGCAAAGGAGACAGACTTC	CATCCACGCAGAACTTCTCA
<i>FABP4</i>	TACTGGGCCAGGAATTTGAC	TACCAGGACACCCCATCTA
<i>DIO2</i>	GGAAGAGCTTCTCCTCGAT	CTGGAGACATGCACCACACT
<i>GLUT4</i>	AACTGGACGAGCAACTTCATC	AGGACCGCAAATAGAAGGAAG
<i>NDUFA</i>	CCGAACACTGTGCACCAATTC	GGGTCTGTGACATGGGCATT
<i>COX7A1</i>	CCGCTTTCAGAACCGAGTG	AGAGGCCAGCGTTTATTGACA
<i>CRLS1</i>	GCTTGGCCCCAGTTCTGG	GGCCCAGTTTCGAGCAATAA
<i>GPD2</i>	GAAGTGGCTGTGCGCTAGAT	TAGTGCTTCTGCTGCTGGTC
<i>FASN</i>	AAGGACCTGTCTAGGTTTGATGC	TGGCTTCATAGGTGACTTCCA
<i>ADIPOQ</i>	CCTGGTGAGAAGGGTGAGAA	CTCCTTCTGCCTTGGATT