

Additional materials to the article

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### APPENDIX 3.

#### DOWNEXPRESSED GENES

**Table 1.** General list of downexpressed genes

Gene ID	Decrease (fold)
<b>Extremely downexpressed genes</b>	
<i>Npvf</i>	–211.5
<i>Tshb</i>	–171.4
<i>Lrat</i>	–158.8
<i>Avp</i>	–138.3
<i>Ghrh</i>	–122.5
<i>Hcrt</i>	–121.0
<i>Sim1</i>	–93.5
<i>Oxt</i>	–77.2
<i>Calcr</i>	–71.4
<i>Gpr50</i>	–65.5
<i>Cngb1</i>	–64.9
<i>Ghsr</i>	–60.9
<i>Agrp</i>	–59.0
<i>Bsx</i>	–57.9
<i>Six6</i>	–57.5
<i>Gabre</i>	–54.9
<i>Irs4</i>	–54.0
<b>Strongly downexpressed genes</b>	
<i>Chrm5</i>	–46.8
<i>Pmch</i>	–41.6
<i>Arhgap36</i>	–41.1
<i>Pomc</i>	–41.0
<i>Ppp1r17</i>	–39.2
<i>Rax</i>	–38.6
<i>Fam159b</i>	–37.9
<i>Gabrq</i>	–36.5
<i>Gal</i>	–36.4
<i>Nr0b1</i>	–34.9
<i>Tbx19</i>	–30.4
<i>Qrfp</i>	–28.9
<i>Lhx5</i>	–28.6
<i>Pgr15l</i>	–28.3
<i>Zim1</i>	–27.4
<i>Prph</i>	–25.5
<i>AW551984</i>	–25.4
<i>Foxb1</i>	–24.4
<i>Asb4</i>	–24.1
<i>Ern2</i>	–23.0
<i>Brs3</i>	–22.5
<i>Sytl4</i>	–22.4
<i>Cyp2f2</i>	–22.3
<i>Mbnl3</i>	–21.5

Gene ID	Decrease (fold)
<i>Ano7</i>	–21.5
<i>Cartpt</i>	–21.2
<i>Cpa4</i>	–20.8
<i>Gpx3</i>	–20.7
<i>Apobec2</i>	–20.0
<b>Moderately downexpressed genes</b>	
<i>Gpr101</i>	–19.7
<i>Trh</i>	–19.4
<i>Hnflb</i>	–19.3
<i>Hdc</i>	–19.2
<i>Magel2</i>	–19.2
<i>Pitx2</i>	–18.7
<i>Baiap3</i>	–17.4
<i>Peg10</i>	–15.9
<i>Apoc3</i>	–15.6
<i>Adcyap1</i>	–15.3
<i>Dlk1</i>	–15.2
<i>Zfp92</i>	–14.8
<i>Prss30</i>	–14.8
<i>Nms</i>	–14.8
<i>Tnfrsf8</i>	–14.5
<i>Fam159a</i>	–14.5
<i>Fut4</i>	–13.7
<i>Sync</i>	–13.4
<i>Nkx2-1</i>	–13.3
<i>Plcx3</i>	–13.1
<i>Ngb</i>	–12.9
<i>Ces1d</i>	–12.9
<i>Methig1</i>	–12.6
<i>P2rx2</i>	–12.6
<i>Avpr1a</i>	–12.1
<i>Ebf3</i>	–12.0
<i>Gla3</i>	–12.0
<i>Krt17</i>	–11.9
<i>Samd7</i>	–11.9
<i>Sim2</i>	–11.9
<i>Itih3</i>	–11.5
<i>Dgkk</i>	–11.4
<i>Onecut3</i>	–11.4
<i>Gpr179</i>	–11.1
<i>Npbwr1</i>	–11.1
<i>Galr1</i>	–11.1
<i>Prokr1</i>	–11.1
<i>H2-Q1</i>	–10.9

Gene ID	Decrease (fold)
<i>Deup1</i>	-10.8
<i>Atp7b</i>	-10.8
<i>Ucn3</i>	-10.8
<i>Rnf138rt1</i>	-10.6
<i>Fkbp11</i>	-10.5
<i>Scn9a</i>	-10.5
<i>Tssk6</i>	-10.4
<i>Glra4</i>	-10.4
<i>Esyt3</i>	-10.3
<i>Sox14</i>	-10.2
<i>Gpr165</i>	-10.0
<i>Rxfp3</i>	-10.0
<i>Lhx1</i>	-10.0
<i>Uncx</i>	-9.9
<i>Pmfbp1</i>	-9.8
<i>Irx6</i>	-9.6
<i>Epcam</i>	-9.6
<i>Vwce</i>	-9.6
<i>C1qtnf2</i>	-9.4
<i>Rrad</i>	-9.3
<i>Igsf1</i>	-9.2
<i>Cited1</i>	-9.1
<i>Chodl</i>	-9.0
<b>Weakly downexpressed genes</b>	
<i>Scn11a</i>	-8.9
<i>Dpy19l2</i>	-8.9
<i>Mc3r</i>	-8.8
<i>Th</i>	-8.7
<i>Parpbp</i>	-8.7
<i>Tbx3</i>	-8.4
<i>Cckar</i>	-8.2
<i>Lrrn4</i>	-8.2
<i>Tecta</i>	-8.2
<i>Oxct2b</i>	-8.2
<i>Rufy4</i>	-8.2
<i>Tmem255a</i>	-8.0
<i>Wif1</i>	-8.0
<i>Adgrg2</i>	-7.9
<i>Gzmk</i>	-7.8
<i>Adam5</i>	-7.8
<i>Resp18</i>	-7.6
<i>Scn7a</i>	-7.5
<i>Klhl41</i>	-7.4
<i>Cyp2t4</i>	-7.4
<i>B3gnt7</i>	-7.4
<i>Tmem26</i>	-7.3
<i>AI467606</i>	-7.3
<i>Gck</i>	-7.3
<i>Sfrp5</i>	-7.2
<i>Tshr</i>	-7.2
<i>Nts</i>	-7.0
<i>Nxph4</i>	-7.0
<i>Esr1</i>	-6.8

Gene ID	Decrease (fold)
<i>Arl10</i>	-6.7
<i>Optc</i>	-6.7
<i>Slc22a7</i>	-6.7
<i>Tmprss2</i>	-6.7
<i>Bco1</i>	-6.7
<i>Slc18a1</i>	-6.7
<i>Aox2</i>	-6.7
<i>Rtp2</i>	-6.7
<i>9530036O11Rik</i>	-6.7
<i>Ngp</i>	-6.7
<i>Vwa5b1</i>	-6.6
<i>F2rl2</i>	-6.5
<i>Usp51</i>	-6.5
<i>Vat1</i>	-6.5
<i>Foxd2</i>	-6.5
<i>Zbtb7c</i>	-6.5
<i>Hap1</i>	-6.4
<i>Ecell1</i>	-6.4
<i>Nnat</i>	-6.4
<i>Tmem130</i>	-6.3
<i>Lingo4</i>	-6.3
<i>Scn5a</i>	-6.2
<i>Slc18a2</i>	-6.2
<i>Aldh3b2</i>	-6.2
<i>Celf6</i>	-6.2
<i>Kir3dl2</i>	-5.9
<i>Dapl1</i>	-5.9
<i>Npb</i>	-5.9
<i>Cbln1</i>	-5.9
<i>Ubap11</i>	-5.8
<i>Vax1</i>	-5.8
<i>Pi16</i>	-5.8
<i>Arhgef33</i>	-5.8
<i>Sparc</i>	-5.8
<i>Foxa1</i>	-5.8
<i>Fndc9</i>	-5.7
<i>Gstm6</i>	-5.7
<i>Qrfpr</i>	-5.7
<i>Jph2</i>	-5.7
<i>Lrrc43</i>	-5.7
<i>Rbm46</i>	-5.7
<i>C2cd4d</i>	-5.7
<i>Atg9b</i>	-5.7
<i>Zechc12</i>	-5.7
<i>Npffr1</i>	-5.6
<i>Lck</i>	-5.6
<i>Zan</i>	-5.6
<i>Pklr</i>	-5.6
<i>Rgn</i>	-5.6
<i>A730017C20Rik</i>	-5.5
<i>D330045A20Rik</i>	-5.4
<i>Gch1</i>	-5.4
<i>Arhgef16</i>	-5.4
<i>Irx5</i>	-5.4

Gene ID	Decrease (fold)
<i>Rhcg</i>	-5.3
<i>Nynrin</i>	-5.3
<i>Ndn</i>	-5.3
<i>N4bp2</i>	-5.3
<i>Pcsk1</i>	-5.3
<i>Slc36a2</i>	-5.2
<i>Mustn1</i>	-5.2
<i>Fam90a1b</i>	-5.2
<i>Gprin2</i>	-5.2
<i>Tmie</i>	-5.2
<i>Ankrd55</i>	-5.2

Gene ID	Decrease (fold)
<i>Cyp4x1</i>	-5.1
<i>Sncg</i>	-5.1
<i>Ddc</i>	-5.1
<i>Cdhr2</i>	-5.1
<i>Fam196b</i>	-5.1
<i>Scg2</i>	-5.0
<i>Mrap2</i>	-5.0
<i>I700003F12Rik</i>	-5.0
<i>Gm3500</i>	-5.0
<i>Wdr6</i>	-5.0

**Table 2.** Genes encoding hormones, peptides and propeptides downregulated in the hippocampus of mice with a depression-like condition caused by social stress after their exposure to the M2 macrophages conditioned medium

Gene ID	Protein function	Decrease (fold)
<i>Npvf</i>	Neuropeptide VF Precursor, a potent negative regulator of gonadotropin synthesis and secretion. NPVF efficiently inhibits forskolin-induced production of cAMP.	-212
<i>Tshb</i>	Thyroid Stimulating Hormone Subunit Beta	-171
<i>Avp</i>	Arginine Vasopressin	-138
<i>Ghrh</i>	Growth Hormone Releasing Hormone (Somatoliberin), released by the hypothalamus and acts on the adenohypophyse to stimulate the secretion of growth hormone.	-122
<i>Hcrt</i>	Hypocretin Neuropeptide Precursor, a hypothalamic neuropeptide precursor protein that gives rise to two mature neuropeptides, orexin A and orexin B.	-121
<i>Oxt</i>	Oxytocin/Neurophysin I Prepropeptide	-77
<i>Agrp</i>	Agouti Related Neuropeptide, an antagonist of the melanocortin-3 and melanocortin-4 receptor.	-59
<i>Pmch</i>	Pro-Melanin Concentrating Hormone, a preproprotein that is proteolytically processed to generate multiple protein products including melanin-concentrating hormone (MCH), neuropeptide-glutamic acid-isoleucine (NEI), and neuropeptide-glycine-glutamic acid (NGE).	-42
<i>Pomc</i>	Proopiomelanocortin.	-41
<i>Gal</i>	Galanin And GMAP Prepropeptide, a precursor that is proteolytically processed to generate two mature peptides: galanin and galanin message-associated peptide (GMAP).	-36
<i>Qrfp</i>	Pyroglutamylated RFamide Peptide, a preproprotein that is proteolytically processed to generate multiple protein products including the neuropeptides 26RFa and the N-terminally extended form, 43RFa.	-29
<i>CartPT</i>	CART Prepropeptide, a preproprotein that is proteolytically processed to generate multiple biologically active peptides, which play a role in appetite, energy balance, maintenance of body weight, reward and addiction, and the stress response.	-21
<i>Gpr101</i>	G Protein-Coupled Receptor 101, an orphan G protein-coupled receptor of unknown function.	-20
<i>Trh</i>	Thyrotropin Releasing Hormone.	-19
<i>Adcyap1</i>	Adenylate Cyclase Activating Polypeptide 1, a secreted proprotein that is further processed into multiple mature peptides stimulating adenylate cyclase and increasing cyclic adenosine monophosphate (cAMP) levels.	-15
<i>Nms</i>	Neuromedin S, a preproprotein that is proteolytically processed to generate a biologically active neuropeptide that plays a role in the regulation of circadian rhythm, anorexigenic action, antidiuretic action, cardiovascular function and stimulation of oxytocin and vasopressin release.	-15
<i>Ucn3</i>	Urocortin 3, Suppresses food intake, delays gastric emptying and decreases heat-induced edema. Might represent an endogenous ligand for maintaining homeostasis after stress.	-11

**Table 3.** Genes encoding receptors downregulated in the hippocampus of mice with a depression-like condition caused by social stress after their exposure to the M2 macrophages conditioned medium

<b>Gene ID</b>	<b>Protein function</b>	<b>Decrease (fold)</b>
<i>Calcr</i>	Calcitonin Receptor, involved in maintaining calcium homeostasis and in regulating osteoclast-mediated bone resorption.	-71
<i>Gpr50</i>	G Protein-Coupled Receptor 50, inhibits melatonin receptor 1A function through heterodimerization.	-65
<i>Ghsr</i>	Growth Hormone Secretagogue Receptor, receptor for ghrelin, coupled to G-alpha-11 proteins. Stimulates growth hormone secretion. Binds also other growth hormone releasing peptides (GHRP) (e.g. Met-enkephalin and GHRP-6) as well as non-peptide, low molecular weight secretagogues (e.g. L-692,429, MK-0677, adenosine).	-61
<i>Gabre</i>	Gamma-Aminobutyric Acid Type A Receptor Subunit Epsilon, the gamma-aminobutyric acid (GABA) A receptor which is a multisubunit chloride channel that mediates the fastest inhibitory synaptic transmission in the central nervous system.	-55
<i>Irs4</i>	Insulin Receptor Substrate 4, a cytoplasmic protein that contains many potential tyrosine and serine/threonine phosphorylation sites. Acts as an interface between multiple growth factor receptors possessing tyrosine kinase activity, such as insulin receptor, IGF1R and FGFR1, and a complex network of intracellular signaling molecules containing SH2 domains.	-54
<i>Chrm5</i>	Cholinergic Receptor Muscarinic 5, mediates various cellular responses, including inhibition of adenylate cyclase, breakdown of phosphoinositides and modulation of potassium channels through the action of G proteins. Primary transducing effect is Pi turnover.	-47
<i>Gabrq</i>	Gamma-Aminobutyric Acid Type A Receptor Subunit Theta, gamma-aminobutyric acid (GABA) A receptor is a multisubunit chloride channel that mediates the fastest inhibitory synaptic transmission in the central nervous system.	-37
<i>Nr0B1</i>	Nuclear Receptor Subfamily 0 Group B Member 1, orphan nuclear receptor, acts as a dominant-negative regulator of transcription which is mediated by the retinoic acid receptor. This protein also functions as an anti-testis gene by acting antagonistically to Sry. Component of a cascade required for the development of the hypothalamic-pituitary-adrenal-gonadal axis.	-35
<i>Pgr15l</i>	G protein-coupled receptor 15-like	-28
<i>Brs3</i>	Bombesin Receptor Subtype 3, a G protein-coupled membrane receptor that binds bombesin-like peptides. This binding results in activation of a phosphatidylinositol-calcium second messenger system, with physiological effects including regulation of metabolic rate, glucose metabolism, and hypertension.	-22
<i>Tnfrsf8</i>	TNF Receptor Superfamily Member 8, a positive regulator of apoptosis, and also has been shown to limit the proliferative potential of autoreactive CD8 effector T cells and protect the body against autoimmunity.	-14
<i>P2rx2</i>	Purinergic Receptor P2X 2, a ligand-gated ion channel. Binding to ATP mediates synaptic transmission between neurons and from neurons to smooth muscle.	-13
<i>Avpr1A</i>	Arginine Vasopressin Receptor 1A, the activity of this receptor is mediated by G proteins which activate a phosphatidyl-inositol-calcium second messenger system. Has been involved in social behaviors, including affiliation and attachment.	-12
<i>Gpr179</i>	G Protein-Coupled Receptor 179, a member of the glutamate receptor subfamily of G protein-coupled receptors. Orphan receptor, involved in vision. Required for signal transduction through retinal depolarizing bipolar cells.	-11
<i>Deup1</i>	Deuterosome Assembly Protein 1, key structural component of the deuterosome, a structure that promotes de novo centriole amplification in multiciliated cells. Deuterosome-mediated centriole amplification occurs in terminally differentiated multiciliated cells and can generate more than 100 centrioles. Probably sufficient for the specification and formation of the deuterosome inner core. Interacts with CEP152 and recruits PLK4 to activate centriole biogenesis.	-11
<i>Npbwr1</i>	Neuropeptides B And W Receptor 1, interacts specifically with a number of opioid ligands. Receptor for neuropeptides B and W, which may be involved in neuroendocrine system regulation, food intake and the organization of other signals.	-11
<i>Galr1</i>	Galanin Receptor 1, activity of this receptor is mediated by G proteins that inhibit adenylate cyclase activity.	-11

Gene ID	Protein function	Decrease (fold)
<i>Prokr1</i>	Prokineticin Receptor 1. Exclusively coupled to the G(q) subclass of heteromeric G proteins. Activation leads to mobilization of calcium, stimulation of phosphoinositide turnover and activation of p44/p42 mitogen-activated protein kinase. Involved in angiogenesis and inflammation.	-11
<i>GlrA4</i>	Glycine Receptor Alpha 4, plays a role in the down-regulation of neuronal excitability. Contributes to the generation of inhibitory postsynaptic currents (Probable).	-10
<i>Gpr165</i>	G Protein-Coupled Receptor 162, Orphan receptor with unknown function.	-10
<i>Rxfp3</i>	Relaxin Family Peptide Receptor 3, receptor for RNL3/relaxin-3. Binding of the ligand inhibit cAMP accumulation.	-10

**Table 4.** Genes encoding transcription factors downregulated in the hippocampus of mice with a depression-like condition caused by social stress after their exposure to the M2 macrophages conditioned medium

Gene ID	Decrease (fold)
<i>Sim1</i>	-94
<i>Bsx</i>	-58
<i>Lhx5</i>	-28
<i>Hnf1B</i>	-19
<i>Pitx2</i>	-19
<i>Zfp92</i>	-14
<i>Nkx2-1</i>	-13
<i>Ebf3</i>	-12
<i>Sox14</i>	-10
<i>Lhx1</i>	-10
<i>Uncx</i>	-10
<i>Irx6</i>	-9
<i>Cited1</i>	-9