Appendix I: Upregulated genes in OGT cKO hippocampi at 2 months of age

Gene Symbol	Description	log2 FC
Ccl3	chemokine (C-C motif) ligand 3	5.0
Clec7a	C-type lectin domain family 7, member a	4.9
Cst7	cystatin F (leukocystatin)	4.9
Cxcl10	chemokine (C-X-C motif) ligand 10	4.3
Ccl4	chemokine (C-C motif) ligand 4	3.9
Itgax	integrin alpha X	3.6
Isg15	ISG15 ubiquitin-like modifier	3.2
Ccl12	chemokine (C-C motif) ligand 12|c-C motif chemokine 12-like	3.2
Glycam1	glycosylation dependent cell adhesion molecule 1	3.1
Ccl5	chemokine (C-C motif) ligand 5	3.0
Usp18	ubiquitin specific peptidase 18	3.0
Ifi27l2a	interferon, alpha-inducible protein 27 like 2A	2.9
Ccl6	chemokine (C-C motif) ligand 6	2.9
Cd52	CD52 antigen	2.9
Taar3	trace amine-associated receptor 3	2.8
Ifit1	interferon-induced protein with tetratricopeptide repeats 1	2.7
Irf7	interferon regulatory factor 7	2.7
Timp1	tissue inhibitor of metalloproteinase 1	2.7
Pyhin1	pyrin and HIN domain family, member 1	2.7
Zc3h12d	zinc finger CCCH type containing 12D	2.7
Gfap	glial fibrillary acidic protein	2.6
Trem2	triggering receptor expressed on myeloid cells 2	2.6
Rtp4	receptor transporter protein 4	2.5
Cxcl9	chemokine (C-X-C motif) ligand 9	2.5
C3ar1	complement component 3a receptor 1	2.5
I830012O16Rik	RIKEN cDNA I830012O16 gene	2.5
Mpeg1	macrophage expressed gene 1	2.4
Lag3	lymphocyte-activation gene 3	2.3
Lgals3bp	lectin, galactoside-binding, soluble, 3 binding protein	2.3
Bst2	bone marrow stromal cell antigen 2	2.3
Slc15a3	solute carrier family 15, member 3	2.3
Siglec5	sialic acid binding Ig-like lectin 5	2.3
Endou	endonuclease, polyU-specific	2.2
Oasl2	2'-5' oligoadenylate synthetase-like 2	2.2
Ch25h	cholesterol 25-hydroxylase	2.2
Aspg	asparaginase homolog (S. cerevisiae)	2.2
Tlr2	toll-like receptor 2	2.2
Ly86	lymphocyte antigen 86	2.2
Cd48	CD48 antigen	2.1

Gpr84	G protein-coupled receptor 84	2.1
Gpnmb	glycoprotein (transmembrane) nmb	2.1
Gbp3	guanylate binding protein 3	2.0
C1qb	complement component 1, q subcomponent, beta polypeptide	2.0
Ccl2	chemokine (C-C motif) ligand 2	2.0
Ip6k3	inositol hexaphosphate kinase 3	2.0
Ch25h	cholesterol 25-hydroxylase	2.0
Tyrobp	TYRO protein tyrosine kinase binding protein	2.0
Osmr	oncostatin M receptor	2.0
Lat2	linker for activation of T cells family, member 2	2.0
Slc11a1	solute carrier family 11 (proton-coupled divalent metal ion transporters), member 1	2.0
Cd14	CD14 antigen	2.0
Csf3r	colony stimulating factor 3 receptor (granulocyte)	2.0
Ddx60	DEAD (Asp-Glu-Ala-Asp) box polypeptide 60	1.9
Mpeg1	macrophage expressed gene 1	1.9
Capg	capping protein (actin filament), gelsolin-like	1.9
Cfb	complement factor B	1.9
Hvcn1	hydrogen voltage-gated channel 1	1.9
Ctsz	cathepsin Z	1.9
Rnf213	ring finger protein 213	1.9
Plek	pleckstrin	1.9
Tap1	transporter 1, ATP-binding cassette, sub-family B (MDR/TAP)	1.8
Parp14	poly (ADP-ribose) polymerase family, member 14	1.8
Sstr5	somatostatin receptor 5	1.8
1700112E06Rik	RIKEN cDNA 1700112E06 gene	1.8
C1qc	complement component 1, q subcomponent, C chain	1.8
LOC68395	histocompatibility 2, Q region locus 6-like	1.8
Psmb9	proteasome (prosome, macropain) subunit, beta type 9 (large multifunctional peptidase 2)	1.8
Cd68	CD68 antigen	1.8
C1qa	complement component 1, q subcomponent, alpha polypeptide	1.8
Cd72	CD72 antigen|b-cell differentiation antigen CD72-like	1.8
Gvin1	GTPase, very large interferon inducible 1|predicted gene 4070|very large inducible GTPase 1 pseudogene|very large inducible GTPase 1 pseudogene	1.8
Fyb	FYN binding protein	1.8
Psmb8	proteasome (prosome, macropain) subunit, beta type 8 (large multifunctional peptidase 7)	1.8
Cxcl5	chemokine (C-X-C motif) ligand 5	1.8
Fcgr4	Fc receptor, IgG, low affinity IV	1.8
Trim30d	tripartite motif-containing 30D|tripartite motif-containing 30A	1.7
Itgb2	integrin beta 2	1.7
Tbxas1	thromboxane A synthase 1, platelet	1.7

A2m	alpha-2-macroglobulin	1.7
Myo1f	myosin IF	1.7
Igtp	interferon gamma induced GTPase	1.7
Trim34a	tripartite motif-containing 34A	1.6
Ctss	cathepsin S	1.6
Irf8	interferon regulatory factor 8	1.6
Socs3	suppressor of cytokine signaling 3	1.6
Mx2	myxovirus (influenza virus) resistance 2	1.6
Gbp2	guanylate binding protein 2	1.6
Fcer1g	Fc receptor, IgE, high affinity I, gamma polypeptide	1.6
Ifitm3	interferon induced transmembrane protein 3	1.6
Fcgr2b	Fc receptor, IgG, low affinity IIb	1.6
Naip5	NLR family, apoptosis inhibitory protein 5	1.6
Cyba	cytochrome b-245, alpha polypeptide	1.6
Phf11	PHD finger protein 11|predicted gene 4902|predicted gene 6904	1.5
Ms4a6c	membrane-spanning 4-domains, subfamily A, member 6C	1.5
Fcgr1	Fc receptor, IgG, high affinity I	1.5
Havcr2	hepatitis A virus cellular receptor 2	1.5
Ggta1	glycoprotein galactosyltransferase alpha 1, 3	1.5
Zc3hav1	zinc finger CCCH type, antiviral 1	1.5
Ddx58	DEAD (Asp-Glu-Ala-Asp) box polypeptide 58	1.5
Irf9	interferon regulatory factor 9	1.5
Cd74	CD74 antigen (invariant polypeptide of major histocompatibility complex, class II antigen-associated)	1.5
Trim25	tripartite motif-containing 25	1.5
Icam1	intercellular adhesion molecule 1	1.5
Gbp6	guanylate binding protein 6	1.5
D14Ertd668e	DNA segment, Chr 14, ERATO Doi 668, expressed	1.5
AF251705	cDNA sequence AF251705	1.5
Laptm5	lysosomal-associated protein transmembrane 5	1.4
Dnase2a	deoxyribonuclease II alpha	1.4
Fcgr3	Fc receptor, IgG, low affinity III	1.4
Samsn1	SAM domain, SH3 domain and nuclear localization signals, 1	1.4
Irgm2	immunity-related GTPase family M member 2	1.4
Ptpn6	protein tyrosine phosphatase, non-receptor type 6	1.4
Gusb	glucuronidase, beta	1.4
Aif1	allograft inflammatory factor 1	1.4
Iigp1	interferon inducible GTPase 1	1.4
Ifi44	interferon-induced protein 44	1.4
Pld4	phospholipase D family, member 4	1.4
Mlxipl	MLX interacting protein-like	1.4
Tlr7	toll-like receptor 7	1.4

Mettl11b	methyltransferase like 11B	1.4
Spp1	secreted phosphoprotein 1	1.4
Slc43a3	solute carrier family 43, member 3	1.4
Fcrls	Fc receptor-like S, scavenger receptor	1.4
Lgals9	lectin, galactose binding, soluble 9	1.4
Il4i1	interleukin 4 induced 1|Nup62-Il4i1 protein	1.4
Irgm1	immunity-related GTPase family M member 1	1.4
Olfml3	olfactomedin-like 3	1.4
Tlr13	toll-like receptor 13	1.3
Lair1	leukocyte-associated Ig-like receptor 1	1.3
Fcgr2b	Fc receptor, IgG, low affinity IIb	1.3
Herc6	hect domain and RLD 6	1.3
Vav1	vav 1 oncogene	1.3
Ptpn18	protein tyrosine phosphatase, non-receptor type 18	1.3
Parp9	poly (ADP-ribose) polymerase family, member 9	1.3
Cd53	CD53 antigen	1.3
Slfn2	schlafen 2	1.3
Grn	granulin	1.3
Samd9l	sterile alpha motif domain containing 9-like	1.3
Tcfcp2l1	transcription factor CP2-like 1	1.3
Hexb	hexosaminidase B	1.3
A430084P05Rik	RIKEN cDNA A430084P05 gene	1.3
Btk	Bruton agammaglobulinemia tyrosine kinase	1.3
Cd74	CD74 antigen (invariant polypeptide of major histocompatibility complex, class II antigen-associated)	1.3
Ctsh	cathepsin H	1.3
Parp3	poly (ADP-ribose) polymerase family, member 3	1.3
Tnfaip8l2	tumor necrosis factor, alpha-induced protein 8-like 2	1.3
Wdfy4	WD repeat and FYVE domain containing 4	1.3
Plin4	perilipin 4	1.3
Irf5	interferon regulatory factor 5	1.3
Igsf6	immunoglobulin superfamily, member 6	1.3
Trim12a	tripartite motif-containing 12A	1.3
Slamf9	SLAM family member 9	1.3
Hk3	hexokinase 3	1.2
Cd44	CD44 antigen	1.2
Batf3	basic leucine zipper transcription factor, ATF-like 3	1.2
Oasl1	2'-5' oligoadenylate synthetase-like 1	1.2
Ifit2	interferon-induced protein with tetratricopeptide repeats 2	1.2
Pyroxd2	pyridine nucleotide-disulphide oxidoreductase domain 2	1.2
Hpse	heparanase	1.2
Gpr65	G-protein coupled receptor 65	1.2

Tgfbr2	transforming growth factor, beta receptor II	1.2
Arl11	ADP-ribosylation factor-like 11	1.2
Tnfrsf1a	tumor necrosis factor receptor superfamily, member 1a	1.2
Cd274	CD274 antigen	1.2
Hcst	hematopoietic cell signal transducer	1.2
Cd86	CD86 antigen	1.2
Ctsd	cathepsin D	1.2
Ifi47	interferon gamma inducible protein 47	1.2
Cx3cr1	chemokine (C-X3-C) receptor 1	1.2
Uba7	ubiquitin-like modifier activating enzyme 7	1.2
Hck	hemopoietic cell kinase	1.2
Inpp5d	inositol polyphosphate-5-phosphatase D	1.2
Nckap1l	NCK associated protein 1 like	1.2
Isg20	interferon-stimulated protein	1.2
Emr1	EGF-like module containing, mucin-like, hormone receptor-like sequence 1	1.2
Parp12	poly (ADP-ribose) polymerase family, member 12	1.2
Fermt3	fermitin family homolog 3 (Drosophila)	1.2
Pros1	protein S (alpha)	1.2
Rac2	RAS-related C3 botulinum substrate 2	1.2
Il1a	interleukin 1 alpha	1.2
Sh3rf2	SH3 domain containing ring finger 2	1.2
Tubb6	tubulin, beta 6	1.2
Msn	moesin	1.1
Slc14a1	solute carrier family 14 (urea transporter), member 1	1.1
Lair1	leukocyte-associated Ig-like receptor 1	1.1
Pfkfb3	6-phosphofructo-2-kinase/fructose-2,6-biphosphatase 3	1.1
Hcls1	hematopoietic cell specific Lyn substrate 1	1.1
Serpina3n	serine (or cysteine) peptidase inhibitor, clade A, member 3N	1.1
Ncf1	neutrophil cytosolic factor 1	1.1
Lrmp	lymphoid-restricted membrane protein	1.1
Hcst	hematopoietic cell signal transducer	1.1
Csf1r	colony stimulating factor 1 receptor	1.1
Dtx3l	deltex 3-like (Drosophila)	1.1
Il1r2	interleukin 1 receptor, type II	1.1
Itgb5	integrin beta 5	1.1
Arpc1b	actin related protein 2/3 complex, subunit 1B	1.1
Blnk	B-cell linker	1.1
Glrp1	glutamine repeat protein 1	1.1
Parp12	poly (ADP-ribose) polymerase family, member 12	1.1
Cd84	CD84 antigen	1.1
Arhgap30	Rho GTPase activating protein 30	1.1

Slfn5	schlafen 5	1.1
B2m	beta-2 microglobulin	1.1
Tor3a	torsin family 3, member A	1.1
Neat1	nuclear paraspeckle assembly transcript 1 (non-protein coding)	1.1
S100a6	S100 calcium binding protein A6 (calcyclin)	1.1
Abca1	ATP-binding cassette, sub-family A (ABC1), member 1	1.1
Snx20	sorting nexin 20	1.1
Thbs4	thrombospondin 4	1.1
Trim21	tripartite motif-containing 21	1.1
Plscr2	phospholipid scramblase 2	1.1
Apobec1	apolipoprotein B mRNA editing enzyme, catalytic polypeptide 1	1.1
Was	Wiskott-Aldrich syndrome homolog (human)	1.1
Apbb1ip	amyloid beta (A4) precursor protein-binding, family B, member 1 interacting protein	1.1
Tex11	testis expressed gene 11	1.1
Parp10	poly (ADP-ribose) polymerase family, member 10	1.1
C3	complement component 3	1.1
Serping1	serine (or cysteine) peptidase inhibitor, clade G, member 1	1.0
Glipr2	GLI pathogenesis-related 2	1.0
Ifi30	interferon gamma inducible protein 30	1.0
Tlr12	toll-like receptor 12	1.0
Gpsm3	G-protein signalling modulator 3 (AGS3-like, C. elegans)	1.0
Ms4a6d	membrane-spanning 4-domains, subfamily A, member 6D	1.0
Lpxn	leupaxin	1.0
Kcnj2	potassium inwardly-rectifying channel, subfamily J, member 2	1.0
Slc7a7	solute carrier family 7 (cationic amino acid transporter, y+ system), member 7	1.0
Trim56	tripartite motif-containing 56	1.0
Axl	AXL receptor tyrosine kinase	1.0
Hspb6	heat shock protein, alpha-crystallin-related, B6	1.0
Tnni2	troponin I, skeletal, fast 2	1.0
Dhx58	DEXH (Asp-Glu-X-His) box polypeptide 58	1.0
H2-Aa	histocompatibility 2, class II antigen A, alpha	1.0
Spint1	serine protease inhibitor, Kunitz type 1	1.0
Hpgds	hematopoietic prostaglandin D synthase	1.0
Ctla2b	cytotoxic T lymphocyte-associated protein 2 beta	1.0
Ptprc	protein tyrosine phosphatase, receptor type, C	1.0
Guca1a	guanylate cyclase activator 1a (retina)	1.0
Wnk4	WNK lysine deficient protein kinase 4	0.99
Tap2	transporter 2, ATP-binding cassette, sub-family B (MDR/TAP)	0.99
Rasa4	RAS p21 protein activator 4	0.99
Sh3bp2	SH3-domain binding protein 2	0.99

Ctla2b	cytotoxic T lymphocyte-associated protein 2 beta	0.99
Baiap2l2	BAI1-associated protein 2-like 2	0.99
Cchcr1	coiled-coil alpha-helical rod protein 1	0.98
Trim21	tripartite motif-containing 21	0.98
Ifi27l1	interferon, alpha-inducible protein 27 like 1	0.97
Gadl1	glutamate decarboxylase-like 1	0.97
Hmox1	heme oxygenase (decycling) 1	0.97
Fblim1	filamin binding LIM protein 1	0.97
P2ry6	pyrimidinergic receptor P2Y, G-protein coupled, 6	0.97
Neurl3	neuralized homolog 3 homolog (Drosophila)	0.97
Gngt2	guanine nucleotide binding protein (G protein), gamma transducing activity polypeptide 2	0.97
Adora3	adenosine A3 receptor	0.97
Il1r1	interleukin 1 receptor, type I	0.97
Gbp5	guanylate binding protein 5	0.96
Asap3	ArfGAP with SH3 domain, ankyrin repeat and PH domain 3	0.96
Eif2ak2	eukaryotic translation initiation factor 2-alpha kinase 2	0.96
Cd9	CD9 antigen	0.96
Naprt1	nicotinate phosphoribosyltransferase domain containing 1	0.96
H2-DMb1	histocompatibility 2, class II, locus Mb1|class II histocompatibility antigen, M beta 1 chain-like	0.96
Dok1	docking protein 1	0.96
Selplg	selectin, platelet (p-selectin) ligand	0.95
Padi2	peptidyl arginine deiminase, type II	0.95
S100a4	S100 calcium binding protein A4	0.95
Itgb5	integrin beta 5	0.95
Hk2	hexokinase 2	0.95
F11r	F11 receptor	0.94
Fmod	fibromodulin	0.94
Vim	vimentin	0.93
Aldh1l2	aldehyde dehydrogenase 1 family, member L2	0.93
Rasgrp3	RAS, guanyl releasing protein 3	0.93
Rasal3	RAS protein activator like 3	0.93
Spata13	spermatogenesis associated 13	0.93
Hist1h4h	histone cluster 1, H4h	0.93
Flnc	filamin C, gamma	0.92
Tmem176a	transmembrane protein 176A	0.92
Tmem176b	transmembrane protein 176B	0.92
Ms4a7	membrane-spanning 4-domains, subfamily A, member 7	0.92
LOC635918	beta-1,3-galactosyl-O-glycosyl-glycoprotein beta-1,6-N-acetylglucosaminyltransferase-like	0.92
Itgam	integrin alpha M	0.92
Tspo	translocator protein	0.92

Arhgap9	Rho GTPase activating protein 9	0.92
Ttc28	tetratricopeptide repeat domain 28	0.91
H2-Ab1	histocompatibility 2, class II antigen A, beta 1	0.90
Sash3	SAM and SH3 domain containing 3	0.90
Npas4	neuronal PAS domain protein 4	0.90
Prrx2	paired related homeobox 2	0.90
Syngr2	synaptogyrin 2	0.89
Naip6	NLR family, apoptosis inhibitory protein 6	0.89
Ifi35	interferon-induced protein 35	0.89
Arhgap25	Rho GTPase activating protein 25	0.89
Renbp	renin binding protein	0.89
4632428N05Rik	RIKEN cDNA 4632428N05 gene	0.89
Hpgd	hydroxyprostaglandin dehydrogenase 15 (NAD)	0.89
Cd63	CD63 antigen|CD63 antigen-like	0.88
Epsti1	epithelial stromal interaction 1 (breast)	0.88
Pmp22	peripheral myelin protein 22	0.88
Bcl3	B-cell leukemia/lymphoma 3	0.88
Zfp36	zinc finger protein 36	0.88
Phyhd1	phytanoyl-CoA dioxygenase domain containing 1	0.87
Clic1	chloride intracellular channel 1	0.87
P4ha3	procollagen-proline, 2-oxoglutarate 4-dioxygenase (proline 4-hydroxylase), alpha polypeptide III	0.87
Tapbp	TAP binding protein	0.87
Kcnk6	potassium inwardly-rectifying channel, subfamily K, member 6	0.86
Unc93b1	unc-93 homolog B1 (C. elegans)	0.86
Runx1	runt related transcription factor 1	0.86
Il10ra	interleukin 10 receptor, alpha	0.86
Gpr34	G protein-coupled receptor 34	0.86
Gal3st4	galactose-3-O-sulfotransferase 4	0.86
Aqp4	aquaporin 4	0.86
F9	coagulation factor IX	0.86
Tep1	telomerase associated protein 1	0.86
Tgif1	TGFB-induced factor homeobox 1	0.85
5430435G22Rik	RIKEN cDNA 5430435G22 gene	0.85
Pik3cg	phosphoinositide-3-kinase, catalytic, gamma polypeptide	0.85
Mafb	v-maf musculoaponeurotic fibrosarcoma oncogene family, protein B (avian)	0.85
Siglech	sialic acid binding Ig-like lectin H	0.84
Itgb5	integrin beta 5	0.84
Hlx	H2.0-like homeobox	0.84
Dock8	dedicator of cytokinesis 8	0.84
Csf2rb	colony stimulating factor 2 receptor, beta, low-affinity (granulocyte-macrophage)	0.84

Syngr2	synaptogyrin 2	0.84
Lamp2	lysosomal-associated membrane protein 2	0.83
Ly9	lymphocyte antigen 9	0.83
Hexa	hexosaminidase A	0.83
Nfkb2	nuclear factor of kappa light polypeptide gene enhancer in B-cells 2, p49/p100	0.83
Rhoj	ras homolog gene family, member J	0.83
Ms4a6d	membrane-spanning 4-domains, subfamily A, member 6D	0.83
Lgi4	leucine-rich repeat LGI family, member 4	0.83
BC026585	cDNA sequence BC026585	0.83
Apoc1	apolipoprotein C-I	0.82
Tcn2	transcobalamin 2	0.82
Rtp4	receptor transporter protein 4	0.82
Rrbp1	ribosome binding protein 1	0.82
Anxa3	annexin A3	0.81
Smoc1	SPARC related modular calcium binding 1	0.81
Cmtm3	CKLF-like MARVEL transmembrane domain containing 3	0.81
Pbxip1	pre-B-cell leukemia transcription factor interacting protein 1	0.80
Bgn	biglycan	0.80
Pdpn	podoplanin	0.80
Tcirg1	T-cell, immune regulator 1, ATPase, H+ transporting, lysosomal V0 protein A3	0.80
H2-M3	histocompatibility 2, M region locus 3	0.80
Kcne1l	potassium voltage-gated channel, Isk-related family, member 1-like, pseudogene	0.80
Sox9	SRY-box containing gene 9	0.80
Pik3ap1	phosphoinositide-3-kinase adaptor protein 1	0.79
2810459M11Rik	RIKEN cDNA 2810459M11 gene	0.78
Lrig1	leucine-rich repeats and immunoglobulin-like domains 1	0.78
Rgs1	regulator of G-protein signaling 1	0.78
Tmem173	transmembrane protein 173	0.78
Myo1g	myosin IG	0.78
Slc25a45	solute carrier family 25, member 45	0.77
Fxyd1	FXYD domain-containing ion transport regulator 1	0.77
Mrc2	mannose receptor, C type 2	0.77
Tlr3	toll-like receptor 3	0.76
A830007P12Rik	RIKEN cDNA A830007P12 gene	0.76
Slc1a4	solute carrier family 1 (glutamate/neutral amino acid transporter), member 4	0.76
Slc13a3	solute carrier family 13 (sodium-dependent dicarboxylate transporter), member 3	0.76
Fgl2	fibrinogen-like protein 2	0.76
Ptplad2	protein tyrosine phosphatase-like A domain containing 2	0.76

Ddit3	DNA-damage inducible transcript 3	0.76
Plce1	phospholipase C, epsilon 1	0.75
Lgmn	legumain	0.75
Gm885	predicted gene 885	0.74
Man2b1	mannosidase 2, alpha B1	0.74
Asph	aspartate-beta-hydroxylase	0.74
Itpr2	inositol 1,4,5-triphosphate receptor 2	0.74
Oas2	2'-5' oligoadenylate synthetase 2	0.74
Plxnb2	plexin B2	0.74
C1ra	complement component 1, r subcomponent A|complement component 1, r subcomponent B	0.73
Sdc4	syndecan 4	0.73
Thbs1	thrombospondin 1	0.73
Tmc6	transmembrane channel-like gene family 6	0.73
Tchh	trichohyalin	0.73
Samhd1	SAM domain and HD domain, 1	0.72
Cmtm7	CKLF-like MARVEL transmembrane domain containing 7	0.72
Col16a1	collagen, type XVI, alpha 1	0.72
Wfdc3	WAP four-disulfide core domain 3	0.71
Mvp	major vault protein	0.71
Dap	death-associated protein	0.71
Ahnak	AHNAK nucleoprotein (desmoyokin)	0.71
Anxa4	annexin A4	0.71
Anxa2	annexin A2	0.71
Oas1c	2'-5' oligoadenylate synthetase 1C	0.71
Atp1b2	ATPase, Na+/K+ transporting, beta 2 polypeptide	0.70
Tnfrsf1b	tumor necrosis factor receptor superfamily, member 1b	0.70
Gmfg	glia maturation factor, gamma	0.70
Plcd4	phospholipase C, delta 4	0.70
Ncf4	neutrophil cytosolic factor 4	0.69
Nmi	N-myc (and STAT) interactor	0.69
Cd37	CD37 antigen	0.69
Ccr5	chemokine (C-C motif) receptor 5	0.69
Gmip	Gem-interacting protein	0.69
Cdt1	chromatin licensing and DNA replication factor 1	0.69
Pik3r5	phosphoinositide-3-kinase, regulatory subunit 5, p101	0.69
Slc29a3	solute carrier family 29 (nucleoside transporters), member 3	0.69
Casp8	caspase 8	0.69
Hrsp12	heat-responsive protein 12	0.69
S100a10	S100 calcium binding protein A10 (calpactin)	0.69
Sparc	secreted acidic cysteine rich glycoprotein	0.68
Angpt1	angiopoietin 1	0.68

Hepacam	hepatocyte cell adhesion molecule	0.68
Npc2	Niemann Pick type C2	0.68
Trim66	tripartite motif-containing 66	0.68
Ehd4	EH-domain containing 4	0.67
Entpd4	ectonucleoside triphosphate diphosphohydrolase 4	0.67
Fgfrl1	fibroblast growth factor receptor-like 1	0.67
Fgfrl1	fibroblast growth factor receptor-like 1	0.67
Gem	GTP binding protein (gene overexpressed in skeletal muscle)	0.67
Eif4ebp1	eukaryotic translation initiation factor 4E binding protein 1	0.67
Arhgdib	Rho, GDP dissociation inhibitor (GDI) beta	0.67
Ikzf1	IKAROS family zinc finger 1	0.67
Cnn3	calponin 3, acidic	0.67
Plekhg2	pleckstrin homology domain containing, family G (with RhoGef domain) member 2	0.66
Rcsd1	RCSD domain containing 1	0.66
Fam46a	family with sequence similarity 46, member A	0.66
Kif23	kinesin family member 23	0.66
Gcnt1	glucosaminyl (N-acetyl) transferase 1, core 2	0.66
Dna2	DNA replication helicase 2 homolog (yeast)	0.66
Ahnak	AHNAK nucleoprotein (desmoyokin)	0.66
Map3k1	mitogen-activated protein kinase kinase kinase 1	0.65
Naglu	alpha-N-acetylglucosaminidase (Sanfilippo disease IIIB)	0.65
Tmem119	transmembrane protein 119	0.65
Ltbp3	latent transforming growth factor beta binding protein 3	0.65
Mtmr11	myotubularin related protein 11	0.65
Lmo2	LIM domain only 2	0.65
Rgs10	regulator of G-protein signalling 10	0.65
Ang	angiogenin, ribonuclease, RNase A family, 5|angiogenin, ribonuclease A family, member 3|angiogenin, ribonuclease A family, member 4	0.65
Anxa5	annexin A5	0.65
Sbno2	strawberry notch homolog 2 (Drosophila)	0.65
Asb2	ankyrin repeat and SOCS box-containing 2	0.65
P2ry13	purinergic receptor P2Y, G-protein coupled 13	0.65
Tor1aip1	torsin A interacting protein 1	0.65
Gpr160	G protein-coupled receptor 160	0.65
Tnfrsf11a	tumor necrosis factor receptor superfamily, member 11a	0.65
H2-Eb1	histocompatibility 2, class II antigen E beta	0.65
2610528A11Rik	RIKEN cDNA 2610528A11 gene	0.64
Mfsd1	major facilitator superfamily domain containing 1	0.64
Abcc3	ATP-binding cassette, sub-family C (CFTR/MRP), member 3	0.64
Unc93b1	unc-93 homolog B1 (C. elegans)	0.64
Csf1	colony stimulating factor 1 (macrophage)	0.64

Pdlim4	PDZ and LIM domain 4	0.64
Pde4d	phosphodiesterase 4D, cAMP specific	0.64
Rps6ka1	ribosomal protein S6 kinase polypeptide 1	0.64
Sdc3	syndecan 3	0.64
Il6ra	interleukin 6 receptor, alpha	0.64
Il20rb	interleukin 20 receptor beta	0.64
Srebf1	sterol regulatory element binding transcription factor 1	0.64
Hmha1	histocompatibility (minor) HA-1	0.64
Tagln2	transgelin 2	0.63
Reep3	receptor accessory protein 3	0.63
Abhd4	abhydrolase domain containing 4	0.63
Cebpa	CCAAT/enhancer binding protein (C/EBP), alpha	0.63
Trib3	tribbles homolog 3 (Drosophila)	0.63
Igfbp5	insulin-like growth factor binding protein 5	0.63
Pnpla7	patatin-like phospholipase domain containing 7	0.63
Rapgef3	Rap guanine nucleotide exchange factor (GEF) 3	0.63
Stom	stomatin	0.62
Amotl1	angiomotin-like 1	0.62
Sfxn5	sideroflexin 5	0.62
Zfp703	zinc finger protein 703	0.62
Tal1	T-cell acute lymphocytic leukemia 1	0.62
Lrrfip1	leucine rich repeat (in FLII) interacting protein 1	0.62
Epb4.1l2	erythrocyte protein band 4.1-like 2	0.62
Scamp2	secretory carrier membrane protein 2	0.61
Zfp36l1	zinc finger protein 36, C3H type-like 1	0.61
Gpr37l1	G protein-coupled receptor 37-like 1	0.61
Foxn3	forkhead box N3	0.61
Gna15	guanine nucleotide binding protein, alpha 15	0.61
Prcp	prolylcarboxypeptidase (angiotensinase C)	0.61
Tln1	talin 1	0.61
Rhbdf1	rhomboid family 1 (Drosophila)	0.61
Chchd2	coiled-coil-helix-coiled-coil-helix domain containing 2	0.60
Gns	glucosamine (N-acetyl)-6-sulfatase	0.60
Trim47	tripartite motif-containing 47	0.60
Cd83	CD83 antigen	0.60
Skap2	src family associated phosphoprotein 2	0.60
Susd3	sushi domain containing 3	0.59
Iqgap1	IQ motif containing GTPase activating protein 1	0.59
3110049J23Rik	RIKEN cDNA 3110049J23 gene	0.59
AW112010	expressed sequence AW112010	0.59
Lect1	leukocyte cell derived chemotaxin 1	0.59

Gnao1	guanine nucleotide binding protein, alpha O	0.59
Gltp	glycolipid transfer protein	0.58
Ptgs1	prostaglandin-endoperoxide synthase 1	0.58
Slc9a3r1	solute carrier family 9 (sodium/hydrogen exchanger), member 3 regulator 1	0.58
Cmtm6	CKLF-like MARVEL transmembrane domain containing 6	0.58
Itga6	integrin alpha 6	0.57
Serpine2	serine (or cysteine) peptidase inhibitor, clade E, member 2	0.57
Gsdmd	gasdermin D	0.57
Lamb2	laminin, beta 2	0.57
Liph	lipase, member H	0.57
Serpinf1	serine (or cysteine) peptidase inhibitor, clade F, member 1	0.57
Necap2	NECAP endocytosis associated 2	0.57
Foxd1	forkhead box D1	0.56
Socs1	suppressor of cytokine signaling 1	0.56
Sept11	septin 11	0.56
Ccrl2	chemokine (C-C motif) receptor-like 2	0.56
Nfe2l2	nuclear factor, erythroid derived 2, like 2	0.56
Scarf2	scavenger receptor class F, member 2	0.55
Hsd3b7	hydroxy-delta-5-steroid dehydrogenase, 3 beta- and steroid delta-isomerase 7	0.55
Gnai2	guanine nucleotide binding protein (G protein), alpha inhibiting 2	0.55
Ppnr	per-pentamer repeat gene	0.55
Sepn1	selenoprotein N, 1	0.55
Plcg2	phospholipase C, gamma 2	0.55
Myd88	myeloid differentiation primary response gene 88	0.55
Stat2	signal transducer and activator of transcription 2	0.55
Rhog	ras homolog gene family, member G	0.55
Ptprf	protein tyrosine phosphatase, receptor type, F	0.54
Amz1	archaelysin family metallopeptidase 1	0.54
Cyth4	cytohesin 4	0.54
Hpn	hepsin	0.54
Arhgap18	Rho GTPase activating protein 18	0.54
Elavl1	ELAV (embryonic lethal, abnormal vision, Drosophila)-like 1 (Hu antigen R)	0.54
Slc39a1	solute carrier family 39 (zinc transporter), member 1	0.54
Tprn	taperin	0.54
Aqp4	aquaporin 4	0.54
Ctsl	cathepsin L	0.54
Shisa5	shisa homolog 5 (Xenopus laevis)	0.54
S100a1	S100 calcium binding protein A1	0.54
Fgfbp1	fibroblast growth factor binding protein 1	0.53
Cnn3	calponin 3, acidic	0.53

Inppl1	inositol polyphosphate phosphatase-like 1	0.53
Sgpl1	sphingosine phosphate lyase 1	0.53
Ppapdc1a	phosphatidic acid phosphatase type 2 domain containing 1A	0.53
Cdk2	cyclin-dependent kinase 2	0.53
Lrrc33	leucine rich repeat containing 33	0.52
Cdk5rap2	CDK5 regulatory subunit associated protein 2	0.52
Cyp4v3	cytochrome P450, family 4, subfamily v, polypeptide 3	0.52
Apod	apolipoprotein D	0.52
Rab13	RAB13, member RAS oncogene family	0.52
Fam129b	family with sequence similarity 129, member B	0.52
AA388235	expressed sequence AA388235	0.52
Scpep1	serine carboxypeptidase 1	0.52
Hist1h1c	histone cluster 1, H1c	0.51
Nfatc1	nuclear factor of activated T-cells, cytoplasmic, calcineurin-dependent 1	0.51
Rab31	RAB31, member RAS oncogene family	0.51
Slc7a11	solute carrier family 7 (cationic amino acid transporter, y+ system), member 11	0.51
S100a16	S100 calcium binding protein A16	0.51
St6gal1	beta galactoside alpha 2,6 sialyltransferase 1	0.51
Cspg5	chondroitin sulfate proteoglycan 5	0.51
Htra3	HtrA serine peptidase 3	0.50
S100a13	S100 calcium binding protein A13	0.50
Triobp	TRIO and F-actin binding protein	0.50
Tirap	toll-interleukin 1 receptor (TIR) domain-containing adaptor protein	0.50
Rbms2	RNA binding motif, single stranded interacting protein 2	0.50
Atp1a2	ATPase, Na+/K+ transporting, alpha 2 polypeptide	0.50
Scrg1	scrapie responsive gene 1	0.50
P2ry1	purinergic receptor P2Y, G-protein coupled 1	0.50
Cklf	chemokine-like factor	0.50
Vasp	vasodilator-stimulated phosphoprotein	0.50
Sft2d2	SFT2 domain containing 2	0.50
Plcb3	phospholipase C, beta 3	0.50
Slc7a3	solute carrier family 7 (cationic amino acid transporter, y+ system), member 3	0.49
Ptbp1	polypyrimidine tract binding protein 1	0.49
Rabgap1l	RAB GTPase activating protein 1-like	0.49
Cd151	CD151 antigen	0.49
Suclg2	succinate-Coenzyme A ligase, GDP-forming, beta subunit	0.49
Myo10	myosin X	0.49
Dock1	dedicator of cytokinesis 1	0.49
Vsig4	V-set and immunoglobulin domain containing 4	0.49
Gria2	glutamate receptor, ionotropic, AMPA2 (alpha 2)	0.49

Ucma	upper zone of growth plate and cartilage matrix associated	0.48
Igdcc4	immunoglobulin superfamily, DCC subclass, member 4	0.48
Timeless	timeless homolog (Drosophila)|protein timeless homolog	0.48
Rab7l1	RAB7, member RAS oncogene family-like 1	0.48
Hyi	hydroxypyruvate isomerase homolog (E. coli)	0.48
Vcam1	vascular cell adhesion molecule 1	0.48
Gpr56	G protein-coupled receptor 56	0.48
Lgals1	lectin, galactose binding, soluble 1	0.48
Zcwpw1	zinc finger, CW type with PWWP domain 1	0.48
Scara3	scavenger receptor class A, member 3	0.47
Adam17	a disintegrin and metallopeptidase domain 17	0.47
Sh3glb1	SH3-domain GRB2-like B1 (endophilin)	0.47
Fastk	Fas-activated serine/threonine kinase	0.47
Ddah1	dimethylarginine dimethylaminohydrolase 1	0.47
Kank2	KN motif and ankyrin repeat domains 2	0.47
Tspan4	tetraspanin 4	0.47
Phka1	phosphorylase kinase alpha 1	0.47
Entpd2	ectonucleoside triphosphate diphosphohydrolase 2	0.47
Itih3	inter-alpha trypsin inhibitor, heavy chain 3	0.47
Npc2	Niemann Pick type C2	0.47
Spc25	SPC25, NDC80 kinetochore complex component, homolog (S. cerevisiae)	0.47
Bak1	BCL2-antagonist/killer 1	0.47
Sft2d2	SFT2 domain containing 2	0.47
Tsc22d4	TSC22 domain family, member 4	0.46
Rhou	ras homolog gene family, member U	0.46
Ripk1	receptor (TNFRSF)-interacting serine-threonine kinase 1	0.46
Il13ra1	interleukin 13 receptor, alpha 1	0.46
Zfp521	zinc finger protein 521	0.46
Tmod3	tropomodulin 3	0.46
Phactr4	phosphatase and actin regulator 4	0.46
Prc1	protein regulator of cytokinesis 1	0.46
Lpcat2	lysophosphatidylcholine acyltransferase 2	0.46
Fcgrt	Fc receptor, IgG, alpha chain transporter	0.46
Csf2ra	colony stimulating factor 2 receptor, alpha, low-affinity (granulocyte-macrophage)	0.46
Angptl6	angiopoietin-like 6	0.45
Yap1	yes-associated protein 1	0.45
Itpripl2	inositol 1,4,5-triphosphate receptor interacting protein-like 2	0.45
Zcchc24	zinc finger, CCHC domain containing 24	0.45
Ssfa2	sperm specific antigen 2	0.45
Fli1	Friend leukemia integration 1	0.45

Fmnl3	formin-like 3	0.45
Mertk	c-mer proto-oncogene tyrosine kinase	0.45
Rassf2	Ras association (RalGDS/AF-6) domain family member 2	0.45
Ttyh2	tweety homolog 2 (Drosophila)|protein tweety homolog 2-like	0.44
Map3k14	mitogen-activated protein kinase kinase kinase 14	0.44
Gjb6	gap junction protein, beta 6	0.44
Id3	inhibitor of DNA binding 3	0.44
2310014H01Rik	RIKEN cDNA 2310014H01 gene	0.44
Mfng	MFNG O-fucosylpeptide 3-beta-N-acetylglucosaminyltransferase	0.44
X99384	cDNA sequence X99384	0.44
Heatr5a	HEAT repeat containing 5A	0.44
Sun2	Sad1 and UNC84 domain containing 2	0.44
Dapp1	dual adaptor for phosphotyrosine and 3-phosphoinositides 1	0.44
Vcl	vinculin	0.43
Atf5	activating transcription factor 5	0.43
Cotl1	coactosin-like 1 (Dictyostelium)	0.43
Sepp1	selenoprotein P, plasma, 1	0.43
Grin2c	glutamate receptor, ionotropic, NMDA2C (epsilon 3)	0.43
Tmem184b	transmembrane protein 184b	0.43
Hist2h3c2-ps	histone cluster 2, H3c2, pseudogene	0.43
Ccna2	cyclin A2	0.43
Srpk3	serine/arginine-rich protein specific kinase 3	0.43
Samd4	sterile alpha motif domain containing 4	0.43
Abca9	ATP-binding cassette, sub-family A (ABC1), member 9	0.43
Atp13a4	ATPase type 13A4	0.43
2310007A19Rik	RIKEN cDNA 2310007A19Rik	0.43
Adipor2	adiponectin receptor 2	0.42
Rcan3	regulator of calcineurin 3	0.42
Gm2a	GM2 ganglioside activator protein	0.42
Rhoc	ras homolog gene family, member C	0.42
Cyp4f14	cytochrome P450, family 4, subfamily f, polypeptide 14	0.42
Sirpa	signal-regulatory protein alpha	0.42
Myo6	myosin VI	0.42
Nagpa	N-acetylglucosamine-1-phosphodiester alpha-N-acetylglucosaminidase	0.42
Acot11	acyl-CoA thioesterase 11	0.41
Cxadr	coxsackie virus and adenovirus receptor	0.41
Tead1	TEA domain family member 1	0.41
Rgs20	regulator of G-protein signaling 20	0.40
Stk10	serine/threonine kinase 10	0.40
Gba	glucosidase, beta, acid	0.40
Sept8	septin 8	0.40

Bmpr1b	bone morphogenetic protein receptor, type 1B	0.40
Klc1	kinesin light chain 1	0.40
Fubp1	far upstream element (FUSE) binding protein 1	0.40
Psd2	pleckstrin and Sec7 domain containing 2	0.40
Erbb2ip	Erbb2 interacting protein	0.40
Ctsb	cathepsin B	0.39
Tpcn1	two pore channel 1	0.39
Cd24a	CD24a antigen	0.39
Ly6e	lymphocyte antigen 6 complex, locus E	0.39
Notch1	Notch gene homolog 1 (Drosophila)	0.38
Fbxw4	F-box and WD-40 domain protein 4	0.38
Arrdc3	arrestin domain containing 3	0.38
Itsn1	intersectin 1 (SH3 domain protein 1A)	0.38
Reln	reelin	0.38
Slc20a1	solute carrier family 20, member 1	0.38
Slc44a2	solute carrier family 44, member 2	0.38
Glb1	galactosidase, beta 1	0.38
Itfg3	integrin alpha FG-GAP repeat containing 3	0.37
Tst	thiosulfate sulfurtransferase, mitochondrial	0.37
Dcx	doublecortin	0.36
Tns3	tensin 3	0.36
Dazap2	DAZ associated protein 2	0.36
Nln	neurolysin (metallopeptidase M3 family)	0.36
Ednrb	endothelin receptor type B	0.36
Carhsp1	calcium regulated heat stable protein 1	0.36
Lrrc8a	leucine rich repeat containing 8A	0.35
Plekhb1	pleckstrin homology domain containing, family B (evectins) member 1	0.35
Aldh1a1	aldehyde dehydrogenase family 1, subfamily A1	0.35
Trf	transferrin	0.35
Wsb1	WD repeat and SOCS box-containing 1	0.35
Dhrs1	dehydrogenase/reductase (SDR family) member 1	0.35
Kcnj10	potassium inwardly-rectifying channel, subfamily J, member 10	0.35
Mrps6	mitochondrial ribosomal protein S6	0.35
Rela	v-rel reticuloendotheliosis viral oncogene homolog A (avian)	0.34
Heatr7a	HEAT repeat containing 7A	0.34
Ndp	Norrie disease (pseudoglioma) (human)	0.34
Pcsk6	proprotein convertase subtilisin/kexin type 6	0.34
Klc4	kinesin light chain 4	0.34
Asph	aspartate-beta-hydroxylase	0.34
Ankrd44	ankyrin repeat domain 44	0.34
Mcl1	myeloid cell leukemia sequence 1	0.34

Slc1a3	solute carrier family 1 (glial high affinity glutamate transporter), member 3	0.34
Inpp5a	inositol polyphosphate-5-phosphatase A	0.34
Appbp2	amyloid beta precursor protein (cytoplasmic tail) binding protein 2	0.33
Bcas1	breast carcinoma amplified sequence 1	0.33
Bcan	brevican	0.33
Paox	polyamine oxidase (exo-N4-amino)	0.32
Rlbp1	retinaldehyde binding protein 1	0.32
Pla2g15	phospholipase A2, group XV	0.32
Mfap3l	microfibrillar-associated protein 3-like	0.32
Cdc42	cell division cycle 42 homolog (S. cerevisiae)	0.32
Cav1	caveolin 1, caveolae protein	0.32
Ak3	adenylate kinase 3	0.31
Uap1l1	UDP-N-acteylglucosamine pyrophosphorylase 1-like 1	0.31
Dbp	D site albumin promoter binding protein	0.31
Inf2	inverted formin, FH2 and WH2 domain containing	0.30
Ephx2	epoxide hydrolase 2, cytoplasmic	0.30
Patl1	protein associated with topoisomerase II homolog 1 (yeast)	0.30
St3gal4	ST3 beta-galactoside alpha-2,3-sialyltransferase 4	0.30
Capn2	calpain 2	0.30
Megf10	multiple EGF-like-domains 10	0.29
D19Wsu162e	DNA segment, Chr 19, Wayne State University 162, expressed	0.29
Noxo1	NADPH oxidase organizer 1	0.29
Oat	ornithine aminotransferase	0.29
Phc3	polyhomeotic-like 3 (Drosophila)	0.29
Snx5	sorting nexin 5	0.28
Appl2	adaptor protein, phosphotyrosine interaction, PH domain and leucine zipper containing 2	0.28
Aaas	achalasia, adrenocortical insufficiency, alacrimia	0.26
Samd14	sterile alpha motif domain containing 14|sterile alpha motif domain-containing protein 14-like	0.26

Appendix I: Listed above are the differentially-expressed genes in hippocampi in the OGT cKO mice compared to their WT littermates at 2 months of age. Reported *P*-values are Bonferroni corrected (*P*-values < 0.001).

Appendix II: Downregulated genes in OGT cKO hippocampi at 2 months

Gene Symbol	Description	log2 FC
Creld1	cysteine-rich with EGF-like domains 1	-0.23
Adss	adenylosuccinate synthetase, non muscle	-0.24
Rps6kl1	ribosomal protein S6 kinase-like 1	-0.25
Nkrf	NF-kappaB repressing factor	-0.25
Tmem145	transmembrane protein 145	-0.25
Trappc1	trafficking protein particle complex 1	-0.26
Dbc1	deleted in bladder cancer 1 (human)	-0.26
Prosapip1	ProSAPiP1 protein	-0.26
Porcn	porcupine homolog (Drosophila)	-0.26
Aqp11	aquaporin 11	-0.28
Hecw1	HECT, C2 and WW domain containing E3 ubiquitin protein ligase 1	-0.28
Ankmy2	ankyrin repeat and MYND domain containing 2	-0.29
Hk1	hexokinase 1	-0.29
Sult4a1	sulfotransferase family 4A, member 1	-0.29
Fam174a	family with sequence similarity 174, member A	-0.30
Hmg20a	high mobility group 20A	-0.30
0610007P14Rik	RIKEN cDNA 0610007P14 gene	-0.30
Sirt5	sirtuin 5 (silent mating type information regulation 2 homolog) 5 (S. cerevisiae)	-0.30
Ppapdc2	phosphatidic acid phosphatase type 2 domain containing 2	-0.30
A930017M01Rik	Smg-5 homolog, nonsense mediated mRNA decay factor pseudogene	-0.30
Enox2	ecto-NOX disulfide-thiol exchanger 2	-0.31
Zfp235	zinc finger protein 235	-0.31
Rin1	Ras and Rab interactor 1	-0.31
Cdhr1	cadherin-related family member 1	-0.31
Napepld	N-acyl phosphatidylethanolamine phospholipase D	-0.31
Kbtbd7	kelch repeat and BTB (POZ) domain containing 7	-0.32
Aimp2	aminoacyl tRNA synthetase complex-interacting multifunctional protein 2	-0.32
Ypel1	yippee-like 1 (Drosophila)	-0.32
Slc35f4	solute carrier family 35, member F4	-0.32
Fam164a	family with sequence similarity 164, member A	-0.32
Gzf1	GDNF-inducible zinc finger protein 1	-0.33
Rgmb	RGM domain family, member B	-0.33
Abhd6	abhydrolase domain containing 6	-0.33
Mpp3	membrane protein, palmitoylated 3 (MAGUK p55 subfamily member 3)	-0.33
Ydjc	YdjC homolog (bacterial)	-0.33
Ankrd33b	ankyrin repeat domain 33B	-0.33
Pcdhb12	protocadherin beta 12	-0.33

Mcrs1	microspherule protein 1|microspherule protein 1-like	-0.34
Zfp94	zinc finger protein 94	-0.34
Arhgef25	Rho guanine nucleotide exchange factor (GEF) 25	-0.34
Copg2	coatomer protein complex, subunit gamma 2	-0.34
Esd	esterase D/formylglutathione hydrolase	-0.34
AI593442	expressed sequence AI593442	-0.34
Icam5	intercellular adhesion molecule 5, telencephalin	-0.35
Strbp	spermatid perinuclear RNA binding protein	-0.35
Nap1l3	nucleosome assembly protein 1-like 3	-0.35
Sept6	septin 6	-0.35
AW209491	expressed sequence AW209491	-0.35
Acss2	acyl-CoA synthetase short-chain family member 2	-0.35
A330050F15Rik	RIKEN cDNA A330050F15 gene	-0.36
Dffa	DNA fragmentation factor, alpha subunit	-0.36
Arhgap20	Rho GTPase activating protein 20	-0.36
Stxbp5l	syntaxin binding protein 5-like	-0.36
Gspt2	G1 to S phase transition 2	-0.36
2200002K05Rik	RIKEN cDNA 2200002K05 gene	-0.36
Exoc6	exocyst complex component 6	-0.37
Fam92a	family with sequence similarity 92, member A	-0.37
Tars2	threonyl-tRNA synthetase 2, mitochondrial (putative)	-0.37
Ppapdc3	phosphatidic acid phosphatase type 2 domain containing 3	-0.37
Tram1l1	translocation associated membrane protein 1-like 1	-0.37
Dnajc4	DnaJ (Hsp40) homolog, subfamily C, member 4	-0.37
Ccdc30	coiled-coil domain containing 30	-0.37
Txndc9	thioredoxin domain containing 9	-0.37
Lrrc20	leucine rich repeat containing 20	-0.37
Papolg	poly(A) polymerase gamma	-0.37
Myadml2	myeloid-associated differentiation marker-like 2	-0.37
Rundc3b	RUN domain containing 3B	-0.38
Ola1	Obg-like ATPase 1	-0.38
Fam57b	family with sequence similarity 57, member B	-0.38
Tmem8b	transmembrane protein 8B	-0.38
Adcy1	adenylate cyclase 1	-0.38
Prkcc	protein kinase C, gamma	-0.38
Syt16	synaptotagmin XVI	-0.38
Lmbr1	limb region 1	-0.38
Rpl23	ribosomal protein L23	-0.38
Inpp4b	inositol polyphosphate-4-phosphatase, type II	-0.39
Gm11818	predicted gene 11818	-0.39
Pfkp	phosphofructokinase, platelet	-0.39

Fuk	fucokinase	-0.39
Zfp27	zinc finger protein 27	-0.39
Rasd2	RASD family, member 2	-0.39
Zfand2b	zinc finger, AN1 type domain 2B	-0.39
Mkx	mohawk homeobox	-0.39
Brms1l	breast cancer metastasis-suppressor 1-like	-0.39
B3galnt1	UDP-GalNAc:betaGlcNAc beta 1,3-galactosaminyltransferase, polypeptide 1	-0.40
Pcdhb9	protocadherin beta 9	-0.40
Gpi1	glucose phosphate isomerase 1	-0.40
Rerg	RAS-like, estrogen-regulated, growth-inhibitor	-0.40
Zmat2	zinc finger, matrin type 2	-0.40
Krt10	keratin 10	-0.40
Yrdc	yrdC domain containing (E.coli)	-0.40
Pacrgl	PARK2 co-regulated-like	-0.41
Tdrkh	tudor and KH domain containing protein	-0.41
Dapk3	death-associated protein kinase 3	-0.41
Fam131b	family with sequence similarity 131, member B	-0.41
Fam116a	family with sequence similarity 116, member A	-0.41
Cep70	centrosomal protein 70	-0.41
Fam120b	family with sequence similarity 120, member B	-0.42
Zfp799	zinc finger protein 799	-0.42
Wbscr27	Williams Beuren syndrome chromosome region 27 (human)	-0.42
Reep6	receptor accessory protein 6	-0.42
B3galt4	UDP-Gal:betaGlcNAc beta 1,3-galactosyltransferase, polypeptide 4	-0.42
Mas1	MAS1 oncogene	-0.42
4930572J05Rik	RIKEN cDNA 4930572J05 gene	-0.42
Fbxl2	F-box and leucine-rich repeat protein 2	-0.43
Snx19	sorting nexin 19	-0.43
N6amt1	N-6 adenine-specific DNA methyltransferase 1 (putative)	-0.43
Dcbld1	discoidin, CUB and LCCL domain containing 1	-0.43
Col11a1	collagen, type XI, alpha 1	-0.44
Fkrp	fukutin related protein	-0.44
Nupl1	nucleoporin like 1	-0.44
Fam84a	family with sequence similarity 84, member A	-0.45
Srebf2	sterol regulatory element binding factor 2	-0.45
Nanos1	nanos homolog 1 (Drosophila)	-0.45
Acat2	acetyl-Coenzyme A acetyltransferase 2	-0.45
Galnt13	UDP-N-acetyl-alpha-D-galactosamine:polypeptide N-acetylgalactosaminyltransferase 13	-0.46
Nov	nephroblastoma overexpressed gene	-0.46
Bnip3	BCL2/adenovirus E1B interacting protein 3	-0.47

Zfp940	zinc finger protein 940	-0.47
2810032G03Rik	RIKEN cDNA 2810032G03 gene	-0.47
Mrps33	mitochondrial ribosomal protein S33	-0.48
Pcdhb17	protocadherin beta 17	-0.48
3830406C13Rik	RIKEN cDNA 3830406C13 gene	-0.48
Wdr17	WD repeat domain 17	-0.48
Dhcr7	7-dehydrocholesterol reductase	-0.48
Sstr3	somatostatin receptor 3	-0.48
Mpped2	metallophosphoesterase domain containing 2	-0.48
1700001L05Rik	RIKEN cDNA 1700001L05 gene	-0.48
AW209491	expressed sequence AW209491	-0.49
Gp1bb	glycoprotein Ib, beta polypeptide	-0.49
Mast3	microtubule associated serine/threonine kinase 3	-0.49
Adnp2	ADNP homeobox 2	-0.49
Rab26	RAB26, member RAS oncogene family	-0.50
E130012A19Rik	RIKEN cDNA E130012A19 gene	-0.50
Agbl4	ATP/GTP binding protein-like 4	-0.50
Tarsl2	threonyl-tRNA synthetase-like 2	-0.51
Ptpn3	protein tyrosine phosphatase, non-receptor type 3	-0.51
Gm9885	predicted gene 9885	-0.51
Ccdc106	coiled-coil domain containing 106	-0.51
Nkrf	NF-kappaB repressing factor	-0.51
Hmgn3	high mobility group nucleosomal binding domain 3	-0.51
Zfp239	zinc finger protein 239	-0.51
Smoc2	SPARC related modular calcium binding 2	-0.51
Ankrd37	ankyrin repeat domain 37	-0.52
Rps16	ribosomal protein S16	-0.52
D4Bwg0951e	DNA segment, Chr 4, Brigham & Women's Genetics 0951 expressed	-0.52
Fbxo27	F-box protein 27	-0.52
Zfp277	zinc finger protein 277	-0.52
Zfp189	zinc finger protein 189	-0.53
Polr2k	polymerase (RNA) II (DNA directed) polypeptide K	-0.53
Cdh9	cadherin 9	-0.53
Plekha2	pleckstrin homology domain-containing, family A (phosphoinositide binding specific) member 2	-0.54
Neurod6	neurogenic differentiation 6	-0.54
Utp23	UTP23, small subunit (SSU) processome component, homolog (yeast)	-0.54
Hspa1a	heat shock protein 1A	-0.54
Pex11b	peroxisomal biogenesis factor 11 beta	-0.55
Ftl1	ferritin light chain 1	-0.55
Tmem29	transmembrane protein 29	-0.55

Rnf8	ring finger protein 8	-0.55
Sebox	SEBOX homeobox	-0.55
2900060B14Rik	RIKEN cDNA 2900060B14 gene	-0.55
Sertad4	SERTA domain containing 4	-0.55
Shroom2	shroom family member 2	-0.56
Insig1	insulin induced gene 1	-0.56
3632451O06Rik	RIKEN cDNA 3632451O06 gene	-0.57
Gnas	GNAS (guanine nucleotide binding protein, alpha stimulating) complex locus	-0.57
Kcnj3	potassium inwardly-rectifying channel, subfamily J, member 3	-0.57
Zfp108	zinc finger protein 108	-0.57
Gls	glutaminase	-0.57
Rapgef4	Rap guanine nucleotide exchange factor (GEF) 4	-0.57
Fam19a1	family with sequence similarity 19, member A1	-0.58
Grm8	glutamate receptor, metabotropic 8	-0.60
Eif4a2	eukaryotic translation initiation factor 4A2	-0.61
Ripply2	ripply2 homolog (zebrafish)	-0.61
Fxr1	fragile X mental retardation gene 1, autosomal homolog	-0.63
A830031A19Rik	RIKEN cDNA A830031A19 gene	-0.63
Pgam2	phosphoglycerate mutase 2	-0.63
Arhgap32	Rho GTPase activating protein 32	-0.63
Lrrc10b	leucine rich repeat containing 10B	-0.63
Pcdhb16	protocadherin beta 16	-0.63
Adamtsl2	ADAMTS-like 2	-0.64
Sebox	SEBOX homeobox	-0.64
Ccdc85a	coiled-coil domain containing 85A	-0.64
Ralyl	RALY RNA binding protein-like	-0.64
Ccdc32	coiled-coil domain containing 32	-0.64
Cpne9	copine family member IX	-0.65
Ywhag	tyrosine 3-monooxygenase/tryptophan 5-monooxygenase activation protein, gamma polypeptide	-0.65
Hsd17b7	hydroxysteroid (17-beta) dehydrogenase 7	-0.65
Glt8d2	glycosyltransferase 8 domain containing 2	-0.66
Rwdd2a	RWD domain containing 2A	-0.66
Kbtbd3	kelch repeat and BTB (POZ) domain containing 3	-0.66
Acot5	acyl-CoA thioesterase 5	-0.68
Glyctk	glycerate kinase	-0.68
Fdft1	farnesyl diphosphate farnesyl transferase 1	-0.68
Trpc6	transient receptor potential cation channel, subfamily C, member 6	-0.69
Kcnk4	potassium channel, subfamily K, member 4	-0.69
Limd2	LIM domain containing 2	-0.70
Dusp4	dual specificity phosphatase 4	-0.70

Adra1d	adrenergic receptor, alpha 1d	-0.71
Arhgap15	Rho GTPase activating protein 15	-0.72
Chst9	carbohydrate (N-acetylgalactosamine 4-0) sulfotransferase 9	-0.74
Rwdd2a	RWD domain containing 2A	-0.75
Acot3	acyl-CoA thioesterase 3	-0.76
Cyp51	cytochrome P450, family 51	-0.76
Zcchc5	zinc finger, CCHC domain containing 5	-0.77
Mvd	mevalonate (diphospho) decarboxylase	-0.78
Dtd1	D-tyrosyl-tRNA deacylase 1 homolog (S. cerevisiae)	-0.80
Cyp51	cytochrome P450, family 51	-0.82
Stard4	StAR-related lipid transfer (START) domain containing 4	-0.86
Tm7sf2	transmembrane 7 superfamily member 2	-0.88
Sc4mol	sterol-C4-methyl oxidase-like	-0.95
Capn3	calpain 3	-0.96
Scgn	secretagogin, EF-hand calcium binding protein	-1.1
Cldn22	claudin 22	-1.1
Icam4	intercellular adhesion molecule 4, Landsteiner-Wiener blood group	-1.1
Fdps	farnesyl diphosphate synthetase	-1.2
Tdo2	tryptophan 2,3-dioxygenase	-1.2
Idi1	isopentenyl-diphosphate delta isomerase	-1.2

Appendix II: Listed above are the downregulated genes in hippocampi in the OGT cKO mice compared to their WT littermates at 2 months of age. Reported *P*-values are Bonferroni corrected (*P*-values < 0.001)

Appendix III- qPCR Primers

Gene	#	Forward Primer	Reverse Primer
2010111I 01Rik	5	GGATGATCTGCCTCTCATGGC	AAGAAAAGCACTATGTTGCCCT
Actr5	5	GGAGGCTCGATGCCAAAAA	CATGCGGCTGAGTGTGATG
Advyap1	9	CTCGGACGGCATCTTCACA	CCTCTGTTTATACCTTTTCCCTAG CA
Apod	4	TCCCACCCTCTTCAAGACAC	GGTTTCTGGCTTGCTACTGG
Apoe	4	TGAACCGCTTCTGGGATTAC	TGTGTGACTTGGGAGCTCTG
Arc	1	TGGAGCAGCTTATCCAGAGG	TATTCAGGCTGGGTCCTGTC
B2m	3	ATGGCTCGCTCGGTGACCCT	TTCTCCGGTGGGTGGCGTGA
Bcl6	3	TGAGGTCGTGGAGAACAATATG	GAGATGGCTGTACATGGGATAAG
Bdnf	1	CAGAGCAGCTGCCTTGATGTT	GCCTTGTCCGTGGACGTTTA
Brsk2	5	ACCTGCTGCTAGATGAGAGGA	CTCGCCCCGAATCACTTCC
C1qa	5	CCAGGAGAGTCCATACCAGAA	GTCCCACTTGGAGATCACTTG
C1qb	3	TGAGCCACGCAACGGCAAGT	TCGCGGCCACGAACGAGATT
C1qc	3	CAGAGGCCAACGCCCTCGTC	AGAGGCCCGGCACTTCACAG
C3	3	ACCCCCGATGGCATTCCTGTCA	GCTCGGATCTTCCACTGCCCC
Cd14	3	ATTCGGAGCCCTGCGTGTGC	ATCGGGTCCGGTGGCTTCCA
Cd52	5	ATCCTTGGGACAAGCCACTAC	GGCACATTAAGGTATTGGCAAAG
Cd63	4	TAACTGTGGGCTGTGGGAAT	TCCCAAGACCTCCACAAAAG
Cdk5	3	CACCGTTGGTGCAATGAATAC	TACACTAGGCTTACCTCCTACC
Cnot3	5	TGAGATCAAGGACAAAAGGCAG	CACAACTTTGAACCGTTCCATTT
Cre	11	TTGGGCCAGCTAAACATGCT	GCATTGCTGTCACTTGGTCG
Creb1 (α/β)	4	ACTAAATGACCATGGAATCTGGA G	ACCTGGGCTAATGTGGCAAT
Creb1 (β)	4	AGTTATCCAGTCTCCACAAGTCC	CTGAGTTCCGGAGAAAAGTCTT
Crem	8	CAGAGGAAGAAGGGACACCA	TTGTATTGCCCCGTGCTAGT
Ctnnb1	1	TTATGGACTGCCTGTTGTGG	AGTCGTGGAATAGCACCCTG
Ctsd	3	CTCCCGGCGTCTTGCTGCTC	AGCCGCCCACCTCCGTCATA
Ctsh	4	GAGATGGGGACAGACAGGAA	CCTGTGGCCATTACACTCCT
Cyba	4	GTGGACTCCCATTGAGCCTA	CTCCTCTTCACCCTCACTCG
Egr1	4	GACGAGTTATCCCAGCCAAA	GGTTCAGGCCACAAAGTGTT
Egr2	1	TGCGGGCATCTTGCAAGGGG	GTCCCGTGGCCAGTGGGTTG
Fcgr1	4	CCCCAAACTCCCACACTCTA	AAAGCTCTCACCACCCAATG
Fdps	4	CTGAGAAGGAGCTGGGACAC	CCGGTTGTACTTGCCTCCTA
Fos	1	CCGACTCCTTCTCCAGCAT	TCACCGTGGGGATAAAGTTG
Gap43	4	GCTGTAGACGAAGCCAAACC	CAACGTGGAAAGCCATTTCT
Gfp	4	AAGCTGACCCTGAAGTTCATC	CGTCCTGGACGTAGCCTCG
Gfpt1	10	CCTCGTGATGTTTGCTCTCA	GGACCGACTTCTGGTGGTAA
Gfpt2	10	TCGGGGTACGAAGCAAATAC	TAAGAAGATGACCCGGTTGG
Grin2b	4	AGGTCGTTTCCAGAAGGACA	ATTGCTGGAGCCATTGAAAG

Grm1	6	TCCACCTCATAGCCTTCGAT	GGGGGTTACTGAGTGCCAT
Gusb	3	TCCGTTGGCTCGGGGCAAAT	TGCCCACACCGGGACACTCA
Igsf6	4	ACGGTCCAAGAAGCAGAGAA	GTGCCCTCTTGCTCAGGTAG
Il1b	2	TTGTGGCTGTGGAGAAGCTGT	ACCTGCTGGTGTGTGACGTT
Irak1	5	ACTCCAGAGAAGTCCCAACCA	CAGGAATGCAGGGTAGCAGAG
Itgb5	4	CAACGAGGAAGTGAGGAAGC	CCGATCTTCTCCTTGCAGAC
Kif1c	5	GGAGCCTCCGTGAAAGTTG	CCGAAGTATGCGACCAGTAAGA
Lgals3bp	4	ACTGCCCTGGACACCAATAG	GTAGAAGGGGCGTATGACCA
Man2b1	3	CCCGGGCGACACCAAAAACG	ACTGGTGCTCCAAGCGCAGC
Mgea5	10	TGGAAGACCTTGGGTTATGG	TGCTCAGCTTCTTCCACTGA
Nr4a1	1	TGATGTTCCCGCCTTTGC	CAATGCGATTCTGCAGCTCTT
Nr4a3	1	GATCACAGAGCGACATGGGTTA	GAGCCTGTCCCTTCCTCTGG
Ogt	5	TATCAGGCAGGAGATTTTGAGGC	ACACCAGTATTGTCAGGCTCT
Opa3	1	GCAAAGGCAAAAGATGGAAC	GTGTTCACCGAAGGAAGGAG
Parp1	5	GCTTTATCGAGTGGAGTACGC	GGAGGGAGTCCTTGGGAATAC
Pdia4	5	ACAGGCCGTTGACTATGATGG	GTGGAGGTGTCCAATCAGGC
Per1	1	CAGGCTAACCAGGAATATTACCAGC	CACAGCCACAGAGAAGGTGTCCTGG
Pou2f2	5	TCTGTGGATTCAAGCCTACCC	GGACATTCGTCTCGATGCTG
Rttn	5	TGGGATGCAGTGTCTTCCAG	GTGCCACGTCCAAAGGAGA
Spp1	3	CCCGGTGAAAGTGACTGATTCTGGC	GGGTCAGGCACCAGCCATGTG
Syn1	4	CTGAGCCCTTCATTGATGCT	GGTCTTCCAGTTACCCGACA
Synpo2	4	CCAGTGAGTCGGAAGTGGAT	TGTGGTGTCTGGCAACATTT
Synt	4	CATCAAGCTGGAGAACAGCA	CGCGTGTTCCACATTGTACT
Syp	4	CTCCTCGGCTGAATTCTTTG	CATTGGCCCTTTGTTGTTCT
Syt1	4	ATGCAGAACGGCAAGAGACT	CTCGAACGGAACTTCAAAGC
Tlr1	5	TGAGGGTCCTGATAATGTCCTAC	AGAGGTCCAAATGCTTGAGGC
Trem2	7	GGGAGCAGGAATACTGGTGT	TTGGTGTGTGGAGAATGTTT
Tyrobp	3	TGAGCCCTGGTGTACTGGCTGG	TTGACCTCGGGAGACCAGGCG
Wnt2	1	CATAGCCCCCCACCACTGT	AGTTCCTTCGCTATGTGATGTTTCT

Reference Primers:

Gene	#	Forward Primer	Reverse Primer
Rpl3	1	TCATTGACACCACCTCCAAA	GCACAAAGTGGTCCTGGAAT
Gapdh	1	CTGAGTATGTCGTGGAGTCTACTGG	GTCATATTTCTCGTGGTTCACACC
Rps17	5	CCGGCTATGTCACGCATCTG	ATGATCTCCTGATCTAGGGCTG
a4Tub	5	ATGCGCGAGTGCATTTCAG	CACCAATGGTCTTATCGCTGG

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