

Deciphering the contribution of human meningeothelial cells to the inflammatory /
antimicrobial response at the meninges

Pierre-Joseph Royer, Andrew J. Rogers, Karl G. Wooldridge, Patrick Tighe, Jafar Mahdavi,
Michael G. Rittig, Dlawer Ala'Aldeen.

School of Molecular Medical Sciences and School of Biomedical Sciences, University of
Nottingham, UK

Supplemental Material

Table S1. Primers used for QPCR experiments

Primer	Sequence	Product size
GAPDH F	GGGAAACTGTGGCGTGAT	98
GAPDH R	TTCAGCTCAGGGATGACCTT	
Myd88 F	TGAGGGAGCCTAACCATGTC	100
Myd88 R	TGGGTCCTTTCCAGAGTTTG	
TRIF F	CCCTGTGGACAGTGGAAGAT	80
TRIF R	GCCCGTTTTGTCTAAATGA	
IRAK-4 F	CCACCCTCCAGACTTGAGAA	81
IRAK-4 R	TTGAAGTTGAGTGCCTGTGG	
TLR1 F	GGGTCAGCTGGACTTCAGAG	86
TLR1 R	CGAACACATCGCTGACAACT	
TLR2 F	GATGCCTACTGGGTGGAGAA	94
TLR2 R	CAGGAATGAAGTCCCCTTA	
TLR3 F	CTTTGCAACACTCCACCTCA	89
TLR3 R	AAGAGTTCAAAGGGGGCACT	
TLR4 F	AGTCCATCGTTTGGTTCTGG	95
TLR4 R	CAATGGTCAAATTGCACAGG	
TLR5 F	TACCGTTCGTCTGCTGTG	92
TLR5 R	AGAAAGCACGTCAGCCATCT	
TLR6 F	GGAGTGATGATGGGAGGAGA	110
TLR6 R	GGCCGAAACTGGTTTATTGA	
TLR7 F	GGAAATTGCCCTCGTTGTTA	102
TLR7 R	TTCTGTCAGCGCATCAAAG	
TLR8 F	CCTGGCTCACCATTGTTTT	94
TLR8 R	TTGGGATGTGAAAAGAGACC	
TLR9 F	CCTATTCATGGACGGCAACT	106
TLR9 R	GAGTGACAGGTGGGTGAGGT	

Table S2. Annotated gene transcripts differentially expressed by meningotheial cells after treatment with MC58.

	ID	Symbol	Log2 Fold change (mean)	Description
1	M13509	MMP1	3.80	matrix metalloproteinase 1 (interstitial collagenase)
2	NM_000584	IL8	3.38	interleukin 8
3	NM_004591	CCL20	3.06	chemokine (C-C motif) ligand 20
4	NM_005409	CXCL11	2.92	chemokine (C-X-C motif) ligand 11
5	NM_000963	PTGS2	2.90	prostaglandin-endoperoxide synthase 2 (prostaglandin G/H synthase and cyclooxygenase)
6	NM_001165	BIRC3	2.84	baculoviral IAP repeat-containing 3
7	NM_080657	RSAD2	2.83	radical S-adenosyl methionine domain containing 2
8	NM_001547	IFIT2	2.65	interferon-induced protein with tetratricopeptide repeats 2
9	NM_001565	CXCL10	2.63	chemokine (C-X-C motif) ligand 10
10	NM_000758	CSF2	2.63	colony stimulating factor 2 (granulocyte-macrophage)
11	NM_002575	SERPINF2	2.60	serpin peptidase inhibitor, clade B (ovalbumin), member 2
12	NM_000600	IL6	2.53	interleukin 6 (interferon, beta 2)
13	NM_002176	IFNB1	2.50	interferon, beta 1, fibroblast
14	NM_000201	ICAM1	2.48	intercellular adhesion molecule 1
15	NM_014314	DDX58	2.47	DEAD (Asp-Glu-Ala-Asp) box polypeptide 58
16	NM_001549	IFIT3	2.46	interferon-induced protein with tetratricopeptide repeats 3
17	NM_001548	IFIT1	2.44	interferon-induced protein with tetratricopeptide repeats 1
18	NM_006290	TNFAIP3	2.43	tumor necrosis factor, alpha-induced protein 3
19	NM_003733	OASL	2.21	2'-5'-oligoadenylate synthetase-like
20	NM_002852	PTX3	2.15	pentraxin 3, long
21	NM_022168	IFIH1	2.12	interferon induced with helicase C domain 1
22	NM_001775	CD38	2.07	CD38 molecule
23	NM_021127	PMAIP1	2.05	phorbol-12-myristate-13-acetate-induced protein 1
24	NM_017414	USP18	2.04	ubiquitin specific peptidase 18
25	NM_001511	CXCL1	2.01	chemokine (C-X-C motif) ligand 1 (melanoma growth stimulating activity, alpha)
26	AK001823	GBP3	1.95	guanylate binding protein 3
27	NM_002198	IRF1	1.93	interferon regulatory factor 1
28	AK022542	PARP14	1.92	poly (ADP-ribose) polymerase family, member 14
29	NM_000576	IL1B	1.88	interleukin 1, beta
30	NM_002985	CCL5	1.88	chemokine (C-C motif) ligand 5
31	NM_002982	CCL2	1.82	chemokine (C-C motif) ligand 2
32	NM_006417	IFI44	1.82	interferon-induced protein 44
33	NM_007036	ESM1	1.79	endothelial cell-specific molecule 1
34	NM_004165	RRAD	1.78	Ras-related associated with diabetes
35	NM_020529	NFKBIA	1.76	nuclear factor of kappa light polypeptide gene enhancer in B-cells inhibitor, alpha
36	NM_003821	RIPK2	1.67	receptor-interacting serine-threonine kinase 2
37	NM_022147	RTP4	1.66	receptor (chemosensory) transporter protein 4
38	NM_017654	SAMD9	1.65	sterile alpha motif domain containing 9
39	NM_006734	HIVEP2	1.61	human immunodeficiency virus type I enhancer binding protein 2
40	NM_012320	PLA2G15	1.57	phospholipase A2, group XV
41	NM_001561	TNFRSF9	1.55	tumor necrosis factor receptor superfamily, member 9
42	NM_002462	MX1	1.51	myxovirus (influenza virus) resistance 1, interferon-inducible protein p78 (mouse)
43	NM_002053	GBP1	1.38	guanylate binding protein 1, interferon-inducible, 67kDa
44	NM_000283	PDE6B	-1.30	phosphodiesterase 6B, cGMP-specific, rod, beta
45	NM_005486	TOM1L1	-1.31	target of myb1 (chicken)-like 1
46	NM_003149	STAC	-1.32	SH3 and cysteine rich domain
47	NM_004746	DLGAP1	-1.32	discs, large (Drosophila) homolog-associated protein 1
48	NM_002275	KRT15	-1.32	keratin 15
49	NM_016162	ING4	-1.33	inhibitor of growth family, member 4
50	NM_001149	ANK3	-1.34	ankyrin 3, node of Ranvier (ankyrin G)
51	NM_014960	ARSG	-1.36	arylsulfatase G
52	NM_025198	MTERFD3	-1.37	MTERF domain containing 3
53	NM_001733	C1R	-1.37	complement component 1, r subcomponent
54	NM_006305	ANP32A	-1.38	acidic (leucine-rich) nuclear phosphoprotein 32 family, member A
55	NM_007098	CLTCL1	-1.39	clathrin, heavy chain-like 1
56	NM_000213	ITGB4	-1.40	integrin, beta 4
57	NM_014936	ENPP4	-1.40	ectonucleotide pyrophosphatase/phosphodiesterase 4 (putative)
58	NM_001741	CALCA	-1.41	calcitonin-related polypeptide alpha
59	NM_002015	FOXO1	-1.41	forkhead box O1
60	NM_005374	MPP2	-1.42	membrane protein, palmitoylated 2 (MAGUK p55 subfamily member 2)
61	NM_014585	SLC40A1	-1.43	solute carrier family 40 (iron-regulated transporter), member 1
62	NM_018093	WDR74	-1.43	WD repeat domain 74
63	NM_020323	ABCD4	-1.44	ATP-binding cassette, sub-family D (ALD), member 4
64	NM_020039	ACCN2	-1.45	amiloride-sensitive cation channel 2, neuronal
65	NM_002297	LCN1	-1.45	lipocalin 1 (tear prealbumin)
66	NM_002153	HSD17B2	-1.45	hydroxysteroid (17-beta) dehydrogenase 2
67	NM_000956	PTGER2	-1.46	prostaglandin E receptor 2 (subtype EP2), 53kDa
68	NM_017832	C9ORF6	-1.46	chromosome 9 open reading frame 6
69	NM_023009	MARCKSL1	-1.46	MARCKS-like 1
70	NM_018418	SPATA7	-1.48	spermatogenesis associated 7
71	NM_004684	SPARCL1	-1.48	SPARC-like 1 (hevin)
72	NM_003551	NME5	-1.48	non-metastatic cells 5, protein expressed in (nucleoside-diphosphate kinase)
73	NM_013436	NCKAP1	-1.50	NCK-associated protein 1
74	NM_014946	SPAST	-1.52	spastin
75	NM_022169	ABCG4	-1.52	ATP-binding cassette, sub-family G (WHITE), member 4
76	NM_001322	CST2	-1.54	cystatin SA
77	NM_019848	SLC10A3	-1.54	solute carrier family 10 (sodium/bile acid cotransporter family), member 3
78	NM_019899	ABCC1	-1.55	ATP-binding cassette, sub-family C (CFTR/MRP), member 1
79	NM_012266	DNAJB5	-1.55	DnaJ (Hsp40) homolog, subfamily B, member 5
80	NM_025125	C10ORF57	-1.55	chromosome 10 open reading frame 57
81	NM_021154	PSAT1	-1.55	phosphoserine aminotransferase 1
82	NM_017677	MTMR8	-1.55	myotubularin related protein 8
83	NM_001854	COL11A1	-1.56	collagen, type XI, alpha 1
84	NM_006646	WASF3	-1.56	WAS protein family, member 3
85	NM_017987	RUFY2	-1.56	RUN and FYVE domain containing 2
86	NM_003505	FZD1	-1.56	frizzled homolog 1 (Drosophila)
87	NM_030881	DDX17	-1.56	DEAD (Asp-Glu-Ala-Asp) box polypeptide 17
88	NM_022369	STRA6	-1.56	stimulated by retinoic acid gene 6 homolog (mouse)
89	NM_024010	MTRR	-1.57	5-methyltetrahydrofolate-homocysteine methyltransferase reductase
90	NM_014012	REM1	-1.57	RAS (RAD and GEM)-like GTP-binding 1

91	NM_000383	AIRE	-1.58	autoimmune regulator
92	NM_007011	ABHD2	-1.58	abhydrolase domain containing 2
93	NM_022353	OSGEPL1	-1.58	O-sialoglycoprotein endopeptidase-like 1
94	NM_012368	OR2C1	-1.58	olfactory receptor, family 2, subfamily C, member 1
95	NM_000894	LHB	-1.59	luteinizing hormone beta polypeptide
96	NM_003385	VSNL1	-1.59	visinin-like 1
97	NM_006475	POSTN	-1.59	periostin, osteoblast specific factor
98	NM_001933	DLST	-1.60	dihydroliipoamide S-succinyltransferase (E2 component of 2-oxo-glutarate complex)
99	NM_002003	FCN1	-1.60	ficolin (collagen/fibrinogen domain containing) 1
100	NM_018365	MNS1	-1.60	meiosis-specific nuclear structural 1
101	NM_020208	SLC6A20	-1.62	solute carrier family 6 (proline IMINO transporter), member 20
102	NM_000133	F9	-1.63	coagulation factor IX
103	NM_030901	OR7A17	-1.63	olfactory receptor, family 7, subfamily A, member 17
104	NM_014554	SENP1	-1.63	SUMO1/sentrin specific peptidase 1
105	NM_018538	ERMAP	-1.64	erythroblast membrane-associated protein (Scianna blood group)
106	NM_016544	DNAJC27	-1.64	DnaJ (Hsp40) homolog, subfamily C, member 27
107	NM_024997	ATF7IP2	-1.64	activating transcription factor 7 interacting protein 2
108	NM_004081	DAZ1	-1.64	deleted in azoospermia 1
109	NM_018849	ABCB4	-1.64	ATP-binding cassette, sub-family B (MDR/TAP), member 4
110	NM_024639	ZNF322A	-1.65	zinc finger protein 322A
111	NM_170753	PGBD3	-1.65	piggyBac transposable element derived 3
112	NM_001943	DSG2	-1.65	desmoglein 2
113	NM_021048	MAGEA10	-1.66	melanoma antigen family A, 10
114	NM_022480	KLHL25	-1.66	kelch-like 25 (Drosophila)
115	NM_002034	FUT5	-1.67	fucosyltransferase 5 (alpha (1,3) fucosyltransferase)
116	NM_025259	MSH5	-1.67	mutS homolog 5 (E. coli)
117	NM_000668	ADH1B	-1.67	alcohol dehydrogenase 1B (class I), beta polypeptide
118	NM_007180	TREH	-1.67	trehalase (brush-border membrane glycoprotein)
119	NM_012230	POMZP3	-1.68	POM121 and ZP3 fusion
120	NM_002009	FGF7	-1.69	fibroblast growth factor 7
121	NM_002729	HHEX	-1.69	hematopoietically expressed homeobox
122	NM_021033	RAP2A	-1.69	RAP2A, member of RAS oncogene family
123	NM_004473	FOXE1	-1.71	forkhead box E1 (thyroid transcription factor 2)
124	NM_019888	MC3R	-1.71	melanocortin 3 receptor
125	NM_001648	KLK3	-1.72	kallikrein-related peptidase 3
126	NM_004110	FDXR	-1.73	ferredoxin reductase
127	NM_000639	FASLG	-1.74	Fas ligand (TNF superfamily, member 6)
128	NM_019863	F8	-1.74	coagulation factor VIII, procoagulant component
129	NM_016827	OGG1	-1.76	8-oxoguanine DNA glycosylase
130	NM_019119	PCDHB9	-1.76	protocadherin beta 9
131	NM_018355	ZNF415	-1.77	zinc finger protein 415
132	NM_023013	PRAMEF1	-1.78	PRAME family member 1
133	NM_016263	FZR1	-1.78	fizzy/cell division cycle 20 related 1 (Drosophila)
134	NM_014009	FOXP3	-1.79	forkhead box P3
135	NM_052997	ANKRD30A	-1.80	ankyrin repeat domain 30A
136	NM_032638	GATA2	-1.81	GATA binding protein 2
137	NM_032638	GATA2	-1.81	GATA binding protein 2
138	AC009180	EXOC4	-1.81	exocyst complex component 4
139	NM_003247	THBS2	-1.81	thrombospondin 2
140	NM_016123	IRAK4	-1.81	interleukin-1 receptor-associated kinase 4
141	NM_004732	KCNAB3	-1.83	potassium voltage-gated channel, shaker-related subfamily, beta member 3
142	NM_004628	XPC	-1.84	xeroderma pigmentosum, complementation group C
143	NM_001160	APAF1	-1.84	apoptotic peptidase activating factor 1
144	NM_053039	UGT2B28	-1.84	UDP glucuronosyltransferase 2 family, polypeptide B28
145	NM_007281	SCRG1	-1.85	stimulator of chondrogenesis 1
146	NM_001179	ART3	-1.85	ADP-ribosyltransferase 3
147	NM_003301	TRHR	-1.86	thyrotropin-releasing hormone receptor
148	NM_013989	DIO2	-1.87	deiodinase, iodothyronine, type II
149	NM_080792	SIRPA	-1.87	signal-regulatory protein alpha
150	NM_020652	ZNF286A	-1.90	zinc finger protein 286A
151	NM_020394	ZNF695	-1.91	zinc finger protein 695
152	NM_001340	CYLC2	-1.92	cyclicin, basic protein of sperm head cytoskeleton 2
153	NM_022785	EFCAB6	-1.92	EF-hand calcium binding domain 6
154	NM_005173	ATP2A3	-1.93	ATPase, Ca++ transporting, ubiquitous
155	NM_014393	STAU2	-1.93	staufen, RNA binding protein, homolog 2 (Drosophila)
156	NM_022493	NARFL	-1.93	nuclear prelamin A recognition factor-like
157	NM_000557	GDF5	-1.94	growth differentiation factor 5
158	NM_014626	TAAR2	-1.95	trace amine associated receptor 2
159	NM_016820	OGG1	-1.95	8-oxoguanine DNA glycosylase
160	AF313485	VCP	-1.95	valosin-containing protein
161	NM_012222	MUTYH	-1.97	mutY homolog (E. coli)
162	NM_016651	DACT1	-1.98	dapper, antagonist of beta-catenin, homolog 1 (Xenopus laevis)
163	NM_022576	PDC	-1.99	phosducin
164	NM_018951	HOXA10	-2.00	homeobox A10
165	NM_004039	ANXA2	-2.01	annexin A2
166	NM_024578	OCEL1	-2.01	occludin/ELL domain containing 1
167	NM_014686	KIAA0355	-2.01	KIAA0355
168	NM_016144	COMMD10	-2.01	COMM domain containing 10
169	NM_024612	DHX40	-2.04	DEAH (Asp-Glu-Ala-His) box polypeptide 40
170	NM_022083	FAM129A	-2.04	family with sequence similarity 129, member A
171	NM_024345	DCAF10	-2.05	DDB1 and CUL4 associated factor 10
172	NM_013987	PARK2	-2.05	Parkinson disease (autosomal recessive, juvenile) 2, parkin
173	NM_001840	CNR1	-2.06	cannabinoid receptor 1 (brain)
174	NM_000511	FUT2	-2.07	fucosyltransferase 2 (secretor status included)
175	NM_000180	GUCY2D	-2.08	guanylate cyclase 2D, membrane (retina-specific)
176	U71278	F12	-2.11	coagulation factor XII (Hageman factor)
177	NM_005212	CSN3	-2.11	casein kappa
178	NM_022777	RABL5	-2.12	RAB, member RAS oncogene family-like 5
179	NM_025061	LRRRC8E	-2.12	leucine rich repeat containing 8 family, member E
180	NM_023948	MOSPD3	-2.12	motile sperm domain containing 3
181	NM_004436	ENSA	-2.12	endosulfine alpha
182	NM_025080	ASRGL1	-2.13	asparaginase like 1

183	NM_015043	TBC1D9B	-2.14	TBC1 domain family, member 9B (with GRAM domain)
184	NM_000182	HADHA	-2.14	hydroxyacyl-CoA dehydrogenase/3-ketoacyl-CoA thiolase/enoyl-CoA hydratase (trifunctional protein), alpha subunit
185	NM_018338	WDR52	-2.15	WD repeat domain 52
186	NM_024834	C10ORF119	-2.15	chromosome 10 open reading frame 119
187	NM_024665	TBL1XR1	-2.16	transducin (beta)-like 1 X-linked receptor 1
188	NM_000575	IL1A	-2.16	interleukin 1, alpha
189	NM_015286	SYNM	-2.17	synemin, intermediate filament protein
190	NM_003469	SCG2	-2.17	secretogranin II
191	NM_022829	SLC13A3	-2.18	solute carrier family 13 (sodium-dependent dicarboxylate transporter), member 3
192	NM_004078	CSRP1	-2.19	cysteine and glycine-rich protein 1
193	NM_001965	EGR4	-2.21	early growth response 4
194	NM_002377	MAS1	-2.21	MAS1 oncogene
195	NM_003340	UBE2D3	-2.21	ubiquitin-conjugating enzyme E2D 3 (UBC4/5 homolog, yeast)
196	NM_000911	OPRD1	-2.22	opioid receptor, delta 1
197	NM_003994	KITLG	-2.22	KIT ligand
198	NM_024837	ATP8B4	-2.23	ATPase, class I, type 8B, member 4
199	NM_004116	FKBP1B	-2.23	FK506 binding protein 1B, 12.6 kDa
200	NM_000655	SELL	-2.24	selectin L
201	NM_014413	EIF2AK1	-2.25	eukaryotic translation initiation factor 2-alpha kinase 1
202	NM_020351	COL8A1	-2.25	collagen, type VIII, alpha 1
203	NM_024835	GGNBP2	-2.28	gametogenetin binding protein 2
204	NM_024531	GPR172A	-2.29	G protein-coupled receptor 172A
205	NM_003596	TPST1	-2.29	tyrosylprotein sulfotransferase 1
206	NM_022061	MRPL17	-2.30	mitochondrial ribosomal protein L17
207	NM_025115	C8ORF41	-2.30	chromosome 8 open reading frame 41
208	NM_003737	DCHS1	-2.32	dachsous 1 (Drosophila)
209	NM_024295	DERL1	-2.32	Der1-like domain family, member 1
210	NM_000864	HTR1D	-2.33	5-hydroxytryptamine (serotonin) receptor 1D
211	NM_002318	LOXL2	-2.33	lysyl oxidase-like 2
212	NM_002221	ITPKB	-2.34	inositol 1,4,5-trisphosphate 3-kinase B
213	NM_020127	TUFT1	-2.34	tuftelin 1
214	NM_004768	SRSF11	-2.35	serine/arginine-rich splicing factor 11
215	NM_017790	RGS3	-2.36	regulator of G-protein signaling 3
216	NM_002082	GRK6	-2.37	G protein-coupled receptor kinase 6
217	NM_020323	ABCD5	-2.37	ATP-binding cassette, sub-family D (ALD), member 5
218	NM_002631	PGD	-2.37	phosphogluconate dehydrogenase
219	NM_024871	MAP6D1	-2.37	MAP6 domain containing 1
220	NM_022453	RNF25	-2.39	ring finger protein 25
221	NM_003023	SH3BP2	-2.39	SH3-domain binding protein 2
222	NM_022169	ABCG5	-2.40	ATP-binding cassette, sub-family G (WHITE), member 5
223	NM_000615	NCAM1	-2.40	neural cell adhesion molecule 1
224	NM_024330	SLC27A3	-2.40	solute carrier family 27 (fatty acid transporter), member 3
225	NM_002035	KDSR	-2.40	3-ketodihydrospingosine reductase
226	NM_005074	SLC17A1	-2.41	solute carrier family 17 (sodium phosphate), member 1
227	NM_000916	OXTR	-2.41	oxytocin receptor
228	NM_024325	ZNF343	-2.41	zinc finger protein 343
229	NM_000994	RPL32	-2.42	ribosomal protein L32
230	NM_022304	HRH2	-2.42	histamine receptor H2
231	NM_024868	OBSCN	-2.42	obscurin, cytoskeletal calmodulin and titin-interacting RhoGEF
232	NM_024945	RMI1	-2.42	RMI1, RecQ mediated genome instability 1, homolog (S. cerevisiae)
233	NM_025212	CXXC4	-2.42	CXXC finger 4
234	NM_007011	ABHD14	-2.43	abhydrolase domain containing 14
235	NM_020139	BDH2	-2.44	3-hydroxybutyrate dehydrogenase, type 2
236	NM_021806	FAM3A	-2.44	family with sequence similarity 3, member A
237	NM_021806	FAM3A	-2.44	family with sequence similarity 3, member A
238	NM_006419	CXCL13	-2.45	chemokine (C-X-C motif) ligand 13
239	NM_024527	ABHD20	-2.45	abhydrolase domain containing 20
240	NM_018401	STK32B	-2.46	serine/threonine kinase 32B
241	NM_020998	MST1	-2.46	macrophage stimulating 1 (hepatocyte growth factor-like)
242	NM_000521	HEXB	-2.46	hexosaminidase B (beta polypeptide)
243	NM_025181	SLC35F5	-2.48	solute carrier family 35, member F5
244	NM_019093	UGT1A3	-2.48	UDP glucuronosyltransferase 1 family, polypeptide A3
245	NM_024037	C10RF135	-2.49	chromosome 1 open reading frame 135
246	NM_024860	SETD6	-2.50	SET domain containing 6
247	NM_001379	DNMT1	-2.50	DNA (cytosine-5-)-methyltransferase 1
248	NM_024989	PGAP1	-2.52	post-GPI attachment to proteins 1
249	NM_024859	MAGIX	-2.53	MAGI family member, X-linked
250	NM_003005	SELP	-2.53	selectin P (granule membrane protein 140kDa, antigen CD62)
251	NM_002739	PRKCG	-2.53	protein kinase C, gamma
252	NM_017952	PTCD3	-2.53	Pentatricopeptide repeat domain 3
253	NM_025003	ADAMTS20	-2.53	ADAM metalloproteinase with thrombospondin type 1 motif, 20
254	NM_023931	ZNF747	-2.53	zinc finger protein 747
255	NM_006414	RPP38	-2.54	ribonuclease P/MRP 38kDa subunit
256	NM_021727	FADS3	-2.54	fatty acid desaturase 3
257	NM_016185	HN1	-2.56	hematological and neurological expressed 1
258	NM_012390	SMR3A	-2.57	submaxillary gland androgen regulated protein 3A
259	NM_006275	SRSF6	-2.57	serine/arginine-rich splicing factor 6
260	NM_001980	STX2	-2.58	syntaxin 2
261	NM_005434	MALL	-2.58	mal, T-cell differentiation protein-like
262	NM_018644	B3GAT1	-2.59	beta-1,3-glucuronosyltransferase 1 (glucuronosyltransferase P)
263	NM_024751	GSTCD	-2.59	glutathione S-transferase, C-terminal domain containing
264	NM_006402	HBXIP	-2.60	hepatitis B virus x interacting protein
265	NM_005217	DEFA3	-2.63	defensin, alpha 3, neutrophil-specific
266	NM_022477	NDRG3	-2.64	NDRG family member 3
267	NM_024619	FN3KRP	-2.65	fructosamine 3 kinase related protein
268	NM_024527	ABHD8	-2.65	abhydrolase domain containing 8
269	NM_005998	CCT3	-2.66	chaperonin containing TCP1, subunit 3 (gamma)
270	NM_024327	ZNF576	-2.67	zinc finger protein 576
271	NM_001066	TNFRSF1B	-2.67	tumor necrosis factor receptor superfamily, member 1B
272	NM_006874	ELF2	-2.68	E74-like factor 2 (ets domain transcription factor)
273	NM_022910	NDRG4	-2.68	NDRG family member 4
274	NM_006305	ANP32A	-2.69	acidic (leucine-rich) nuclear phosphoprotein 32 family, member A

275	NM_000860	HPGD	-2.70	hydroxyprostaglandin dehydrogenase 15-(NAD)
276	NM_025235	TNKS2	-2.70	tankyrase, TRF1-interacting ankyrin-related ADP-ribose polymerase 2
277	NM_018070	SSBP3	-2.70	single stranded DNA binding protein 3
278	NM_023940	RASL11B	-2.70	RAS-like, family 11, member B
279	NM_002347	LY6H	-2.71	lymphocyte antigen 6 complex, locus H
280	NM_005383	NEU2	-2.75	sialidase 2 (cytosolic sialidase)
281	NM_021133	RNASEL	-2.77	ribonuclease L (2',5'-oligoadenylate synthetase-dependent)
282	NM_022367	SEMA4A	-2.78	sema domain, immunoglobulin domain (Ig), transmembrane domain (TM) and short cytoplasmic domain, (semaphorin) 4A
283	NM_023007	JMJD4	-2.80	jumonji domain containing 4
284	NM_025109	MYO19	-2.80	myosin XIX
285	NM_017614	BHMT2	-2.80	betaine--homocysteine S-methyltransferase 2
286	NM_015136	STAB1	-2.81	stabilin 1
287	NM_024642	GALNT12	-2.81	UDP-N-acetyl-alpha-D-galactosamine:polypeptide N-acetylgalactosaminyltransferase 12 (GalNAc-T12)
288	NM_017442	TLR9	-2.83	toll-like receptor 9
289	NM_022490	POLR1E	-2.85	polymerase (RNA) I polypeptide E, 53kDa
290	NM_024045	DDX50	-2.86	DEAD (Asp-Glu-Ala-Asp) box polypeptide 50
291	NM_002731	PRKACB	-2.86	protein kinase, cAMP-dependent, catalytic, beta
292	NM_000379	XDH	-2.88	xanthine dehydrogenase
293	NM_025135	FHOD3	-2.88	formin homology 2 domain containing 3
294	NM_031313	ALPPL2	-2.90	alkaline phosphatase, placental-like 2
295	NM_022068	FAM38B	-2.91	family with sequence similarity 38, member B
296	NM_024301	FKRP	-2.91	fukutin related protein
297	NM_003729	RTCD1	-2.92	RNA terminal phosphate cyclase domain 1
298	NM_002415	MIF	-2.97	macrophage migration inhibitory factor (glycosylation-inhibiting factor)
299	NM_025211	GKAP1	-2.98	G kinase anchoring protein 1
300	NM_014753	BMS1	-3.00	BMS1 homolog, ribosome assembly protein (yeast)
301	NM_012113	CA14	-3.04	carbonic anhydrase XIV
302	NM_025203	C2ORF44	-3.06	chromosome 2 open reading frame 44
303	NM_003704	FAM193A	-3.06	family with sequence similarity 193, member A
304	NM_018930	PCDHB10	-3.08	protocadherin beta 10
305	NM_001483	GBAS	-3.10	glioblastoma amplified sequence
306	NM_014138	FAM156A	-3.93	family with sequence similarity 156, member A