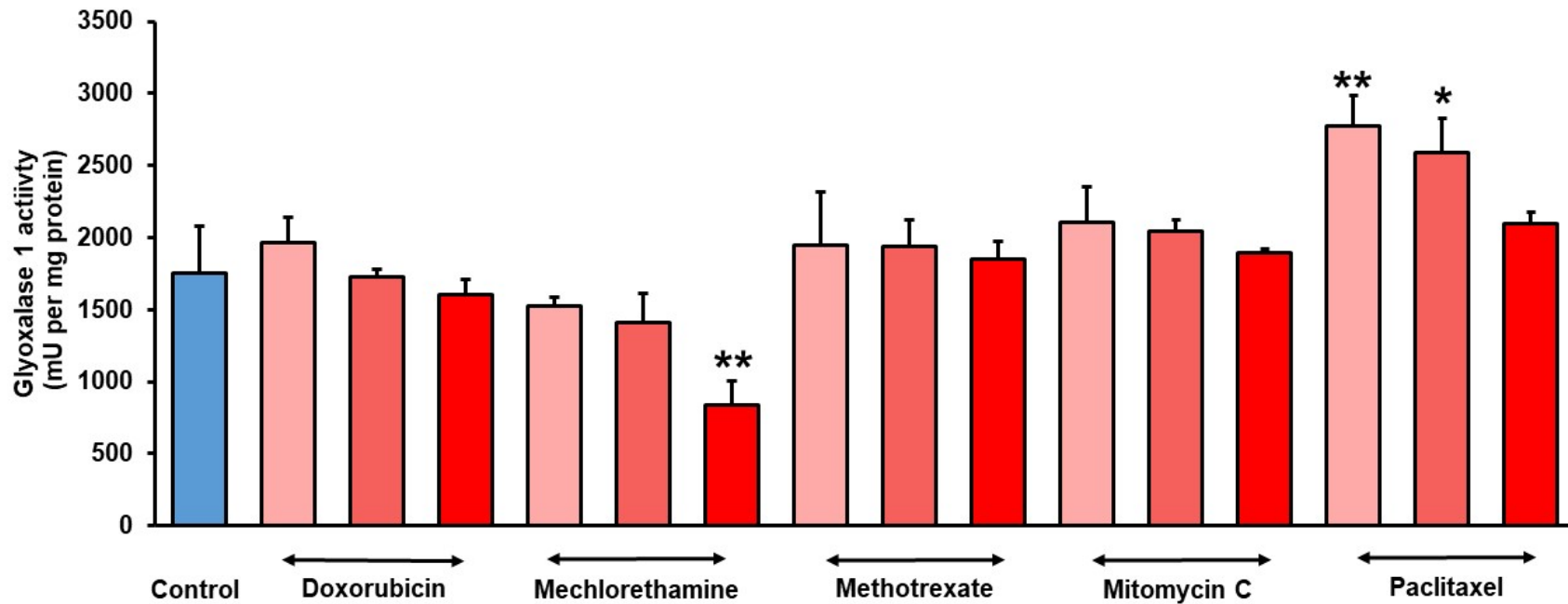


**Studies of glyoxalase 1-linked multidrug resistance reveal glycolysis-derived reactive metabolite, methylglyoxal, is a common contributor in cancer chemotherapy targeting the spliceosome.**

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**Figure S1.** The effect of the anti-cancer drugs on Glo1 activity of HEK293 cell lysates. Anticancer drugs were added to diluted cytosolic extracts of HEK293 cells and activity of glyoxalase 1 assayed as described [1]. Data are mean  $\pm$  SD ( $n = 4$  for control and  $n = 3$  for drug treated). Significance: \* and \*\*,  $P < 0.05$  and  $P < 0.05$ , with respect to control; *Student's t-test*. Key for drug concentrations: , + GC<sub>50</sub>; , + 2 x GC<sub>50</sub>; and , + 5 x GC<sub>50</sub>.



**Studies of glyoxalase 1-linked multidrug resistance reveal glycolysis-derived reactive metabolite, methylglyoxal, is a common contributor in cancer chemotherapy targeting the spliceosome.**

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**Table S1. Proteins in the cytoplasmic extract increased in abundance by treatment with methylglyoxal.**

No	Gene	Name of protein	Fold change
1	TMEM63B	CSC1-like protein 2	30.5
2	MEGF11	Multiple epidermal growth factor-like domains protein 11	14.0
3	TMEM259	Membralin	8.2
4	TSTA3	GDP-L-fucose synthase	5.7
5	CORO1C	Coronin	5.2
6	EIF4E	Eukaryotic translation initiation factor 4E	5.1
7	LSM7	U6 snRNA-associated Sm-like protein LSm7	4.9
8	TMEM132B	Transmembrane protein 132B	4.8
9	NIN	Ninein	4.8
10	UBL5	Ubiquitin-like protein 5	4.4
11	NLRP2	NACHT, LRR and PYD domains-containing protein 2	4.1
12	TUB	Tubby-like protein	3.9
13	TSPYL2	Testis-specific Y-encoded-like protein 2	3.8
14	TRIM52	Tripartite motif-containing protein 52	3.6
15	CHMP2A	Charged multivesicular body protein 2a	3.5
16	GC	Vitamin D-binding protein	3.5
17	C5	Complement C5	3.5
18	GPR119	Glucose-dependent insulinotropic receptor	3.4
19	KRT9	Keratin, type I cytoskeletal 9	3.3
20	ABHD12B	Protein ABHD12B	3.2
21	CACNA1H	Voltage-dependent T-type calcium channel subunit alpha-1H	3.2
22	SV2B	Synaptic vesicle glycoprotein 2B	3.2
23	PHF5A	PHD finger-like domain-containing protein 5A	3.0
24	CTSB CPSB	Cathepsin B	2.9
25	NUP50	Nuclear pore complex protein Nup50	2.8
26		Uncharacterized protein	2.8
27	THRA	Thyroid hormone receptor alpha	2.7
28	KIAA0355	Uncharacterized protein KIAA0355	2.6
29	COQ9	Ubiquinone biosynthesis protein COQ9, mitochondrial	2.6
30	FAAP20	Fanconi anemia core complex-associated protein 20	2.6
31	REXO2	Oligoribonuclease, mitochondrial	2.4
32	CIITA	MHC class II transactivator	2.4
33	DROSHA	Ribonuclease 3	2.4
34	VAT1	Synaptic vesicle membrane protein VAT-1 homolog	2.3
35	MZT2A	Mitotic-spindle organizing protein 2A	2.3
36	PPARD	Peroxisome proliferator-activated receptor delta	2.2
37	CKS2	Cyclin-dependent kinases regulatory subunit 2	2.2
38	MRPL1	39S ribosomal protein L1, mitochondrial	2.1
39	ZNF568	Zinc finger protein 568	2.1
40	BRCA2	Breast cancer type 2 susceptibility protein	2.1
41	MXRA7	HBV PreS1-transactivated protein 1	2.1
42	HIBADH	3-hydroxyisobutyrate dehydrogenase, mitochondrial	2.1
43	PTPRN2	Receptor-type tyrosine-protein phosphatase N2	2.1
44	SLC25A37	Mitoferrin-1	2.1
45	METAP1	Methionine aminopeptidase 1	2.1
46	SCAPER	S phase cyclin A-associated protein in the ER	2.1
47	SDHA	Succinate dehydrogenase [ubiquinone] flavoprotein subunit, mitochondrial	2.1
48	GGCT	Gamma-glutamylcyclotransferase	2.1
49	NIPBL	Nipped-B-like protein	2.0

50	TUBGCP6	Gamma-tubulin complex component 6	2.0
51	UNG	Uracil-DNA glycosylase	2.0
52	COL4A4	Collagen alpha-4	2.0
53	CLN5	Ceroid-lipofuscinosis neuronal protein 5	2.0
54	MACF1	Microtubule-actin cross-linking factor 1, isoforms 1/2/3/5	2.0
55	CRABP2	Cellular retinoic acid-binding protein 2	2.0
56	TSFM	Elongation factor Ts, mitochondrial	2.0
57	COL27A1	Collagen alpha-1	2.0
58	MECP2	Methyl-CpG-binding protein 2	1.9
59	CCNDBP1	Cyclin-D1-binding protein 1	1.9
60	PLCB1	1-phosphatidylinositol 4,5-bisphosphate phosphodiesterase	1.9
61	SERPINA7	Thyroxine-binding globulin	1.9
62	ZSWIM9	Uncharacterized protein ZSWIM9	1.9
63	CCDC8	Coiled-coil domain-containing protein 8	1.9
64	IWS1	Protein IWS1 homolog	1.9
65	SPTA1	Spectrin alpha chain, erythrocytic 1	1.8
66	SEMA4B	Semaphorin-4B	1.8
67	CPEB1	Cytoplasmic polyadenylation element binding protein 1, isoform CRA_c	1.8
68	CRELD2	Cysteine-rich with EGF-like domain protein 2	1.8
69	UNC13B	Protein unc-13 homolog B	1.8
70	SEPTIN9	Septin 9	1.8
71	A2M	Alpha-2-macroglobulin	1.8
72	CABIN1	Calcineurin-binding protein cabin-1	1.8
73	ZNF622	Zinc finger protein 622	1.8
74	YARS2	Tyrosine-tRNA ligase	1.8
75	MBOAT7	Lysophospholipid acyltransferase 7	1.8
76	LRBA	Lipopolysaccharide-responsive and beige-like anchor protein	1.7
77	SLC6A9	Transporter	1.7
78	ARMH3	Armadillo-like helical domain-containing protein 3	1.7
79	NPEPPS	Puromycin-sensitive aminopeptidase	1.7
80	MYEF2	Myelin expression factor 2	1.7
81	TMPRSS11B	Transmembrane protease serine 11B	1.7
82	MDC1	Mediator of DNA damage checkpoint protein 1	1.6
83	UBQLN1	Ubiquilin-1	1.6
84	MUC20	Mucin-20	1.6
85	SPRED2	Sprouty-related, EVH1 domain-containing protein 2	1.6
86	BUD31	Protein BUD31 homolog	1.6
87	SAMD11	Sterile alpha motif domain-containing protein 11	1.6
88	CEP250	Centrosome-associated protein CEP250	1.6
89	WDR33	pre-mRNA 3' end processing protein WDR33	1.6
90	CCT7	T-complex protein 1 subunit eta	1.5
91	SNRPB2	U2 small nuclear ribonucleoprotein B"	1.5
92	SDHB	Succinate dehydrogenase [ubiquinone] iron-sulfur subunit, mitochondrial	1.5
93	PPP4R1L	Putative serine/threonine-protein phosphatase 4 regulatory subunit 1-like	1.5
94	ALK	Tyrosine-protein kinase receptor	1.5
95	SNTG2	Gamma-2-syntrophin	1.5
96	C20orf27	UPF0687 protein C20orf27	1.5
97	EIPR1	EARP and GARP complex-interacting protein 1	1.5
98	DAP3	28S ribosomal protein S29, mitochondrial	1.5
99	WDR61	WD repeat-containing protein 61	1.5
100	DIS3L2	DIS3-like exonuclease 2	1.4
101	ALDH3A2	Fatty aldehyde dehydrogenase	1.4
102	ETS1	Protein C-ets-1	1.4
103	DAAM2	Disheveled-associated activator of morphogenesis 2	1.4
104	WNK3	Serine/threonine-protein kinase WNK3	1.4

105	EDC3	Enhancer of mRNA-decapping protein 3	1.4
106	FMN2	Formin-2	1.4
107	GRD1	Glutathione reductase, mitochondrial	1.4
108	FAM27E3	Protein FAM27E3	1.3
109	MRPS9	28S ribosomal protein S9, mitochondrial	1.3
110	MBNL1	Muscle blind-like protein 1	1.3
111	LMNA	Prelamin-A/C [Cleaved into: Lamin-A/C	1.3
112	WBP11	WW domain-binding protein 11	1.3
113	SMG6	Telomerase-binding protein EST1A	1.3
114	LMNA	Prelamin-A/C	1.3
115	FABP5	Fatty acid-binding protein 5	1.2
116	RBM14	RNA-binding protein 14	1.2
117	POM121C	Nuclear envelope pore membrane protein POM 121C	1.2
118	NFU1	NFU1 iron-sulfur cluster scaffold homolog, mitochondrial	1.2
119	AKR1B1	Aldo-keto reductase family 1 member B1	1.2
120	TRA2B	Transformer-2 protein homolog beta	1.2
121	NASP	Nuclear autoantigenic sperm protein	1.2

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**Table S2. Proteins in the cytoplasmic extract decreased in abundance by treatment with methylglyoxal.**

No	Gene	Name of protein	Fold change
1	HNRNPK	Heterogeneous nuclear ribonucleoprotein K	0.91
2	GDI1	Rab GDP dissociation inhibitor alpha	0.90
3	YWHAZ	14-3-3 protein zeta/delta	0.89
4	GDI1	Rab GDP dissociation inhibitor	0.89
5	DDX21	Nucleolar RNA helicase 2	0.89
6	HSP90B1	Endoplasmin	0.89
7	GDI2	Rab GDP dissociation inhibitor	0.88
8	NPM1	Nucleophosmin	0.88
9	NASP	Nuclear autoantigenic sperm protein	0.88
10	SERBP1	Plasminogen activator inhibitor 1 RNA-binding protein	0.88
11	RTCB	tRNA-splicing ligase RtcB homolog	0.88
12	ACTN4	Alpha-actinin-4	0.88
13	HSPE1	10 kDa heat shock protein, mitochondrial	0.87
14	SRSF1	Serine/arginine-rich-splicing factor 1	0.87
15	MYH9	Myosin-9	0.87
16	RBM39	RNA-binding protein 39	0.87
17	EIF3J	Eukaryotic translation initiation factor 3 subunit J	0.87
18	LMNB1	Lamin-B1	0.87
19	EIF4EBP1	Eukaryotic translation initiation factor 4E-binding protein 1	0.87
20	CALU	Calumenin	0.87
21	SEPT11	Septin-11	0.87
22	SRSF6	Serine/arginine-rich splicing factor 6	0.86
23	ARHGDI1	Rho GDP-dissociation inhibitor 1	0.86
24	FUS	RNA-binding protein FUS	0.86
25	CNPY2	Protein canopy homolog 2	0.86
26	TPR	Nucleoprotein TPR	0.86
27	RAB4A	Ras-related protein Rab-4A	0.86
28	RAN	GTP-binding nuclear protein Ran	0.86
29	SGTA	Small glutamine-rich tetratricopeptide repeat-containing protein alpha	0.86
30	RRP1B	Ribosomal RNA processing protein 1 homolog B	0.86
31	PCBD1	Pterin-4-alpha-carbinolamine dehydratase	0.86
32	RPS14	40S ribosomal protein S14	0.86
33	FTSJ3	pre-rRNA processing protein FTSJ3	0.85
34	RPS10P5	Putative 40S ribosomal protein S10-like	0.85
35	RPLP2	60S acidic ribosomal protein P2	0.85
36	H2AFY	Core histone macro-H2A.1	0.85
37	TPP2	Tripeptidyl-peptidase 2	0.85
38	PPA1	Inorganic pyrophosphatase	0.85
39	RCC2	Protein RCC2	0.85
40	CYFIP1	Cytoplasmic FMR1-interacting protein 1	0.85
41	DYNC1I2	Cytoplasmic dynein 1 intermediate chain 2	0.85
42	TPD52L2	Tumor protein D54	0.85
43	SUMO2	Small ubiquitin-related modifier 2	0.85
44	METAP2	Methionine aminopeptidase 2	0.85
45	PFN1	Profilin	0.85
46	LMNB1	Lamin B1, isoform CRA_a	0.85
47	TMEM189-UBI	HCG2044781	0.84
48	TXNDC17	Thioredoxin domain-containing protein 17	0.84
49	SPTAN1	Spectrin alpha chain, non-erythrocytic 1	0.84

50	MCM6	DNA replication licensing factor MCM6	0.84
51	HSP90AB4P	Putative heat shock protein HSP 90-beta 4	0.84
52	PKM	Pyruvate kinase	0.84
53	STRBP	Spermatid perinuclear RNA-binding protein	0.84
54	ZCCHC2	Zinc finger CCHC domain-containing protein 2	0.84
55	NPEPPSL1	Puromycin-sensitive aminopeptidase-like protein	0.84
56	COPS3	COP9 signalosome complex subunit 3	0.84
57	RPS6	40S ribosomal protein S6	0.84
58	MTHFD1	C-1-tetrahydrofolate synthase, cytoplasmic	0.83
59	RPL23A	60S ribosomal protein L23a	0.83
60	MAP4	Microtubule-associated protein	0.83
61	GDI2	Rab GDP dissociation inhibitor beta	0.83
62	ILF3	Interleukin enhancer-binding factor 3	0.83
63	KHSRP	Far upstream element-binding protein 2	0.83
64	LARS	Leucine--tRNA ligase, cytoplasmic	0.83
65	SUMO3	Small ubiquitin-related modifier 3	0.83
66	PDIA6	Protein disulfide-isomerase A6	0.83
67	PLS3	Plastin-3	0.83
68	PDHB	Pyruvate dehydrogenase E1 component subunit beta, mitochondrial	0.83
69	GSPT1	Eukaryotic peptide chain release factor GTP-binding subunit ERF3A	0.83
70	TBCA	Tubulin-specific chaperone A	0.83
71	SF3A1	Splicing factor 3A subunit 1	0.82
72	PTRHD1	Putative peptidyl-tRNA hydrolase PTRHD1	0.82
73	FKBP4	Peptidyl-prolyl cis-trans isomerase FKBP4	0.82
74	HSP90AB1	Heat shock protein HSP 90-beta	0.82
75	POLR2C	DNA-directed RNA polymerase II subunit RPB3	0.82
76	U2AF2	Splicing factor U2AF 65 kDa subunit	0.82
77	MCM3	DNA replication licensing factor MCM3	0.82
78	SLC1A5	Neutral amino acid transporter B(0)	0.82
79	RPL10	60S ribosomal protein L10	0.82
80	DHX15	Pre-mRNA-splicing factor ATP-dependent RNA helicase DHX15	0.82
81	PRPS1L1	Ribose-phosphate pyrophosphokinase 3	0.82
82	RPSA	40S ribosomal protein SA	0.82
83	CAND1	Cullin-associated NEDD8-dissociated protein 1	0.82
84	DDX39A	ATP-dependent RNA helicase DDX39A	0.82
85	EEF1D	Elongation factor 1-delta	0.82
86	HYOU1	Hypoxia up-regulated protein 1	0.82
87	PKM	Pyruvate kinase PKM	0.82
88	RPL31	60S ribosomal protein L31	0.82
89	FAM98B	Protein FAM98B	0.82
90	KYAT3	Kynurenine--oxoglutarate transaminase 3	0.82
91	TARDBP	TAR DNA-binding protein 43	0.81
92	MYBBP1A	Myb-binding protein 1A	0.81
93	DPP3	Dipeptidyl peptidase 3	0.81
94	PKM	Pyruvate kinase	0.81
95	PYGL	Alpha-1,4 glucan phosphorylase	0.81
96	TRIM46	Tripartite motif-containing protein 46	0.81
97	YARS	Tyrosine--tRNA ligase, cytoplasmic	0.81
98	CSNK2A2	Casein kinase II subunit alpha'	0.81
99	HN1	Hematological and neurological-expressed 1 protein	0.81
100	SUPT16H	FACT complex subunit SPT16	0.81
101	CCDC124	Coiled-coil domain-containing protein 124	0.81
102	CLPP	ATP-dependent Clp protease proteolytic subunit	0.81
103	RPL12	60S ribosomal protein L12	0.81
104	FEN1	Flap endonuclease 1	0.81

105	HNRNPM	Heterogeneous nuclear ribonucleoprotein M	0.81
106	MYH10	Myosin-10	0.81
107	MAGOHB	Protein mago nashi homolog 2	0.81
108	EWSR1	RNA-binding protein EWS	0.81
109	OLA1	Obg-like ATPase 1	0.81
110	SND1	Staphylococcal nuclease domain-containing protein 1	0.81
111	CAP1	Adenylyl cyclase-associated protein 1	0.80
112	HIKESHI	Protein Hikeshi	0.80
113	PSMD4	26S proteasome non-ATPase regulatory subunit 4	0.80
114	TKT	Transketolase	0.80
115	CRKL	Crk-like protein	0.80
116	NAP1L4	Nucleosome assembly protein 1-like 4	0.80
117	SMARCA5	SWI/SNF-related matrix-associated actin-dependent regulator of chromatin subfamily	0.80
118	SF3B5	Splicing factor 3B subunit 5	0.80
119	NAP1L4	Nucleosome assembly protein 1-like 4	0.80
120	SF3B3	Splicing factor 3B subunit 3	0.80
121	EIF1	Eukaryotic translation initiation factor 1	0.80
122	ATP5B	ATP synthase subunit beta	0.80
123	CHMP5	Charged multivesicular body protein 5	0.80
124	SEPT2	Septin-2	0.80
125	DCTPP1	dCTP pyrophosphatase 1	0.80
126	TFG	Protein TFG	0.80
127	ALDOA	Fructose-bisphosphate aldolase A	0.80
128	FKBP10	Peptidylprolyl isomerase	0.80
129	LDHB	L-lactate dehydrogenase B chain	0.80
130	ATP5A1	ATP synthase subunit alpha, mitochondrial	0.80
131	SMARCE1	SWI/SNF-related matrix-associated actin-dependent regulator of chromatin subfamily	0.80
132	RPS27	40S ribosomal protein S27	0.80
133	SF3B1	Splicing factor 3B subunit 1	0.80
134	PPP4C	Serine/threonine-protein phosphatase	0.80
135	ACOT7	Cytosolic acyl coenzyme A thioester hydrolase	0.80
136	ATP5B	ATP synthase subunit beta, mitochondrial	0.80
137	MYBBP1A	Myb-binding protein 1A	0.80
138	SULT1B1	Sulfotransferase family cytosolic 1B member 1	0.80
139	COPE	Coatomer protein complex, subunit epsilon, isoform CRA_g	0.80
140	VIM	Vimentin	0.80
141	TMEM109	Transmembrane protein 109	0.79
142	ALDOA	Fructose-bisphosphate aldolase	0.79
143	PYGB	Glycogen phosphorylase, brain form	0.79
144	KRI1	Protein KRI1 homolog	0.79
145	EIF2S1	Eukaryotic translation initiation factor 2 subunit 1	0.79
146	HIST1H1E	Histone H1.4	0.79
147	CCT5	T-complex protein 1 subunit epsilon	0.79
148	FHL1	Four and a half LIM domains protein 1	0.79
149	MCM2	DNA helicase	0.79
150	ACPI	Low molecular weight phosphotyrosine protein phosphatase	0.79
151	TNPO3	Transportin-3	0.79
152	NME1-NME2	Nucleoside diphosphate kinase	0.79
153	NIFK	MKI67 FHA domain-interacting nucleolar phosphoprotein	0.79
154	FDPS	Farnesyl diphosphate synthase (Farnesyl pyrophosphate synthetase, dimethylallyltrans	0.79
155	MARS	Methionine--tRNA ligase, cytoplasmic	0.79
156	CLEC16A	Protein CLEC16A	0.79
157	HSD17B4	Peroxisomal multifunctional enzyme type 2	0.79
158	RAB1B	Ras-related protein Rab-1B	0.79
159	GMPS	GMP synthase [glutamine-hydrolyzing]	0.79

160	LDHA	L-lactate dehydrogenase A chain	0.79
161	HMG1	High mobility group protein HMG-I/HMG-Y	0.79
162	COL6A2	Collagen alpha-2(VI) chain	0.79
163	RPL8	60S ribosomal protein L8	0.79
164	DBR1	Lariat debranching enzyme	0.79
165	CSDE1	Cold shock domain-containing protein E1	0.79
166	EIF3J	Eukaryotic translation initiation factor 3 subunit J	0.79
167	FKBP5	Peptidyl-prolyl cis-trans isomerase FKBP5	0.79
168	STIP1	Stress-induced-phosphoprotein 1	0.79
169	ACOT7	Cytosolic acyl coenzyme A thioester hydrolase	0.79
170	ST13	Hsc70-interacting protein	0.79
171	NIFK	MKI67 FHA domain-interacting nucleolar phosphoprotein	0.78
172	HEXIM1	Protein HEXIM1	0.78
173	VDAC1	Voltage-dependent anion-selective channel protein 1	0.78
174	NME1	Nucleoside diphosphate kinase A	0.78
175	RPL6	60S ribosomal protein L6	0.78
176	DDX39B	Spliceosome RNA helicase DDX39B	0.78
177	EBNA1BP2	EBNA1 binding protein 2, isoform CRA_d	0.78
178	CBX3	Chromobox protein homolog 3	0.78
179	UBB	Polyubiquitin-B	0.78
180	ESPNL	Espin-like protein	0.78
181	AHCY	Adenosylhomocysteinase	0.78
182	NAA50	N-alpha-acetyltransferase 50	0.78
183	HSPE1-MOB4	HSPE1-MOB4 readthrough	0.78
184	RPL18	60S ribosomal protein L18	0.78
185	AKAP12	A-kinase anchor protein 12	0.78
186	PA2G4	Proliferation-associated protein 2G4	0.78
187	RPS18	40S ribosomal protein S18	0.78
188	MSH6	DNA mismatch repair protein Msh6	0.78
189	PCBP2	Poly(rC)-binding protein 2	0.78
190	PEBP1	Phosphatidylethanolamine-binding protein 1	0.78
191	DISC1	Disrupted in schizophrenia 1 isoform 49	0.78
192	ATP5B	ATP synthase subunit beta, mitochondrial	0.78
193	QARS	Glutamine--tRNA ligase	0.78
194	KARS	Lysine--tRNA ligase	0.78
195	DDX23	Probable ATP-dependent RNA helicase DDX23	0.78
196	MRPL3	39S ribosomal protein L3, mitochondrial	0.78
197	PSMB6	Proteasome subunit beta type-6	0.78
198	CANX	Calnexin	0.78
199	LANCL1	LanC-like protein 1	0.78
200	RAB1A	Ras-related protein Rab-1A	0.77
201	EEF1D	Elongation factor 1-delta	0.77
202	FKBP1A	Peptidylprolyl isomerase	0.77
203	PFN2	Profilin	0.77
204	PRMT3	Protein arginine N-methyltransferase 3	0.77
205	VDAC1	Voltage-dependent anion-selective channel protein 1	0.77
206	RPL22	60S ribosomal protein L22	0.77
207	RAB2A	Ras-related protein Rab-2A	0.77
208	RPS20	40S ribosomal protein S20	0.77
209	PABPC4	Polyadenylate-binding protein 4	0.77
210	GCN1	eIF-2-alpha kinase activator GCN1	0.77
211	HNRNPU	Heterogeneous nuclear ribonucleoprotein U	0.77
212	ATOX1	Copper transport protein ATOX1	0.77
213	MYL6	Myosin light polypeptide 6	0.77
214	PMPCB	Mitochondrial-processing peptidase subunit beta	0.77



215	RARS	Arginine--tRNA ligase, cytoplasmic	0.77
216	PSAT1	Phosphoserine aminotransferase	0.77
217	IDH1	Isocitrate dehydrogenase [NADP] cytoplasmic	0.77
218	COX17	Cytochrome c oxidase copper chaperone	0.77
219	DDX5	Probable ATP-dependent RNA helicase DDX5	0.77
220	NUCKS1	Nuclear ubiquitous casein and cyclin-dependent kinase substrate 1	0.77
221	RPL23	60S ribosomal protein L23	0.77
222	RDX	Radixin	0.77
223	FAHD2A	Fumarylacetoacetate hydrolase domain-containing protein 2A	0.77
224	TXNDC9	Thioredoxin domain containing 9, isoform CRA_a	0.77
225	SRM	Spermidine synthase	0.77
226	MDH1	Malate dehydrogenase, cytoplasmic	0.77
227	PRPF4	U4/U6 small nuclear ribonucleoprotein Prp4	0.77
228	PRDX2	Peroxiredoxin-2	0.77
229	HIST1H4A	Histone H4	0.77
230	PRDX1	Peroxiredoxin-1	0.76
231	DCTN2	Dynactin subunit 2	0.76
232	LAP3	Cytosol aminopeptidase	0.76
233	HARS2	Probable histidine--tRNA ligase, mitochondrial	0.76
234	ILF2	Interleukin enhancer-binding factor 2	0.76
235	UBE2O	(E3-independent) E2 ubiquitin-conjugating enzyme	0.76
236	AK2	Adenylate kinase 2, mitochondrial	0.76
237	ADSS	Adenylosuccinate synthetase isozyme 2	0.76
238	AIMP1	Aminoacyl tRNA synthase complex-interacting multifunctional protein 1	0.76
239	PRDX1	Peroxiredoxin-1	0.76
240	DFFA	DNA fragmentation factor subunit alpha	0.76
241	RPL8	60S ribosomal protein L8	0.76
242	NFYA	Nuclear transcription factor Y subunit alpha	0.76
243	RPL35	60S ribosomal protein L35	0.76
244	MAK16	Protein MAK16 homolog	0.76
245	ALDH16A1	Aldehyde dehydrogenase family 16 member A1	0.76
246	CAMSAP2	Calmodulin-regulated spectrin-associated protein 2	0.76
247	DCTN1	Dynactin subunit 1	0.76
248	CCT6A	T-complex protein 1 subunit zeta	0.76
249	TST	Thiosulfate sulfurtransferase	0.76
250	RRP12	RRP12-like protein	0.76
251	TUFM	Elongation factor Tu, mitochondrial	0.76
252	FLNB	Filamin-B	0.76
253	LASP1	LIM and SH3 domain protein 1	0.76
254	MATR3	Matrin-3	0.76
255	DCTN2	Dynactin subunit 2	0.76
256	TPM1	Tropomyosin 1 (Alpha), isoform CRA_f	0.76
257	RPS3	40S ribosomal protein S3	0.76
258	IARS	Isoleucine--tRNA ligase, cytoplasmic	0.75
259	ACYP1	Acylphosphatase	0.75
260	ELOB	Elongin-B	0.75
261	SMC1A	Structural maintenance of chromosomes protein 1A	0.75
262	EIF3D	Eukaryotic translation initiation factor 3 subunit D	0.75
263	DNMT1	DNA (cytosine-5)-methyltransferase 1	0.75
264	EXOSC2	Exosome complex component RRP4	0.75
265	PRDX2	Peroxiredoxin 2, isoform CRA_a	0.75
266	VPS35	Vacuolar protein sorting-associated protein 35	0.75
267	CSE1L	Exportin-2	0.75
268	MCM7	DNA replication licensing factor MCM7	0.75
269	HNRNPU	Heterogeneous nuclear ribonucleoprotein U	0.75

270	SRP14	Signal recognition particle 14 kDa protein	0.75
271	TUBA1B	Tubulin alpha-1B chain	0.75
272	SLIRP	SRA stem-loop-interacting RNA-binding protein, mitochondrial	0.75
273	SARS	Serine--tRNA ligase, cytoplasmic	0.75
274	RECQL5	ATP-dependent DNA helicase Q5	0.75
275	CDV3	Protein CDV3 homolog	0.75
276	WDR77	Methylosome protein 50	0.75
277	SRPRB	Signal recognition particle receptor subunit beta	0.75
278	EIF3G	Eukaryotic translation initiation factor 3 subunit G	0.75
279	TRAP1	Heat shock protein 75 kDa, mitochondrial	0.75
280	RPS27L	40S ribosomal protein S27	0.75
281	EIF4A3	Eukaryotic initiation factor 4A-III	0.75
282	MCM4	DNA replication licensing factor MCM4	0.75
283	RPL17	60S ribosomal protein L17	0.75
284	SF3B2	Splicing factor 3B subunit 2	0.75
285	CHMP4B	Charged multivesicular body protein 4b	0.75
286	MMP3	Stromelysin-1	0.75
287	CCT8	T-complex protein 1 subunit theta	0.75
288	PPP2R1A	Serine/threonine-protein phosphatase 2A 65 kDa regulatory subunit A alpha isoform	0.75
289	TBR1	T-box brain protein 1	0.75
290	ASNS	Asparagine synthetase [glutamine-hydrolyzing]	0.75
291	UCHL5	Ubiquitin carboxyl-terminal hydrolase	0.75
292	CYB5A	Cytochrome b5	0.75
293	SKP1	S-phase kinase-associated protein 1	0.75
294	BAG3	BAG family molecular chaperone regulator 3	0.75
295	CELF1	CUG triplet repeat, RNA binding protein 1, isoform CRA_c	0.75
296	PAF1	RNA polymerase II-associated factor 1 homolog	0.74
297	DPYSL5	Dihydropyrimidinase-related protein 5	0.74
298	CCT4	T-complex protein 1 subunit delta	0.74
299	ADSL	Adenylosuccinate lyase	0.74
300	API5	Apoptosis inhibitor 5	0.74
301	AIMP1	Aminoacyl tRNA synthase complex-interacting multifunctional protein 1	0.74
302	LARP1	La-related protein 1	0.74
303	MRPS26	28S ribosomal protein S26, mitochondrial	0.74
304	PSMD12	26S proteasome non-ATPase regulatory subunit 12	0.74
305	BOP1	Ribosome biogenesis protein BOP1	0.74
306	RAB14	Ras-related protein Rab-14	0.74
307	FUBP1	Far upstream element-binding protein 1	0.74
308	DDB1	DNA damage-binding protein 1	0.74
309	AP3B1	AP-3 complex subunit beta-1	0.74
310	PSMA4	Proteasome endopeptidase complex	0.74
311	AP1B1	AP-1 complex subunit beta-1	0.74
312	EXOSC2	Exosome complex component RRP4	0.74
313	ADAR	Double-stranded RNA-specific adenosine deaminase	0.74
314	MAPRE1	Microtubule-associated protein RP/EB family member 1	0.74
315	EIF3M	Eukaryotic translation initiation factor 3 subunit M	0.74
316	PRPF4B	Serine/threonine-protein kinase PRP4 homolog	0.74
317	PSMC5	26S protease regulatory subunit 8	0.74
318	RPS16	40S ribosomal protein S16	0.74
319	THUMPD1	THUMP domain-containing protein 1	0.74
320	ZRANB2	Zinc finger Ran-binding domain-containing protein 2	0.74
321	SNX2	Sorting nexin-2	0.74
322	ETF1	Eukaryotic peptide chain release factor subunit 1	0.74
323	EIF3M	Eukaryotic translation initiation factor 3 subunit M	0.74
324	BUB3	Mitotic checkpoint protein BUB3	0.74

325	RPL32	60S ribosomal protein L32	0.74
326	EPN1	Epsin-1	0.73
327	EZR	Ezrin	0.73
328	CORO1B	Coronin-1B	0.73
329	MOGS	Mannosyl-oligosaccharide glucosidase	0.73
330	ADSL	Adenylosuccinate lyase	0.73
331	IMPDH1	Inosine-5'-monophosphate dehydrogenase 1	0.73
332	PDCD6IP	Programmed cell death 6-interacting protein	0.73
333	STUB1	E3 ubiquitin-protein ligase CHIP	0.73
334	PMPCA	Mitochondrial-processing peptidase subunit alpha	0.73
335	DCXR	L-xylulose reductase	0.73
336	ANKRD17	Ankyrin repeat domain-containing protein 17	0.73
337	VARS	Valine--tRNA ligase	0.73
338	PCCA	Propionyl-CoA carboxylase alpha chain, mitochondrial	0.73
339	DUT	Deoxyuridine 5'-triphosphate nucleotidohydrolase, mitochondrial	0.73
340	EEF2	Elongation factor 2	0.73
341	PDLIM1	PDZ and LIM domain protein 1	0.73
342	CTNBL1	Beta-catenin-like protein 1	0.73
343	VBP1	Prefoldin subunit 3	0.73
344	PSMB2	Proteasome subunit beta type-2	0.73
345	MTHFD1L	Monofunctional C1-tetrahydrofolate synthase, mitochondrial	0.73
346	EPS15L1	Epidermal growth factor receptor substrate 15-like 1	0.73
347	SRCAP	Helicase SRCAP	0.73
348	RTN4	Reticulon	0.73
349	SMC1A	Structural maintenance of chromosomes protein	0.73
350	CHORDC1	Cysteine and histidine-rich domain-containing protein 1	0.73
351	ARL6IP4	ADP-ribosylation factor-like protein 6-interacting protein 4	0.73
352	RCN2	Reticulocalbin-2	0.73
353	EWSR1	RNA-binding protein EWS	0.73
354	UBTF	Nucleolar transcription factor 1	0.73
355	TRIM28	Transcription intermediary factor 1-beta	0.73
356	CTPS1	CTP synthase 1	0.73
357	VDAC2	Voltage-dependent anion-selective channel protein 2	0.73
358	PTMS	Parathymosin	0.73
359	GNPDA1	Glucosamine-6-phosphate isomerase	0.73
360	PLIN3	Perilipin-3	0.73
361	STAG2	Cohesin subunit SA-2	0.73
362	GEMIN5	Gem-associated protein 5	0.73
363	KTN1	Kinectin	0.73
364	TXNL1	Thioredoxin-like protein 1	0.73
365	SNRNP70	U1 small nuclear ribonucleoprotein 70 kDa	0.73
366	HIST1H2BN	Histone H2B	0.73
367	BOP1	Ribosome biogenesis protein BOP1	0.73
368	SSRP1	FACT complex subunit SSRP1	0.73
369	PPP1R7	Protein phosphatase 1 regulatory subunit 7	0.73
370	NAMPT	Nicotinamide phosphoribosyltransferase	0.73
371	RABGAP1	Rab GTPase-activating protein 1	0.72
372	RBM17	Splicing factor 45	0.72
373	PRPSAP2	Phosphoribosyl pyrophosphate synthase-associated protein 2	0.72
374	GAF3	FGF-2 activity-associated protein 3	0.72
375	S100A13	Protein S100-A13	0.72
376	EIF3I	Eukaryotic translation initiation factor 3 subunit I	0.72
377	EIF2S1	Eukaryotic translation initiation factor 2 subunit 1	0.72
378	AGL	Glycogen debranching enzyme	0.72
379	FLNA	Filamin-A	0.72

380	SPG20	Spartin	0.72
381	EEF1A1	Elongation factor 1-alpha 1	0.72
382	PPID	Peptidyl-prolyl cis-trans isomerase D	0.72
383	CNDP2	Cytosolic non-specific dipeptidase	0.72
384	ELAC2	ElaC homolog 2 (E. coli), isoform CRA_a	0.72
385	RPS10-NUDT3	RPS10-NUDT3 readthrough	0.72
386	STARD9	StAR-related lipid transfer protein 9	0.72
387	GINS3	DNA replication complex GINS protein PSF3	0.72
388	NAP1L1	Nucleosome assembly protein 1-like 1	0.72
389	OTUB1	Ubiquitin thioesterase	0.72
390	ACACA	Acetyl-CoA carboxylase 1	0.72
391	CHD4	Chromodomain-helicase-DNA-binding protein 4	0.72
392	ALPI	Intestinal-type alkaline phosphatase	0.72
393	PDCD5	Programmed cell death protein 5	0.72
394	AHCYL2	Adenosylhomocysteinase	0.72
395	PSMA6	Proteasome subunit alpha type	0.72
396	KIN	DNA/RNA-binding protein KIN17	0.72
397	BCLAF1	Bel-2-associated transcription factor 1	0.72
398	VPS26A	Vacuolar protein sorting-associated protein 26A	0.72
399	AP2B1	AP-2 complex subunit beta	0.72
400	CDK1	Cyclin-dependent kinase 1	0.72
401	PPIE	Peptidyl-prolyl cis-trans isomerase	0.72
402	TPM3	Tropomyosin alpha-3 chain	0.72
403	COX6B1	Cytochrome c oxidase subunit 6B1	0.71
404	MYL12A	Myosin regulatory light chain 12A	0.71
405	EIF3CL	Eukaryotic translation initiation factor 3 subunit C-like protein	0.71
406	HIST1H2BJ	Histone H2B type 1-J	0.71
407	MDN1	Midasin	0.71
408	DDX18	ATP-dependent RNA helicase DDX18	0.71
409	BAZ1B	Tyrosine-protein kinase BAZ1B	0.71
410	COPA	Coatomer subunit alpha	0.71
411	ARHGDI1	Rho GDP-dissociation inhibitor 1	0.71
412	GART	Trifunctional purine biosynthetic protein adenosine-3	0.71
413	DYNC1H1	Cytoplasmic dynein 1 heavy chain 1	0.71
414	GTF2F1	General transcription factor IIF subunit 1	0.71
415	ZBTB1	Zinc finger and BTB domain-containing protein 1	0.71
416	RPS29	40S ribosomal protein S29	0.71
417	PAPOLA	Poly(A) polymerase alpha	0.71
418	PRKAR2A	cAMP-dependent protein kinase type II-alpha regulatory subunit	0.71
419	EXOSC5	Exosome complex component RRP46	0.71
420	LRRFIP1	Leucine-rich repeat flightless-interacting protein 1	0.71
421	CARS	Cysteine--tRNA ligase, cytoplasmic	0.71
422	PSME1	Proteasome activator complex subunit 1	0.71
423	KPNA1	Importin subunit alpha-5	0.71
424	CCDC43	CCDC43 protein	0.71
425	PPT1	Palmitoyl-protein thioesterase 1	0.71
426	CDV3	Protein CDV3 homolog	0.71
427	MRPS22	28S ribosomal protein S22, mitochondrial	0.71
428	PPA2	Inorganic pyrophosphatase 2, mitochondrial	0.71
429	KCTD5	BTB/POZ domain-containing protein KCTD5	0.71
430	EIF4G1	Eukaryotic translation initiation factor 4 gamma 1	0.71
431	C7orf50	Uncharacterized protein C7orf50	0.71
432	GNPDA2	Glucosamine-6-phosphate isomerase 2	0.71
433	SNRNP200	U5 small nuclear ribonucleoprotein 200 kDa helicase	0.71
434	RBM17	Splicing factor 45	0.71

435	RACK1	Receptor of-activated protein C kinase 1	0.71
436	TBCB	Tubulin-folding cofactor B	0.71
437	CDKN2A	Cyclin-dependent kinase inhibitor 2A	0.71
438	TXNDC5	Thioredoxin domain-containing protein 5	0.71
439	ATXN10	Ataxin-10	0.71
440	C19orf25	UPF0449 protein C19orf25	0.71
441	DIABLO	Diablo homolog, mitochondrial	0.71
442	P4HA1	Prolyl 4-hydroxylase subunit alpha-1	0.71
443	VARS	Valine--tRNA ligase	0.71
444	EFTUD2	116 kDa U5 small nuclear ribonucleoprotein component	0.71
445	PPP2R5D	Serine/threonine-protein phosphatase 2A 56 kDa regulatory subunit delta isoform	0.71
446	FASTKD2	FAST kinase domain-containing protein 2, mitochondrial	0.71
447	CIAO1	Probable cytosolic iron-sulfur protein assembly protein CIAO1	0.71
448	COPS8	COP9 signalosome complex subunit 8	0.70
449	SETD3	Histone-lysine N-methyltransferase setd3	0.70
450	YTHDF1	YTH domain-containing family protein 1	0.70
451	ME2	NAD-dependent malic enzyme, mitochondrial	0.70
452	ACTR2	Actin-related protein 2	0.70
453	PSMD3	26S proteasome non-ATPase regulatory subunit 3	0.70
454	SYAP1	Synapse-associated protein 1	0.70
455	UPF1	Regulator of nonsense transcripts 1	0.70
456	TUBA4A	Tubulin alpha-4A chain	0.70
457	STAM2	Signal transducing adapter molecule 2	0.70
458	CUL4B	Cullin 4B, isoform CRA_e	0.70
459	EML5	Echinoderm microtubule-associated protein-like 5	0.70
460	ARPC4-TTLL3	ARPC4-TTLL3 readthrough	0.70
461	CYB5R3	NADH-cytochrome b5 reductase 3	0.70
462	LARP4	La-related protein 4	0.70
463	PRPF19	Pre-mRNA-processing factor 19	0.70
464	SH3KBP1	SH3 domain-containing kinase-binding protein 1	0.70
465	POLR2E	DNA-directed RNA polymerases I, II, and III subunit RPABC1	0.70
466	KPNA5	Importin subunit alpha-6	0.70
467	CAD	CAD protein	0.70
468	KCTD12	BTB/POZ domain-containing protein KCTD12	0.70
469	PHLPP1	PH domain leucine-rich repeat-containing protein phosphatase 1	0.70
470	RPS28	40S ribosomal protein S28	0.70
471	CLUH	Clustered mitochondria protein homolog	0.70
472	RANGAP1	Ran GTPase-activating protein 1	0.70
473	SF3A2	Splicing factor 3A subunit 2	0.70
474	TOMM34	Mitochondrial import receptor subunit TOM34	0.70
475	UBE2V1	Ubiquitin-conjugating enzyme E2 variant 1	0.70
476	EIF3C	Eukaryotic translation initiation factor 3 subunit C	0.70
477	ABCF2	ATP-binding cassette sub-family F member 2	0.70
478	EMD	Emerin	0.70
479	TACO1	Translational activator of cytochrome c oxidase 1	0.70
480	VTA1	Chromosome 6 open reading frame 55, isoform CRA_b	0.70
481	NOP14	Nucleolar protein 14	0.70
482	DDI2	Protein DDI1 homolog 2	0.70
483	KDELC2	KDEL motif-containing protein 2	0.70
484	POLR2G	DNA-directed RNA polymerase II subunit RPB7	0.70
485	RPL18	60S ribosomal protein L18	0.69
486	PHB	Prohibitin	0.69
487	HK2	Hexokinase-2	0.69
488	IPO8	Importin-8	0.69
489	NDUFS3	NADH dehydrogenase [ubiquinone] iron-sulfur protein 3, mitochondrial	0.69

490	KPNA1	Importin subunit alpha-5	0.69
491	GINS4	DNA replication complex GINS protein SLD5	0.69
492	ATP1A1	Sodium/potassium-transporting ATPase subunit alpha-1	0.69
493	RWDD1	RWD domain-containing protein 1	0.69
494	UBE2O	(E3-independent) E2 ubiquitin-conjugating enzyme	0.69
495	AIMP2	Aminoacyl tRNA synthase complex-interacting multifunctional protein 2	0.69
496	SNX5	Sorting nexin-5	0.69
497	DDX3X	ATP-dependent RNA helicase DDX3X	0.69
498	SRSF5	Serine/arginine-rich splicing factor 5	0.69
499	FSCN1	Fascin	0.69
500	CALD1	Caldesmon	0.69
501	RAC3	Ras-related C3 botulinum toxin substrate 3	0.69
502	RAB14	Ras-related protein Rab-14	0.69
503	SRSF4	Serine/arginine-rich-splicing factor 4	0.69
504	FAM50B	Protein FAM50B	0.69
505	TKFC	Triokinase/FMN cyclase	0.69
506	NAP1L1	Nucleosome assembly protein 1-like 1	0.69
507	HMGB2	High mobility group protein B2	0.69
508	PRPF4B	Serine/threonine-protein kinase PRP4 homolog	0.69
509	MYL12A	Myosin regulatory light chain 12A	0.69
510	PPAT	Amidophosphoribosyltransferase	0.69
511	RPS25	40S ribosomal protein S25	0.69
512	FKBP10	Peptidyl-prolyl cis-trans isomerase FKBP10	0.69
513	HSPA14	Heat shock 70 kDa protein 14	0.69
514	PLCB3	1-phosphatidylinositol 4,5-bisphosphate phosphodiesterase beta-3	0.69
515	POLR2L	DNA-directed RNA polymerases I, II, and III subunit RPABC5	0.69
516	MRPL47	39S ribosomal protein L47, mitochondrial	0.69
517	IMPDH1	Inosine-5'-monophosphate dehydrogenase 1	0.69
518	ARPC5	Actin-related protein 2/3 complex subunit 5	0.69
519	PAFAH1B1	Platelet-activating factor acetylhydrolase IB subunit alpha	0.69
520	DDX10	RNA helicase	0.69
521	RPL11	60S ribosomal protein L11	0.68
522	CFAP20	Cilia- and flagella-associated protein 20	0.68
523	AKR1A1	Alcohol dehydrogenase [NADP(+)]	0.68
524	CCAR2	Cell cycle and apoptosis regulator protein 2	0.68
525	HSPB11	Chromosome 1 open reading frame 41, isoform CRA_b	0.68
526	POP1	Ribonucleases P/MRP protein subunit POP1	0.68
527	MIB2	E3 ubiquitin-protein ligase MIB2	0.68
528	RAD23B	UV excision repair protein RAD23 homolog B	0.68
529	PDE12	2',5'-phosphodiesterase 12	0.68
530	NACA	Nascent polypeptide-associated complex subunit alpha	0.68
531	PSME2	Proteasome activator complex subunit 2	0.68
532	TRMT1L	TRMT1-like protein	0.68
533	ATP5O	ATP synthase subunit O, mitochondrial	0.68
534	RPS11	40S ribosomal protein S11	0.68
535	DHRS7	Dehydrogenase/reductase SDR family member 7	0.68
536	SLK	STE20-like serine/threonine-protein kinase	0.68
537	PNN	Pinin	0.68
538	MYLK	Myosin light chain kinase, smooth muscle	0.68
539	SUPT6H	Transcription elongation factor SPT6	0.68
540	TPM3	Tropomyosin alpha-3 chain	0.68
541	UBASH3B	Ubiquitin-associated and SH3 domain-containing protein B	0.68
542	SRI	Sorcin	0.68
543	COPS7B	COP9 signalosome complex subunit 7b	0.68
544	CALCOCO2	Calcium-binding and coiled-coil domain-containing protein 2	0.68

545	GORASP2	Golgi reassembly-stacking protein 2	0.68
546	CUTA	Protein CutA	0.68
547	TBL3	Transducin beta-like protein 3	0.68
548	RPRD1B	Regulation of nuclear pre-mRNA domain-containing protein 1B	0.68
549	SRPK1	SRSF protein kinase 1	0.68
550	ZNF428	Zinc finger protein 428	0.68
551	PSMA3	Proteasome subunit alpha type-3	0.68
552	VPS29	Vacuolar protein sorting-associated protein 29	0.68
553	TUBB3	Tubulin beta-3 chain	0.68
554	NOP16	Nucleolar protein 16	0.68
555	PSMB1	Proteasome subunit beta type-1	0.68
556	HECTD1	E3 ubiquitin-protein ligase HECTD1	0.68
557	FLYWCH1	FLYWCH-type zinc finger-containing protein 1	0.67
558	TAX1BP3	Tax1-binding protein 3	0.67
559	BAG2	BAG family molecular chaperone regulator 2	0.67
560	RAB10	Ras-related protein Rab-10	0.67
561	RAB8A	Ras-related protein Rab-8A	0.67
562	CISD1	CDGSH iron-sulfur domain-containing protein 1	0.67
563	AP1S1	AP-1 complex subunit sigma-1A	0.67
564	EIF2A	Eukaryotic translation initiation factor 2A	0.67
565	RPL13	60S ribosomal protein L13	0.67
566	GABARAPL2	Gamma-aminobutyric acid receptor-associated protein-like 2	0.67
567	IDH3B	Isocitrate dehydrogenase [NAD] subunit, mitochondrial	0.67
568	KCTD9	BTB/POZ domain-containing protein KCTD9	0.67
569	RAC2	Ras-related C3 botulinum toxin substrate 2	0.67
570	HNRNPM	Heterogeneous nuclear ribonucleoprotein M	0.67
571	MFAP1	Microfibrillar-associated protein 1	0.67
572	FBL	rRNA 2'-O-methyltransferase fibrillarin	0.67
573	RPS8	40S ribosomal protein S8	0.67
574	CTSB	Cathepsin B	0.67
575	HMGCS1	Hydroxymethylglutaryl-CoA synthase, cytoplasmic	0.67
576	ACTL6A	Actin-like protein 6A	0.67
577	CPXM2	Inactive carboxypeptidase-like protein X2	0.67
578	TCEA1	Transcription elongation factor A protein 1	0.67
579	NCAPD2	Condensin complex subunit 1	0.67
580	UNC45A	Protein unc-45 homolog A	0.67
581	RPL11	60S ribosomal protein L11	0.67
582	EEF1A2	Elongation factor 1-alpha 2	0.67
583	AASDHPPT	L-aminoadipate-semialdehyde dehydrogenase-phosphopantetheinyl transferase	0.67
584	PGAM5	Serine/threonine-protein phosphatase PGAM5, mitochondrial	0.67
585	TUBB	Tubulin beta chain	0.67
586	SON	Protein SON	0.67
587	C17orf49	Chromosome 17 open reading frame 49	0.66
588	EHD4	EH domain-containing protein 4	0.66
589	COPB2	Coatomer subunit beta'	0.66
590	PFDN6	Prefoldin subunit 6	0.66
591	RBM10	RNA binding motif protein 10, isoform CRA_d	0.66
592	ATP6V1B2	V-type proton ATPase subunit B, brain isoform	0.66
593	CUL1	Cullin-1	0.66
594	CHMP4A	Charged multivesicular body protein 4a	0.66
595	ATP6V1A	V-type proton ATPase catalytic subunit A	0.66
596	GLRX3	Glutaredoxin-3	0.66
597	EIF3E	Eukaryotic translation initiation factor 3 subunit E	0.66
598	TUBB2A	Tubulin beta-2A chain	0.66
599	HMGB2	High mobility group protein B2	0.66

600	ATP6V1B2	V-type proton ATPase subunit B, brain isoform	0.66
601	DYNC1I1	Cytoplasmic dynein 1 intermediate chain 1	0.66
602	EDC4	Enhancer of mRNA-decapping protein 4	0.66
603	LGALSL	Galectin-related protein	0.66
604	ANXA1	Annexin	0.66
605	USP5	Ubiquitin carboxyl-terminal hydrolase 5	0.66
606	FAHD2B	Fumarylacetoacetate hydrolase domain-containing protein 2B	0.66
607	RRM2	Ribonucleoside-diphosphate reductase subunit M2	0.66
608	DCUN1D5	DCN1-like protein 5	0.66
609	MAP1LC3B	Microtubule-associated protein 1 light chain 3 beta, isoform CRA_f	0.66
610	DPYSL5	Dihydropyrimidinase-related protein 5	0.66
611	ATP1B3	Sodium/potassium-transporting ATPase subunit beta-3	0.66
612	MARCKSL1	MARCKS-related protein	0.66
613	ZFR	Zinc finger RNA-binding protein	0.66
614	RUFY1	RUN and FYVE domain-containing protein 1	0.66
615	IPO4	Importin-4	0.66
616	DNPH1	2'-deoxynucleoside 5'-phosphate N-hydrolase 1	0.66
617	XPO5	Exportin-5	0.66
618	DNAJA2	DnaJ homolog subfamily A member 2	0.66
619	CUL5	Cullin-5	0.66
620	NAA10	N-alpha-acetyltransferase 10	0.66
621	GTF3C5	General transcription factor 3C polypeptide 5	0.66
622	TRMT112	Multifunctional methyltransferase subunit TRM112-like protein	0.66
623	RBMX	RNA-binding motif protein, X chromosome	0.66
624	TECR	Very-long-chain enoyl-CoA reductase	0.66
625	COPB1	Coatomer subunit beta	0.66
626	PSME3	Proteasome activator complex subunit 3	0.66
627	HMOX1	Heme oxygenase 1	0.66
628	DPYSL2	Dihydropyrimidinase-related protein 2	0.65
629	GTF2IRD2B	General transcription factor II-I repeat domain-containing protein 2B	0.65
630	KPNA2	Importin subunit alpha-1	0.65
631	MARCKS	Myristoylated alanine-rich C-kinase substrate	0.65
632	LAMTOR1	Ragulator complex protein LAMTOR1	0.65
633	DNAJC7	DnaJ homolog subfamily C member 7	0.65
634	AQP3	Aquaporin-3	0.65
635	ALDH1A2	Retinal dehydrogenase 2	0.65
636	HM13	Minor histocompatibility antigen H13	0.65
637	MBD3	Methyl-CpG-binding domain protein 3	0.65
638	YWHAH	14-3-3 protein eta	0.65
639	ARF3	ADP-ribosylation factor 3	0.65
640	PDS5A	Sister chromatid cohesion protein PDS5 homolog A	0.65
641	HDAC1	Histone deacetylase 1	0.65
642	SRP9	Signal recognition particle 9 kDa protein	0.65
643	ATP5H	ATP synthase subunit d, mitochondrial	0.65
644	RPL13A	60S ribosomal protein L13a	0.65
645	PAPOLA	Poly(A) polymerase alpha	0.65
646	ARPC2	Actin-related protein 2/3 complex subunit 2	0.65
647	BCLAF1	Bcl-2-associated transcription factor 1	0.65
648	AARS2	Alanine--tRNA ligase, mitochondrial	0.65
649	RAB7A	Ras-related protein Rab-7a	0.65
650	NAA10	N-alpha-acetyltransferase 10	0.65
651	DARS	Aspartate--tRNA ligase, cytoplasmic	0.65
652	TDP1	Tyrosyl-DNA phosphodiesterase 1	0.65
653	DYNC1LI1	Cytoplasmic dynein 1 light intermediate chain 1	0.65
654	ARIH1	E3 ubiquitin-protein ligase ARIH1	0.65



655	CLUH	Clustered mitochondria protein homolog	0.64
656	ACPI	Acid phosphatase 1, soluble, isoform CRA_d	0.64
657	SNX6	Sorting nexin	0.64
658	RPL36	60S ribosomal protein L36	0.64
659	UBAP2L	Ubiquitin-associated protein 2-like	0.64
660	ARF5	ADP-ribosylation factor 5	0.64
661	CDK5RAP3	CDK5 regulatory subunit-associated protein 3	0.64
662	PITPNB	Phosphatidylinositol transfer protein beta isoform	0.64
663	VAMP7	Vesicle-associated membrane protein 7	0.64
664	PRPF40A	Pre-mRNA-processing factor 40 homolog A	0.64
665	PUS7	Pseudouridylate synthase 7 homolog	0.64
666	CAP1	Adenylyl cyclase-associated protein 1	0.64
667	UBXN1	UBX domain-containing protein 1	0.64
668	SHTN1	Shootin-1	0.64
669	HDLBP	High density lipoprotein binding protein (Vigilin), isoform CRA_a	0.64
670	CDC73	Parafibromin	0.64
671	RPL38	60S ribosomal protein L38	0.64
672	DDA1	DET1- and DDB1-associated protein 1	0.64
673	THOC6	THO complex subunit 6 homolog	0.64
674	URM1	Ubiquitin-related modifier 1	0.64
675	QKI	Protein quaking	0.64
676	NPIPA2	Nuclear pore complex-interacting protein family member A2	0.64
677	TMOD3	Tropomodulin-3	0.64
678	LRRC47	Leucine-rich repeat-containing protein 47	0.64
679	OGDH	2-oxoglutarate dehydrogenase, mitochondrial	0.64
680	ALDH1B1	Aldehyde dehydrogenase X, mitochondrial	0.64
681	CCAR2	Cell cycle and apoptosis regulator protein 2	0.63
682	UGDH	UDP-glucose 6-dehydrogenase	0.63
683	PPA2	Inorganic pyrophosphatase 2, mitochondrial	0.63
684	SBDS	Ribosome maturation protein SBDS	0.63
685	DARS	Aspartate--tRNA ligase, cytoplasmic	0.63
686	HBS1L	HBS1-like protein	0.63
687	STAU1	Double-stranded RNA-binding protein Staufen homolog 1	0.63
688	ALDH7A1	Alpha-aminoacidic semialdehyde dehydrogenase	0.63
689	CDK2	Cyclin-dependent kinase 2	0.63
690	KIF11	Kinesin-like protein KIF11	0.63
691	WDR82	WD repeat-containing protein 82	0.63
692	MAT2B	Methionine adenosyltransferase 2 subunit beta	0.63
693	SART3	Squamous cell carcinoma antigen recognized by T-cells 3	0.63
694	MRI1	Methylthioribose-1-phosphate isomerase	0.63
695	RPL7	60S ribosomal protein L7	0.63
696	AKAP1	A-kinase anchor protein 1, mitochondrial	0.63
697	CNOT1	CCR4-NOT transcription complex subunit 1	0.63
698	TWF1	Twinfilin-1	0.63
699	PPP3CA	Serine/threonine-protein phosphatase	0.63
700	DAD1	Dolichyl-diphosphooligosaccharide--protein glycosyltransferase subunit DAD1	0.63
701	GPKOW	G patch domain and KOW motifs-containing protein	0.63
702	SCP2	Non-specific lipid-transfer protein	0.63
703	CUL3	Cullin-3	0.63
704	PACSN2	Protein kinase C and casein kinase substrate in neurons protein 2	0.63
705	COPS4	COP9 signalosome complex subunit 4	0.63
706	C15orf57	Uncharacterized protein C15orf57	0.63
707	PSMD8	26S proteasome non-ATPase regulatory subunit 8	0.63
708	SCLY	Selenocysteine lyase	0.63
709	PAFAH1B3	Platelet-activating factor acetylhydrolase IB subunit gamma	0.63

710	PSMD7	26S proteasome non-ATPase regulatory subunit 7	0.62
711	PPIH	Peptidyl-prolyl cis-trans isomerase	0.62
712	MYO15A	Unconventional myosin-XV	0.62
713	VAMP2	Vesicle-associated membrane protein 2	0.62
714	AP2A1	AP-2 complex subunit alpha-1	0.62
715	H2AFY2	Histone H2A	0.62
716	ESYT1	Extended synaptotagmin-1	0.62
717	PHPT1	14 kDa phosphohistidine phosphatase	0.62
718	DRG2	Developmentally-regulated GTP-binding protein 2	0.62
719	NRDC	Nardilysin	0.62
720	AGBL4	Cytosolic carboxypeptidase 6	0.62
721	PES1	Pescadillo homolog	0.62
722	HAGH	Hydroxyacylglutathione hydrolase, mitochondrial	0.62
723	PFDN2	Prefoldin subunit 2	0.62
724	RAB6B	Ras-related protein Rab-6B	0.62
725	POLR2A	DNA-directed RNA polymerase subunit	0.62
726	COPG1	Coatomer subunit gamma-1	0.62
727	MTA1	Metastasis-associated protein MTA1	0.62
728	ZNF513	Zinc finger protein 513	0.62
729	MAT2B	Methionine adenosyltransferase 2 subunit beta	0.62
730	RPP30	Ribonuclease P protein subunit p30	0.62
731	UFC1	Ubiquitin-fold modifier-conjugating enzyme 1	0.62
732	SMARCE1	SWI/SNF-related matrix-associated actin-dependent regulator of chromatin subfamily	0.62
733	CDK4	Cyclin-dependent kinase 4	0.62
734	POLR1C	DNA-directed RNA polymerases I and III subunit RPAC1	0.62
735	PGM2	Phosphoglucomutase-2	0.61
736	HDAC2	Histone deacetylase 2	0.61
737	TPM2	Tropomyosin beta chain	0.61
738	SEC24C	Protein transport protein Sec24C	0.61
739	DCAF7	DDB1- and CUL4-associated factor 7	0.61
740	HUWE1	E3 ubiquitin-protein ligase HUWE1	0.61
741	UBE2T	Ubiquitin-conjugating enzyme E2 T	0.61
742	PRRC2C	Protein PRRC2C	0.61
743	ZNF345	Zinc finger protein 345	0.61
744	MRPS28	28S ribosomal protein S28, mitochondrial	0.61
745	DARS2	Aspartate--tRNA ligase, mitochondrial	0.61
746	TOP2A	DNA topoisomerase 2-alpha	0.61
747	EPB41L3	Band 4.1-like protein 3	0.61
748	EIF3K	Eukaryotic translation initiation factor 3 subunit K	0.61
749	BSG	Basigin	0.61
750	SRP54	Signal recognition particle 54 kDa protein	0.61
751	UBA52	Ubiquitin-60S ribosomal protein L40	0.61
752	NUP205	Nuclear pore complex protein Nup205	0.61
753	MYD88	Myeloid differentiation primary response protein MyD88	0.61
754	ENAH	Protein enabled homolog	0.61
755	COX7A2	Cytochrome c oxidase subunit 7A2, mitochondrial	0.61
756	CALM2	Calmodulin	0.61
757	UQCRC2	Cytochrome b-c1 complex subunit 2, mitochondrial	0.61
758	MRPS23	28S ribosomal protein S23, mitochondrial	0.61
759	IQGAP1	Ras GTPase-activating-like protein IQGAP1	0.61
760	SDF4	45 kDa calcium-binding protein	0.61
761	KPNA4	Importin subunit alpha-3	0.61
762	TRA2B	Transformer-2 protein homolog beta	0.61
763	CPOX	Oxygen-dependent coproporphyrinogen-III oxidase, mitochondrial	0.61
764	PMM2	Phosphomannomutase	0.61

765	CFDP1	Craniofacial development protein 1	0.61
766	PCK2	Phosphoenolpyruvate carboxykinase [GTP], mitochondrial	0.61
767	IPO8	Importin-8	0.61
768	LOC105372343	Uncharacterized protein	0.61
769	PHB2	Prohibitin-2	0.61
770	DDX54	ATP-dependent RNA helicase DDX54	0.61
771	MRPL13	39S ribosomal protein L13, mitochondrial	0.61
772	TTN	Titin	0.61
773	SH3BGRL3	SH3 domain-binding glutamic acid-rich-like protein 3	0.61
774	MOCS2	Molybdopterin synthase sulfur carrier subunit	0.61
775	POLR2J3	DNA-directed RNA polymerase II subunit RPB11-b2	0.61
776	WNK1	Serine/threonine-protein kinase WNK1	0.60
777	PABPC1	Polyadenylate-binding protein 1	0.60
778	RPUSD3	RNA pseudouridylate synthase domain-containing protein 3	0.60
779	IFT27	Intraflagellar transport protein 27 homolog	0.60
780	UGDH	UDP-glucose 6-dehydrogenase	0.60
781	RAB11B	Ras-related protein Rab-11B	0.60
782	RRM2	Ribonucleoside-diphosphate reductase subunit M2	0.60
783	RAP1GDS1	Rap1 GTPase-GDP dissociation stimulator 1	0.60
784	SH3D19	SH3 domain-containing protein 19	0.60
785	SNRNP40	Small Nuclear Ribonucleoprotein U5 Subunit 40	0.60
786	PAF1	RNA polymerase II-associated factor 1 homolog	0.60
787	RBBP5	Retinoblastoma-binding protein 5	0.60
788	ZCCHC11	Terminal uridylyltransferase 4	0.60
789	SMC2	Structural maintenance of chromosomes protein 2	0.60
790	SLC16A5	Monocarboxylate transporter 6	0.60
791	RRM1	Ribonucleoside-diphosphate reductase large subunit	0.60
792	STAT1	Signal transducer and activator of transcription	0.60
793	TCOF1	Treacle protein	0.60
794	DOCK2	Dedicator of cytokinesis protein 2	0.60
795	CDR2L	Cerebellar degeneration-related protein 2-like	0.60
796	SMU1	WD40 repeat-containing protein SMU1	0.59
797	RAE1	mRNA export factor	0.59
798	STAT1	Signal transducer and activator of transcription 1-alpha/beta	0.59
799	TBCD	Tubulin-specific chaperone D	0.59
800	TSR1	Pre-rRNA-processing protein TSR1 homolog	0.59
801	KDM7A	Lysine-specific demethylase 7A	0.59
802	ATP5J2-PTCD1	ATP5J2-PTCD1 readthrough	0.59
803	TWF1	Twinfilin-1	0.59
804	KIF2A	Kinesin-like protein KIF2A	0.59
805	OSBP	Oxysterol-binding protein 1	0.59
806	GULP1	PTB domain-containing engulfment adapter protein 1	0.59
807	EFHD1	EF-hand domain-containing protein D1	0.59
808	GINS2	DNA replication complex GINS protein PSF2	0.59
809	GNPDA1	Glucosamine-6-phosphate isomerase 1	0.59
810	RPRD1A	Regulation of nuclear pre-mRNA domain-containing protein 1A	0.59
811	HBS1L	HBS1-like protein	0.59
812	PSMD11	26S proteasome non-ATPase regulatory subunit 11	0.59
813	RAB11A	Ras-related protein Rab-11A	0.59
814	COX5B	Cytochrome c oxidase subunit 5B, mitochondrial	0.59
815	NOC4L	Nucleolar complex protein 4 homolog	0.59
816	DRAP1	Dr1-associated corepressor	0.59
817	PPP1R12A	Protein phosphatase 1 regulatory subunit 12A	0.59
818	FASN	Fatty acid synthase	0.59
819	RPS16	40S ribosomal protein S16	0.58

820	SND1	Staphylococcal nuclease domain-containing protein 1	0.58
821	GLA	Alpha-galactosidase A	0.58
822	CDC27	Cell division cycle protein 27 homolog	0.58
823	RPAP3	RNA polymerase II-associated protein 3	0.58
824	SLC25A44	Solute carrier family 25 member 44	0.58
825	RPL26	60S ribosomal protein L26	0.58
826	MSTO1	Protein misato homolog 1	0.58
827	PAAF1	Proteasomal ATPase-associated factor 1	0.58
828	MCCC2	Methylcrotonoyl-CoA carboxylase beta chain, mitochondrial	0.58
829	WDR70	WD repeat-containing protein 70	0.58
830	CKAP5	Cytoskeleton-associated protein 5	0.58
831	TUBB3	HCG1983504, isoform CRA_d	0.58
832	TRMT1	tRNA (guanine(26)-N(2))-dimethyltransferase	0.58
833	NUDC	Nuclear migration protein nudC	0.58
834	TRIT1	tRNA dimethylallyltransferase, mitochondrial	0.58
835	PELP1	Proline-, glutamic acid- and leucine-rich protein 1	0.58
836	FANCI	Fanconi anemia group I protein	0.58
837	NDUFA5	NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 5	0.58
838	DHX16	Putative pre-mRNA-splicing factor ATP-dependent RNA helicase DHX16	0.58
839	CKAP5	Cytoskeleton-associated protein 5	0.58
840	SAR1A	GTP-binding protein SAR1a	0.58
841	WDHD1	WD repeat and HMG-box DNA-binding protein 1	0.58
842	KPNA6	Importin subunit alpha-7	0.58
843	UBFD1	Ubiquitin domain-containing protein UBFD1	0.58
844	RRBP1	Ribosome-binding protein 1	0.58
845	MAPRE2	Microtubule-associated protein RP/EB family member 2	0.58
846	TP53RK	TP53-regulating kinase	0.58
847	SNCA	Alpha-synuclein	0.58
848	PELO	Protein pelota homolog	0.58
849	MICALL1	MICAL-like protein 1	0.58
850	DTYMK	Thymidylate kinase	0.58
851	UBE2Z	Ubiquitin-conjugating enzyme E2 Z	0.58
852	ATXN2	Ataxin-2	0.57
853	NOL9	Polynucleotide 5'-hydroxyl-kinase NOL9	0.57
854	TBCE	Tubulin-specific chaperone E	0.57
855	ATG3	Ubiquitin-like-conjugating enzyme ATG3	0.57
856	ATXN2L	Ataxin-2-like protein	0.57
857	LSM7	U6 snRNA-associated Sm-like protein LSM7	0.57
858	NIP7	60S ribosome subunit biogenesis protein NIP7 homolog	0.57
859	PITPNA	Phosphatidylinositol transfer protein alpha isoform	0.57
860	THOC3	THO complex subunit 3	0.57
861	IMMT	MICOS complex subunit MIC60	0.57
862	RPS13	40S ribosomal protein S13	0.57
863	PFDN5	Prefoldin subunit 5	0.57
864	PDZRN4	PDZ domain-containing RING finger protein 4	0.57
865	ELP3	Elongator complex protein 3	0.56
866	RAD18	E3 ubiquitin-protein ligase RAD18	0.56
867	ABCD3	ATP-binding cassette sub-family D member 3	0.56
868	LAS1L	Ribosomal biogenesis protein LAS1L	0.56
869	UTP14A	U3 small nucleolar RNA-associated protein 14 homolog A	0.56
870	SPEN	Msx2-interacting protein	0.56
871	FAM184B	Protein FAM184B	0.56
872	CMPK1	UMP-CMP kinase	0.56
873	PRKAR2A	cAMP-dependent protein kinase type II-alpha regulatory subunit	0.56
874	BCAP31	B-cell receptor-associated protein 31	0.56

875	FXN	Frataxin, mitochondrial	0.56
876	CACNG6	Voltage-dependent calcium channel gamma-6 subunit	0.56
877	COLGALT1	Procollagen galactosyltransferase 1	0.56
878	MED29	Intersex-like (Drosophila)	0.56
879	ZNF503	Zinc finger protein 503	0.56
880	PYCR2	Pyrroline-5-carboxylate reductase 2	0.56
881	TPM4	Tropomyosin alpha-4 chain	0.56
882	FAM98A	Protein FAM98A	0.56
883	SHCBP1L	Testicular spindle-associated protein SHCBP1L	0.56
884	BCAT1	Branched-chain-amino-acid aminotransferase, cytosolic	0.56
885	PIN4	Peptidyl-prolyl cis-trans isomerase NIMA-interacting 4	0.56
886	TXLNA	Alpha-taxilin	0.55
887	DSP	Desmoplakin	0.55
888	CFAP36	Cilia- and flagella-associated protein 36	0.55
889	NUMA1	Nuclear mitotic apparatus protein 1	0.55
890	NOB1	RNA-binding protein NOB1	0.55
891	VPS4A	Vacuolar protein sorting-associated protein 4A	0.55
892	GRIPAP1	GRIP1-associated protein 1	0.55
893	ATP6V1G1	V-type proton ATPase subunit G 1	0.55
894	NUDT15	Nucleotide triphosphate diphosphatase NUDT15	0.55
895	EEF1E1	Eukaryotic translation elongation factor 1 epsilon-1	0.55
896	TSEN34	tRNA-splicing endonuclease subunit Sen34	0.55
897	NCKAP1	Nck-associated protein 1	0.55
898	ACO1	Cytoplasmic aconitate hydratase	0.55
899	CUL2	Cullin-2	0.55
900	RGPD8	RANBP2-like and GRIP domain-containing protein 8	0.55
901	UBAP2L	Ubiquitin-associated protein 2-like	0.55
902	DDX56	DEAD (Asp-Glu-Ala-Asp) box polypeptide 56, isoform CRA_a	0.55
903	WDR19	WD repeat-containing protein 19	0.55
904	MRPS5	28S ribosomal protein S5, mitochondrial	0.55
905	PGRMC1	Membrane-associated progesterone receptor component 1	0.55
906	IPO11	Importin-11	0.55
907	CNBP	Cellular nucleic acid-binding protein	0.55
908	ATP6V1C1	V-type proton ATPase subunit C 1	0.54
909	LYPLA2	Acyl-protein thioesterase 2	0.54
910	TACC3	Transforming acidic coiled-coil-containing protein 3	0.54
911	KYAT3	Kynurenine--oxoglutarate transaminase 3	0.54
912	DHX57	Putative ATP-dependent RNA helicase DHX57	0.54
913	ANKRD1	Ankyrin repeat domain-containing protein 1	0.54
914	PFDN5	Prefoldin subunit 5	0.54
915	HAS1	Hyaluronan synthase 1	0.54
916	ENAH	Protein enabled homolog	0.54
917	NOLC1	Nucleolar and coiled-body phosphoprotein 1	0.54
918	HRAS	GTPase HRas	0.54
919	PRPF38B	Pre-mRNA-splicing factor 38B	0.54
920	DSTN	Destrin	0.54
921	APEH	Acylamino-acid-releasing enzyme	0.54
922	ASH2L	Set1/Ash2 histone methyltransferase complex subunit ASH2	0.54
923	GTF2F1	General transcription factor IIF subunit 1	0.54
924	TRIM28	Transcription intermediary factor 1-beta	0.54
925	HIBADH	3-hydroxyisobutyrate dehydrogenase, mitochondrial	0.54
926	COASY	Bifunctional coenzyme A synthase	0.54
927	PGP	Glycerol-3-phosphate phosphatase	0.54
928	EED	Polycomb protein EED	0.54
929	MRPL43	39S ribosomal protein L43, mitochondrial	0.54

930	LIMA1	LIM domain and actin-binding protein 1	0.54
931	GNB2	Guanine nucleotide-binding protein G(I)/G(S)/G(T) subunit beta-2	0.53
932	RPL21	60S ribosomal protein L21	0.53
933	PRPF6	Pre-mRNA-processing factor 6	0.53
934	CCM2L	Cerebral cavernous malformations 2 protein-like	0.53
935	CHMP2B	Charged multivesicular body protein 2b	0.53
936	HES1	Transcription factor HES-1	0.53
937	SNX1	Sorting nexin-1	0.53
938	SNX3	Sorting nexin-3	0.53
939	MESDC2	LDLR chaperone MESD	0.53
940	AP2A2	AP-2 complex subunit alpha-2	0.53
941	CPSF7	Cleavage and polyadenylation-specificity factor subunit 7	0.53
942	GEMIN4	Gem-associated protein 4	0.53
943	UBR5	E3 ubiquitin-protein ligase UBR5	0.53
944	ANXA2	Annexin A2	0.53
945	NIPSNAP1	Protein NipSnap homolog 1	0.53
946	KIF1BP	KIF1-binding protein	0.53
947	POLR1A	DNA-directed RNA polymerase subunit	0.53
948	MYO18A	Unconventional myosin-XVIIIa	0.53
949	LAGE3	EKC/KEOPS complex subunit LAGE3	0.53
950	AP1M1	AP-1 complex subunit mu-1	0.52
951	MCM4	DNA replication licensing factor MCM4	0.52
952	ARL1	ADP-ribosylation factor-like protein 1	0.52
953	SH3KBP1	SH3 domain-containing kinase-binding protein 1	0.52
954	TYMS	Thymidylate synthase	0.52
955	LASP1	LIM and SH3 domain protein 1	0.52
956	PLOD2	Procollagen-lysine,2-oxoglutarate 5-dioxygenase 2	0.52
957	AMPD2	AMP deaminase 2	0.52
958	ABCF1	ATP-binding cassette sub-family F member 1	0.52
959	NXN	Nucleoredoxin	0.52
960	GPATCH4	G patch domain-containing protein 4	0.52
961	MRPL58	Peptidyl-tRNA hydrolase ICT1, mitochondrial	0.52
962	AKAP6	A-kinase anchor protein 6	0.52
963	COIL	Coilin	0.52
964	CORO7-PAM16	Coronin	0.52
965	TXN2	Thioredoxin, mitochondrial	0.52
966	COPZ1	Coatomer subunit zeta-1	0.52
967	TTC19	Tetratricopeptide repeat protein 19, mitochondrial	0.52
968	GIPC1	PDZ domain-containing protein GIPC1	0.52
969	NUP133	Nuclear pore complex protein Nup133	0.52
970	EMC2	ER membrane protein complex subunit 2	0.52
971	EIF3H	Eukaryotic translation initiation factor 3 subunit H	0.51
972	MAP2K1	Dual specificity mitogen-activated protein kinase kinase 1	0.51
973	CIAPIN1	Anamorsin	0.51
974	PARD3B	Partitioning defective 3 homolog B	0.51
975	ARGLU1	Arginine and glutamate-rich protein 1	0.51
976	DUS1L	tRNA-dihydrouridine(16/17) synthase [NAD(P)(+)]-like	0.51
977	NUP98	Nuclear pore complex protein Nup98-Nup96	0.51
978	IFT172	Intraflagellar transport protein 172 homolog	0.51
979	TCAF1	TRPM8 channel-associated factor 1	0.51
980	TRIP12	E3 ubiquitin-protein ligase TRIP12	0.51
981	SRPK2	SRSF protein kinase 2	0.51
982	TMED9	Transmembrane emp24 domain-containing protein 9	0.51
983	SUMO1	Small ubiquitin-related modifier 1	0.51
984	PSMG1	Proteasome assembly chaperone 1	0.51

985	ANAPC7	Anaphase-promoting complex subunit 7	0.51
986	RALA	Ras-related protein Ral-A	0.51
987	MRPL1	39S ribosomal protein L1, mitochondrial	0.50
988	TSPYL1	Testis-specific Y-encoded-like protein 1	0.50
989	SCRIB	Protein scribble homolog	0.50
990	CSTB	Cystatin-B	0.50
991	CDC123	Cell division cycle protein 123 homolog	0.50
992	TOP2B	DNA topoisomerase 2	0.50
993	RRP15	RRP15-like protein	0.50
994	PPP3CB	Serine/threonine-protein phosphatase	0.50
995	KLHL33	Kelch-like protein 33	0.50
996	MRPS11	28S ribosomal protein S11, mitochondrial	0.49
997	RPL34	60S ribosomal protein L34	0.49
998	MRPL45	39S ribosomal protein L45, mitochondrial	0.49
999	ANKS3	Ankyrin repeat and SAM domain-containing protein 3	0.49
1000	CBWD1	COBW domain-containing protein 1	0.49
1001	ATXN2L	Ataxin-2-like protein	0.49
1002	RABGGTA	Geranylgeranyl transferase type-2 subunit alpha	0.49
1003	EEF1E1	Eukaryotic translation elongation factor 1 epsilon-1	0.49
1004	SETD7	Histone-lysine N-methyltransferase	0.49
1005	ZNF593	Zinc finger protein 593	0.49
1006	TPT1	Translationally-controlled tumor protein	0.49
1007	POR	NADPH--cytochrome P450 reductase	0.49
1008	RFC1	Replication factor C subunit 1	0.49
1009	ARL8A	ADP-ribosylation factor-like protein 8A	0.49
1010	GBF1	Golgi-specific brefeldin A-resistance guanine nucleotide exchange factor 1	0.49
1011	EIF2AK2	Interferon-induced, double-stranded RNA-activated protein kinase	0.48
1012	MCCC2	Methylcrotonoyl-CoA carboxylase 2 isoform 1	0.48
1013	DIAPH1	Protein diaphanous homolog 1	0.48
1014	GTF3C4	General transcription factor 3C polypeptide 4	0.48
1015	TOX3	TOX high mobility group box family member 3	0.48
1016	RPL22L1	60S ribosomal protein L22-like 1	0.48
1017	NAA16	N-alpha-acetyltransferase 16, NatA auxiliary subunit	0.48
1018	NAPA	Alpha-soluble NSF attachment protein	0.47
1019	CYB5B	Cytochrome b5 type B	0.47
1020	PRKACA	cAMP-dependent protein kinase catalytic subunit alpha	0.47
1021	ACKR2	Atypical chemokine receptor 2	0.47
1022	EPB41L2	Band 4.1-like protein 2	0.47
1023	SAAL1	Protein SAAL1	0.47
1024	TRAPPC3	Trafficking protein particle complex subunit 3	0.47
1025	PYROXD2	Pyridine nucleotide-disulfide oxidoreductase domain-containing protein 2	0.47
1026	ISYNA1	Inositol-3-phosphate synthase 1	0.47
1027	NUCB2	Nucleobindin 2, isoform CRA_b	0.47
1028	SF3B6	Splicing factor 3B subunit 6	0.46
1029	PRKACB	cAMP-dependent protein kinase catalytic subunit beta	0.46
1030	CPE	Carboxypeptidase E	0.46
1031	RPS26P11	Putative 40S ribosomal protein S26-like 1	0.46
1032	TBC1D15	TBC1 domain family member 15	0.46
1033	TELO2	Telomere length regulation protein TEL2 homolog	0.46
1034	NME7	Nucleoside diphosphate kinase 7	0.46
1035	BAG6	BCL2 Associated Athanogene 6	0.46
1036	NGDN	Neuroguidin	0.46
1037	RANBP10	Ran-binding protein 10	0.46
1038	MYO5A	Unconventional myosin-Va	0.46
1039	PCNT	Pericentrin	0.46

1040	GPD2	Glycerol-3-phosphate dehydrogenase, mitochondrial	0.46
1041	CKAP4	Cytoskeleton-associated protein 4	0.46
1042	NECAP1	Adaptin ear-binding coat-associated protein 1	0.45
1043	UBC	Polyubiquitin-C	0.45
1044	ASS1	Argininosuccinate synthase	0.45
1045	TTC1	Tetratricopeptide repeat protein 1	0.45
1046	DHCR24	Delta(24)-sterol reductase	0.45
1047	CTNND1	Catenin delta-1	0.45
1048	BZW2	Basic leucine zipper and W2 domain-containing protein 2	0.45
1049	TRIM33	E3 ubiquitin-protein ligase TRIM33	0.45
1050	AKT1S1	Proline-rich AKT1 substrate 1	0.45
1051	UQCRFS1	Cytochrome b-c1 complex subunit Rieske, mitochondrial	0.45
1052	EPB41L3	Band 4.1-like protein 3	0.44
1053	LXN	Latexin	0.44
1054	IMPDH1	Inosine-5'-monophosphate dehydrogenase	0.44
1055	DPCD	Protein DPCD	0.44
1056	DLAT	Dihydrolipoyllysine-residue acetyltransferase component of pyruvate dehydrogenase c	0.44
1057	NDUFA9	NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 9, mitochondrial	0.44
1058	RAB18	Ras-related protein Rab-18	0.44
1059	C18orf25	Uncharacterized protein C18orf25	0.44
1060	ARFIP1	Arfaptin-1	0.44
1061	PLK1	Serine/threonine-protein kinase PLK1	0.44
1062	RPS6KA3	Ribosomal protein S6 kinase alpha-3	0.43
1063	RPF2	Ribosome production factor 2 homolog	0.43
1064	RIF1	Telomere-associated protein RIF1	0.43
1065	ECHDC1	Ethylmalonyl-CoA decarboxylase	0.43
1066	HSPBP1	Hsp70-binding protein 1	0.43
1067	ADPRHL2	Poly(ADP-ribose) glycohydrolase ARH3	0.43
1068	CHD3	Chromodomain-helicase-DNA-binding protein 3	0.42
1069	KIFC3	Kinesin-like protein KIFC3	0.42
1070	UBE2C	Ubiquitin-conjugating enzyme E2	0.42
1071	TUBG1	Tubulin gamma-1 chain	0.42
1072	NFATC4	Nuclear factor of activated T-cells, cytoplasmic 4	0.42
1073	ARHGAP1	Rho GTPase-activating protein 1	0.42
1074	PRPF3	U4/U6 small nuclear ribonucleoprotein Prp3	0.42
1075	FAH	Fumarylacetoacetase	0.42
1076	QKI	Protein quaking	0.42
1077	ARPC3	Actin-related protein 2/3 complex subunit 3	0.41
1078	NMD3	60S ribosomal export protein NMD3	0.41
1079	FADD	FAS-associated death domain protein	0.41
1080	DYNLL1	Dynein light chain 1, cytoplasmic	0.41
1081	NCF2	Neutrophil cytosol factor 2	0.41
1082	CRK	Adapter molecule crk	0.41
1083	NIF3L1	NIF3-like protein 1	0.41
1084	EFHD2	EF-hand domain-containing protein D2	0.40
1085	FAM117B	Protein FAM117B	0.40
1086	MCMBP	Mini-chromosome maintenance complex-binding protein	0.40
1087	MRPL11	39S ribosomal protein L11, mitochondrial	0.40
1088	STRC	Stereocilin	0.39
1089	STAT3	Signal transducer and activator of transcription	0.39
1090	SLC39A11	Zinc transporter ZIP11	0.39
1091	CCDC12	Coiled-coil domain containing 12, isoform CRA_a	0.39
1092	AGPS	Alkylglycerone-phosphate synthase	0.39
1093	MID1	E3 ubiquitin-protein ligase Midline-1	0.39
1094	TEX33	Testis-expressed protein 33	0.39



1095	MBIP	MAP3K12-binding inhibitory protein 1	0.38
1096	PRX	Periaxin	0.38
1097	UQCRC1	Cytochrome b-c1 complex subunit 1, mitochondrial	0.38
1098	MAGEB4	Melanoma-associated antigen B4	0.38
1099	LBR	Lamin-B receptor	0.38
1100	AACS	Acetoacetyl-CoA synthetase	0.38
1101	CDK7	Cyclin-dependent kinase 7	0.38
1102	DDX56	Probable ATP-dependent RNA helicase DDX56	0.38
1103	PTDSS1	Phosphatidylserine synthase 1	0.38
1104	FAM186A	Protein FAM186A	0.38
1105	GNAO1	Guanine nucleotide-binding protein G(o) subunit alpha	0.38
1106	USP19	Ubiquitin carboxyl-terminal hydrolase 19	0.37
1107	ZNF346	Zinc finger protein 346	0.37
1108	TRPT1	tRNA 2'-phosphotransferase 1	0.37
1109	NVL	Nuclear valosin-containing protein-like	0.37
1110	PRKAR1A	cAMP-dependent protein kinase type I-alpha regulatory subunit	0.36
1111	PLAA	Phospholipase A-2-activating protein	0.36
1112	SIRT5	NAD-dependent protein deacylase sirtuin-5, mitochondrial	0.36
1113	PDXDC1	Pyridoxal-dependent decarboxylase domain-containing protein 1	0.36
1114	TRNT1	CCA tRNA nucleotidyltransferase 1, mitochondrial	0.36
1115	MAP7	Enscosin	0.35
1116	HGH1	Protein HGH1 homolog	0.35
1117	MRFAP1	MORF4 family-associated protein 1	0.35
1118	PRR3	Proline-rich protein 3	0.35
1119	RNF181	E3 ubiquitin-protein ligase RNF181	0.34
1120	POLR2B	DNA-directed RNA polymerase subunit beta	0.34
1121	MAGOH	Protein mago nashi homolog	0.34
1122	EIF1AD	Probable RNA-binding protein EIF1AD	0.34
1123	UPF3B	Regulator of nonsense transcripts 3B	0.34
1124	POLR2I	DNA-directed RNA polymerase II subunit RPB9	0.34
1125	FAU	40S ribosomal protein S30	0.33
1126	TXNL1	Thioredoxin-like protein 1	0.33
1127	RPN2	Dolichyl-diphosphooligosaccharide--protein glycosyltransferase subunit 2	0.33
1128	PACS1	Phosphofurin acidic cluster sorting protein 1	0.33
1129	TIMM8B	Mitochondrial import inner membrane translocase subunit Tim8 B	0.32
1130	NAGK	N-acetyl-D-glucosamine kinase	0.32
1131	RANGRF	Ran guanine nucleotide release factor	0.32
1132	SUCLG2	Succinate--CoA ligase [GDP-forming] subunit beta, mitochondrial	0.31
1133	HELLS	Helicase, lymphoid-specific, isoform CRA_d	0.31
1134	MEA1	Male-enhanced antigen 1	0.31
1135	SNAP23	Synaptosomal-associated protein	0.30
1136	ATP5J	ATP synthase-coupling factor 6, mitochondrial	0.30
1137	TAB1	TGF-beta-activated kinase 1 and MAP3K7-binding protein 1	0.29
1138	OGT	UDP-N-acetylglucosamine--peptide N-acetylglucosaminyltransferase 110 kDa subunit	0.29
1139	RAD23A	UV excision repair protein RAD23 homolog A	0.29
1140	C2	Complement C2	0.28
1141	MAPK7	Mitogen-activated protein kinase 7	0.28
1142	GYG1	Glycogenin 1, isoform CRA_e	0.28
1143	CENPC	Centromere protein C	0.28
1144	MKLN1	Muskelin	0.28
1145	NCAPG2	Condensin-2 complex subunit G2	0.27
1146	LIG3	DNA ligase 3	0.27
1147	SNX17	Sorting nexin-17	0.27
1148	PPP6R3	Serine/threonine-protein phosphatase 6 regulatory subunit 3	0.27
1149	PPIC	Peptidyl-prolyl cis-trans isomerase C	0.25

1150	HEXB	Beta-hexosaminidase subunit beta	0.25
1151	GADD45GIP1	Growth arrest and DNA damage-inducible proteins-interacting protein 1	0.25
1152	VSTM2A	V-set and transmembrane domain-containing protein 2A	0.25
1153	BIRC5	Baculoviral IAP repeat-containing protein 5	0.24
1154	RPS19	40S ribosomal protein S19	0.24
1155	MRPS21	28S ribosomal protein S21, mitochondrial	0.24
1156	TRIM21	E3 ubiquitin-protein ligase TRIM21	0.24
1157	ASCC2	Activating signal cointegrator 1 complex subunit 2	0.23
1158	AHCYL1	Adenosylhomocysteinase 2	0.22
1159	STK4	Serine/threonine-protein kinase 4	0.22
1160	TOM1	Target of Myb protein 1	0.22
1161	LUZP1	Leucine zipper protein 1	0.22
1162	FAM208A	Protein TASOR	0.22
1163	MORF4L2	Mortality factor 4-like protein 2	0.21
1164	TRMT5	tRNA (guanine(37)-N1)-methyltransferase	0.21
1165	KIAA0556	Protein KIAA0556	0.21
1166	BUD31	Protein BUD31 homolog	0.21
1167	HEXB	Beta-hexosaminidase subunit beta	0.19
1168	RPL29	60S ribosomal protein L29	0.19
1169	CROCC	Rootletin	0.18
1170	LIPE	Hormone-sensitive lipase	0.17
1171	SAV1	Protein salvador homolog 1	0.16
1172	MRPL27	39S ribosomal protein L27, mitochondrial	0.16
1173	FAM162A	Protein FAM162A	0.15
1174	SNW1	SNW domain-containing protein 1	0.15
1175	TAF3	Transcription initiation factor TFIID subunit 3	0.13
1176	TAF1L	Transcription initiation factor TFIID subunit 1-like	0.12
1177	IRGQ	Immunity-related GTPase family Q protein	0.11
1178	PDDC1	Parkinson disease 7 domain-containing protein 1	0.10
1179	FBXW8	F-box/WD repeat-containing protein 8	0.10
1180	NRBP1	Nuclear receptor-binding protein	0.10
1181	CHRD1	Chordin-like protein 1	0.09
1182	GLTSCR2	Glioma tumor suppressor candidate region gene 2 protein	0.07
1183	ANXA1	Annexin A1	0.06
1184	OR4A15	Olfactory receptor 4A15	0.05
1185	IFT81	Intraflagellar transport protein 81 homolog	0.03

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**Table S3. Proteins of the cytoplasmic extract containing MG-H1 residues and increased by HEK293 cells treatment with methylglyoxal**

No	Gene	Name of protein	Fold change
1	MEGF11	Multiple epidermal growth factor-like domains protein 11	14.0
2	TSTA3	GDP-L-fucose synthase	5.7
3	NLRP2	NACHT, LRR and PYD domains-containing protein 2	4.1
4	TRIM52	Tripartite motif-containing protein 52	3.6
5	CHMP2A	Charged multivesicular body protein 2a	3.5
6	GPR119	Glucose-dependent insulinotropic receptor	3.4
7	KRT9	Keratin, type I cytoskeletal 9	3.3
8	ABHD12B	Alpha/Beta Hydrolase Domain-Containing Protein 12B	3.2
9	CACNA1H	Voltage-dependent T-type calcium channel subunit alpha-1H	3.2
10	SV2B	Synaptic vesicle glycoprotein 2B	3.2
11	THRA	Thyroid hormone receptor alpha	2.7
12	KIAA0355	Uncharacterized protein KIAA0355	2.6
13	FAAP20	Fanconi anemia core complex-associated protein 20	2.6
14	REXO2	Oligoribonuclease, mitochondrial	2.4
15	CIITA	MHC class II transactivator	2.4
16	MZT2A	Mitotic-spindle organizing protein 2A	2.3
17	PTPRN2	Receptor-type tyrosine-protein phosphatase N2	2.1
18	SLC25A37	Mitoferrin-1	2.1
19	TUBGCP6	Gamma-tubulin complex component 6	2.0
20	CLN5	Ceroid-lipofuscinosis neuronal protein 5	2.0
21	MACF1	Microtubule-actin cross-linking factor 1, isoforms 1/2/3/5	2.0
22	COL27A1	Collagen alpha-1(XXVII) chain	2.0
23	PLCB1	Phosphoinositide phospholipase C	1.9
24	C19orf68	Uncharacterized protein C19orf68	1.9
25	SEMA4B	Semaphorin-4B	1.8
26	CABIN1	Calcineurin-binding protein cabin-1	1.8
27	SLC6A9	Fanconi Anemia Core Complex Associated Protein 20	1.7
28	MYEF2	Myelin expression factor 2	1.7
29	MUC20	Mucin-20	1.6
30	SAMD11	Sterile alpha motif domain-containing protein 11	1.6
31	CEP250	Centrosome-associated protein CEP250	1.6
32	WDR33	pre-mRNA 3' end processing protein WDR33	1.6
33	PPP4R1L	Putative serine/threonine-protein phosphatase 4 regulatory subunit 1-like	1.5
34	SNTG2	Gamma-2-syntrophin	1.5
35	DAP3	28S ribosomal protein S29, mitochondrial	1.5
36	WNK3	Serine/threonine-protein kinase WNK3	1.4
37	EDC3	Enhancer of mRNA-decapping protein 3	1.4
38	FAM27E3	Family With Sequence Similarity 27 Member E3	1.3
39	SMG6	Telomerase-binding protein EST1A	1.3
40	POM121C	Nuclear envelope pore membrane protein POM 121C	1.2
41	NASP	Nuclear autoantigenic sperm protein	1.2

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**Table S4. Proteins of the cytoplasmic extract containing MG-H1 residues and decreased by HEK293 cells treatment with methylglyoxal**

No	Gene	Name of protein	Fold change
1	HNRNPK	Heterogeneous nuclear ribonucleoprotein K	0.91
2	FUS	RNA-binding protein FUS	0.86
3	ZCCHC2	Zinc finger CCHC domain-containing protein 2	0.84
4	DHX15	Pre-mRNA-splicing factor ATP-dependent RNA helicase	0.82
5	TRIM46	Tripartite motif-containing protein 46	0.81
6	CSNK2A2	Casein kinase II subunit alpha'	0.81
7	HNRNPM	Heterogeneous nuclear ribonucleoprotein M	0.81
8	EWSR1	RNA-binding protein EWS	0.81
9	KRI1	Protein KRI1 homolog	0.79
10	LDHA	L-lactate dehydrogenase A chain	0.79
11	ESPNL	Espin-like protein	0.78
12	MSH6	DNA mismatch repair protein Msh6	0.78
13	ILF2	Interleukin enhancer-binding factor 2	0.76
14	PRDX1	Peroxiredoxin-1	0.76
15	MAK16	Protein MAK16 homolog OS	0.76
16	HNRNPU	Heterogeneous nuclear ribonucleoprotein U	0.75
17	RECQL5	ATP-dependent DNA helicase	0.75
18	EEF2	Elongation factor 2	0.73
19	HIST1H2BN	Histone H2B	0.73
20	BAZ1B	Tyrosine-protein kinase BAZ1B	0.71
21	ATXN10	Ataxin-10	0.71
22	PHLPP1	PH domain leucine-rich repeat-containing protein phosphatase 1	0.70
23	SUPT6H	Transcription elongation factor SPT6	0.68
24	KCTD9	BTB/POZ domain-containing protein KCTD9	0.67
25	CPXM2	Inactive carboxypeptidase-like protein X2	0.67
26	USP5	Ubiquitin carboxyl-terminal hydrolase 5	0.66
27	ZFR	Zinc finger RNA-binding protein	0.66
28	NPIPA2	Nuclear pore complex-interacting protein family member A2	0.64
29	MYO15A	Unconventional myosin-XV	0.62
30	AGBL4	Cytosolic carboxypeptidase 6	0.62
31	HAGH	Hydroxyacylglutathione hydrolase, mitochondrial	0.62
32	ZNF513	Zinc finger protein 513	0.62
33	ZNF345	Zinc finger protein 345	0.61
34	SRP54	Signal recognition particle 54 kDa protein	0.61
35	UBA52	Ubiquitin-60S ribosomal protein L40	0.61
36	MYD88	Myeloid differentiation primary response protein MyD88	0.61
37	LOC105372343	Uncharacterized protein	0.61
38	RPUSD3	RNA pseudouridylate synthase domain-containing protein 3	0.60
39	DOCK2	Dedicator of cytokinesis protein 2	0.60
40	TRIT1	tRNA dimethylallyltransferase, mitochondrial	0.58
41	SPEN	Msx2-interacting protein	0.56
42	DSP	Desmoplakin	0.55
43	ANKRD1	Ankyrin repeat domain-containing protein 1	0.54
44	POLR1A	DNA-directed RNA polymerase subunit	0.53
45	MYO18A	Unconventional myosin-XVIIIa	0.53

46	AKAP6	A-kinase anchor protein 6	0.52
47	PARD3B	Partitioning defective 3 homolog B	0.51
48	IFT172	Intraflagellar transport protein 172 homolog	0.51
49	TOP2B	DNA topoisomerase 2	0.50
50	KLHL33	Kelch-like protein 33	0.50
51	ANKS3	Ankyrin repeat and SAM domain-containing protein 3	0.49
52	ACKR2	Atypical chemokine receptor 2	0.47
53	CPE	Carboxypeptidase E	0.46
54	GPD2	Glycerol-3-phosphate dehydrogenase, mitochondrial	0.46
55	CHD3	Chromodomain-helicase-DNA-binding protein 3	0.42
56	SLC39A11	Zinc transporter ZIP11	0.39
57	TEX33	Testis-expressed protein 33	0.39
58	MBIP	MAP3K12-binding inhibitory protein 1	0.38
59	PRX	Periaxin	0.38
60	MAP7	Ensconsin	0.35
61	VSTM2A	V-set and transmembrane domain-containing protein 2A	0.25
62	MRPS21	28S ribosomal protein S21, mitochondrial	0.24
63	TRIM21	E3 ubiquitin-protein ligase TRIM21	0.24
64	KIAA0556	Protein KIAA0556	0.21
65	CROCC	Rootletin	0.18
66	LIPE	Hormone-sensitive lipase	0.17
67	TAF3	Transcription initiation factor TFIID subunit 3	0.13
68	FBXW8	F-box/WD repeat-containing protein 8	0.10
69	OR4A15	Olfactory receptor 4A15	0.05

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**Table S5. Proteins in the nuclear extract increased in abundance by treatment with methylglyoxal.**

No	Gene	Name of protein	Fold change
1	MLXIPL	Carbohydrate-responsive element-binding protein	262.6
2	ATXN7L1	Ataxin-7-like protein 1	216.1
3	PPBP	Platelet basic protein	48.3
4	IGHG2	Immunoglobulin heavy constant gamma 2	23.8
5	TAC1	Protachykinin-1	20.6
6	L1TD1	LINE-1 type transposase domain-containing protein 1	19.5
7	RBM10	RNA binding motif protein 10, isoform CRA_d	19.1
8	KNG1	Kininogen-1	17.3
9	ACAA2	3-ketoacyl-CoA thiolase, mitochondrial	14.7
10	IGHA2	Ig alpha-2 chain C region	14.5
11	HPX	HPX protein	13.9
12	HRG	Histidine-rich glycoprotein	11.3
13	PF4	Platelet factor 4	10.9
14	APOA1	Apolipoprotein A-I	9.6
15	IGHG1	Ig gamma-1 chain C region	9.2
16	TF	Transferrin	8.5
17	IGHG3	Immunoglobulin heavy constant gamma 3	7.8
18	DPH1	Diphthamide biosynthesis protein 1	6.7
19	A2M	Alpha-2-macroglobulin	6.3
20	PRRC1	Protein PRRC1 (Proline-rich and coiled-coil-containing protein 1)	6.2
21	ALB	Albumin	6.2
22	EIF4EBP1	Eukaryotic translation initiation factor 4E-binding protein 1	5.4
23	MRPL28	39S ribosomal protein L28, mitochondrial	4.7
24	NCF2	Neutrophil cytosol factor 2	4.0
25	AHSA1	Activator of 90 kDa heat shock protein ATPase homolog 1	3.0
26	WDR66	WD repeat-containing protein 66	2.9
27	CNPY3	Protein canopy homolog 3	2.8
28	CHTOP	Chromatin target of PRMT1 protein	2.7
29	SUCLG2	Succinate--CoA ligase [GDP-forming] subunit beta, mitochondrial	2.3
30	RWDD1	RWD domain-containing protein 1	2.2
31	SCAMP3	Secretory carrier-associated membrane protein 3	2.2
32	CCDC158	Coiled-coil domain-containing protein 158	2.1
33	ECHS1	Enoyl-CoA hydratase, mitochondrial	2.0
34	SLC9A3R1	Na(+)/H(+) exchange regulatory cofactor NHE-RF1	1.9
35	POTEE	POTE ankyrin domain family member E	1.8
36	NENF	Neudesin	1.6
37	PDIA3	Protein disulfide-isomerase A3	1.6
38	ACTB	Actin, cytoplasmic 1	1.6
39	ACTBL2	Beta-actin-like protein 2	1.6
40	IDE	Insulin-degrading enzyme	1.5
41	CAPZA1	F-actin-capping protein subunit alpha-1	1.5
42	ACTC1	Actin, alpha cardiac muscle 1	1.5
43	PTPN1	Tyrosine-protein phosphatase non-receptor type	1.5
44	HSPA8	Heat shock cognate 71 kDa protein	1.4
45	PSAP	Prosaposin	1.3

46	MMP25	Matrix metalloproteinase-25	1.3
47	COX17	Cytochrome c oxidase copper chaperone	1.2
48	GAA	Lysosomal alpha-glucosidase	1.2

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**Table S6. Proteins in the nuclear extract decreased in abundance by treatment with methylglyoxal.**

No	Gene	Name of protein	Fold change
1	XRCC5	X-ray repair cross-complementing protein 5	0.78
2	PYCR2	Pyrroline-5-carboxylate reductase	0.77
3	MAGOHB	Protein mago nashi homolog 2	0.72
4	CPSF1	Cleavage and polyadenylation specificity factor subunit 1	0.71
5	HNRNPUL1	Heterogeneous nuclear ribonucleoprotein U-like protein 1	0.67
6	CIRBP	Cold-inducible RNA-binding protein	0.67
7	4SV	Uncharacterized protein	0.67
8	SNRPA1	U2 small nuclear ribonucleoprotein A'	0.66
9	RPS5	40S ribosomal protein S5	0.64
10	PCBP2	Poly(rC)-binding protein 2	0.63
11	FAM136A	Family With Sequence Similarity 136 Member A	0.61
12	RPL36A	60S ribosomal protein L36a	0.60
13	ZFR	Zinc finger RNA-binding protein	0.60
14	PHC2	Polyhomeotic-like protein 2	0.59
15	NIP7	60S ribosome subunit biogenesis protein NIP7 homolog	0.58
16	TEX15	Testis-expressed protein 15	0.57
17	FAM50A	Protein FAM50A	0.56
18	GLO1	Glyoxalase 1	0.56
19	SNRPD1	Small nuclear ribonucleoprotein Sm D1	0.56
20	PTBP1	Polypyrimidine tract-binding protein 1	0.55
21	PYCR1	Pyrroline-5-carboxylate reductase 1, mitochondrial	0.50
22	PRMT1	Protein arginine N-methyltransferase 1	0.50
23	ODF3L2	Outer dense fiber protein 3-like protein 2	0.50
24	ARHGAP4	Rho GTPase-activating protein 4	0.49
25	RPL28	60S ribosomal protein L28 OS	0.49
26	MAZ	Myc-associated zinc finger protein	0.47
27	SUB1	Activated RNA polymerase II transcriptional coactivator p15	0.47
28	FSHR	Follicle-stimulating hormone receptor	0.47
29	PUS1	tRNA pseudouridine synthase	0.46
30	DKC1	H/ACA ribonucleoprotein complex subunit 4	0.44
31	NAT10	RNA cytidine acetyltransferase	0.43
32	CHD8	Chromodomain-helicase-DNA-binding protein 8	0.43
33	SF3B4	Splicing factor 3B subunit 4	0.42
34	HADH	Hydroxyacyl-coenzyme A dehydrogenase, mitochondrial	0.42
35	STK38L	Serine/threonine-protein kinase 38-like	0.42
36	MAP4	Microtubule-associated protein	0.41
37	BCKDHB	2-oxoisovalerate dehydrogenase subunit beta, mitochondrial	0.40
38	CETN2	Centrin-2	0.39
39	PRRC2B	Protein PRRC2B (Proline-rich coiled-coil protein 2B)	0.38
40	NIF3L1BP1	Ngg1 interacting factor 3 like 1 binding protein 1, isoform CRA_b	0.37
41	CBR4	Carbonyl reductase family member 4	0.36
42	C19orf53	Leydig cell tumor 10 kDa protein homolog	0.36
43	LYST	Lysosomal-trafficking regulator	0.34
44	LMNTD2	Lamin tail domain-containing protein 2	0.31
45	TERF2IP	Telomeric repeat-binding factor 2-interacting protein 1	0.30



46	ATPIF1	ATPase inhibitor, mitochondrial	0.29
47	RPS27L	40S ribosomal protein S27	0.26
48	HMGGA2	High mobility group protein HMGI-C	0.20
49	THOC5	THO complex subunit 5 homolog	0.20
50	ITPRIPL2	Inositol 1,4,5-trisphosphate receptor-interacting protein-like 2	0.19
51	LSM7	U6 snRNA-associated Sm-like protein LSm7	0.18
52	AASS	Alpha-aminoadipic semialdehyde synthase, mitochondrial	0.17
53	GTF2E2	Transcription initiation factor IIE subunit beta	0.17
54	GYS1	Glycogen [starch] synthase, muscle	0.16
55	GCDH	Glutaryl-CoA dehydrogenase, mitochondrial	0.13
56	ABHD14A	Alpha/beta hydrolase domain-containing protein 14A	0.09
57	PSMD7	26S proteasome non-ATPase regulatory subunit 7	0.08
58	RBM3	RNA-binding protein 3	0.02

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**Studies of glyoxalase 1-linked multidrug resistance reveal glycolysis-derived reactive metabolite, methylglyoxal, is a common contributor in cancer chemotherapy targeting the spliceosome.**

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**Table S7. Proteins in the mitochondrial matrix and intermembrane space extract increased in abundance by treatment with methylglyoxal.**

No	Gene	Name of protein	Fold change
1	CRYAB	crystallin alpha B	49.3
2	TERF2	telomeric repeat binding factor 2	27.3
3	ALDH3A1	aldehyde dehydrogenase 3 family member A1	20.6
4	KRT5	keratin 5	18.4
5	SLC26A10	solute carrier family 26 member 10	10.7
6	SAFB2	scaffold attachment factor B2	8
7	MTSS1	MTSS1, I-BAR domain containing	6.8
8	IRAK4	interleukin 1 receptor associated kinase 4	6.6
9	CALML5	calmodulin like 5	4.1
10	CASP14	caspase 14	3
11	MYL6	myosin light chain 6	2
12	RPL21	ribosomal protein L21	1.9
13	RPL3	ribosomal protein L3	1.7
14	RNPS1	RNA binding protein with serine rich domain 1	1.7
15	RPL3	ribosomal protein L3	1.6
16	SOD1	superoxide dismutase 1, soluble	1.4

**Studies of glyoxalase 1-linked multidrug resistance reveal glycolysis-derived reactive metabolite, methylglyoxal, is a common contributor in cancer chemotherapy targeting the spliceosome.**

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**Table S8. Proteins in the mitochondrial matrix and intermembrane space extract decreased in abundance by treatment with methylglyoxal.**

No	Gene	Name of protein	Fold change
1	NAP1L4	Nucleosome assembly protein 1-like 4 OS	0.79
2	PTPN11	Tyrosine-protein phosphatase non-receptor type 11 OS	0.75
3	METAP2	Methionine aminopeptidase 2 OS	0.74
4	RANBP1	Ran-specific GTPase-activating protein OS	0.74
5	NUMA1	Nuclear mitotic apparatus protein 1 OS	0.73
6	NAP1L1	Nucleosome assembly protein 1-like 1 (Fragment) OS	0.72
7	ANP32B	Acidic leucine-rich nuclear phosphoprotein 32 family member B OS	0.71
8	NAP1L1	Nucleosome assembly protein 1-like 1 OS	0.71
9	WDR12	Ribosome biogenesis protein WDR12 OS	0.71
10	MAD2L1	Mitotic spindle assembly checkpoint protein MAD2A OS	0.70
11	UCHL3	Ubiquitin carboxyl-terminal hydrolase OS	0.69
12	GIGYF2	PERQ amino acid-rich with GYF domain-containing protein 2 OS	0.68
13	NAPA	Alpha-soluble NSF attachment protein OS	0.67
14	EIF5A	Eukaryotic translation initiation factor 5A (Fragment) OS	0.67
15	CCT8	T-complex protein 1 subunit theta OS	0.67
16	RNASEH2A	Ribonuclease H2 subunit A OS	0.67
17	API5	Apoptosis inhibitor 5 OS	0.66
18	NAE1	NEDD8-activating enzyme E1 regulatory subunit OS	0.66
19	NELFE	Negative elongation factor E OS	0.65
20	TRMT6	tRNA (adenine(58)-N(1))-methyltransferase non-catalytic subunit TRM6 OS	0.65
21	PLS3	Plastin-3 OS	0.65
22	PAFAH1B3	Platelet-activating factor acetylhydrolase IB subunit gamma (Fragment) OS	0.62
23	NMD3	60S ribosomal export protein NMD3 OS	0.62
24	OSBP	Oxysterol-binding protein 1 OS	0.61
25	ACP1	Low molecular weight phosphotyrosine protein phosphatase OS	0.61
26	ARHGDI1	Rho GDP-dissociation inhibitor 1 (Fragment) OS	0.60
27	UBTF	Nucleolar transcription factor 1 OS	0.60
28	EIF2B2	Translation initiation factor eIF-2B subunit beta OS	0.59
29	SRPK2	SRSF protein kinase 2 OS	0.59
30	KHSRP	Far upstream element-binding protein 2 OS	0.59
31	JMJD6	Bifunctional arginine demethylase and lysyl-hydroxylase JMJD6 OS	0.59
32	APOA1	Apolipoprotein A-I OS	0.59
33	SMARCC1	SWI/SNF complex subunit SMARCC1 OS	0.58
34	C14orf166	UPF0568 protein C14orf166 OS	0.58
35	ECM29	Proteasome-associated protein ECM29 homolog OS	0.57
36	GSTM3	Glutathione S-transferase OS	0.57
37	TROVE2	60 kDa SS-A/Ro ribonucleoprotein (Fragment) OS	0.57
38	CLUH	Clustered mitochondria protein homolog (Fragment) OS	0.56
39	KLC1	Kinesin light chain 1 OS	0.56
40	CCDC124	Coiled-coil domain-containing protein 124 OS	0.55
41	CCDC43	CCDC43 protein OS	0.55
42	VIM	Vimentin OS	0.55
43	TCERG1	Transcription elongation regulator 1 OS	0.54
44	VTA1	Chromosome 6 open reading frame 55, isoform CRA_b OS	0.54
45	APIP	Methylthioribulose-1-phosphate dehydratase OS	0.54

46	ZC3H15	Zinc finger CCCH domain-containing protein 15 OS	0.54
47	DNAJC2	DnaJ homolog subfamily C member 2 OS	0.54
48	STAT1	Signal transducer and activator of transcription OS	0.54
49	PRPF31	U4/U6 small nuclear ribonucleoprotein Prp31 OS	0.54
50	CLUH	Clustered mitochondria protein homolog OS	0.54
51	ARMT1	Protein-glutamate O-methyltransferase OS	0.53
52	CNDP2	Cytosolic non-specific dipeptidase OS	0.53
53	EDC4	Enhancer of mRNA-decapping protein 4 OS	0.52
54	SURF2	Surfeit locus protein 2 OS	0.52
55	SNX5	Sorting nexin-5 OS	0.51
56	IFT88	Intraflagellar transport protein 88 homolog (Fragment) OS	0.51
57	TFG	Protein TFG (Fragment) OS	0.51
58	GLOD4	Glyoxalase domain-containing protein 4 OS	0.50
59	ATXN7L3B	Putative ataxin-7-like protein 3B OS	0.49
60	EAPP	E2F-associated phosphoprotein OS	0.48
61	PKN2	Serine/threonine-protein kinase N2 OS	0.48
62	CTTN	Src substrate cortactin OS	0.47
63	GTPBP1	GTP-binding protein 1 OS	0.47
64	PPIA	Peptidyl-prolyl cis-trans isomerase A	0.47
65	CBSL	Cystathionine beta-synthase-like protein OS	0.46
66	RABGGTB	Geranylgeranyl transferase type-2 subunit beta OS	0.46
67	UBE2G1	Ubiquitin-conjugating enzyme E2 G1 OS	0.46
68	TST	Thiosulfate sulfurtransferase OS	0.45
69	ADI1	1,2-dihydroxy-3-keto-5-methylthiopentene dioxygenase OS	0.45
70	NUP133	Nuclear pore complex protein Nup133 OS	0.44
71	HSD17B4	Peroxisomal multifunctional enzyme type 2 OS	0.44
72	DDX55	RNA helicase OS	0.44
73	HSPB11	Chromosome 1 open reading frame 41, isoform CRA_b OS	0.43
74	GINS1	DNA replication complex GINS protein PSF1 OS	0.43
75	RIOK1	Serine/threonine-protein kinase RIO1 OS	0.42
76	DSP	Desmoplakin OS	0.42
77	PREP	Prolyl endopeptidase OS	0.42
78	ARL6IP4	ADP-ribosylation factor-like protein 6-interacting protein 4 OS	0.42
79	CDC123	Cell division cycle protein 123 homolog OS	0.42
80	GRB2	Growth factor receptor-bound protein 2 OS	0.41
81	EIF1	Eukaryotic translation initiation factor 1 OS	0.41
82	BLVRA	Biliverdin reductase A OS	0.40
83	NT5C	5'(3')-deoxyribonucleotidase, cytosolic type OS	0.40
84	RABL6	Rab-like protein 6 OS	0.40
85	CWC27	Peptidyl-prolyl cis-trans isomerase CWC27 homolog OS	0.39
86	HNRNPH3	Heterogeneous nuclear ribonucleoprotein H3 OS	0.39
87	TXNRD1	Thioredoxin reductase 1, cytoplasmic OS	0.39
88	AFM	Afamin OS	0.39
89	PHF6	PHD finger protein 6 OS	0.39
90	NLN	Neurolysin, mitochondrial OS	0.39
91	PGM1	Phosphoglucomutase-1 OS	0.38
92	GTF3C5	General transcription factor 3C polypeptide 5 OS	0.38
93	POLR1C	DNA-directed RNA polymerases I and III subunit RPAC1 OS	0.37
94	ACTN2	Alpha-actinin-2 OS	0.36
95	STAU1	Double-stranded RNA-binding protein Staufen homolog 1 OS	0.36
96	POLR2G	DNA-directed RNA polymerase II subunit RPB7 OS	0.36

97	VPS29	Vacuolar protein sorting-associated protein 29 OS	0.36
98	TLR3	Toll-like receptor 3 OS	0.36
99	EIF4H	Eukaryotic translation initiation factor 4H OS	0.34
100	AHSA1	Activator of 90 kDa heat shock protein ATPase homolog 1 OS	0.34
101	SNX9	Sorting nexin-9 OS	0.34
102	PABPN1	Polyadenylate-binding protein 2 (Fragment) OS	0.34
103	PPP1R7	Protein phosphatase 1 regulatory subunit 7 OS	0.33
104	TFAM	Transcription factor A, mitochondrial (Fragment) OS	0.32
105	POLR2A	DNA-directed RNA polymerase subunit OS	0.32
106	GNL3L	Guanine nucleotide-binding protein-like 3-like protein OS	0.31
107	PDXK	Pyridoxal kinase OS	0.30
108	PRRC2C	Protein PRRC2C OS	0.30
109	BOLA2	BolA-like protein 2 OS	0.28
110	WBSCR22	Probable 18S rRNA (guanine-N(7))-methyltransferase (Fragment) OS	0.27
111	PRPF4	U4/U6 small nuclear ribonucleoprotein Prp4 OS	0.27
112	CCDC40	Coiled-coil domain-containing protein 40 OS	0.26
113	DUSP9	Dual specificity protein phosphatase 9 OS	0.25
114	UTP18	U3 small nucleolar RNA-associated protein 18 homolog OS	0.25
115	CRK	Adapter molecule crk OS	0.24
116	NDUFB10	NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 10 OS	0.23
117	FAM217A	Protein FAM217A OS	0.23
118	FUBP1	Far upstream element-binding protein 1 OS	0.23
119	ARL2	ADP-ribosylation factor-like protein 2 OS	0.22
120	PFAS	Phosphoribosylformylglycinamide synthase OS	0.21
121	DDX54	ATP-dependent RNA helicase DDX54 OS	0.17
122	HEATR3	HEAT repeat-containing protein 3 OS	0.14
123	MAT2B	Methionine adenosyltransferase 2 subunit beta (Fragment) OS	0.14
124	PFDN1	Prefoldin subunit 1 OS	0.13
125	VPS50	Syndetin OS	0.12
126	CPNE8	Copine-8 OS	0.10
127	TPP2	Tripeptidyl-peptidase 2 OS	0.08
128	P2RX4	P2X purinoceptor 4 OS	0.06
129	ISOC1	Isochorismatase domain-containing protein 1 (Fragment) OS	0.06
130	MRPL57	Ribosomal protein 63, mitochondrial OS	0.04
131	DUS3L	tRNA-dihydrouridine(47) synthase [NAD(P)(+)]-like OS	0.02
132	BCL9L	B-cell CLL/lymphoma 9-like protein OS	0.02

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**Table S9. Proteins of the mitochondrial membrane of HEK 293 cells increased by treatment with methylglyoxal.**

No	Gene	Protein	Fold change
1	RPS5	Ribosomal protein S5	9.6
2	YLPM1	YLP motif-containing protein 1	9.4
3	CRTC3	CREB-regulated transcription coactivator 3	5.0
4	GRIN2D	Glutamate receptor ionotropic, NMDA 2D	4.4
5	RPS23	40S ribosomal protein S23	4.0
6	STATH	Statherin	3.2
7	GRM6	Metabotropic glutamate receptor 6	2.7
8	PHB	Prohibitin	2.5
9	UFSP1	Inactive Ufm1-specific protease 1	2.1

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**Table S10. Proteins of the mitochondrial membrane of HEK 293 cells decreased by treatment with methylglyoxal.**

No	Gene	Protein	Fold change
1	HSPD1	60 kDa heat shock protein, mitochondrial	0.69
2	TOPAZ1	Testis- and ovary-specific PAZ domain-containing protein 1	0.53
3	PRB1	Basic salivary proline-rich protein 1	0.51
4	TUBB	Tubulin beta chain	0.47
5	SLC25A6	ADP/ATP translocase 3	0.47
6	IL4	Interleukin 4 variant 2	0.46
7	RPS14	40S ribosomal protein S14	0.43
8	ATP5B	ATP synthase subunit beta, mitochondrial	0.39
9	APEH	Acylamino-acid-releasing enzyme	0.38
10	HSPA1B	Heat shock 70 kDa protein 1B	0.38
11	HIST1H1D	Histone H1.3	0.37
12	ATP5D	ATP synthase subunit delta, mitochondrial	0.37
13	RAVER2	Ribonucleoprotein PTB-binding 2	0.35
14	hCG_2039566	Histone H2A	0.35
15	COX5B	Cytochrome c oxidase subunit 5B, mitochondrial	0.32
16	YBX1	Nuclease-sensitive element-binding protein 1	0.32
17	HSPE1	10 kDa heat shock protein, mitochondrial	0.31
18	SDHB	Succinate dehydrogenase [ubiquinone] iron-sulfur subunit, mitochondrial	0.31
19	ATP5A1	ATP synthase subunit alpha, mitochondrial	0.31
20	EPB41L2	Band 4.1-like protein 2	0.31
21	STOML2	Stomatin-like protein 2, mitochondrial	0.31
22	SRSF3	Serine/arginine-rich splicing factor 3	0.30
23	MDH2	Malate dehydrogenase, mitochondrial	0.30
24	CAPNS1	Calpain small subunit 1	0.29
25	ACADVL	Very long-chain-specific acyl-CoA dehydrogenase, mitochondrial	0.28
26	ATP5O	ATP synthase subunit O, mitochondrial	0.28
27	ACTC1	Actin, alpha cardiac muscle 1	0.27
28	SHMT2	Serine hydroxymethyltransferase	0.27
29	GAPDH	Glyceraldehyde-3-phosphate dehydrogenase	0.26
30	UQCRB	Cytochrome b-c1 complex subunit 7	0.26
31	HSPA8	Heat shock cognate 71 kDa protein	0.26
32	S100A11	Protein S100-A11 (Calgizzarin)	0.25
33	LAMP2	Lysosome-associated membrane glycoprotein	0.25
34	PSIP1	PC4 and SFRS1-interacting protein	0.25
35	MATR3	Matrin-3	0.25
36	ATP2A2	Sarcoplasmic/endoplasmic reticulum calcium ATPase 2	0.25
37	PPIA	Peptidyl-prolyl cis-trans isomerase A	0.24
38	PHC3	Polyhomeotic-like protein 3	0.24
39	RPLP1	60S acidic ribosomal protein P1	0.23
40	HNRNPA1	Heterogeneous nuclear ribonucleoprotein A1	0.23
41	SLC25A11	Mitochondrial 2-oxoglutarate/malate carrier protein	0.23
42	EPHX1	Epoxide hydrolase 1	0.23
43	H2AFX	Histone H2AX	0.23

44	ACTB	Actin, cytoplasmic 1	0.22
45	SFXN1	Sideroflexin-1	0.22
46	ATP5J2-PTCD1	ATP synthase membrane subunit f	0.22
47	FAM162A	Protein FAM162A	0.21
48	ALYREF	THO complex subunit 4	0.21
49	FAM71E1	Protein FAM71E1	0.21
50	SEC61B	Protein transport protein Sec61 subunit beta	0.21
51	PPIB	Peptidyl-prolyl cis-trans isomerase B	0.21
52	BANF1	Barrier-to-autointegration factor	0.21
53	OCIAD1	OCIA domain-containing protein 1	0.20
54	COX7C	Cytochrome c oxidase subunit 7C, mitochondrial	0.20
55	ENO1	Alpha-enolase	0.20
56	IGF2BP1	Insulin-like growth factor 2 mRNA-binding protein 1	0.19
57	HSPA5	78 kDa glucose-regulated protein	0.19
58	IMMT	MICOS complex subunit MIC60	0.19
59	DDX5	Probable ATP-dependent RNA helicase DDX5	0.19
60	RCC1	Regulator of chromosome condensation	0.19
61	BCAP31	B-cell receptor-associated protein 31	0.19
62	PGRMC1	Membrane-associated progesterone receptor component 1	0.18
63	DNA2	DNA replication ATP-dependent helicase/nuclease DNA2	0.18
64	ENO2	Gamma-enolase	0.18
65	STAR	Steroidogenic acute regulatory protein, mitochondrial	0.18
66	RAB7A	Ras-related protein Rab-7a	0.18
67	CISD1	CDGSH iron-sulfur domain-containing protein 1	0.18
68	FUBP1	Far upstream element-binding protein 1	0.18
69	UQCR10	Cytochrome b-c1 complex subunit 9	0.18
70	SUB1	Activated RNA polymerase II transcriptional coactivator p15	0.17
71	SCAMP1	Secretory carrier-associated membrane protein	0.17
72	HADHA	Trifunctional enzyme subunit alpha, mitochondrial	0.16
73	LRRC59	Leucine-rich repeat-containing protein 59	0.16
74	EIF5A	Eukaryotic translation initiation factor 5A	0.16
75	CORO7-PAM16	Coronin	0.15
76	TIMM9	Mitochondrial import inner membrane translocase subunit Tim9	0.15
77	RPN1	Dolichyl-diphosphooligosaccharide--protein glycosyltransferase subunit 1	0.15
78	PRDX1	Peroxiredoxin-1	0.14
79	CYCS	Cytochrome c	0.14
80	HSP90AA1	Heat shock protein HSP 90-alpha	0.14
81	CCDC74A	Coiled-coil domain-containing protein 74A	0.14
82	PDIA3	Protein disulfide-isomerase A3	0.13
83	TAGLN2	Transgelin-2	0.13
84	COX5A	Cytochrome c oxidase subunit 5A, mitochondrial	0.13
85	NDUFA4	Cytochrome c oxidase subunit NDUFA4	0.13
86	ANXA2	Annexin	0.13
87	RBMX	RNA-binding motif protein, X chromosome	0.13
88	HNRNPH1	Heterogeneous nuclear ribonucleoprotein H	0.13
89	HMGB1	High mobility group protein B1	0.12
90	HADH	Hydroxyacyl-coenzyme A dehydrogenase, mitochondrial	0.12
91	NPM1	Nucleophosmin	0.11
92	PTBP1	Polypyrimidine tract-binding protein 1	0.11
93	NDUFA5	NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 5	0.11



94	ATP5H	ATP synthase subunit d, mitochondrial	0.11
95	PDCD5	Programmed cell death protein 5	0.10
96	SNRPC	U1 small nuclear ribonucleoprotein C	0.10
97	SCP2	Non-specific lipid-transfer protein	0.10
98	SSR3	Translocon-associated protein subunit gamma	0.10
99	MTDH	Protein LYRIC (Metadherin)	0.09
100	CALM2	Calmodulin	0.09
101	HNRNPC	Heterogeneous nuclear ribonucleoproteins C1/C2	0.09
102	NDUFB10	NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 10	0.09
103	MRPS35	28S ribosomal protein S35, mitochondrial	0.08
104	TECR	Very-long-chain enoyl-CoA reductase	0.08
105	PDIA6	Protein disulfide-isomerase A6	0.08
106	SRSF1	Serine/arginine-rich splicing factor 1	0.06
107	LMAN2	Vesicular integral-membrane protein VIP36	0.06
108	DOCK8	Dedicator of cytokinesis protein 8	0.05
109	SYCP2	Synaptonemal complex protein 2	0.05
110	GOT2	Aspartate aminotransferase, mitochondrial	0.04
111	HS3ST3B1	Heparan sulfate glucosamine 3-O-sulfotransferase 3B1	0.04
112	HMG2	Non-histone chromosomal protein HMG-17	0.02
113	UACA	Uveal autoantigen with coiled-coil domains and ankyrin repeats	0.02
114	ANXA5	Annexin A5	0.01
115	TIRAP	Toll/interleukin-1 receptor domain-containing adapter protein	0.01
116	TAF15	TATA-binding protein-associated factor 2N	0.00

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**Table S11. Proteins of the mitochondrial membrane extract containing MG-H1 residues and changed in abundance by HEK293 cell treatment with methylglyoxal**

No	Gene	Name of protein	Fold change
1	GRIN2D	Glutamate receptor ionotropic, NMDA 2D	4.44
2	GRM6	Metabotropic glutamate receptor 6	2.71
3	TOPAZ1	Testis- and ovary-specific PAZ domain-containing protein 1	0.53
4	ACADVL	Very long-chain-specific acyl-CoA dehydrogenase, mitochondrial	0.28
5	PHC3	Polyhomeotic-like protein 3	0.24
6	FAM71E1	Protein FAM71E1	0.21
7	ENO2	Gamma-enolase	0.18
8	STAR	Steroidogenic acute regulatory protein, mitochondrial	0.18
9	CCDC74A	Coiled-coil domain-containing protein 74A	0.14
10	DOCK8	Dedicator of cytokinesis protein 8	0.05
11	SYCP2	Synaptonemal complex protein 2	0.05
12	TIRAP	Toll/interleukin-1 receptor domain-containing adapter protein	0.01

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**Table S12. Correlation of gene expression with Glo1 in the CCLE database of human tumor cell lines.**

Correlation coefficients (Pearson)			
Positive correlations		negative correlations	
Gene correlate	r	Gene correlate	r
1 PPIL1	0.568	1 CHAC1	-0.134
2 RPL7L1	0.566	2 PDXK	-0.134
3 PRIM2	0.531	3 NR1H3	-0.134
4 CDC5L	0.517	4 FBXW8	-0.135
5 CCT4	0.506	5 ZSWIM8	-0.135
6 CENPQ	0.489	6 TMEM143	-0.135
7 SF3B14	0.481	7 SLC39A3	-0.135
8 SNRPC	0.479	8 RP11.849H4.4	-0.135
9 CSE1L	0.463	9 DDIT4	-0.135
10 AC107081.5	0.458	10 SUSD1	-0.135
11 GPN3	0.454	11 FBXW4	-0.135
12 TAF11	0.449	12 KCNN4	-0.135
13 TTK	0.447	13 STAG3L5P.PV	-0.135
14 RPS10	0.445	14 CTSA	-0.135
15 RAD54B	0.445	15 MBD1	-0.135
16 LSM12	0.443	16 SDHAP1	-0.135
17 LSM2	0.438	17 CTC.512J14.5	-0.136
18 CDK1	0.436	18 MOGS	-0.136
19 RNF8	0.434	19 TOM1L2	-0.136
20 XPO1	0.431	20 WDR13	-0.136
21 RRP36	0.428	21 RP11.876N24.4	-0.136
22 RP11.355B11.2	0.426	22 UBALD2	-0.136
23 SRSF3	0.424	23 ITPKC	-0.136
24 MRPL19	0.423	24 RP11.425L10.1	-0.136
25 MTERFD1	0.418	25 ITPR3	-0.136
26 GMPS	0.418	26 CD44	-0.136
27 GMNN	0.417	27 KIF13B	-0.136
28 SRP9	0.414	28 PILRB	-0.136
29 LRRC40	0.414	29 DUSP28	-0.136
30 MAD2L1	0.413	30 RASSF7	-0.136
31 PAK1IP1	0.413	31 SEC24C	-0.137
32 ERCC6L	0.412	32 SLC3A2	-0.137
33 SUMO1	0.411	33 AGAP10	-0.137
34 HSP90AB1	0.410	34 PRDX5	-0.137
35 ORC3	0.410	35 ANAPC2	-0.137
36 OLA1	0.410	36 MCEE	-0.137
37 MIR3917	0.407	37 ANKRD10	-0.137
38 HDAC2	0.406	38 EXOC3	-0.137
39 LIN9	0.406	39 NCOR2	-0.137
40 NDC1	0.403	40 AKAP17A	-0.137

41 HNRNPC	0.401	41 MTND1P23	-0.137
42 PPP2R5D	0.400	42 LMAN2	-0.137
43 NUP54	0.400	43 CCDC146	-0.137
44 MRPL42	0.399	44 CYTH2	-0.137
45 NUDCD1	0.397	45 DCUN1D3	-0.137
46 UQCC2	0.396	46 SERINC2	-0.138
47 MRPS10	0.396	47 C21orf2	-0.138
48 RPF2	0.396	48 WBP1	-0.138
49 NUP155	0.395	49 LINC00999	-0.138
50 SPC25	0.393	50 DNAJC3	-0.138
51 BTF3L4	0.392	51 EIF2S3L	-0.138
52 NOL11	0.392	52 ZNF213	-0.138
53 SKA2	0.391	53 RABGGTA	-0.138
54 PTGES3	0.390	54 B4GALT1	-0.138
55 CCDC138	0.389	55 MT.RNR1	-0.138
56 MRPL47	0.389	56 ZNFX1	-0.138
57 CCT8	0.389	57 FADS3	-0.138
58 RRM1.AS1	0.388	58 MIR22HG	-0.138
59 NUP43	0.388	59 COL7A1	-0.138
60 MATR3	0.387	60 IRF2	-0.138
61 PCNP	0.386	61 ARHGAP26	-0.139
62 DFFA	0.386	62 FAM214B	-0.139
63 ZBTB9	0.386	63 ZNF408	-0.139
64 NUP35	0.386	64 TAGLN2	-0.139
65 RPP40	0.385	65 RP11.1246C19.	-0.139
66 SUV39H2	0.385	66 TMC4	-0.139
67 KHDRBS1	0.385	67 JAG1	-0.139
68 CCT7	0.384	68 SIL1	-0.139
69 GLMN	0.384	69 PER2	-0.139
70 MELK	0.384	70 CASP8	-0.139
71 SGOL2	0.384	71 WDR90	-0.139
72 DHFR	0.383	72 TMEM62	-0.139
73 UTP11L	0.382	73 AC005154.6	-0.139
74 TRMT10C	0.382	74 XBP1	-0.139
75 METTL2A	0.382	75 GLG1	-0.140
76 IPO11	0.382	76 ANKS3	-0.140
77 PSMC1	0.381	77 ZNF628	-0.140
78 KNSTRN	0.381	78 CCDC107	-0.140
79 CKS1B	0.381	79 CTSK	-0.140
80 USP1	0.380	80 CTD.2547E10.1	-0.140
81 MAD2L1BP	0.380	81 RP11.296I10.6	-0.140
82 MRPL13	0.378	82 RP11.680G24.5	-0.140
83 NPM1	0.378	83 AC084018.1	-0.140
84 CENPI	0.377	84 KIAA0895L	-0.140
85 RP11.342K6.1	0.376	85 ITGA3	-0.141
86 PSMD12	0.376	86 VPS13C	-0.141
87 VTA1	0.376	87 RNH1	-0.141
88 PCGF6	0.375	88 TECPR1	-0.141

89 KPNA2	0.375	89 ITGB1P1	-0.141
90 CDC25C	0.375	90 KRT8P33	-0.141
91 RP11.138C9.1	0.374	91 ARID5A	-0.141
92 HSPA4	0.374	92 KRCC1	-0.141
93 BYSL	0.374	93 CDKN1A	-0.141
94 XPO5	0.374	94 TRIM52	-0.142
95 NAE1	0.374	95 ADHFE1	-0.142
96 KIF11	0.373	96 ARHGAP23	-0.142
97 TCP1	0.373	97 MAP3K11	-0.142
98 COQ3	0.373	98 CDK6	-0.142
99 APOO	0.372	99 RP11.927P21.1	-0.142
100 KIAA0101	0.371	100 ATP13A1	-0.142
101 CHAF1B	0.370	101 RPS2P7	-0.142
102 XRCC5	0.370	102 MT.ND2	-0.142
103 HAT1	0.369	103 NME3	-0.142
104 PAICS	0.369	104 TMED9	-0.142
105 PNO1	0.369	105 ERVK13.1	-0.142
106 COIL	0.368	106 OGT	-0.142
107 GTF3C4	0.368	107 ADRBK1	-0.143
108 TPRKB	0.368	108 DHX38	-0.143
109 UTP18	0.368	109 S100A6	-0.143
110 DCLRE1B	0.367	110 RP11.263K19.6	-0.143
111 MLF1IP	0.367	111 AC005594.3	-0.143
112 MTBP	0.366	112 TTC17	-0.143
113 CEP78	0.366	113 CTU1	-0.143
114 NAA15	0.366	114 FER1L4	-0.143
115 CTD.2510F5.4	0.366	115 CTSC	-0.143
116 CDC27	0.365	116 RP11.347C12.2	-0.144
117 TAF9B	0.364	117 TMEM63A	-0.144
118 TIPIN	0.364	118 PROB1	-0.144
119 NUSAP1	0.364	119 FBXW7	-0.144
120 PARPBP	0.363	120 GP1BA	-0.144
121 MRPL14	0.363	121 RP11.458F8.4	-0.144
122 AHCTF1	0.361	122 RP4.669L17.10	-0.144
123 FKBPL	0.361	123 DNAJB2	-0.144
124 AMD1	0.361	124 ENKD1	-0.144
125 RP11.360L9.7	0.361	125 SEL1L3	-0.144
126 MMS22L	0.361	126 CUX1	-0.144
127 SNRNP40	0.360	127 SEC24D	-0.144
128 SSB	0.360	128 TMEM87B	-0.144
129 MRPL22	0.360	129 CMIP	-0.144
130 RFC5	0.360	130 RP11.446E9.1	-0.144
131 DEK	0.359	131 FAM193B	-0.144
132 FAM98B	0.359	132 RPL24P4	-0.144
133 RAD51AP1	0.359	133 RP11.498C9.2	-0.144
134 NCAPG	0.358	134 LBX2.AS1	-0.144
135 PSMB1	0.358	135 TAZ	-0.145
136 SNRPE	0.357	136 CHD2	-0.145

137 HNRNPK	0.357	137 CCDC85B	-0.145
138 VDAC2	0.357	138 FERMT3	-0.146
139 DYNC1LI1	0.357	139 MFSD3	-0.146
140 CCNB1	0.357	140 RPS6KA2	-0.146
141 VBP1	0.356	141 TYK2	-0.146
142 EEF1E1	0.356	142 GGT1	-0.146
143 HSPD1P1	0.355	143 TPST2	-0.146
144 RP11.303E16.8	0.355	144 IFI27	-0.146
145 SNRPD1	0.354	145 PSMC1P1	-0.146
146 PBK	0.354	146 MYCBP2	-0.146
147 GEMIN6	0.354	147 RPS7P10	-0.146
148 FBXO5	0.354	148 MPPE1	-0.146
149 CACYBP	0.353	149 NCOA3	-0.146
150 SLC25A17	0.353	150 CIC	-0.146
151 HBS1L	0.353	151 ZNF784	-0.147
152 RFC4	0.353	152 ELL2	-0.147
153 UBE2N	0.352	153 FAM156A	-0.147
154 RP11.15L13.4	0.352	154 PIGQ	-0.147
155 CDC7	0.352	155 ABHD17A	-0.147
156 NUF2	0.352	156 CATSPER2P1	-0.147
157 TOP2A	0.352	157 GPR89B	-0.147
158 EIF4E	0.351	158 TNK2	-0.147
159 IPO7	0.351	159 AC132872.1	-0.147
160 RP11.342K6.2	0.350	160 CYLD	-0.147
161 SMIM13	0.350	161 FICD	-0.147
162 PFDN6	0.350	162 LMF2	-0.147
163 RRM1	0.350	163 SPTBN1	-0.147
164 AL590762.1	0.350	164 AC007969.5	-0.147
165 GCFC2	0.349	165 AC000068.9	-0.148
166 PTTG1	0.349	166 PCNXL3	-0.148
167 ESCO2	0.349	167 LAMP1	-0.148
168 CCT5	0.349	168 RINL	-0.148
169 XRCC6	0.349	169 NLRP1	-0.148
170 NUP37	0.349	170 PLEC	-0.148
171 TUBD1	0.349	171 BMS1P5	-0.148
172 RPF1	0.348	172 MFSD10	-0.148
173 ZWILCH	0.348	173 GBAP1	-0.148
174 DSCC1	0.348	174 SRCAP	-0.148
175 KPNB1	0.348	175 RHOG	-0.148
176 MCM10	0.348	176 DGKQ	-0.148
177 ISCA1	0.348	177 AGAP7	-0.149
178 ST13	0.348	178 RP11.258F1.1	-0.149
179 GCSH	0.347	179 SMAD7	-0.149
180 CEP57L1	0.347	180 CLASRP	-0.149
181 STIL	0.347	181 VPS39	-0.149
182 PDCL3	0.347	182 POLM	-0.149
183 BRIX1	0.347	183 ELF1	-0.149
184 BCCIP	0.347	184 TMEM80	-0.149

185 OSGEPL1	0.346	185 AMY2B	-0.149
186 HSF2	0.346	186 TMEM258	-0.149
187 PPP1CC	0.346	187 RP11.143J12.2	-0.150
188 RMI1	0.346	188 VAMP8	-0.150
189 CSNK2B	0.346	189 TCF25	-0.150
190 NSL1	0.345	190 SPNS1	-0.150
191 CENPW	0.345	191 ANKZF1	-0.150
192 VDAC3	0.345	192 CAPG	-0.150
193 SERBP1	0.345	193 TBC1D3H	-0.150
194 RPAP3	0.345	194 AP001062.7	-0.151
195 CTB.43P18.1	0.344	195 AIM1	-0.151
196 UBE2T	0.344	196 VIMP	-0.151
197 UCHL5	0.343	197 GSTK1	-0.151
198 GINS4	0.343	198 ABHD4	-0.151
199 SET	0.343	199 TXNDC5	-0.151
200 LSM5	0.342	200 CCNL1	-0.151
201 AUNIP	0.342	201 AC009404.2	-0.151
202 PSMB3	0.342	202 TRAF3IP2	-0.151
203 LSM3	0.342	203 CBLB	-0.151
204 CCDC58	0.342	204 PGAM4	-0.151
205 ZW10	0.341	205 TSC22D4	-0.151
206 TRIP13	0.341	206 IDS	-0.151
207 TFAM	0.341	207 ATAD3C	-0.151
208 PSMD14	0.341	208 ARHGEF2	-0.152
209 POLR1C	0.341	209 OTUD5	-0.152
210 SGOL1	0.340	210 INE1	-0.152
211 STMN1	0.340	211 MAN2B1	-0.152
212 ATP5F1	0.340	212 JUND	-0.152
213 DLGAP5	0.340	213 ZFAND2A	-0.152
214 PPP2CA	0.340	214 RP11.361D15.2	-0.152
215 DDX20	0.340	215 ASMTL.AS1	-0.152
216 ILF2	0.339	216 HCLS1	-0.152
217 DNA2	0.339	217 TMEM129	-0.152
218 DEPDC1	0.339	218 HNRNPA1P10	-0.152
219 COPS2	0.339	219 RP11.274B21.1	-0.152
220 SUMO2	0.339	220 NSUN5P1	-0.152
221 GEMIN5	0.339	221 NOMO3	-0.152
222 CCT2	0.339	222 GUK1	-0.152
223 POLE2	0.339	223 RDH14	-0.152
224 KIFC1	0.338	224 SQSTM1	-0.152
225 RP5.1113E3.3	0.338	225 TPP1	-0.153
226 DHX9	0.337	226 ACSF3	-0.153
227 NUP107	0.337	227 SLC25A45	-0.153
228 MCM3	0.337	228 ANXA2P2	-0.153
229 KIF15	0.337	229 CLEC16A	-0.153
230 MRPL50	0.337	230 RP11.39C10.1	-0.153
231 RP11.474G23.2	0.337	231 WWP2	-0.153
232 RACGAP1	0.336	232 ARPC1B	-0.153

233 CCT3	0.336	233 ARPC2	-0.153
234 HPRT1	0.336	234 PSKH1	-0.153
235 CBX1	0.336	235 SLC10A3	-0.153
236 ATAD2	0.336	236 AP003068.9	-0.153
237 ORC4	0.336	237 RRN3P1	-0.154
238 TMEM14B	0.336	238 RNF31	-0.154
239 LTV1	0.335	239 BMS1P1	-0.154
240 TIMM8A	0.335	240 RP3.368A4.6	-0.154
241 HNRNPA3	0.335	241 NFE2L1	-0.154
242 MIS18A	0.335	242 FTX	-0.154
243 RFC2	0.335	243 TNRC18	-0.154
244 KIF4A	0.335	244 CTD.3126B10.	-0.154
245 DTL	0.334	245 RP11.347C12.1	-0.154
246 RPA2	0.334	246 TBC1D2	-0.154
247 C11orf82	0.334	247 IFI27L2	-0.155
248 SSX2IP	0.334	248 PDF	-0.155
249 ARMC1	0.334	249 SLC12A9	-0.155
250 RFC3	0.334	250 HLA.F	-0.155
251 GNAI3	0.334	251 NUCB1.AS1	-0.155
252 DONSON	0.334	252 LAT2	-0.155
253 SLC25A33	0.333	253 CCDC78	-0.155
254 ELAVL1	0.333	254 CTBP1	-0.155
255 ASNSD1	0.333	255 HLA.C	-0.156
256 TIMM23B	0.333	256 RP11.493K19.3	-0.156
257 DARS2	0.333	257 RP11.179G5.1	-0.156
258 CCNB2	0.333	258 AC021224.1	-0.156
259 MDH1	0.333	259 NARFL	-0.156
260 PSMG1	0.333	260 VDAC1P1	-0.156
261 SMC3	0.333	261 RP11.20I23.8	-0.156
262 DBF4	0.333	262 NPIPA5	-0.156
263 UBA2	0.332	263 GOLGA6L5	-0.156
264 DSN1	0.332	264 HLA.DMA	-0.156
265 POLA1	0.331	265 RP11.395L14.1	-0.157
266 DENR	0.331	266 MYH9	-0.157
267 NEDD1	0.330	267 NUCB1	-0.157
268 EIF1AX	0.330	268 DPP7	-0.157
269 SKA3	0.330	269 FUK	-0.157
270 UNG	0.330	270 IER2	-0.157
271 DCAF13	0.329	271 WDR81	-0.157
272 AASDHPPT	0.329	272 STX5	-0.157
273 HSPE1	0.329	273 EML2	-0.157
274 MCMBP	0.328	274 ZNF319	-0.157
275 ZCRB1	0.328	275 PBXIP1	-0.157
276 WDYHV1	0.328	276 HNRNPA1P7	-0.157
277 GART	0.328	277 CCM2	-0.157
278 SNRPB	0.328	278 FAM203B	-0.157
279 ANKRD32	0.327	279 AL162151.3	-0.158
280 UBXN2A	0.327	280 ELMO3	-0.158



281 HNRNPA1	0.327	281 RPL5P4	-0.158
282 TMEM177	0.327	282 CTSD	-0.158
283 ETF1	0.327	283 ACBD4	-0.158
284 MED20	0.327	284 UBQLN4P1	-0.158
285 SNRPG	0.327	285 OVGP1	-0.159
286 NUP153	0.327	286 TBC1D10A	-0.159
287 HAUS6	0.326	287 TRABD	-0.159
288 GINS1	0.326	288 MXD4	-0.159
289 FANCB	0.325	289 SDHAP2	-0.159
290 TAF1B	0.325	290 RRBPI	-0.160
291 CENPL	0.325	291 FKBP2	-0.160
292 ORC2	0.325	292 RP5.1142A6.9	-0.160
293 WDR75	0.325	293 TBRG1	-0.160
294 MRTO4	0.324	294 STUB1	-0.160
295 RBMXL1	0.324	295 DDA1	-0.160
296 MCUR1	0.324	296 MOB2	-0.160
297 MAGOHB	0.324	297 GADD45A	-0.160
298 PPAT	0.324	298 SLC7A7	-0.160
299 CCT6A	0.324	299 MGRN1	-0.160
300 UBE2V2	0.324	300 ZMIZ2	-0.160
301 MRPS22	0.323	301 RP11.112J3.15	-0.160
302 CTD.2256P15.4	0.323	302 ANKH	-0.160
303 SKP2	0.323	303 BANF1P3	-0.161
304 PHF13	0.323	304 AFF1	-0.161
305 TMPO	0.323	305 TMEM243	-0.161
306 MRPL39	0.323	306 CAPN1	-0.161
307 ZMYM1	0.323	307 ANXA11	-0.161
308 ABCE1	0.322	308 SLC8B1	-0.161
309 CCZ1B	0.322	309 MANBA	-0.161
310 MRPL3	0.322	310 MPRIPP1	-0.161
311 FAM104B	0.322	311 AMT	-0.161
312 TUBB	0.322	312 RP11.572P18.1	-0.162
313 CDKN2AIPNL	0.321	313 API5P1	-0.162
314 BAG4	0.321	314 RP5.1050D4.2	-0.162
315 CCNE2	0.321	315 CAPS	-0.162
316 SPAG5	0.321	316 LA16c.349E10.	-0.162
317 ERAL1	0.321	317 RP11.252A24.2	-0.162
318 CMSS1	0.321	318 F8A2	-0.162
319 TOMM22	0.320	319 RP11.146F11.1	-0.162
320 NUFIP1	0.320	320 MNT	-0.162
321 NEK2	0.320	321 NAGLU	-0.162
322 RP11.144G7.2	0.320	322 EEF1A1P13	-0.162
323 NDC80	0.319	323 UBE2SP2	-0.162
324 NDUFB4	0.319	324 TNXB	-0.162
325 EIF2S1	0.319	325 RP11.958N24.2	-0.162
326 SKP1	0.319	326 SLC35E1	-0.162
327 MAGOH	0.319	327 ANKRD13D	-0.163
328 PSMA4	0.319	328 ACADVL	-0.163

329 WDR46	0.318	329 DYX1C1.CCPC	-0.163
330 TIMM23	0.318	330 BIRC3	-0.163
331 RRM2	0.318	331 HIVEP2	-0.163
332 DESI2	0.318	332 FASTK	-0.163
333 MRPS23	0.318	333 HSF4	-0.163
334 FARSB	0.318	334 CENPT	-0.163
335 EXO1	0.318	335 RP4.800G7.2	-0.163
336 MRPS15	0.317	336 NPIP5	-0.163
337 MRPL51	0.317	337 TBC1D3G	-0.163
338 HAUS1	0.316	338 LAT	-0.163
339 PRPF4	0.316	339 ISCA1P1	-0.163
340 C4orf46	0.316	340 HM13	-0.163
341 KIAA1524	0.316	341 SLC52A2	-0.163
342 USP39	0.316	342 PISD	-0.164
343 MASTL	0.316	343 HMGN2P5	-0.164
344 TPX2	0.316	344 POLR2J4	-0.164
345 C2orf69	0.316	345 ALPK1	-0.164
346 CDC6	0.316	346 C17orf59	-0.164
347 PRIM1	0.316	347 P4HB	-0.164
348 MSH2	0.315	348 SRPR	-0.164
349 KIF23	0.315	349 EIF5AL1	-0.164
350 BRIP1	0.315	350 RPS3AP25	-0.165
351 ZNF146	0.315	351 RP11.163E9.2	-0.165
352 SAYSD1	0.315	352 RP11.490H24.5	-0.165
353 RPL21	0.314	353 RGPDI	-0.165
354 BCAS2	0.314	354 RPL4P4	-0.165
355 CETN3	0.314	355 ELL	-0.165
356 CDC23	0.314	356 ZFAND2B	-0.165
357 PPP3R1	0.314	357 AC073869.1	-0.165
358 HMGB1	0.314	358 RTN3P1	-0.165
359 ACTL6A	0.313	359 HLA.A	-0.165
360 SF3A3	0.313	360 AC104134.2	-0.165
361 TEX10	0.313	361 MFSD6	-0.166
362 MRPS9	0.313	362 RPL39P3	-0.166
363 KIAA1143	0.313	363 MAP2K3	-0.166
364 ZNF644	0.313	364 NPIP4	-0.166
365 RBM27	0.313	365 FAM157C	-0.166
366 AC008132.12	0.312	366 TAF10	-0.167
367 CENPH	0.312	367 RP11.497H16.5	-0.167
368 AURKA	0.312	368 ADCY7	-0.167
369 SNX4	0.312	369 CTC.338M12.7	-0.167
370 RBMX	0.312	370 STAG3L2	-0.167
371 HSPD1	0.312	371 MT.CYB	-0.167
372 RPL6	0.312	372 RP11.164J13.1	-0.167
373 RAD18	0.311	373 TTLL3	-0.167
374 HSP90AA1	0.311	374 B4GALT7	-0.167
375 GTF2H2	0.311	375 ACRC	-0.167
376 E2F6	0.311	376 RPS7P1	-0.167

377 H2AFZ	0.311	377 AC138969.4	-0.167
378 NOC3L	0.311	378 NEK8	-0.167
379 METTL6	0.310	379 NMRK1	-0.167
380 TBCE	0.310	380 RP11.556K13.1	-0.168
381 CCDC77	0.310	381 RP4.673M15.1	-0.168
382 C2orf44	0.309	382 RNPS1P1	-0.168
383 FXR1	0.309	383 PKD1P5	-0.168
384 CCNA2	0.309	384 CYB561D1	-0.168
385 CNOT6	0.309	385 TSR3	-0.168
386 WDR5	0.309	386 LRCH4	-0.168
387 ERH	0.309	387 CCDC9	-0.168
388 RNF2	0.308	388 SLC12A6	-0.168
389 KIF20A	0.308	389 RHOT2	-0.168
390 RANBP1	0.308	390 EML3	-0.168
391 RPA3	0.308	391 TPRA1	-0.169
392 NUP85	0.308	392 CCPG1	-0.169
393 ACTR6	0.308	393 CTD.3065B20.	-0.169
394 C5orf34	0.307	394 RP11.567G24.1	-0.169
395 GAR1	0.307	395 ZNF785	-0.169
396 MRPL37	0.307	396 C4B	-0.169
397 KIF2C	0.307	397 RP11.758P17.3	-0.169
398 RAD51C	0.306	398 ANKRD61	-0.169
399 BUB1B	0.306	399 CSAD	-0.169
400 CASP8AP2	0.306	400 BCL3	-0.169
401 SASS6	0.306	401 SLX1B	-0.169
402 COX7A2	0.306	402 RAB40C	-0.169
403 BLM	0.306	403 VPS51	-0.169
404 NDUFB6	0.306	404 ZFYVE27	-0.169
405 VMA21	0.306	405 TLK2P1	-0.170
406 PSRC1	0.305	406 SLC22A20	-0.170
407 NLN	0.305	407 ANP32AP1	-0.170
408 NIF3L1	0.305	408 CTD.3193O13.	-0.170
409 CBX3	0.305	409 RNF213	-0.170
410 CDCA2	0.305	410 RP11.91A18.4	-0.170
411 DRG1	0.305	411 AC018804.6	-0.171
412 H3F3A	0.305	412 ST3GAL1	-0.171
413 RP11.212P7.3	0.305	413 UVSSA	-0.171
414 BZW1	0.305	414 R3HDM4	-0.171
415 RPS26	0.305	415 TUBA4A	-0.171
416 FBXO45	0.304	416 LINC00894	-0.171
417 CEBPZ	0.304	417 CLSTN3	-0.171
418 MRPL18	0.304	418 CLTB	-0.171
419 POC1A	0.304	419 GPR108	-0.171
420 NASP	0.304	420 SLC39A13	-0.171
421 RPL39	0.304	421 RP11.274B21.4	-0.171
422 CKS2	0.304	422 STAT5A	-0.171
423 KLHL23	0.303	423 SEMA4B	-0.172
424 C1orf112	0.303	424 PARP3	-0.172

425	GTF2H3	0.303	425	ARRDC1	-0.172
426	NUS1	0.303	426	SLC12A4	-0.172
427	MND1	0.303	427	DBNL	-0.172
428	PAPOLA	0.303	428	PPP1R12B	-0.172
429	PRDX3	0.303	429	HLA.E	-0.172
430	STIP1	0.302	430	LCAT	-0.172
431	MCM6	0.302	431	AC093818.1	-0.172
432	RNGTT	0.302	432	RP11.274B21.2	-0.172
433	NUP205	0.302	433	INO80B	-0.172
434	DEPDC4	0.302	434	AC004057.1	-0.172
435	NOL10	0.302	435	AC068580.6	-0.172
436	ATG4C	0.302	436	CTC.471F3.4	-0.172
437	EFTUD2	0.302	437	GOLGA6L10.1	-0.173
438	DEPDC1B	0.301	438	EHD1	-0.173
439	PAIP1	0.301	439	AC018738.2	-0.173
440	KLHDC3	0.301	440	CLCN7	-0.173
441	DNAJC8	0.301	441	TRIM41	-0.173
442	KIF18A	0.301	442	AC083873.4	-0.173
443	METAP2	0.301	443	C1S	-0.173
444	MKI67IP	0.301	444	MAPK13	-0.174
445	SRPK1	0.301	445	NPIPA1	-0.174
446	PFDN4	0.300	446	MAVS	-0.174
447	KATNBL1	0.300	447	ATG2A	-0.174
448	HNRNPA2B1	0.300	448	RP11.783K16.1	-0.174
449	LRPPRC	0.300	449	RP11.244H3.1	-0.174
450	CSNK2A1	0.300	450	GOLGA3	-0.174
451	LRRC58	0.300	451	SNRPEP4	-0.174
452	ZNF451	0.300	452	AC027612.1	-0.174
453	USP33	0.299	453	ZC3H11B	-0.174
454	ZWINT	0.299	454	CFLAR	-0.174
455	PRRC2A	0.299	455	CCDC159	-0.175
456	RIOK1	0.299	456	TPCN1	-0.175
457	TBC1D31	0.299	457	AC015849.19	-0.175
458	CENPF	0.299	458	CCDC88B	-0.175
459	BCLAF1	0.299	459	CCDC130	-0.175
460	OIP5	0.299	460	TRIM73	-0.175
461	CENPK	0.299	461	ADCK5	-0.175
462	XXbac.BPG252	0.299	462	STOML1	-0.175
463	EXOSC2	0.299	463	PIGG	-0.175
464	MZT1	0.298	464	SCAMP2	-0.175
465	TTC26	0.298	465	SLC1A5	-0.175
466	ATP5O	0.298	466	GHDC	-0.176
467	ITGB3BP	0.298	467	SZT2.AS1	-0.176
468	PHF6	0.298	468	CD27.AS1	-0.176
469	NCAPH	0.298	469	PDPK2	-0.176
470	HELLS	0.297	470	SEC61A1	-0.176
471	UQCR11	0.297	471	LRRC37A2	-0.176
472	STXBP4	0.297	472	VMAC	-0.176

473 LMNB1	0.297	473 RP11.473M20.1	-0.176
474 GBAS	0.297	474 GOLGA8I	-0.176
475 FASTKD3	0.296	475 AC138035.2	-0.176
476 CDC25A	0.296	476 ZZEF1	-0.176
477 ACAT2	0.296	477 MR1	-0.176
478 ATG5	0.296	478 MPRIP	-0.176
479 WDR3	0.296	479 ABCA7	-0.177
480 SYNCRIP	0.296	480 CCDC57	-0.177
481 NELFE	0.296	481 RP11.408P14.1	-0.177
482 SEH1L	0.296	482 KIAA0556	-0.177
483 E2F3	0.295	483 TSC2	-0.177
484 WDHD1	0.295	484 MGLL	-0.177
485 FKBP3	0.295	485 ARFGAP1	-0.177
486 TARDBP	0.295	486 C1orf63	-0.177
487 SMS	0.295	487 POU2F2	-0.177
488 EIF3E	0.295	488 FAM73B	-0.177
489 RP11.5106.1	0.294	489 KLF13	-0.177
490 PUS7	0.294	490 SPG7	-0.177
491 INTS8	0.294	491 MKLN1.AS1	-0.177
492 NCBP1	0.294	492 NONOP2	-0.178
493 TRMT61B	0.294	493 CAPN15	-0.178
494 PSMC6	0.294	494 LMO7	-0.178
495 CENPE	0.294	495 LTB4R	-0.178
496 WDR76	0.294	496 SNX29	-0.178
497 HNRNPR	0.294	497 ZCCHC6	-0.178
498 RP11.552M11.4	0.294	498 CIITA	-0.178
499 PCMT1	0.294	499 TRIM21	-0.178
500 KIF20B	0.294	500 GLUD1P3	-0.178
501 HRSP12	0.294	501 MST1	-0.179
502 RP3.337H4.10	0.294	502 C11orf35	-0.179
503 WDR77	0.294	503 LINC01001	-0.179
504 RPS18	0.293	504 EIF2AK3	-0.179
505 ATP5J	0.293	505 NUDT18	-0.179
506 CENPA	0.293	506 CAPN3	-0.179
507 SMC2	0.293	507 ESRRA	-0.179
508 MRPL35	0.293	508 SIDT2	-0.179
509 ORC6	0.292	509 PPIAP22	-0.179
510 AIDA	0.292	510 GLUD2	-0.179
511 RP11.156E6.1	0.292	511 RP11.228B15.4	-0.179
512 CAND1	0.292	512 AP1G2	-0.180
513 CKAP2	0.292	513 C4A	-0.180
514 MRPL15	0.291	514 YWHAZP3	-0.180
515 ARHGAP11A	0.291	515 AC098614.2	-0.180
516 EXOSC9	0.291	516 HAGHL	-0.180
517 TRA2B	0.291	517 RP11.66N24.4	-0.180
518 SNHG16	0.291	518 MST1R	-0.180
519 KIAA1429	0.291	519 RP4.717I23.3	-0.180
520 C2orf76	0.291	520 AC135048.13	-0.180

521 DNAJA1	0.291	521 RP3.437C15.1	-0.180
522 KDM1A	0.291	522 C20orf24	-0.181
523 EXOSC3	0.290	523 MC1R	-0.181
524 RWDD4	0.290	524 CREBRF	-0.181
525 HSPB11	0.290	525 KHNYN	-0.181
526 PPID	0.290	526 HDAC7	-0.182
527 NUPL1	0.290	527 LINC00174	-0.182
528 ECT2	0.290	528 CCNDBP1	-0.182
529 RUVBL1	0.290	529 PIEZO1	-0.182
530 MORF4L1	0.290	530 WASH4P	-0.182
531 RHNO1	0.289	531 DNASE1L1	-0.182
532 VRK1	0.289	532 PKD1P6	-0.182
533 CDC42	0.289	533 CHKB	-0.182
534 PIP5K1A	0.289	534 RP11.361L15.4	-0.182
535 PLK4	0.289	535 DENND3	-0.183
536 RAE1	0.289	536 MXD1	-0.183
537 CCNC	0.289	537 AC004878.3	-0.183
538 CNOT10	0.289	538 MAN2B2	-0.183
539 PPP4R2	0.288	539 ORAI2	-0.183
540 SNRPF	0.288	540 RP11.512F24.1	-0.183
541 SELRC1	0.288	541 SBF1	-0.183
542 MEA1	0.288	542 PMS2P2	-0.184
543 NKIRAS1	0.288	543 MMP19	-0.184
544 BUB1	0.288	544 CTD.3185P2.1	-0.184
545 LACE1	0.288	545 ARHGAP27	-0.184
546 ARMC8	0.287	546 SMARCA2	-0.184
547 FAM161A	0.287	547 FAM160A2	-0.184
548 UBE2V1	0.287	548 APOL2	-0.185
549 PRIMPOL	0.287	549 DDRGK1	-0.185
550 HAUS2	0.287	550 PRELID1P1	-0.185
551 ECD	0.286	551 TMEM214	-0.185
552 HMGXB4	0.286	552 GS1.44D20.1	-0.185
553 PPP6C	0.286	553 ANKRD11	-0.186
554 TOMM20	0.286	554 MYD88	-0.186
555 TEFM	0.286	555 TFEB	-0.186
556 PHF5A	0.286	556 ATF4P3	-0.186
557 WRNIP1	0.286	557 RP3.508I15.14	-0.186
558 HACE1	0.286	558 NPIP3	-0.186
559 ORC1	0.286	559 EPS8L2	-0.186
560 CENPO	0.286	560 AC010468.1	-0.186
561 LYRM2	0.286	561 CHPF	-0.186
562 RP11.118M9.3	0.286	562 RP11.274B21.3	-0.186
563 YTHDF2	0.286	563 IRF3	-0.186
564 KATNA1	0.285	564 SPDYE2B	-0.187
565 NDUFB5	0.285	565 SLC16A3	-0.187
566 TSN	0.285	566 GLRX	-0.187
567 PPIL4	0.284	567 GRN	-0.187
568 SLIRP	0.284	568 PKD1P1	-0.187

569 DHX57	0.284	569 NPM1P27	-0.187
570 PRPF40A	0.284	570 PPARA	-0.187
571 RP11.10N23.4	0.284	571 C1DP1	-0.187
572 GMFB	0.284	572 AC002310.7	-0.188
573 ERI3	0.284	573 ZNF598	-0.188
574 TRIM37	0.283	574 GS1.124K5.11	-0.188
575 EMG1	0.283	575 COMTD1	-0.188
576 PTPLAD1	0.283	576 NUDT22	-0.188
577 PSMA1	0.283	577 RP11.894P9.1	-0.188
578 RPS3A	0.283	578 CNPPD1	-0.189
579 COPS4	0.283	579 ORAI3	-0.189
580 TIPRL	0.283	580 PPP1R15A	-0.189
581 MAP6D1	0.283	581 ERAP2	-0.189
582 LZIC	0.283	582 RAB4B	-0.189
583 L2HGDH	0.283	583 STK10	-0.189
584 BANF1	0.283	584 ARFRP1	-0.190
585 DIMT1	0.283	585 LENG8.AS1	-0.190
586 KIF14	0.283	586 RP13.996F3.5	-0.190
587 ZNF473	0.283	587 AKAP13	-0.190
588 SKIV2L2	0.282	588 BET1L	-0.190
589 ZFP1	0.282	589 GMIP	-0.190
590 DCTN4	0.282	590 TMEM127	-0.190
591 CDK4	0.282	591 EIF1AXP1	-0.191
592 IPO9	0.282	592 FTLP3	-0.191
593 TMEM183A	0.282	593 TMEM8A	-0.191
594 GEMIN2	0.282	594 AC005822.1	-0.191
595 ZNF143	0.282	595 NABP1	-0.191
596 CNOT7	0.282	596 FAM214A	-0.191
597 NAA50	0.282	597 TGFBR2	-0.191
598 RNF5	0.281	598 ARAP1.AS1	-0.191
599 RNASEH2A	0.281	599 SDF4	-0.191
600 CHCHD4	0.281	600 AC011737.2	-0.191
601 AC104655.2	0.281	601 RPL4P5	-0.191
602 YWHAE	0.281	602 TRIM66	-0.191
603 AC000068.10	0.280	603 RP11.641D5.1	-0.191
604 GXYLT1	0.280	604 CD74	-0.192
605 ZMYM4	0.280	605 WDR24	-0.192
606 PRR11	0.280	606 TPGS1	-0.192
607 LYRM4	0.280	607 GET4	-0.192
608 MTFR2	0.280	608 HLA.B	-0.192
609 GTF2H2B	0.280	609 RP11.84G21.1	-0.192
610 RP11.677I18.3	0.280	610 RHBDL1	-0.192
611 AC007390.5	0.280	611 SQRDL	-0.192
612 FKBP4	0.280	612 ENTHD2	-0.192
613 RPL23A	0.280	613 ABHD17AP1	-0.192
614 YEATS4	0.280	614 RELB	-0.192
615 LARP4	0.279	615 PCNXL2	-0.193
616 PSMD11	0.279	616 CBX4	-0.193

617 ORC5	0.279	617 RP5.1050D4.3	-0.193
618 POLR3F	0.279	618 EIF2S2P4	-0.193
619 NUDT21	0.279	619 CAMTA2	-0.193
620 NUP93	0.279	620 ACAP3	-0.194
621 PSMB4	0.279	621 CTC.250I14.6	-0.194
622 MED17	0.279	622 MT.CO2	-0.194
623 NUP133	0.279	623 RP11.489E7.4	-0.194
624 LRR1	0.278	624 TRAF1	-0.194
625 DPM1	0.278	625 KLC1	-0.194
626 ZCCHC17	0.278	626 SMG1P1	-0.194
627 CDC26	0.278	627 DNHD1	-0.195
628 CCDC117	0.278	628 RP11.20O24.4	-0.195
629 ZYG11B	0.278	629 STX4	-0.195
630 CPSF3	0.278	630 TNFAIP3	-0.195
631 GNL3	0.278	631 DHRS1	-0.195
632 DDX50	0.278	632 LINC00893	-0.196
633 DBR1	0.278	633 HEXDC	-0.196
634 YWHAQ	0.278	634 TBC1D17	-0.196
635 PRC1	0.278	635 LINC00672	-0.196
636 SAAL1	0.278	636 NOL3	-0.196
637 MORN2	0.278	637 CDK10	-0.197
638 MEX3A	0.278	638 SLX1B.SULT1	-0.197
639 ENY2	0.278	639 SERINC3	-0.197
640 CCDC59	0.278	640 LA16c.390E6.5	-0.197
641 ZNHIT3	0.278	641 DTX2	-0.197
642 RP11.312J18.5	0.278	642 CES2	-0.197
643 CDKN3	0.278	643 PEX16	-0.198
644 SRSF7	0.277	644 FBRS	-0.198
645 PWP1	0.277	645 RP11.3P17.3	-0.198
646 WARS2	0.277	646 SULT1A3	-0.198
647 RPS7	0.277	647 RABAC1	-0.198
648 TBCA	0.276	648 GSDMB	-0.198
649 FANCI	0.276	649 CTB.31O20.4	-0.198
650 TAF5	0.276	650 ISG20	-0.199
651 USP14	0.276	651 RPL14P1	-0.199
652 RARS2	0.276	652 MPG	-0.199
653 PAIP2	0.276	653 ARHGEF1	-0.199
654 GTF2H5	0.276	654 RP11.587D21.1	-0.199
655 ADSL	0.276	655 TMEM198B	-0.200
656 G3BP1	0.276	656 CSNK2A3	-0.200
657 CLSPN	0.276	657 RRN3P3	-0.200
658 WBP11	0.276	658 ENSAP2	-0.200
659 RAD54L	0.276	659 ADAM8	-0.200
660 RP11.360L9.4	0.275	660 NR1H2	-0.201
661 POLB	0.275	661 MT.CO1	-0.201
662 THUMPD3	0.275	662 GAK	-0.201
663 NDUFC1	0.275	663 MIR1282	-0.201
664 CDCA7	0.275	664 RPL41P1	-0.201



665 RP4.785G19.5	0.275	665 CPEB2	-0.202
666 PSMB2	0.275	666 PMS2P3	-0.202
667 HNRNPAB	0.275	667 CTGLF11P	-0.202
668 CAPN7	0.275	668 EIF4BP6	-0.202
669 LARS	0.275	669 HNRNPA1P48	-0.203
670 SMC4	0.274	670 OGFOD2	-0.203
671 SSBP1	0.274	671 SH2B1	-0.203
672 NFU1	0.274	672 RP11.203F10.6	-0.203
673 SPRTN	0.274	673 PLK3	-0.203
674 CDC40	0.274	674 RP11.632C17_	-0.204
675 STRAP	0.274	675 RPL7AP30	-0.204
676 CDC45	0.274	676 RP11.47A8.5	-0.204
677 CAMTA1	0.274	677 RP11.108K14.4	-0.204
678 POLR2D	0.274	678 YBX1P1	-0.204
679 CHCHD1	0.274	679 SIRT7	-0.204
680 CDCA3	0.274	680 LPXN	-0.205
681 SMARCC1	0.274	681 NIPAL3	-0.205
682 MTCH2	0.274	682 ANKMY1	-0.205
683 SAE1	0.274	683 TNIP1	-0.205
684 RAD21	0.274	684 PDLIM1	-0.205
685 UTP15	0.274	685 PHYKPL	-0.205
686 ERCC8	0.274	686 SLX1A.SULT1	-0.206
687 DENND6A	0.273	687 AC138783.12	-0.206
688 MRPL11	0.273	688 FTH1P10	-0.206
689 THOC1	0.273	689 SPRYD3	-0.206
690 FANCC	0.273	690 RP11.574K11.2	-0.206
691 MRPS28	0.273	691 UBALD1	-0.206
692 RPP30	0.272	692 MINK1	-0.206
693 RP4.635E18.6	0.272	693 CTD.2139B15.1	-0.206
694 MRPS27	0.272	694 RP11.395P17.3	-0.206
695 HSPA14	0.272	695 APOL6	-0.206
696 ERI1	0.272	696 STAT6	-0.207
697 RP11.269F19.2	0.272	697 SERBP1P5	-0.207
698 GNG5	0.272	698 CDC42P6	-0.207
699 CUL3	0.272	699 TXNIP	-0.207
700 ZNF367	0.272	700 TCP11L2	-0.207
701 KBTBD6	0.272	701 BLCAP	-0.208
702 AHCY	0.271	702 VPS9D1	-0.208
703 NDUFA8	0.271	703 TICAM1	-0.208
704 XPO7	0.271	704 CYP3A5	-0.208
705 BIRC5	0.271	705 C19orf10	-0.208
706 PCNA	0.271	706 ST13P4	-0.209
707 DDX18	0.271	707 RAD51.AS1	-0.209
708 BOLA3	0.270	708 RP5.857K21.7	-0.209
709 GTF2H4	0.270	709 JUNB	-0.210
710 RAN	0.270	710 RP11.324H6.5	-0.210
711 RNF138	0.270	711 ALDH3B1	-0.210
712 SNX3	0.270	712 ZNF276	-0.210

713 RPL24	0.270	713 RPS7P11	-0.211
714 NUDT15	0.270	714 FAUP1	-0.211
715 RAD1	0.270	715 TBC1D22A	-0.211
716 PSMA5	0.270	716 TPI1P1	-0.211
717 NCAPG2	0.269	717 MAN2C1	-0.211
718 C5orf22	0.269	718 RPL21P28	-0.212
719 C17orf58	0.269	719 AMPD3	-0.212
720 POLR1E	0.269	720 RP11.9L18.2	-0.212
721 NEK4	0.269	721 NPIPA2	-0.212
722 CTB.131K11.1	0.269	722 CYB561A3	-0.212
723 PDRG1	0.269	723 GTF2IRD2P1	-0.212
724 SGOL1.AS1	0.269	724 RPL12P4	-0.212
725 TUBA1B	0.269	725 MT.ND5	-0.212
726 THAP1	0.269	726 DYNC1I2P1	-0.212
727 FANCE	0.269	727 AC016734.2	-0.213
728 PSIP1	0.268	728 ARHGAP1	-0.213
729 FAM136A	0.268	729 PSD4	-0.214
730 ANKRD18EP	0.268	730 ERN1	-0.214
731 XXbac.BPG300	0.268	731 CYBA	-0.214
732 RIF1	0.268	732 TRIM8	-0.214
733 MCM8	0.268	733 FBXW5	-0.214
734 MRPS18B	0.268	734 RP11.958N24.1	-0.215
735 CCDC121	0.268	735 ZDHHC24	-0.216
736 BRMS1L	0.268	736 RP11.819M15.	-0.216
737 NDUFA6	0.268	737 RP4.592A1.2	-0.216
738 SMN2	0.268	738 RP11.23N2.4	-0.217
739 SPAST	0.267	739 RP11.1212A22	-0.217
740 CSDE1	0.267	740 SEL1L	-0.217
741 QTRTD1	0.267	741 MYO18A	-0.217
742 ZC3HC1	0.267	742 SZT2	-0.218
743 SNRPA1	0.267	743 MGAT1	-0.218
744 TMEM126A	0.267	744 RP11.466H18.1	-0.218
745 PSMA3	0.267	745 NDUFV2P1	-0.218
746 ALG6	0.267	746 IL20RB	-0.218
747 ANAPC7	0.267	747 RP11.64B16.2	-0.218
748 DAXX	0.266	748 EEF1A1P12	-0.218
749 PSMB7	0.266	749 HOOK2	-0.218
750 HMGN1	0.266	750 RP11.46D6.1	-0.218
751 NDUFAF4	0.266	751 EIF4BP3	-0.219
752 ADAM11	0.266	752 AHSA2	-0.219
753 SDHC	0.266	753 POLR2J3	-0.219
754 ISOC1	0.266	754 SLC35C1	-0.219
755 RPS6KB1	0.266	755 IKBKGP1	-0.219
756 HNRNPU	0.266	756 RP11.730G20.2	-0.219
757 MTHFD1	0.266	757 TRAPPC12	-0.220
758 LYPLA1	0.265	758 RP11.1212A22	-0.220
759 METTL10	0.265	759 DGKZP1	-0.220
760 ATP5G1	0.265	760 MKNK2	-0.220

761 GOLGA7	0.265	761 PPIAP29	-0.220
762 IMMT	0.265	762 SUN2	-0.221
763 MCM4	0.265	763 CTD.2047H16.	-0.221
764 ARL5A	0.265	764 ZBTB7A	-0.221
765 BARD1	0.265	765 RP11.567I13.1	-0.221
766 SRFBP1	0.265	766 RPL9P8	-0.221
767 RCN2	0.265	767 RP13.996F3.4	-0.221
768 IPO5	0.265	768 EIF4HP1	-0.222
769 DNM1L	0.265	769 D2HGDH	-0.222
770 CSTF3	0.264	770 AC027601.1	-0.222
771 ZNF670	0.264	771 MON1B	-0.222
772 CTPS1	0.264	772 RP11.571M6.7	-0.223
773 SNRPD3	0.264	773 RPL21P39	-0.223
774 FANCG	0.264	774 NR1D1	-0.223
775 GTPBP8	0.264	775 WASH2P	-0.223
776 UTP20	0.264	776 RPS26P47	-0.223
777 COA6	0.264	777 HERPUD1	-0.224
778 CDK2	0.264	778 TOM1	-0.224
779 PRC1.AS1	0.264	779 AGAP9	-0.224
780 COMMD2	0.263	780 PRKD2	-0.224
781 ZNF2	0.263	781 PPP1R14BP3	-0.224
782 GINS3	0.263	782 DGKA	-0.225
783 RP11.32B11.2	0.263	783 RPL7AP66	-0.225
784 MOB1A	0.263	784 DNAJC4	-0.225
785 CENPN	0.263	785 RP3.508I15.19	-0.225
786 XRCC2	0.263	786 RP11.449P15.2	-0.225
787 ANAPC10	0.263	787 PDCL3P4	-0.225
788 TMEM106C	0.263	788 ERAP1	-0.226
789 RMND1	0.263	789 SBNO2	-0.226
790 SENP6	0.263	790 TBC1D3F	-0.226
791 KPNA3	0.263	791 NEAT1	-0.226
792 SMU1	0.263	792 LA16c.366D1.3	-0.227
793 GTF2A2	0.263	793 RP4.706A16.3	-0.227
794 CDC20	0.262	794 RP5.1142A6.2	-0.227
795 DHFRP1	0.262	795 AQP3	-0.227
796 RP4.816N1.7	0.262	796 UNKL	-0.229
797 NDRG3	0.262	797 TCIRG1	-0.229
798 RP11.804A23.2	0.262	798 MIR611	-0.229
799 ZFYVE20	0.262	799 C16orf58	-0.230
800 PNPT1	0.262	800 MZF1	-0.230
801 PAFAH1B3	0.262	801 RP11.452L6.5	-0.230
802 METTL2B	0.262	802 EEF1A1P19	-0.231
803 SMN1	0.261	803 SLX1A	-0.231
804 PMS1	0.261	804 RP11.122K13.1	-0.231
805 UMPS	0.261	805 ZC3H12A	-0.231
806 UHRF1BP1	0.261	806 BRD7P2	-0.232
807 MSH6	0.261	807 AC093724.2	-0.232
808 HNRNPH3	0.261	808 SPPL2B	-0.232

809 ATG10	0.261	809 EEF1A1P11	-0.232
810 RWDD1	0.261	810 AC017116.11	-0.232
811 MUT	0.261	811 AGAP5	-0.232
812 JPX	0.261	812 STIM1	-0.232
813 TLK2	0.261	813 CTB.54D4.1	-0.232
814 DNTTIP2	0.261	814 EIF3FP3	-0.232
815 PRDX6	0.261	815 ZNF865	-0.232
816 RPS27	0.261	816 AC093106.7	-0.233
817 ENOPH1	0.261	817 AC079250.1	-0.233
818 HMMR	0.261	818 ADPGK.AS1	-0.233
819 RP11.386G11.1	0.261	819 MEF2D	-0.233
820 CHEK2	0.261	820 CTC.575D19.1	-0.234
821 RP11.265N6.2	0.260	821 FTH1P8	-0.234
822 RBBP4	0.260	822 NFKBIZ	-0.234
823 SMNDC1	0.260	823 OS9	-0.234
824 ZNF280C	0.260	824 PKD1	-0.235
825 RPA1	0.260	825 RP11.3P17.4	-0.235
826 RIOK2	0.260	826 C7orf43	-0.235
827 UBE3D	0.260	827 STAT2	-0.236
828 ARL6IP6	0.260	828 ARSA	-0.236
829 DGUOK	0.260	829 ERCC5	-0.237
830 EXOSC8	0.259	830 RP11.448G15.3	-0.237
831 URI1	0.259	831 GOLGA6L3	-0.238
832 DPH5	0.259	832 PSMB8	-0.238
833 TRMT5	0.259	833 B2M	-0.238
834 PEX3	0.259	834 RP11.75L1.2	-0.238
835 TOMM70A	0.259	835 SDCBP2	-0.238
836 CTD.2410N18.4	0.259	836 RP11.395B7.7	-0.238
837 KIAA1586	0.259	837 hsa.mir.6723	-0.238
838 ESF1	0.259	838 RP11.796E2.4	-0.238
839 SUPT16H	0.259	839 FAM3C2	-0.239
840 NAA25	0.259	840 ABTB1	-0.239
841 CHCHD3	0.259	841 UBXN6	-0.239
842 RBBP7	0.259	842 FLYWCH1	-0.239
843 C12orf4	0.259	843 NPIPA8	-0.240
844 SUZ12	0.259	844 LPCAT4	-0.240
845 WDR12	0.258	845 RP11.517A5.4	-0.241
846 ABT1	0.258	846 TUBGCP6	-0.242
847 MRPS18A	0.258	847 CALCOCO1	-0.242
848 DLEU2	0.258	848 LENG8	-0.242
849 SNRNP27	0.258	849 RPL18AP3	-0.242
850 TAF9	0.258	850 CTD.2015B23.1	-0.242
851 FAM49B	0.258	851 TMSB4XP8	-0.242
852 ACAT1	0.258	852 RP11.158M2.3	-0.243
853 SPATA5	0.257	853 RP11.393I23.2	-0.243
854 KIAA1191	0.257	854 RPL13AP20	-0.245
855 COPS3	0.257	855 C19orf60	-0.245
856 COX11	0.257	856 JMJD8	-0.245

857 C6orf211	0.257	857 WHAMM	-0.245
858 RRP1B	0.257	858 AC137934.1	-0.246
859 RTN4IP1	0.257	859 SLC9A8	-0.246
860 SMIM11	0.257	860 COX6A1P2	-0.246
861 PIGW	0.257	861 ZNF688	-0.247
862 U2SURP	0.257	862 FKBP11	-0.248
863 TRUB1	0.257	863 RPLP0P6	-0.248
864 ZNF639	0.257	864 CTD.2260A17.	-0.248
865 TRAIP	0.256	865 RPS26P3	-0.248
866 SLBP	0.256	866 YPEL3	-0.248
867 C1QBP	0.256	867 GTF2IRD2	-0.248
868 TMEM194A	0.256	868 TOLLIP	-0.249
869 SMARCA5	0.256	869 IKBKG	-0.249
870 CS	0.256	870 MIB2	-0.249
871 DTYMK	0.256	871 GDI2P2	-0.249
872 RP11.203B9.4	0.256	872 RP11.66N24.3	-0.249
873 HNRNPD	0.256	873 TEP1	-0.251
874 NUP188	0.256	874 TMEM175	-0.251
875 CTD.2555O16.2	0.256	875 CTD.2287O16.	-0.251
876 MAPRE1	0.255	876 CTD.2192J16.1	-0.251
877 RARS	0.255	877 RP11.592N21.1	-0.251
878 BRCA1	0.255	878 RPS11P5	-0.251
879 TATDN1	0.255	879 PDIA3P	-0.252
880	0.255	880 TECRP1	-0.252
881 FEN1	0.255	881 RN7SL4P	-0.252
882 CUL5	0.255	882 DNAH1	-0.253
883 ZNF184	0.255	883 TYMP	-0.253
884 TFB2M	0.255	884 EME2	-0.253
885 DNAJC7	0.255	885 PML	-0.253
886 RPL7	0.255	886 CHPF2	-0.254
887 GABPA	0.255	887 ST13P15	-0.255
888 DDX46	0.255	888 AP003419.11	-0.256
889 C2orf47	0.254	889 RAC1P2	-0.256
890 RNF219	0.254	890 RABEP2	-0.256
891 NKAP	0.254	891 UBA7	-0.256
892 CTB.96E2.7	0.254	892 RP11.543P15.1	-0.256
893 RPSA	0.254	893 RP11.304L19.4	-0.257
894 C12orf29	0.254	894 SPSB3	-0.257
895 NOP58	0.254	895 CDIPT	-0.258
896 NONO	0.254	896 RNPEPL1	-0.258
897 GNL2	0.254	897 NADSYN1	-0.258
898 ELP6	0.253	898 FBXL15	-0.258
899 MAPK9	0.253	899 RP11.386M24.4	-0.259
900 UBE2C	0.253	900 POLD4	-0.259
901 TIMM17A	0.253	901 EHBP1L1	-0.259
902 ZNF627	0.253	902 MVP	-0.259
903 CEP76	0.253	903 RP11.175B9.3	-0.259
904 PSMB6	0.253	904 PTK2B	-0.261

905 NUP88	0.253	905 ST13P6	-0.261
906 SIRT1	0.253	906 RP11.3P17.5	-0.261
907 RP4.694A7.2	0.252	907 RP11.286H14.4	-0.261
908 RPL10AP6	0.252	908 IRF1	-0.263
909 KRR1	0.252	909 PIK3IP1	-0.263
910 MRPL45	0.252	910 AC007238.1	-0.263
911 GTPBP4	0.252	911 UPF3AP1	-0.264
912 SNRPB2	0.252	912 ST13P19	-0.264
913 CHAC2	0.252	913 NPIPA3	-0.264
914 CASC5	0.252	914 ARMC5	-0.264
915 SPG21	0.252	915 TXNDC11	-0.265
916 RHOT1	0.252	916 AP006621.8	-0.267
917 DCUN1D1	0.252	917 HIST2H4A	-0.267
918 API5	0.252	918 AP5Z1	-0.267
919 TBC1D22B	0.252	919 MROH1	-0.267
920 UTP6	0.252	920 RBCK1	-0.267
921 GDI2	0.251	921 PPP1R12C	-0.267
922 GRPEL1	0.251	922 RPL3P4	-0.267
923 C8orf59	0.251	923 RP11.742N3.1	-0.268
924 ZC3H15	0.251	924 NOMO2	-0.269
925 TTC21B	0.251	925 PNPLA2	-0.269
926 RP11.345J4.5	0.251	926 RPS26P8	-0.269
927 PHB	0.251	927 FTH1P23	-0.270
928 SERF1B	0.251	928 RP11.166B2.1	-0.270
929 TOPBP1	0.251	929 RP11.50D9.1	-0.271
930 TBCC	0.251	930 RPL7AP11	-0.271
931 FAM35A	0.251	931 RP3.417G15.1	-0.272
932 CDCA8	0.251	932 RP11.168J18.6	-0.272
933 CCBL2	0.251	933 RP11.16F15.2	-0.272
934 GGCT	0.250	934 KIAA0247	-0.272
935 BAG6	0.250	935 AC092155.1	-0.273
936 CWF19L1	0.250	936 GS1.184P14.2	-0.273
937 CYCS	0.250	937 NLRC5	-0.273
938 GPSM2	0.250	938 RPL21P119	-0.274
939 VPS26A	0.250	939 RP11.475C16.1	-0.274
940 SKA1	0.250	940 ARAP1	-0.274
941 CSTF2	0.250	941 AC022431.1	-0.276
942 RP5.867C24.5	0.250	942 OSBPL7	-0.277
943 KPNA4	0.250	943 UPF3AP2	-0.277
944 TYMS	0.250	944 YIPF2	-0.277
945 FAM210A	0.250	945 C5orf56	-0.279
946 DHX29	0.250	946 RPL13AP5	-0.280
947 MRPL1	0.250	947 CTD.2031P19.4	-0.280
948 OPA1	0.250	948 EEF1B2P3	-0.281
949 DHX36	0.250	949 RP11.761N21.2	-0.281
950 ACAD9	0.250	950 AC093734.1	-0.281
951 ALMS1	0.250	951 SYVN1	-0.283
952 ZNF271	0.250	952 TMEM259	-0.283

953 RBM18	0.250	953 LINC00957	-0.284
954 KPNA5	0.249	954 PLEKHM1P	-0.286
955 SRBD1	0.249	955 SLC38A10	-0.288
956 DDX31	0.249	956 MAFK	-0.290
957 HMGN2	0.249	957 AC116366.6	-0.290
958 ZNF326	0.249	958 MAP1LC3B2	-0.291
959 RP11.697E22.2	0.249	959 ZFP36	-0.292
960 UBE2L3	0.249	960 RASA4B	-0.293
961 UTP23	0.249	961 LRP10	-0.293
962 TBPL1	0.249	962 MT.ND6	-0.294
963 CHEK1	0.249	963 FTH1P2	-0.296
964 CRYZL1	0.249	964 AP000936.1	-0.298
965 FANCL	0.249	965 PCSK7	-0.299
966 HMGN4	0.249	966 TBC1D3C	-0.301
967 NCL	0.248	967 ARAP1.AS2	-0.303
968 RPL15	0.248	968 C1orf132	-0.303
969 RP11.650L12.2	0.248	969 AC107983.4	-0.303
970 GINS2	0.248	970 TTC7A	-0.303
971 GAPVD1	0.248	971 PARP10	-0.304
972 RPL22	0.248	972 RPL13AP7	-0.304
973 EIF2B3	0.248	973 RP11.514P8.8	-0.305
974 AZIN1	0.248	974 CTD.3232M19.	-0.305
975 POLA2	0.248	975 GTF2IRD2B	-0.307
976 C1orf109	0.248	976 RP11.680H20.1	-0.308
977 EIF3I	0.248	977 PLEKHM1	-0.309
978 ZNRD1	0.248	978 PSMB10	-0.309
979 HILPDA	0.247	979 MAPK8IP3	-0.309
980 XRN2	0.247	980 RPL13AP25	-0.315
981 RBBP5	0.247	981 RP11.680G24.4	-0.316
982 WRB	0.247	982 RASA4CP	-0.319
983 EXOSC10	0.247	983 KB.1027C11.4	-0.321
984 MRPS30	0.247	984 CTB.134H23.2	-0.333
985 TRMT11	0.247	985 TAPBPL	-0.335
986 CKAP2L	0.247	986 GNPTG	-0.336
987 ATP5H	0.247	987 RP11.109L13.1	-0.348
988 DNAJC9.AS1	0.247	988 RP11.490O6.2	-0.351
989 NAF1	0.246	989 TRADD	-0.353
990 HSPA8	0.246		
991 MTFR1	0.246		
992 TFDP2	0.246		
993 STOML2	0.246		
994 IDI1	0.246		
995 UBTD2	0.246		
996 NARG2	0.246		
997 COX7B	0.246		
998 ZFYVE16	0.246		
999 ARHGAP19	0.246		
1000 ATAD5	0.245		

1001 UBE2W	0.245
1002 TRMT1L	0.245
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1004 DCLRE1A	0.245
1005 HAUS3	0.245
1006 LSM14A	0.245
1007 RP11.423P10.2	0.245
1008 MRPL44	0.245
1009 CEP55	0.245
1010 HEATR1	0.245
1011 TUBG1	0.245
1012 CUL2	0.244
1013 ZBTB6	0.244
1014 FAM72B	0.244
1015 FANCD2	0.244
1016 CAPRIN1	0.244
1017 DHX40	0.244
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1019 POMP	0.244
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1024 LANCL1	0.243
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1026 PPP1R8	0.243
1027 MYL6B	0.243
1028 GPBP1	0.243
1029 SDHB	0.243
1030 PPT1	0.243
1031 SEC22C	0.243
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1034 POLR2B	0.242
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1036 ANP32E	0.242
1037 SPC24	0.242
1038 MED27	0.242
1039 SFXN1	0.242
1040 RP5.935K16.1	0.242
1041 MAPK14	0.242
1042 RBL1	0.242
1043 HDAC3	0.242
1044 PSMD8	0.242
1045 CLNS1A	0.241
1046 TMEM38B	0.241
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1048 NANP	0.241



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1054 RNF219.AS1	0.240
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1056 ZNF684	0.240
1057 PDCD2	0.240
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1060 PHF3	0.240
1061 CCDC167	0.240
1062 RP11.101E13.5	0.240
1063 MAK16	0.240
1064 TADA1	0.240
1065 CDC123	0.240
1066 PIGX	0.240
1067 COPRS	0.240
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1069 FAM20B	0.239
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1077 MORF4L2	0.239
1078 USP28	0.239
1079 FBXO28	0.238
1080 OAZ2	0.238
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1082 NCBP2.AS1	0.238
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1087 CNIH4	0.238
1088 ANKRD40	0.238
1089 RPL29	0.238
1090 THAP5	0.238
1091 DIAPH3	0.238
1092 SNRNP48	0.238
1093 TTC27	0.237
1094 EBNA1BP2	0.237
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1105 RP11.294J22.6	0.237
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1109 RPL9	0.237
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1145 MAP3K7	0.234
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1153 KB.1608C10.2	0.233
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1157 TMEM237	0.233
1158 RP11.603J24.17	0.233
1159 RP1.40E16.11	0.233
1160 CCDC41	0.233
1161 EIF2S2	0.233
1162 ZRANB3	0.233
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1164 CNBP	0.233
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1168 GTF3C6	0.233
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1171 TCEB3	0.232
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1179 KNTC1	0.232
1180 ARL6IP1	0.232
1181 WRAP53	0.232
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1183 RNF20	0.231
1184 RP11.631M6.2	0.231
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1186 CCP110	0.231
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1188 SENP1	0.231
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1195 RRP15	0.230
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1198 C1D	0.230
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1200 TAF2	0.230
1201 WDR70	0.230
1202 ARHGEF39	0.230
1203 TGS1	0.230
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1205 H2AFV	0.229
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1208 PIN4	0.229
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1210 C14orf166	0.229
1211 RPL7A	0.229
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1215 AURKB	0.229
1216 VPS72	0.229
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1219 SUPV3L1	0.228
1220 YARS2	0.228
1221 C5orf51	0.228
1222 PTPN11	0.228
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1232 DDX21	0.228
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1234 NDUFA5	0.228
1235 ANGEL2	0.228
1236 SLC29A1	0.227
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1238 CCSAP	0.227
1239 CAPZA1	0.227
1240 RSBN1	0.227

1241 RP11.161H23.9	0.227
1242 PIK3R4	0.227
1243 RP11.973D8.4	0.227
1244 RABEP1	0.227
1245 C17orf104	0.227
1246 DPH3	0.227
1247 SLC25A15	0.227
1248 PRPF38A	0.227
1249 MED4	0.226
1250 MPHOSPH6	0.226
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1252 FUBP3	0.226
1253 CISD2	0.226
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1257 RP11.95D17.1	0.226
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1259 SMC6	0.226
1260 TTC33	0.226
1261 HN1	0.226
1262 RAD23B	0.226
1263 YWHAZ	0.226
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1268 PDZD11	0.225
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1272 TSNAX	0.225
1273 SLC25A32	0.225
1274 TOPORS	0.225
1275 COMMD1	0.225
1276 TPI1	0.225
1277 ZNF138	0.224
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1279 SLC25A3	0.224
1280 PRMT5.AS1	0.224
1281 PSMB5	0.224
1282 HSPH1	0.224
1283 MCM2	0.224
1284 PANK3	0.224
1285 RP3.337H4.9	0.224
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1288 SHMT1	0.224

1289 TTI1	0.224
1290 RWDD4P1	0.224
1291 PSME3	0.224
1292 USP13	0.224
1293 C1orf52	0.223
1294 RP11.802O23.3	0.223
1295 ATP6V1C1	0.223
1296 GRPEL2	0.223
1297 ITGB1BP1	0.223
1298 RP11.256L6.2	0.223
1299 PTC3	0.223
1300 ARPP19	0.223
1301 WDR43	0.223
1302 COX6A1	0.223
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2006 AGBL5	0.182
2007 YTHDC2	0.182
2008 MIS18BP1	0.182

2009 SCYL2	0.182
2010 MRE11A	0.182
2011 AP000320.7	0.182
2012 ABCB10	0.181
2013 C10orf88	0.181
2014 METTL9	0.181
2015 FAM216A	0.181
2016 POLDIP2	0.181
2017 RP11.1094M14.	0.181
2018 SLC25A19	0.181
2019 FAM200A	0.181
2020 CRK	0.181
2021 TDG	0.181
2022 CBY1	0.181
2023 KIAA1009	0.181
2024 ZBTB26	0.181
2025 NBPF20	0.181
2026 SF3B3	0.181
2027 OSBPL8	0.181
2028 LSM6	0.181
2029 MSL1	0.181
2030 C3orf33	0.181
2031 SLC25A11	0.181
2032 RP11.773H22.4	0.181
2033 MTX1	0.181
2034 TK1	0.181
2035 LTA4H	0.181
2036 SLC5A6	0.181
2037 YBX1	0.181
2038 SERAC1	0.181
2039 MED30	0.181
2040 PLCG1	0.180
2041 NUP98	0.180
2042 UBLCP1	0.180
2043 KLHL12	0.180
2044 RP11.315I20.1	0.180
2045 KIAA0947	0.180
2046 PSMA6	0.180
2047 CTD.2026K11.2	0.180
2048 RCL1	0.180
2049 NPM3	0.180
2050 NDUFA12	0.180
2051 THAP9	0.180
2052 MRPL36	0.180
2053 THOC3	0.180
2054 NDUFA9	0.180
2055 HNRNPF	0.180
2056 RALA	0.180

2057 INTS9	0.180
2058 RP11.316M1.12	0.180
2059 SFPQ	0.180
2060 Sep-07	0.179
2061 TCERG1	0.179
2062 XRCC6BP1	0.179
2063 LLPH	0.179
2064 DUSP12	0.179
2065 PSMD10	0.179
2066 FRS2	0.179
2067 RAC1	0.179
2068 SF3B4	0.179
2069 LMBR1	0.179
2070 PAPOLG	0.179
2071 PHF16	0.179
2072 UBXLN7	0.179
2073 MIS12	0.179
2074 FUT10	0.179
2075 TOMM40	0.179
2076 SLC25A30	0.179
2077 ACOT7	0.178
2078 FAM53C	0.178
2079 UBL7.AS1	0.178
2080 TMEM67	0.178
2081 RTCA	0.178
2082 TIMM50	0.178
2083 NT5C3B	0.178
2084 RPS28	0.178
2085 TTC1	0.178
2086 GRSF1	0.178
2087 GPALPP1	0.178
2088 ERCC6L2	0.178
2089 SNW1	0.178
2090 RNFT1	0.177
2091 IPO8	0.177
2092 AFG3L2	0.177
2093 AC109828.1	0.177
2094 HCCS	0.177
2095 DTNBP1	0.177
2096 LARS2	0.177
2097 FIGNL1	0.177
2098 PSMA7	0.177
2099 UBL7	0.177
2100 ERCC3	0.177
2101 CCNF	0.177
2102 RWDD3	0.177
2103 TPMT	0.177
2104 DTNB	0.177

2105 LMNB2	0.177
2106 SLC25A5.AS1	0.177
2107 PCM1	0.177
2108 LPHN1	0.177
2109 BRK1	0.176
2110 RPS2	0.176
2111 DNAJC2	0.176
2112 MERTK	0.176
2113 SUPT3H	0.176
2114 UBQLN4	0.176
2115 STAU2	0.176
2116 AP2B1	0.176
2117 HMGCS1	0.176
2118 UBA1	0.176
2119 CNOT11	0.176
2120 PIK3R3	0.176
2121 WDR36	0.176
2122 RP13.638C3.4	0.176
2123 DR1	0.176
2124 C1orf174	0.176
2125 NHP2L1	0.176
2126 BNIP1	0.176
2127 KBTBD7	0.176
2128 FAM175A	0.176
2129 ERLIN1	0.176
2130 AKIRIN1	0.176
2131 NDUFAF2	0.176
2132 ATP5G2	0.176
2133 NRM	0.176
2134 RP11.1033A18.	0.175
2135 DTWD2	0.175
2136 C5orf54	0.175
2137 KIAA1279	0.175
2138 MRPL17	0.175
2139 TRIM52.AS1	0.175
2140 ACTR10	0.175
2141 C1orf216	0.175
2142 HNRNPDL	0.175
2143 WRN	0.175
2144 PLEKHA8	0.175
2145 VARS	0.175
2146 CLP1	0.175
2147 HEATR2	0.175
2148 PMPCB	0.175
2149 CWC15	0.175
2150 MYBL2	0.175
2151 CHD1L	0.175
2152 CUTA	0.175

2153 SUCLG1	0.174
2154 NSDHL	0.174
2155 FAM200B	0.174
2156 RMDN1	0.174
2157 ODF2	0.174
2158 VPS52	0.174
2159 MTFMT	0.174
2160 TAOK1	0.174
2161 COQ7	0.174
2162 POP7	0.174
2163 WEE1	0.174
2164 PFDN1	0.174
2165 SMCHD1	0.174
2166 RP11.61A14.3	0.174
2167 KM.PA.2	0.174
2168 ADNP	0.174
2169 NOP56	0.174
2170 SCLT1	0.174
2171 BRD3	0.174
2172 MAPT	0.173
2173 ANP32B	0.173
2174 CNIH2	0.173
2175 TACO1	0.173
2176 XXYLT1	0.173
2177 AC010127.5	0.173
2178 RP11.231C14.3	0.173
2179 LONRF1	0.173
2180 HMGB3	0.173
2181 ILF3	0.173
2182 GPANK1	0.173
2183 GDAP1	0.173
2184 TSEN34	0.173
2185 PPP2R3C	0.173
2186 ALG10	0.173
2187 CEP192	0.173
2188 EMC2	0.173
2189 FAM204A	0.172
2190 FAM92A1	0.172
2191 VPS25	0.172
2192 RP11.282O18.3	0.172
2193 AASDH	0.172
2194 BUD31	0.172
2195 PLRG1	0.172
2196 CDK5	0.172
2197 BRCA2	0.172
2198 VAPB	0.172
2199 NUDC	0.172
2200 ARPC3	0.172



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2202 DBI	0.172
2203 RNFT2	0.172
2204 MRPL21	0.172
2205 RP11.253M7.1	0.172
2206 PGBD1	0.172
2207 PSMC4	0.172
2208 MKLN1	0.172
2209 PHB2	0.172
2210 TOP2B	0.171
2211 RBM12B	0.171
2212 PARL	0.171
2213 BCL7C	0.171
2214 CEP85	0.171
2215 ARPC1A	0.171
2216 DHODH	0.171
2217 TOE1	0.171
2218 DYNC112	0.171
2219 POLE	0.171
2220 RPS4X	0.171
2221 TTI2	0.171
2222 NDUFB9	0.171
2223 NBN	0.171
2224 CEP135	0.171
2225 R3HDM1	0.171
2226 MBLAC2	0.171
2227 ITSN1	0.171
2228 RP11.889L3.1	0.171
2229 Sep-02	0.171
2230 PALB2	0.170
2231 E2F5	0.170
2232 ZNF322	0.170
2233 COX16	0.170
2234 MIER3	0.170
2235 PBRM1	0.170
2236 NQO2	0.170
2237 STRBP	0.170
2238 STAG2	0.170
2239 PMPCA	0.170
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2242 HACL1	0.170
2243 MYEOV2	0.170
2244 EIF3L	0.170
2245 SYAP1	0.170
2246 TARS	0.170
2247 AL358781.1	0.169
2248 SETP14	0.169

2249	NXT1	0.169
2250	FAM175B	0.169
2251	AL139819.1	0.169
2252	ASIC1	0.169
2253	CCAR1	0.169
2254	NDUFB3	0.169
2255	C11orf58	0.169
2256	TMTC3	0.169
2257	PDCD2L	0.169
2258	MCM5	0.169
2259	ENTPD1.AS1	0.169
2260	ATP5L	0.169
2261	WASF1	0.169
2262	MRPL48	0.169
2263	PGGT1B	0.169
2264	TMEM126B	0.169
2265	RP11.815I9.4	0.169
2266	GFM1	0.169
2267	TCEA1	0.168
2268	RNMTL1	0.168
2269	LRRC20	0.168
2270	FOXK2	0.168
2271	AC004381.6	0.168
2272	SEC23IP	0.168
2273	NDUFB2	0.168
2274	CIAPIN1	0.168
2275	MRPL33	0.168
2276	ING2	0.168
2277	CHAF1A	0.168
2278	LSM14B	0.168
2279	PPA2	0.168
2280	RP11.391M1.4	0.168
2281	POC5	0.168
2282	CCDC25	0.168
2283	AGO1	0.168
2284	HIPK1	0.168
2285	MPLKIP	0.168
2286	LBR	0.168
2287	SLC39A10	0.167
2288	CHCHD6	0.167
2289	TRMT112	0.167
2290	BDP1	0.167
2291	HCG25	0.167
2292	SNX14	0.167
2293	PIGP	0.167
2294	C6orf106	0.167
2295	MRPS35	0.167
2296	PINX1	0.167

2297 MDM1	0.167
2298 SRRM1	0.167
2299 FOXRED2	0.167
2300 RFWD2	0.167
2301 RSRC1	0.167
2302 IQCB1	0.167
2303 USP10	0.167
2304 APOA1BP	0.167
2305 IMPDH2	0.167
2306 WASH5P	0.167
2307 FAM189B	0.167
2308 RMI2	0.167
2309 RWDD2A	0.166
2310 TRIM24	0.166
2311 SLC25A14	0.166
2312 TSEN2	0.166
2313 TMEM242	0.166
2314 RP11.603J24.14	0.166
2315 THOC5	0.166
2316 NDUFAF6	0.166
2317 NDUFS5	0.166
2318 DLEU1	0.166
2319 FAM210B	0.166
2320 PRKCI	0.166
2321 ZNF107	0.166
2322 FOXP4	0.166
2323 AC002117.1	0.166
2324 ISCA2	0.166
2325 COMMD4	0.166
2326 WBP4	0.166
2327 GLOD4	0.166
2328 PUS3	0.165
2329 DENND5A	0.165
2330 MTA3	0.165
2331 C7orf73	0.165
2332 FASTKD5	0.165
2333 ERGIC2	0.165
2334 ZMYND19	0.165
2335 UBXN2B	0.165
2336 HSPA4L	0.165
2337 EIF3J	0.165
2338 SDAD1	0.165
2339 NDUFS1	0.165
2340 SUZ12P	0.165
2341 COMMD10	0.165
2342 TWF1	0.165
2343 KPNA1	0.165
2344 MAGI3	0.165

2345 GPATCH2	0.165
2346 SMEK2	0.164
2347 METTL21A	0.164
2348 HOMER1	0.164
2349 NFYA	0.164
2350 WRAP73	0.164
2351 RP11.180C16.1	0.164
2352 DCUN1D4	0.164
2353 TOP1	0.164
2354 JAGN1	0.164
2355 PGK1	0.164
2356 C2CD5	0.164
2357 VAPA	0.164
2358 BUD13	0.164
2359 DHX35	0.164
2360 ASH2L	0.164
2361 RC3H2	0.164
2362 FAHD2B	0.164
2363 FKTN	0.164
2364 BAZ1B	0.164
2365 UBIAD1	0.164
2366 ALKBH8	0.164
2367 KB.431C1.4	0.163
2368 C11orf84	0.163
2369 LYSMD1	0.163
2370 TNPO3	0.163
2371 TXNL1	0.163
2372 SREK1IP1	0.163
2373 NCAPH2	0.163
2374 UBXN8	0.163
2375 AHCYL1	0.163
2376 C4orf21	0.163
2377 XPR1	0.163
2378 CCDC47	0.163
2379 GTF2B	0.163
2380 RAB1F	0.163
2381 TMEM167A	0.163
2382 TSEN15	0.163
2383 PGRMC1	0.163
2384 CCDC15	0.163
2385 ZNF584	0.163
2386 EARS2	0.163
2387 ATF1	0.163
2388 BBS4	0.163
2389 CTNNA1	0.163
2390 TOR1AIP1	0.162
2391 NDUFAF5	0.162
2392 RPS24	0.162

2393 STXBP3	0.162
2394 HEATR3	0.162
2395 SNX16	0.162
2396 CRKL	0.162
2397 NGDN	0.162
2398 ACADM	0.162
2399 NTAN1	0.162
2400 ANKRD46	0.162
2401 RNF14	0.162
2402 EPB41L5	0.162
2403 DHX30	0.162
2404 NSA2	0.162
2405 C11orf30	0.162
2406 ZNF37A	0.162
2407 CPSF6	0.162
2408 ARL1	0.161
2409 KDM1B	0.161
2410 RP3.508I15.9	0.161
2411 PET117	0.161
2412 TTLL4	0.161
2413 KIAA1715	0.161
2414 AC016773.1	0.161
2415 CBWD1	0.161
2416 SAP18	0.161
2417 RPL12P1	0.161
2418 LCLAT1	0.161
2419 APIP	0.161
2420 CDK5R1	0.161
2421 WAPAL	0.161
2422 SOAT1	0.161
2423 RP11.423H2.1	0.161
2424 SFXN4	0.161
2425 CFDP1	0.161
2426 TUBGCP4	0.161
2427 FIG4	0.161
2428 RBM17	0.160
2429 INIP	0.160
2430 RPL23AP79	0.160
2431 FAM208B	0.160
2432 GLE1	0.160
2433 RFXAP	0.160
2434 CDCA4	0.160
2435 PTBP1	0.160
2436 C17orf75	0.160
2437 FAM199X	0.160
2438 PFAS	0.160
2439 THAP9.AS1	0.160
2440 OSGIN2	0.160

2441 TMEM50B	0.160
2442 IBTK	0.160
2443 UTP14A	0.160
2444 BCORL1	0.160
2445 UBE2E1	0.160
2446 CBWD3	0.159
2447 MIB1	0.159
2448 ZNHIT6	0.159
2449 MARCKSL1	0.159
2450 ADK	0.159
2451 DROSHA	0.159
2452 AL357673.1	0.159
2453 ANKRD26	0.159
2454 RPS18P9	0.159
2455 EPT1	0.159
2456 CRLS1	0.159
2457 MCPH1	0.159
2458 COX15	0.159
2459 GPM6B	0.159
2460 ZNF436	0.159
2461 ZBTB24	0.159
2462 SNRNP25	0.159
2463 RAP1A	0.159
2464 XXbac.BPG181	0.159
2465 TRNAU1AP	0.159
2466 CAD	0.159
2467 SNX6	0.159
2468 RP11.316M21.6	0.158
2469 MRPL46	0.158
2470 COA4	0.158
2471 TMX1	0.158
2472 NT5DC1	0.158
2473 ANKRD39	0.158
2474 SEMA4F	0.158
2475 MEX3D	0.158
2476 PGM2	0.158
2477 PSMD2	0.158
2478 LIG3	0.158
2479 GPATCH11	0.158
2480 C12orf60	0.158
2481 MCTS1	0.158
2482 CYB5B	0.158
2483 CHUK	0.158
2484 HADHB	0.158
2485 TOMM34	0.158
2486 MKKS	0.158
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2488 LSM11	0.158

2489 ATXN10	0.158
2490 CDK16	0.158
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2494 KREMEN1	0.157
2495 RPL41	0.157
2496 ELMOD2	0.157
2497 NDUFB8	0.157
2498 C19orf12	0.157
2499 AC009005.2	0.157
2500 RBM3	0.157
2501 UAP1	0.157
2502 SWT1	0.157
2503 PFN2	0.157
2504 GAPDHP1	0.157
2505 TRAF3IP2.AS1	0.157
2506 KCNIP4	0.157
2507 THUMPD1	0.157
2508 RPS6KA5	0.157
2509 AAR2	0.157
2510 RP11.27I1.4	0.157
2511 SENP2	0.157
2512 AC010976.2	0.157
2513 GID4	0.157
2514 PRKAG1	0.157
2515 PPP6R3	0.157
2516 RPS15A	0.156
2517 PIK3CB	0.156
2518 BLOC1S2	0.156
2519 CEP170	0.156
2520 RP11.977G19.1	0.156
2521 TMEM170A	0.156
2522 ZHX1	0.156
2523 DCP1A	0.156
2524 POMGNT2	0.156
2525 IDE	0.156
2526 N6AMT1	0.156
2527 COPS6	0.156
2528 SLC25A40	0.156
2529 RAB18	0.156
2530 PPM1G	0.156
2531 SLC25A5	0.156
2532 FARP2	0.156
2533 KIAA0586	0.156
2534 SRP14	0.156
2535 WDFY1	0.156
2536 RINT1	0.156

2537 CEP44	0.156
2538 ATP7B	0.155
2539 DHTKD1	0.155
2540 RP1.152L7.5	0.155
2541 ALDH1B1	0.155
2542 ZNF250	0.155
2543 IQCC	0.155
2544 MTMR4	0.155
2545 DIXDC1	0.155
2546 KHSRP	0.155
2547 CTC.524C5.2	0.155
2548 CTC.366B18.2	0.155
2549 CCDC18	0.155
2550 FBXO30	0.155
2551 UBR2	0.155
2552 ZNF565	0.155
2553 PES1	0.155
2554 NABP2	0.154
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2559 LRRC57	0.154
2560 BCAP29	0.154
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2567 CLPX	0.154
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2571 EIF4G2	0.154
2572 TXNL4A	0.154
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2577 INCENP	0.153
2578 PGAM1	0.153
2579 MTR	0.153
2580 ZNF45	0.153
2581 GTF2IP1	0.153
2582 KLHL7	0.153
2583 HNRNPU.AS1	0.153
2584 RHEB	0.153



2585 FAM222A	0.153
2586 EAF1.AS1	0.153
2587 CTB.96E2.3	0.153
2588 TATDN3	0.153
2589 IQCH	0.153
2590 RBBP8	0.153
2591 RHEBL1	0.153
2592 ESCO1	0.153
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2599 SMARCD1	0.153
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2603 COX20	0.152
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2607 MIER1	0.152
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2609 DDB1	0.152
2610 RXRB	0.152
2611 SFMBT1	0.152
2612 RP11.517B11.7	0.152
2613 LEO1	0.152
2614 SMC5	0.152
2615 MRP63	0.152
2616 CRY1	0.152
2617 AKR7A2	0.152
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2623 MTMR2	0.152
2624 YY1	0.152
2625 RAB7L1	0.152
2626 EXOSC5	0.152
2627 FECH	0.151
2628 AC034193.5	0.151
2629 PHYH	0.151
2630 COX5B	0.151
2631 CHTOP	0.151
2632 IARS	0.151

2633 KIF3A	0.151
2634 ZNF148	0.151
2635 AC006547.8	0.151
2636 COMMD5	0.151
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2659 GTPBP10	0.150
2660 RPS25	0.150
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2662 RP11.864J10.4	0.150
2663 ANKHD1	0.150
2664 ZFX	0.150
2665 FKBP5	0.150
2666 RBM22	0.150
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2668 HNRNPH1	0.149
2669 SAP30BP	0.149
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2671 GPN1	0.149
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2676 TMEM60	0.149
2677 HADHA	0.149
2678 AEBP2	0.149
2679 FUNDC1	0.149
2680 RP11.126K1.8	0.149

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2683 FOXN2	0.149
2684 CSRNP2	0.149
2685 RMND5A	0.149
2686 RP3.467N11.1	0.149
2687 DHRS13	0.149
2688 SACS	0.149
2689 SHPRH	0.149
2690 RP11.580I16.2	0.149
2691 PHF23	0.149
2692 COPZ1	0.149
2693 CTC.453G23.5	0.149
2694 TRMU	0.149
2695 PEF1	0.149
2696 FAM115A	0.149
2697 C19orf48	0.149
2698 RNF216P1	0.149
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