

SUPPLEMENTARY TABLE 2. Differentially enriched metabolic GO genes.

The total number of nucleosomes within each gene from differentially enriched metabolic GO pathways determined using HOMER (Heinz et al. 2010) are listed for each treatment group by EntrezID, gene symbol and gene description.

EntrezID	Gene Symbol	Gene Description	Nucleosome Number		
			LF	HF	HF+NaB
76251	0610007P08Rik	RIKEN cDNA 0610007P08 gene	690	693	668
58520	0610007P14Rik	RIKEN cDNA 0610007P14 gene	113	100	108
68327	0610007P22Rik	RIKEN cDNA 0610007P22 gene	16	16	19
66055	0610009D07Rik	RIKEN cDNA 0610009D07 gene	78	74	74
56700	0610031J06Rik	RIKEN cDNA 0610031J06 gene	46	49	47
68550	1110002N22Rik	RIKEN cDNA 1110002N22 gene	80	82	88
74319	1110005A03Rik	RIKEN cDNA 1110005A03 gene	12	11	14
66132	1110008L16Rik	RIKEN cDNA 1110008L16 gene	102	99	93
68497	1110018G07Rik	RIKEN cDNA 1110018G07 gene	123	120	121
66129	1110018J18Rik	RIKEN cDNA 1110018J18 gene	126	120	121
68646	1110020G09Rik	RIKEN cDNA 1110020G09 gene	181	178	177
66179	1110031I02Rik	RIKEN cDNA 1110031I02 gene	4	3	2
68736	1110034B05Rik	RIKEN cDNA 1110034B05 gene	470	471	478
66185	1110037F02Rik	RIKEN cDNA 1110037F02 gene	230	232	233
66209	1110054O05Rik	RIKEN cDNA 1110054O05 gene	229	232	231
76974	1190003J15Rik	RIKEN cDNA 1190003J15 gene	31	32	29
98685	1190005F20Rik	RIKEN cDNA 1190005F20 gene	98	96	95
74133	1200011M11Rik	RIKEN cDNA 1200011M11 gene	45	49	44
71997	1500002O20Rik	RIKEN cDNA 1500002O20 gene	93	94	93
68964	1500010J02Rik	RIKEN cDNA 1500010J02 gene	49	47	50
78896	1500015O10Rik	RIKEN cDNA 1500015O10 gene	486	504	468
76927	1700021C14Rik	RIKEN cDNA 1700021C14 gene	60	53	60
100502698	1700021K19Rik	RIKEN cDNA 1700021K19 gene	101	95	98
69382	1700024P04Rik	RIKEN cDNA 1700024P04 gene	329	332	337
67334	1700054O13Rik	RIKEN cDNA 1700054O13 gene	239	230	223
73582	1700106N22Rik	RIKEN cDNA 1700106N22 gene	677	686	668
73626	1810009J06Rik	RIKEN cDNA 1810009J06 gene	74	73	72
69064	1810014F10Rik	RIKEN cDNA 1810014F10 gene	29	29	29
329509	1810024B03Rik	RIKEN cDNA 1810024B03 gene	79	79	80
67490	1810074P20Rik	RIKEN cDNA 1810074P20 gene	708	710	700
69816	2010001M09Rik	RIKEN cDNA 2010001M09 gene	39	41	43
66552	2010106G01Rik	RIKEN cDNA 2010106G01 gene	170	172	171
72061	2010111I01Rik	RIKEN cDNA 2010111I01 gene	523	525	528
67373	2210010C04Rik	RIKEN cDNA 2210010C04 gene	388	398	384
66526	2210012G02Rik	RIKEN cDNA 2210012G02 gene	107	108	108
233545	2210018M11Rik	RIKEN cDNA 2210018M11 gene	267	275	269
71881	2310001A20Rik	RIKEN cDNA 2310001A20 gene	133	129	121
71885	2310003H01Rik	RIKEN cDNA 2310003H01 gene	97	102	99
69487	2310003L22Rik	RIKEN cDNA 2310003L22 gene	266	291	274
76947	2310030N02Rik	RIKEN cDNA 2310030N02 gene	170	167	156
69596	2310035K24Rik	RIKEN cDNA 2310035K24 gene	64	60	59
78323	2310046O06Rik	RIKEN cDNA 2310046O06 gene	36	43	43
78890	2310079F23Rik	RIKEN cDNA 2310079F23 gene	70	74	71
66991	2410004A20Rik	RIKEN cDNA 2410004A20 gene	90	88	88
71952	2410016O06Rik	RIKEN cDNA 2410016O06 gene	189	189	179
69709	2410017P09Rik	RIKEN cDNA 2410017P09 gene	127	124	132
66423	2410022L05Rik	RIKEN cDNA 2410022L05 gene	50	46	49
66511	2500003M10Rik	RIKEN cDNA 2500003M10 gene	33	28	30

70312	2510012J08Rik	RIKEN cDNA 2510012J08 gene	36	34	38
70415	2610018G03Rik	RIKEN cDNA 2610018G03 gene	382	382	369
77032	2610029I01Rik	RIKEN cDNA 2610029I01 gene	64	62	63
67958	2610101N10Rik	RIKEN cDNA 2610101N10 gene	207	196	189
214764	2700050L05Rik	RIKEN cDNA 2700050L05 gene	99	104	100
78832	2700078E11Rik	RIKEN cDNA 2700078E11 gene	373	374	377
72650	2810006K23Rik	RIKEN cDNA 2810006K23 gene	155	143	140
66469	2810405K02Rik	RIKEN cDNA 2810405K02 gene	75	74	78
381406	2810408M09Rik	RIKEN cDNA 2810408M09 gene	38	40	38
69962	2810422O20Rik	RIKEN cDNA 2810422O20 gene	74	82	68
72931	2900010J23Rik	RIKEN cDNA 2900010J23 gene	20	21	20
73218	3110056O03Rik	RIKEN cDNA 3110056O03 gene	27	26	29
403183	4832428D23Rik	RIKEN cDNA 4832428D23 gene	514	524	505
228151	4833423E24Rik	RIKEN cDNA 4833423E24 gene	185	183	179
320204	4833442J19Rik	RIKEN cDNA 4833442J19 gene	117	110	113
381393	4921509C19Rik	RIKEN cDNA 4921509C19 gene	508	505	515
66715	4921515J06Rik	RIKEN cDNA 4921515J06 gene	158	148	147
74653	4930444A02Rik	RIKEN cDNA 4930444A02 gene	51	49	55
214639	4930486L24Rik	RIKEN cDNA 4930486L24 gene	116	118	117
75106	4930519F16Rik	RIKEN cDNA 4930519F16 gene	156	158	157
75097	4930524E20Rik	RIKEN cDNA 4930524E20 gene	1823	1856	1761
71001	4931440L10Rik	RIKEN cDNA 4931440L10 gene	89	88	79
229227	4932438A13Rik	RIKEN cDNA 4932438A13 gene	467	465	482
237958	4933407P14Rik	RIKEN cDNA 4933407P14 gene	127	123	136
321000	4933421E11Rik	RIKEN cDNA 4933421E11 gene	344	367	344
99650	4933434E20Rik	RIKEN cDNA 4933434E20 gene	12	13	14
67555	4933434I20Rik	RIKEN cDNA 4933434I20 gene	66	69	70
71275	4933437F05Rik	RIKEN cDNA 4933437F05 gene	85	88	90
75731	5133401N09Rik	RIKEN cDNA 5133401N09 gene	107	110	114
229722	5330417C22Rik	RIKEN cDNA 5330417C22 gene	120	120	120
100502841	5430411K18Rik	RIKEN cDNA 5430411K18 gene	268	274	270
68251	5430437P03Rik	RIKEN cDNA 5430437P03 gene	13	13	10
70564	5730469M10Rik	RIKEN cDNA 5730469M10 gene	137	137	132
77011	5730590G19Rik	RIKEN cDNA 5730590G19 gene	134	122	123
67788	6330577E15Rik	RIKEN cDNA 6330577E15 gene	188	184	186
319582	6430573F11Rik	RIKEN cDNA 6430573F11 gene	460	478	458
328092	6530401N04Rik	RIKEN cDNA 6530401N04 gene	71	76	70
381572	9430007A20Rik	RIKEN cDNA 9430007A20 gene	132	129	130
68118	9430023L20Rik	RIKEN cDNA 9430023L20 gene	32	31	31
241134	9430031J16Rik	RIKEN cDNA 9430031J16 gene	1943	1955	1911
319801	9630033F20Rik	RIKEN cDNA 9630033F20 gene	104	98	97
320454	9930032O22Rik	RIKEN cDNA 9930032O22 gene	199	214	210
50518	a	nonagouti	242	250	241
69865	A1cf	APOBEC1 complementation factor	430	436	414
216792	A230051G13Rik	RIKEN cDNA A230051G13 gene	58	58	58
223267	A2ld1	AIG2-like domain 1	577	566	579
232345	A2m	alpha-2-macroglobulin	471	476	464
215493	A3galt2	alpha 1,3-galactosyltransferase 2 (isoglobotriaosylceramide syntha	97	97	95
239559	A4galt	alpha 1,4-galactosyltransferase	237	242	235
333424	A4gnt	alpha-1,4-N-acetylglucosaminyltransferase	66	69	71
433294	A530098C11Rik	RIKEN cDNA A530098C11 gene	208	213	206
223970	A630055G03Rik	RIKEN cDNA A630055G03 gene	253	251	255
338371	A730011L01Rik	RIKEN cDNA A730011L01 gene	204	206	195
227612	A830007P12Rik	RIKEN cDNA A830007P12 gene	42	38	36
68169	A930038C07Rik	RIKEN cDNA A930038C07 gene	242	235	233

78894	Aacs	acetoacetyl-CoA synthetase	109	115	118
67758	Aadac	arylacetamide deacetylase (esterase)	85	91	85
230883	Aadacl3	arylacetamide deacetylase-like 3	102	105	104
23923	Aadat	aminoadipate aminotransferase	2164	2156	2144
269774	Aak1	AP2 associated kinase 1	197	212	199
11298	Aanat	arylalkylamine N-acetyltransferase	55	52	55
234734	Aars	alanyl-tRNA synthetase	31	32	29
224805	Aars2	alanyl-tRNA synthetase 2, mitochondrial (putative)	63	61	64
231326	Aasdh	aminoadipate-semialdehyde dehydrogenase	150	139	143
67618	Aasdhppt	aminoadipate-semialdehyde dehydrogenase-phosphopantetheinyl	987	997	977
30956	Aass	aminoadipate-semialdehyde synthase	460	479	474
56321	Aatf	apoptosis antagonizing transcription factor	413	424	428
11302	Aatk	apoptosis-associated tyrosine kinase	98	83	94
268860	Abat	4-aminobutyrate aminotransferase	217	211	223
11303	Abca1	ATP-binding cassette, sub-family A (ABC1), member 1	331	327	330
381072	Abca17	ATP-binding cassette, sub-family A (ABC1), member 17	129	138	131
11305	Abca2	ATP-binding cassette, sub-family A (ABC1), member 2	22	22	23
27410	Abca3	ATP-binding cassette, sub-family A (ABC1), member 3	83	83	88
11304	Abca4	ATP-binding cassette, sub-family A (ABC1), member 4	374	369	368
27404	Abca8b	ATP-binding cassette, sub-family A (ABC1), member 8b	343	335	338
217262	Abca9	ATP-binding cassette, sub-family A (ABC1), member 9	198	207	195
18671	Abcb1a	ATP-binding cassette, sub-family B (MDR/TAP), member 1A	223	226	214
18669	Abcb1b	ATP-binding cassette, sub-family B (MDR/TAP), member 1B	297	292	296
18670	Abcb4	ATP-binding cassette, sub-family B (MDR/TAP), member 4	260	253	254
74104	Abcb6	ATP-binding cassette, sub-family B (MDR/TAP), member 6	26	30	26
17250	Abcc1	ATP-binding cassette, sub-family C (CFTR/MRP), member 1	319	311	320
12780	Abcc2	ATP-binding cassette, sub-family C (CFTR/MRP), member 2	114	109	108
76408	Abcc3	ATP-binding cassette, sub-family C (CFTR/MRP), member 3	185	179	191
27416	Abcc5	ATP-binding cassette, sub-family C (CFTR/MRP), member 5	227	226	210
27421	Abcc6	ATP-binding cassette, sub-family C (CFTR/MRP), member 6	131	131	133
19299	Abcd3	ATP-binding cassette, sub-family D (ALD), member 3	295	289	294
224742	Abcf1	ATP-binding cassette, sub-family F (GCN20), member 1	24	26	23
11307	Abcg1	ATP-binding cassette, sub-family G (WHITE), member 1	226	214	218
26357	Abcg2	ATP-binding cassette, sub-family G (WHITE), member 2	463	463	464
27409	Abcg5	ATP-binding cassette, sub-family G (WHITE), member 5	71	69	73
67470	Abcg8	ATP-binding cassette, sub-family G (WHITE), member 8	138	135	132
213012	Abhd10	abhydrolase domain containing 10	154	156	156
193742	Abhd16a	abhydrolase domain containing 16A	27	28	26
105501	Abhd4	abhydrolase domain containing 4	40	45	47
67469	Abhd5	abhydrolase domain containing 5	351	363	357
11308	Abi1	abl-interactor 1	233	214	215
329165	Abi2	abl-interactor 2	292	295	289
11350	Abi1	c-abl oncogene 1, non-receptor tyrosine kinase	283	275	279
11352	Abi2	v-abl Abelson murine leukemia viral oncogene homolog 2 (arg, Abi2)	270	249	258
226251	Ablim1	actin-binding LIM protein 1	579	580	564
231148	Ablim2	actin-binding LIM protein 2	190	210	220
319713	Ablim3	actin binding LIM protein family, member 3	210	218	213
80908	Abo	ABO blood group (transferase A, alpha 1-3-N-acetylgalactosaminyl)	308	308	310
76507	Abp1	amiloride binding protein 1 (amine oxidase, copper-containing)	124	128	130
223513	Abra	actin-binding Rho activating protein	1085	1083	1044
30946	Abt1	activator of basal transcription 1	80	74	73
80283	Abtb1	ankyrin repeat and BTB (POZ) domain containing 1	181	182	189
113868	Acaa1a	acetyl-Coenzyme A acyltransferase 1A	20	24	20
235674	Acaa1b	acetyl-Coenzyme A acyltransferase 1B	114	115	115
52538	Acaa2	acetyl-Coenzyme A acyltransferase 2 (mitochondrial 3-oxoacyl-CoA)	228	226	235

107476	Acaca	acetyl-Coenzyme A carboxylase alpha	448	455	450
100705	Acacb	acetyl-Coenzyme A carboxylase beta	175	191	177
71985	Acad10	acyl-Coenzyme A dehydrogenase family, member 10	57	53	53
102632	Acad11	acyl-Coenzyme A dehydrogenase family, member 11	80	82	78
338350	Acad12	acyl-Coenzyme A dehydrogenase family, member 12	79	74	87
66948	Acad8	acyl-Coenzyme A dehydrogenase family, member 8	99	99	102
229211	Acad9	acyl-Coenzyme A dehydrogenase family, member 9	127	126	125
11363	Acadl	acyl-Coenzyme A dehydrogenase, long-chain	150	145	147
11364	Acadm	acyl-Coenzyme A dehydrogenase, medium chain	79	76	84
11409	Acads	acyl-Coenzyme A dehydrogenase, short chain	157	164	166
66885	Acadsb	acyl-Coenzyme A dehydrogenase, short/branched chain	160	173	166
11370	Acadvl	acyl-Coenzyme A dehydrogenase, very long chain	9	8	9
11595	Acan	aggrecan	284	284	275
216859	Acap1	ArfGAP with coiled-coil, ankyrin repeat and PH domains 1	26	25	24
110446	Acat1	acetyl-Coenzyme A acetyltransferase 1	175	176	169
110460	Acat2	acetyl-Coenzyme A acetyltransferase 2	68	63	62
224530	Acat3	acetyl-Coenzyme A acetyltransferase 3	49	52	50
170760	Acbd3	acyl-Coenzyme A binding domain containing 3	156	150	158
329470	Accs	1-aminocyclopropane-1-carboxylate synthase homolog (Arabidops	61	64	63
381411	Accsl	1-aminocyclopropane-1-carboxylate synthase homolog (Arabidops	138	139	144
497652	Acd	adrenocortical dysplasia	13	9	11
11421	Ace	angiotensin I converting enzyme (peptidyl-dipeptidase A) 1	84	86	76
70008	Ace2	angiotensin I converting enzyme (peptidyl-dipeptidase A) 2	203	209	199
171168	Acer1	alkaline ceramidase 1	70	69	73
230379	Acer2	alkaline ceramidase 2	487	474	483
66190	Acer3	alkaline ceramidase 3	211	197	202
11423	Ache	acetylcholinesterase	49	50	54
56215	Acin1	apoptotic chromatin condensation inducer 1	81	78	82
104112	Acly	ATP citrate lyase	97	92	89
266645	Acmsd	amino carboxymuconate semialdehyde decarboxylase	120	131	124
230161	Acnat1	acyl-coenzyme A amino acid N-acyltransferase 1	131	123	120
209186	Acnat2	acyl-coenzyme A amino acid N-acyltransferase 2	485	498	487
11428	Aco1	aconitase 1	1006	1009	1015
11429	Aco2	aconitase 2, mitochondrial	68	68	68
26897	Acot1	acyl-CoA thioesterase 1	64	65	69
64833	Acot10	acyl-CoA thioesterase 10	2829	2889	2808
329910	Acot11	acyl-CoA thioesterase 11	230	220	226
74156	Acot12	acyl-CoA thioesterase 12	346	340	341
171210	Acot2	acyl-CoA thioesterase 2	75	80	76
171281	Acot3	acyl-CoA thioesterase 3	40	38	38
171282	Acot4	acyl-CoA thioesterase 4	54	56	55
217698	Acot5	acyl-CoA thioesterase 5	56	62	63
217700	Acot6	acyl-CoA thioesterase 6	64	56	52
70025	Acot7	acyl-CoA thioesterase 7	179	166	175
170789	Acot8	acyl-CoA thioesterase 8	27	26	28
56360	Acot9	acyl-CoA thioesterase 9	154	156	150
11430	Acox1	acyl-Coenzyme A oxidase 1, palmitoyl	22	22	23
93732	Acox2	acyl-Coenzyme A oxidase 2, branched chain	129	119	120
80911	Acox3	acyl-Coenzyme A oxidase 3, pristanoyl	136	130	136
74121	Acoxl	acyl-Coenzyme A oxidase-like	385	381	376
11431	Acp1	acid phosphatase 1, soluble	34	32	36
11432	Acp2	acid phosphatase 2, lysosomal	54	55	56
11433	Acp5	acid phosphatase 5, tartrate resistant	63	62	61
56318	Acpp	acid phosphatase, prostate	221	211	211
11434	Acr	acrosin prepropeptide	109	114	106

94180	Acsbg1	acyl-CoA synthetase bubblegum family member 1	145	151	148
328845	Acsbg2	acyl-CoA synthetase bubblegum family member 2	57	59	60
264895	Acsf2	acyl-CoA synthetase family member 2	85	85	85
257633	Acsf3	acyl-CoA synthetase family member 3	193	174	178
14081	Acs11	acyl-CoA synthetase long-chain family member 1	329	332	336
74205	Acs13	acyl-CoA synthetase long-chain family member 3	186	180	180
50790	Acs14	acyl-CoA synthetase long-chain family member 4	466	456	464
433256	Acs15	acyl-CoA synthetase long-chain family member 5	103	90	94
216739	Acs16	acyl-CoA synthetase long-chain family member 6	149	152	146
117147	Acsm1	acyl-CoA synthetase medium-chain family member 1	164	169	163
233799	Acsm2	acyl-CoA synthetase medium-chain family member 2	129	131	129
20216	Acsm3	acyl-CoA synthetase medium-chain family member 3	91	93	93
233801	Acsm4	acyl-CoA synthetase medium-chain family member 4	133	133	136
272428	Acsm5	acyl-CoA synthetase medium-chain family member 5	42	37	41
68738	Acss1	acyl-CoA synthetase short-chain family member 1	109	96	102
60525	Acss2	acyl-CoA synthetase short-chain family member 2	100	108	96
380660	Acss3	acyl-CoA synthetase short-chain family member 3	993	1031	985
11464	Actc1	actin, alpha, cardiac muscle 1	52	49	48
56456	Actl6a	actin-like 6A	159	164	161
83766	Actl6b	actin-like 6B	52	46	43
109275	Actr5	ARP5 actin-related protein 5 homolog (yeast)	31	34	34
56249	Actr8	ARP8 actin-related protein 8 homolog (<i>S. cerevisiae</i>)	55	45	53
11477	Acvr1	activin A receptor, type 1	498	498	519
11479	Acvr1b	activin A receptor, type 1B	121	119	122
269275	Acvr1c	activin A receptor, type 1C	554	535	550
11480	Acvr2a	activin receptor IIA	4795	4884	4725
11481	Acvr2b	activin receptor IIB	110	112	107
11482	Acvr11	activin A receptor, type II-like 1	75	79	71
109652	Acy1	aminoacylase 1	20	23	21
71670	Acy3	aspartoacylase (aminoacylase) 3	26	23	25
11486	Ada	adenosine deaminase	161	155	164
21744	Adad1	adenosine deaminase domain containing 1 (testis specific)	334	334	325
75773	Adad2	adenosine deaminase domain containing 2	36	33	35
75894	Adal	adenosine deaminase-like	41	40	40
11487	Adam10	a disintegrin and metalloproteinase domain 10	350	346	339
11488	Adam11	a disintegrin and metalloproteinase domain 11	131	129	127
11489	Adam12	a disintegrin and metalloproteinase domain 12 (meltrin alpha)	741	757	776
11490	Adam15	a disintegrin and metalloproteinase domain 15 (metargidin)	35	30	36
11491	Adam17	a disintegrin and metalloproteinase domain 17	134	133	121
13524	Adam18	a disintegrin and metalloproteinase domain 18	162	161	161
11492	Adam19	a disintegrin and metalloproteinase domain 19 (meltrin beta)	155	154	145
280668	Adam1a	a disintegrin and metalloproteinase domain 1a	53	55	54
280667	Adam1b	a disintegrin and metalloproteinase domain 1b	79	73	82
11495	Adam2	a disintegrin and metalloproteinase domain 2	154	143	147
56622	Adam21	a disintegrin and metalloproteinase domain 21	86	83	76
11496	Adam22	a disintegrin and metalloproteinase domain 22	462	460	457
23792	Adam23	a disintegrin and metalloproteinase domain 23	503	508	529
13526	Adam24	a disintegrin and metalloproteinase domain 24 (testase 1)	143	148	138
23793	Adam25	a disintegrin and metalloproteinase domain 25 (testase 2)	145	147	150
13525	Adam26a	a disintegrin and metalloproteinase domain 26A (testase 3)	131	131	127
382007	Adam26b	a disintegrin and metalloproteinase domain 26B	346	356	346
13522	Adam28	a disintegrin and metalloproteinase domain 28	575	561	565
11497	Adam3	a disintegrin and metalloproteinase domain 3 (cyritestin)	198	204	187
353188	Adam32	a disintegrin and metalloproteinase domain 32	239	243	239
110751	Adam33	a disintegrin and metalloproteinase domain 33	50	54	49

11499 Adam5	a disintegrin and metallopeptidase domain 5	289	277	284
11500 Adam7	a disintegrin and metallopeptidase domain 7	595	592	582
11501 Adam8	a disintegrin and metallopeptidase domain 8	72	75	74
11502 Adam9	a disintegrin and metallopeptidase domain 9 (meltrin gamma)	81	83	86
58860 Adamdec1	ADAM-like, decysin 1	158	158	162
11504 Adamts1	a disintegrin-like and metallopeptidase (reprolysin type) with throml	447	447	436
224697 Adamts10	a disintegrin-like and metallopeptidase (reprolysin type) with throml	157	153	154
239337 Adamts12	a disintegrin-like and metallopeptidase (reprolysin type) with throml	452	459	454
279028 Adamts13	a disintegrin-like and metallopeptidase (reprolysin type) with throml	58	60	58
237360 Adamts14	a disintegrin-like and metallopeptidase (reprolysin type) with throml	154	160	157
235130 Adamts15	a disintegrin-like and metallopeptidase (reprolysin type) with throml	662	654	650
271127 Adamts16	a disintegrin-like and metallopeptidase (reprolysin type) with throml	1674	1712	1711
233332 Adamts17	a disintegrin-like and metallopeptidase (reprolysin type) with throml	619	614	622
208936 Adamts18	a disintegrin-like and metallopeptidase (reprolysin type) with throml	622	637	606
240322 Adamts19	a disintegrin-like and metallopeptidase (reprolysin type) with throml	484	520	493
216725 Adamts2	a disintegrin-like and metallopeptidase (reprolysin type) with throml	497	495	493
223838 Adamts20	a disintegrin-like and metallopeptidase (reprolysin type) with throml	1226	1229	1194
330119 Adamts3	a disintegrin-like and metallopeptidase (reprolysin type) with throml	773	778	769
240913 Adamts4	a disintegrin-like and metallopeptidase (reprolysin type) with throml	28	27	28
23794 Adamts5	a disintegrin-like and metallopeptidase (reprolysin type) with throml	1919	1964	1935
108154 Adamts6	a disintegrin-like and metallopeptidase (reprolysin type) with throml	750	732	732
108153 Adamts7	a disintegrin-like and metallopeptidase (reprolysin type) with throml	197	200	197
30806 Adamts8	a disintegrin-like and metallopeptidase (reprolysin type) with throml	141	138	145
101401 Adamts9	a disintegrin-like and metallopeptidase (reprolysin type) with throml	298	302	298
56417 Adar	adenosine deaminase, RNA-specific	334	330	340
110532 Adarb1	adenosine deaminase, RNA-specific, B1	200	199	197
94191 Adarb2	adenosine deaminase, RNA-specific, B2	2861	2861	2783
30947 Adat1	adenosine deaminase, tRNA-specific 1	93	91	99
66757 Adat2	adenosine deaminase, tRNA-specific 2, TAD2 homolog (S. cerevis	66	72	67
100113398 Adat3	adenosine deaminase, tRNA-specific 3, TAD2 homolog (S. cerevis	16	15	18
242669 Adc	arginine decarboxylase	138	139	141
72113 Adck1	aarF domain containing kinase 1	502	505	516
57869 Adck2	aarF domain containing kinase 2	49	41	47
67426 Adck3	aarF domain containing kinase 3	357	346	350
76889 Adck4	aarF domain containing kinase 4	41	42	42
268822 Adck5	aarF domain containing kinase 5	96	87	89
432530 Adcy1	adenylate cyclase 1	684	694	675
271639 Adcy10	adenylate cyclase 10	223	222	224
210044 Adcy2	adenylate cyclase 2	1193	1224	1187
104111 Adcy3	adenylate cyclase 3	192	207	202
104110 Adcy4	adenylate cyclase 4	27	28	26
224129 Adcy5	adenylate cyclase 5	435	433	440
11512 Adcy6	adenylate cyclase 6	79	73	73
11513 Adcy7	adenylate cyclase 7	236	240	224
11514 Adcy8	adenylate cyclase 8	1769	1778	1747
11515 Adcy9	adenylate cyclase 9	385	375	372
11516 Adcyap1	adenylate cyclase activating polypeptide 1	4592	4695	4585
11518 Add1	adducin 1 (alpha)	112	116	117
11522 Adh1	alcohol dehydrogenase 1 (class I)	118	116	116
26876 Adh4	alcohol dehydrogenase 4 (class II), pi polypeptide	84	88	80
11532 Adh5	alcohol dehydrogenase 5 (class III), chi polypeptide	100	95	97
69117 Adh6a	alcohol dehydrogenase 6A (class V)	122	120	128
11529 Adh7	alcohol dehydrogenase 7 (class IV), mu or sigma polypeptide	118	118	123
76187 Adhfe1	alcohol dehydrogenase, iron containing, 1	75	71	69
104923 Adi1	acireductone dioxygenase 1	128	140	133

11450	Adipoq	adiponectin, C1Q and collagen domain containing	117	122	116
72674	Adipor1	adiponectin receptor 1	61	64	64
68465	Adipor2	adiponectin receptor 2	191	202	192
11534	Adk	adenosine kinase	559	566	573
11535	Adm	adrenomedullin	208	206	198
11538	Adnp	activity-dependent neuroprotective protein	191	183	191
240442	Adnp2	ADNP homeobox 2	200	199	202
211488	Ado	2-aminoethanethiol (cysteamine) dioxygenase	477	495	468
11539	Adora1	adenosine A1 receptor	123	123	116
11541	Adora2b	adenosine A2b receptor	255	263	264
72141	Adpgk	ADP-dependent glucokinase	418	395	420
11544	Adprh	ADP-ribosylarginine hydrolase	31	32	29
234072	Adprh1	ADP-ribosylhydrolase like 1	120	119	116
11548	Adra1b	adrenergic receptor, alpha 1b	846	845	831
11551	Adra2a	adrenergic receptor, alpha 2a	1454	1472	1464
11552	Adra2b	adrenergic receptor, alpha 2b	99	111	113
11553	Adra2c	adrenergic receptor, alpha 2c	363	360	368
11554	Adrb1	adrenergic receptor, beta 1	333	335	328
11555	Adrb2	adrenergic receptor, beta 2	486	477	478
110355	Adrbk1	adrenergic receptor kinase, beta 1	149	149	141
320129	Adrbk2	adrenergic receptor kinase, beta 2	227	216	216
56436	Adrm1	adhesion regulating molecule 1	126	133	130
11564	Adsl	adenylosuccinate lyase	240	229	230
11566	Adss	adenylosuccinate synthetase, non muscle	330	339	328
11565	Adssl1	adenylosuccinate synthetase like 1	70	69	66
11568	Aebp1	AE binding protein 1	47	46	47
11569	Aebp2	AE binding protein 2	1055	1046	1070
14797	Aes	amino-terminal enhancer of split	34	32	34
226250	Afap112	actin filament associated protein 1-like 2	315	325	315
17355	Aff1	AF4/FMR2 family, member 1	336	330	332
14266	Aff2	AF4/FMR2 family, member 2	1507	1513	1410
16764	Aff3	AF4/FMR2 family, member 3	880	908	891
93736	Aff4	AF4/FMR2 family, member 4	126	124	127
114896	Afg31	AFG3(ATPase family gene 3)-like 1 (yeast)	92	94	92
69597	Afg32	AFG3(ATPase family gene 3)-like 2 (yeast)	98	99	98
71562	Afmid	arylformamidase	22	21	17
11576	Afp	alpha fetoprotein	72	71	79
11593	Aga	aspartylglucosaminidase	6160	6276	5962
347722	Agap1	ArfGAP with GTPase domain, ankyrin repeat and PH domain 1	788	783	799
216439	Agap2	ArfGAP with GTPase domain, ankyrin repeat and PH domain 2	60	47	53
213990	Agap3	ArfGAP with GTPase domain, ankyrin repeat and PH domain 3	88	92	86
244071	Agbl1	ATP/GTP binding protein-like 1	3482	3473	3450
271813	Agbl2	ATP/GTP binding protein-like 2	140	130	133
76223	Agbl3	ATP/GTP binding protein-like 3	188	190	188
78933	Agbl4	ATP/GTP binding protein-like 4	1289	1311	1308
231093	Agbl5	ATP/GTP binding protein-like 5	48	51	48
69923	Agk	acylglycerol kinase	412	433	431
77559	Agl	amylase-1,6-glucosidase, 4-alpha-glucanotransferase	201	187	182
75986	Agmat	agmatine ureohydrolase (agmatinase)	91	80	80
319660	Agmo	alkylglycerol monooxygenase	975	963	914
55979	Agpat1	1-acylglycerol-3-phosphate O-acyltransferase 1 (lysophosphatidic acid)	21	17	17
67512	Agpat2	1-acylglycerol-3-phosphate O-acyltransferase 2 (lysophosphatidic acid)	48	47	50
28169	Agpat3	1-acylglycerol-3-phosphate O-acyltransferase 3	229	210	231
68262	Agpat4	1-acylglycerol-3-phosphate O-acyltransferase 4 (lysophosphatidic acid)	1906	1894	1922
52123	Agpat5	1-acylglycerol-3-phosphate O-acyltransferase 5 (lysophosphatidic acid)	271	266	278

102247	Agpat6	1-acylglycerol-3-phosphate O-acyltransferase 6 (lysophosphatidic :)	108	115	109
231510	Agpat9	1-acylglycerol-3-phosphate O-acyltransferase 9	1093	1107	1085
235386	Agphd1	aminoglycoside phosphotransferase domain containing 1	108	110	108
228061	Agps	alkylglycerone phosphate synthase	309	297	295
11603	Agrn	agrln	115	120	117
11606	Agt	angiotensinogen (serpin peptidase inhibitor, clade A, member 8)	74	68	79
67269	Agtpbp1	ATP/GTP binding protein 1	1012	981	978
11607	Agtr1a	angiotensin II receptor, type 1a	516	520	516
11609	Agtr2	angiotensin II receptor, type 2	419	423	410
11611	Agxt	alanine-glyoxylate aminotransferase	74	76	74
268782	Agxt2	alanine-glyoxylate aminotransferase 2	367	376	371
226747	Ahctf1	AT hook containing transcription factor 1	382	386	383
269378	Ahcy	S-adenosylhomocysteine hydrolase	161	156	154
229709	Ahcy1	S-adenosylhomocysteine hydrolase-like 1	167	161	164
74340	Ahcy2	S-adenosylhomocysteine hydrolase-like 2	356	350	351
11622	Ahr	aryl-hydrocarbon receptor	982	1000	952
11624	Ahrr	aryl-hydrocarbon receptor repressor	142	151	139
106821	AI314976	expressed sequence AI314976	32	28	26
107197	AI462493	expressed sequence AI462493	23	22	20
329828	AI464131	expressed sequence AI464131	51	48	53
11628	Aicda	activation-induced cytidine deaminase	116	116	117
11629	Aif1	allograft inflammatory factor 1	29	28	30
26926	Aifm1	apoptosis-inducing factor, mitochondrion-associated 1	69	68	67
71361	Aifm2	apoptosis-inducing factor, mitochondrion-associated 2	122	125	134
72168	Aifm3	apoptosis-inducing factor, mitochondrion-associated 3	75	76	71
231872	Aimp2	aminoacyl tRNA synthetase complex-interacting multifunctional prc	19	20	17
11632	Aip	aryl-hydrocarbon receptor-interacting protein	29	32	31
114230	Aipl1	aryl hydrocarbon receptor-interacting protein-like 1	390	380	385
11634	Aire	autoimmune regulator (autoimmune polyendocrinopathy candidiasi	10	8	12
104103	Airn	antisense Igf2r RNA	123	127	122
11636	Ak1	adenylate kinase 1	57	55	62
11637	Ak2	adenylate kinase 2	121	120	126
56248	Ak3	adenylate kinase 3	66	67	69
11639	Ak4	adenylate kinase 4	195	198	190
229949	Ak5	adenylate kinase 5	399	406	405
78801	Ak7	adenylate kinase 7	132	134	129
68870	Ak8	adenylate kinase 8	44	48	43
11640	Akap1	A kinase (PRKA) anchor protein 1	318	318	335
83397	Akap12	A kinase (PRKA) anchor protein (gravin) 12	561	540	533
434756	Akap14	A kinase (PRKA) anchor protein 14	77	78	67
338351	Akap17b	A kinase (PRKA) anchor protein 17B	170	178	183
11643	Akap4	A kinase (PRKA) anchor protein 4	174	177	166
238276	Akap5	A kinase (PRKA) anchor protein 5	146	157	148
56399	Akap8	A kinase (PRKA) anchor protein 8	87	83	83
54194	Akap8l	A kinase (PRKA) anchor protein 8-like	86	78	84
433693	Akirin2	akirin 2	538	530	551
100182	Akna	AT-hook transcription factor	87	86	89
11648	Akp3	alkaline phosphatase 3, intestine, not Mn requiring	69	70	70
58810	Akr1a4	aldo-keto reductase family 1, member A4 (aldehyde reductase)	82	76	84
11677	Akr1b3	aldo-keto reductase family 1, member B3 (aldose reductase)	50	52	47
11997	Akr1b7	aldo-keto reductase family 1, member B7	124	125	120
14187	Akr1b8	aldo-keto reductase family 1, member B8	89	85	84
622402	Akr1c12	aldo-keto reductase family 1, member C12	245	251	241
27384	Akr1c13	aldo-keto reductase family 1, member C13	102	103	103
105387	Akr1c14	aldo-keto reductase family 1, member C14	260	269	261

105349	Akr1c18	aldo-keto reductase family 1, member C18	167	166	159
116852	Akr1c20	aldo-keto reductase family 1, member C20	188	178	176
77337	Akr1c21	aldo-keto reductase family 1, member C21	101	111	102
83702	Akr1c6	aldo-keto reductase family 1, member C6	309	322	300
208665	Akr1d1	aldo-keto reductase family 1, member D1	548	578	544
56043	Akr1e1	aldo-keto reductase family 1, member E1	1610	1619	1593
110198	Akr7a5	aldo-keto reductase family 7, member A5 (aflatoxin aldehyde reduc	51	52	57
11651	Akt1	thymoma viral proto-oncogene 1	37	36	37
11652	Akt2	thymoma viral proto-oncogene 2	139	143	140
23797	Akt3	thymoma viral proto-oncogene 3	790	783	771
14339	Aktip	thymoma viral proto-oncogene 1 interacting protein	319	315	323
17025	Alad	aminolevulinate, delta-, dehydratase	26	29	26
11655	Alas1	aminolevulinic acid synthase 1	77	76	76
11656	Alas2	aminolevulinic acid synthase 2, erythroid	158	158	147
69748	Aldh16a1	aldehyde dehydrogenase 16 family, member A1	12	14	13
56454	Aldh18a1	aldehyde dehydrogenase 18 family, member A1	127	126	126
11668	Aldh1a1	aldehyde dehydrogenase family 1, subfamily A1	299	315	290
19378	Aldh1a2	aldehyde dehydrogenase family 1, subfamily A2	406	404	418
56847	Aldh1a3	aldehyde dehydrogenase family 1, subfamily A3	381	392	382
26358	Aldh1a7	aldehyde dehydrogenase family 1, subfamily A7	466	456	444
72535	Aldh1b1	aldehyde dehydrogenase 1 family, member B1	192	185	190
107747	Aldh1I1	aldehyde dehydrogenase 1 family, member L1	193	173	184
216188	Aldh1I2	aldehyde dehydrogenase 1 family, member L2	245	237	234
11669	Aldh2	aldehyde dehydrogenase 2, mitochondrial	94	87	100
11670	Aldh3a1	aldehyde dehydrogenase family 3, subfamily A1	110	122	118
11671	Aldh3a2	aldehyde dehydrogenase family 3, subfamily A2	173	176	172
67689	Aldh3b1	aldehyde dehydrogenase 3 family, member B1	28	28	31
621603	Aldh3b2	aldehyde dehydrogenase 3 family, member B2	65	65	62
212647	Aldh4a1	aldehyde dehydrogenase 4 family, member A1	97	102	105
214579	Aldh5a1	aldehyde dehydrogenase family 5, subfamily A1	133	126	132
104776	Aldh6a1	aldehyde dehydrogenase family 6, subfamily A1	39	45	44
110695	Aldh7a1	aldehyde dehydrogenase family 7, member A1	200	189	186
237320	Aldh8a1	aldehyde dehydrogenase 8 family, member A1	370	372	393
56752	Aldh9a1	aldehyde dehydrogenase 9, subfamily A1	111	113	116
11674	Aldoa	aldolase A, fructose-bisphosphate	31	28	30
353204	Aldoart1	aldolase 1 A retrogene 1	1472	1546	1493
79459	Aldoart2	aldolase 1 A retrogene 2	139	134	139
230163	Aldob	aldolase B, fructose-bisphosphate	95	101	106
11676	Aldoc	aldolase C, fructose-bisphosphate	33	38	37
208211	Alg1	asparagine-linked glycosylation 1 homolog (yeast, beta-1,4-manno	45	42	40
207958	Alg11	asparagine-linked glycosylation 11 homolog (yeast, alpha-1,2-man	81	88	89
223774	Alg12	asparagine-linked glycosylation 12 homolog (yeast, alpha-1,6-man	89	92	88
67574	Alg13	asparagine-linked glycosylation 13 homolog (S. cerevisiae)	180	188	184
56737	Alg2	asparagine-linked glycosylation 2 homolog (yeast, alpha-1,3-mann	157	156	147
320438	Alg6	asparagine-linked glycosylation 6 homolog (yeast, alpha-1,3,-glucc	228	233	213
381903	Alg8	asparagine-linked glycosylation 8 homolog (yeast, alpha-1,3-gluco:	80	91	91
102580	Alg9	asparagine-linked glycosylation 9 homolog (yeast, alpha 1,2 mann	114	105	114
11682	Alk	anaplastic lymphoma kinase	1363	1355	1351
211064	Alkbh1	alkB, alkylation repair homolog 1 (E. coli)	6	7	8
231642	Alkbh2	alkB, alkylation repair homolog 2 (E. coli)	37	40	36
69113	Alkbh3	alkB, alkylation repair homolog 3 (E. coli)	256	264	271
72041	Alkbh4	alkB, alkylation repair homolog 4 (E. coli)	44	44	45
268420	Alkbh5	alkB, alkylation repair homolog 5 (E. coli)	293	290	296
66400	Alkbh7	alkB, alkylation repair homolog 7 (E. coli)	11	10	13
67667	Alkbh8	alkB, alkylation repair homolog 8 (E. coli)	270	256	260

94041	Allc	allantoicase	87	91	97
236266	Alms1	Alstrom syndrome 1 homolog (human)	317	339	313
11684	Alox12	arachidonate 12-lipoxygenase	104	116	114
11686	Alox12b	arachidonate 12-lipoxygenase, 12R type	90	89	95
11685	Alox12e	arachidonate lipoxygenase, epidermal	130	129	120
11687	Alox15	arachidonate 15-lipoxygenase	105	109	113
11689	Alox5	arachidonate 5-lipoxygenase	201	202	199
11690	Alox5ap	arachidonate 5-lipoxygenase activating protein	268	260	268
11688	Alox8	arachidonate 8-lipoxygenase	98	104	97
23801	Aloxe3	arachidonate lipoxygenase 3	46	45	48
76768	Alpi	alkaline phosphatase, intestinal	46	44	42
71481	Alpk1	alpha-kinase 1	200	207	203
11647	Alpl	alkaline phosphatase, liver/bone/kidney	224	222	230
11650	Alpl2	alkaline phosphatase, placental-like 2	514	516	501
74018	Als2	amyotrophic lateral sclerosis 2 (juvenile) homolog (human)	121	117	115
216285	Alx1	ALX homeobox 1	906	922	872
11694	Alx3	aristaless-like homeobox 3	101	96	90
11695	Alx4	aristaless-like homeobox 4	468	449	470
17117	Amacr	alpha-methylacyl-CoA racemase	67	58	56
11699	Ambp	alpha 1 microglobulin/bikunin	269	275	258
228361	Ambra1	autophagy/beclin 1 regulator 1	292	276	281
11702	Amd1	S-adenosylmethionine decarboxylase 1	58	59	62
100041585	Amd2	S-adenosylmethionine decarboxylase 2	50	55	55
71761	Amdhd1	amidohydrolase domain containing 1	66	67	71
245847	Amdhd2	amidohydrolase domain containing 2	37	35	37
23802	Amfr	autocrine motility factor receptor	303	284	286
11705	Amh	anti-Mullerian hormone	16	13	15
110542	Amhr2	anti-Mullerian hormone type 2 receptor	75	71	72
109674	Ampd2	adenosine monophosphate deaminase 2	59	60	65
11717	Ampd3	adenosine monophosphate deaminase 3	287	286	287
434437	Amt	aminomethyltransferase	18	21	22
11722	Amy1	amylase 1, salivary	189	194	183
109959	Amy2a5	amylase 2a5	301	288	293
231842	Amz1	archaelysin family metallopeptidase 1	164	159	154
13929	Amz2	archaelysin family metallopeptidase 2	136	139	137
17222	Anapc1	anaphase promoting complex subunit 1	353	367	349
68999	Anapc10	anaphase promoting complex subunit 10	450	445	445
66156	Anapc11	anaphase promoting complex subunit 11	13	12	14
69010	Anapc13	anaphase promoting complex subunit 13	122	130	119
99152	Anapc2	anaphase promoting complex subunit 2	22	22	19
52206	Anapc4	anaphase promoting complex subunit 4	343	352	344
59008	Anapc5	anaphase-promoting complex subunit 5	92	93	87
56317	Anapc7	anaphase promoting complex subunit 7	151	139	142
11727	Ang	angiogenin, ribonuclease, RNase A family, 5	31	30	29
11730	Ang3	angiogenin, ribonuclease A family, member 3	43	45	43
219033	Ang4	angiogenin, ribonuclease A family, member 4	112	108	110
503844	Ang5	angiogenin, ribonuclease A family, member 5	56	61	58
630952	Ang6	angiogenin, ribonuclease A family, member 6	198	188	180
11600	Angpt1	angiopoietin 1	1651	1704	1669
11602	Angpt4	angiopoietin 4	157	164	165
30924	Angptl3	angiopoietin-like 3	262	263	241
11733	Ank1	ankyrin 1, erythroid	471	461	473
244859	Ankk1	ankyrin repeat and kinase domain containing 1	192	192	181
107765	Ankrd1	ankyrin repeat domain 1 (cardiac muscle)	376	366	388
78321	Ankrd23	ankyrin repeat domain 23	45	46	43

56503	Ankrd49	ankyrin repeat domain 49	17	17	18
11737	Anp32a	acidic (leucine-rich) nuclear phosphoprotein 32 family, member A	323	308	321
16790	Anpep	alanyl (membrane) aminopeptidase	135	139	141
16952	Anxa1	annexin A1	1725	1742	1728
11745	Anxa3	annexin A3	792	823	780
27052	Aoah	acyloxyacyl hydrolase	773	796	763
237940	Aoc2	amine oxidase, copper containing 2 (retina-specific)	16	18	18
11754	Aoc3	amine oxidase, copper containing 3	52	54	56
11761	Aox1	aldehyde oxidase 1	151	158	155
71724	Aox3	aldehyde oxidase 3	239	241	243
71872	Aox4	aldehyde oxidase 4	221	218	208
11783	Apaf1	apoptotic peptidase activating factor 1	667	638	661
11785	Apbp1	amyloid beta (A4) precursor protein-binding, family B, member 1	59	58	59
11789	Apc	adenomatous polyposis coli	433	432	415
11792	Apex1	apurinic/aprimidinic endonuclease 1	8	7	8
77622	Apex2	apurinic/aprimidinic endonuclease 2	50	49	50
226548	Aph1a	anterior pharynx defective 1a homolog (C. elegans)	15	17	13
208117	Aph1b	anterior pharynx defective 1b homolog (C. elegans)	158	161	160
68318	Aph1c	anterior pharynx defective 1c homolog (C. elegans)	157	165	160
56369	Apip	APAF1 interacting protein	296	299	299
69928	Apitd1	apoptosis-inducing, TAF9-like domain 1	52	52	50
72103	Aplf	aprataxin and PNKP like factor	181	179	175
11803	Aplp1	amyloid beta (A4) precursor-like protein 1	39	43	44
11806	Apoa1	apolipoprotein A-I	291	304	294
11807	Apoa2	apolipoprotein A-II	17	16	15
11808	Apoa4	apolipoprotein A-IV	44	43	43
66113	Apoa5	apolipoprotein A-V	41	40	39
238055	Apob	apolipoprotein B	3654	3641	3641
11810	Apobec1	apolipoprotein B mRNA editing enzyme, catalytic polypeptide 1	77	73	73
11811	Apobec2	apolipoprotein B mRNA editing enzyme, catalytic polypeptide 2	56	56	50
71281	Apobec4	apolipoprotein B mRNA editing enzyme, catalytic polypeptide-like 4	181	188	179
171504	Apobr	apolipoprotein B receptor	15	17	11
11812	Apoc1	apolipoprotein C-I	23	24	22
11813	Apoc2	apolipoprotein C-II	19	18	23
11814	Apoc3	apolipoprotein C-III	15	15	16
11816	Apoe	apolipoprotein E	29	25	26
103161	Apof	apolipoprotein F	23	20	23
11818	Apoh	apolipoprotein H	109	108	104
55938	Apom	apolipoprotein M	14	13	13
11820	App	amyloid beta (A4) precursor protein	911	931	911
11821	Aprt	adenine phosphoribosyl transferase	53	53	54
66408	Aptx	aprataxin	312	304	318
11826	Aqp1	aquaporin 1	231	217	221
11834	Aqr	aquarius	182	184	185
11835	Ar	androgen receptor	1743	1791	1708
11836	Araf	v-raf murine sarcoma 3611 viral oncogene homolog	203	202	198
69710	Arap1	ArfGAP with RhoGAP domain, ankyrin repeat and PH domain 1	189	180	190
11839	Areg	amphiregulin	401	430	418
11845	Arf6	ADP-ribosylation factor 6	148	154	149
11846	Arg1	arginase, liver	544	543	548
11847	Arg2	arginase type II	108	109	109
239027	Arhgap22	Rho GTPase activating protein 22	354	333	338
72754	Arhgef10l	Rho guanine nucleotide exchange factor (GEF) 10-like	600	580	611
213498	Arhgef11	Rho guanine nucleotide exchange factor (GEF) 11	276	287	286
93760	Arid1a	AT rich interactive domain 1A (SWI-like)	274	277	275

77044	Arid2	AT rich interactive domain 2 (ARID, RFX-like)	232	231	233
13496	Arid3a	AT rich interactive domain 3A (BRIGHT-like)	52	46	48
56380	Arid3b	AT rich interactive domain 3B (BRIGHT-like)	185	184	192
550619	Arid3c	AT rich interactive domain 3C (BRIGHT-like)	19	24	20
238247	Arid4a	AT rich interactive domain 4A (RBP1-like)	184	177	170
94246	Arid4b	AT rich interactive domain 4B (RBP1-like)	581	576	588
214855	Arid5a	AT rich interactive domain 5A (MRF1-like)	123	119	126
71371	Arid5b	AT rich interactive domain 5B (MRF1-like)	726	746	736
23806	Arih1	ariadne ubiquitin-conjugating enzyme E2 binding protein homolog	218	218	215
23807	Arih2	ariadne homolog 2 (Drosophila)	83	74	82
56327	Arl2	ADP-ribosylation factor-like 2	39	45	43
107566	Arl2bp	ADP-ribosylation factor-like 2 binding protein	121	131	125
11861	Arl4a	ADP-ribosylation factor-like 4A	1742	1726	1700
56297	Arl6	ADP-ribosylation factor-like 6	1330	1336	1316
71703	Armcx3	armadillo repeat containing, X-linked 3	63	71	69
11863	Arnt	aryl hydrocarbon receptor nuclear translocator	90	88	91
11864	Arnt2	aryl hydrocarbon receptor nuclear translocator 2	592	573	569
11865	Arntl	aryl hydrocarbon receptor nuclear translocator-like	539	541	539
272322	Arntl2	aryl hydrocarbon receptor nuclear translocator-like 2	161	157	155
109689	Arrb1	arrestin, beta 1	84	88	85
216869	Arrb2	arrestin, beta 2	50	54	54
11883	Arsa	arylsulfatase A	57	57	62
11881	Arsb	arylsulfatase B	488	512	493
74008	Arsg	arylsulfatase G	177	176	174
545260	Arsi	arylsulfatase i	94	93	91
271970	Arsj	arylsulfatase J	831	857	826
77041	Arsk	arylsulfatase K	51	53	55
11870	Art1	ADP-ribosyltransferase 1	21	20	22
11872	Art2b	ADP-ribosyltransferase 2b	136	141	131
109979	Art3	ADP-ribosyltransferase 3	25	24	28
11875	Art5	ADP-ribosyltransferase 5	22	21	22
68865	Arv1	ARV1 homolog (yeast)	41	38	41
11878	Arx	aristaless related homeobox	1263	1248	1215
57344	As3mt	arsenic (+3 oxidation state) methyltransferase	91	94	91
11886	Asah1	N-acylsphingosine amidohydrolase 1	234	221	221
54447	Asah2	N-acylsphingosine amidohydrolase 2	429	434	440
69299	Asb9	ankyrin repeat and SOCS box-containing 9	682	672	655
69090	Ascc1	activating signal cointegrator 1 complex subunit 1	209	197	199
75452	Ascc2	activating signal cointegrator 1 complex subunit 2	100	96	98
77987	Ascc3	activating signal cointegrator 1 complex subunit 3	1385	1399	1413
17172	Ascl1	achaete-scute complex homolog 1 (Drosophila)	589	593	590
17173	Ascl2	achaete-scute complex homolog 2 (Drosophila)	136	135	132
56787	Ascl3	achaete-scute complex homolog 3 (Drosophila)	38	40	35
66403	Asf1a	ASF1 anti-silencing function 1 homolog A (S. cerevisiae)	142	143	143
66929	Asf1b	ASF1 anti-silencing function 1 homolog B (S. cerevisiae)	93	87	94
11890	Asgr2	asialoglycoprotein receptor 2	107	96	97
192195	Ash1l	ash1 (absent, small, or homeotic)-like (Drosophila)	184	176	172
23808	Ash2l	ash2 (absent, small, or homeotic)-like (Drosophila)	65	65	58
109900	Asl	argininosuccinate lyase	28	38	36
56495	Asna1	arsA arsenite transporter, ATP-binding, homolog 1 (bacterial)	18	15	15
27053	Asns	asparagine synthetase	381	369	364
70396	Asnsd1	asparagine synthetase domain containing 1	499	495	475
11484	Aspa	aspartoacylase	80	81	75
68352	Aspdh	aspartate dehydrogenase domain containing	27	27	29
104816	Aspg	asparaginase homolog (S. cerevisiae)	163	168	172

65973	Asph	aspartate-beta-hydroxylase	694	687	670
233879	Asphd1	aspartate beta-hydroxylase domain containing 1	29	24	24
72898	Asphd2	aspartate beta-hydroxylase domain containing 2	118	112	114
67855	Asprv1	aspartic peptidase, retroviral-like 1	175	181	189
66514	Asrgl1	asparaginase like 1	1034	1042	1048
11898	Ass1	argininosuccinate synthetase 1	405	413	421
215095	Astl	astacin-like metalloendopeptidase (M12 family)	36	36	40
228790	Asxl1	additional sex combs like 1 (Drosophila)	204	197	197
211961	Asxl3	additional sex combs like 3 (Drosophila)	1080	1099	1086
74068	Asz1	ankyrin repeat, SAM and basic leucine zipper domain containing 1	178	177	174
70472	Atad2	ATPase family, AAA domain containing 2	83	81	82
11907	Ate1	arginyltransferase 1	363	376	367
11908	Atf1	activating transcription factor 1	168	167	170
11909	Atf2	activating transcription factor 2	174	177	168
11910	Atf3	activating transcription factor 3	191	189	195
11911	Atf4	activating transcription factor 4	37	36	40
107503	Atf5	activating transcription factor 5	110	115	116
12915	Atf6b	activating transcription factor 6 beta	34	25	26
223922	Atf7	activating transcription factor 7	185	184	186
54343	Atf7ip	activating transcription factor 7 interacting protein	308	319	300
75329	Atf7ip2	activating transcription factor 7 interacting protein 2	188	188	179
66795	Atg10	autophagy-related 10 (yeast)	698	709	687
67526	Atg12	autophagy-related 12 (yeast)	19	18	17
51897	Atg13	ATG13 autophagy related 13 homolog (S. cerevisiae)	80	79	76
100504663	Atg14	VATG14 autophagy related 14 homolog (S. cerevisiae)	249	251	245
77040	Atg16l1	autophagy-related 16-like 1 (yeast)	221	219	213
73683	Atg16l2	autophagy related 16 like 2 (S. cerevisiae)	263	282	284
67841	Atg3	autophagy-related 3 (yeast)	82	81	80
666468	Atg4a	autophagy-related 4A (yeast)	393	376	385
66615	Atg4b	autophagy-related 4B (yeast)	59	56	58
242557	Atg4c	autophagy-related 4C (yeast)	699	713	686
235040	Atg4d	autophagy-related 4D (yeast)	54	50	48
11793	Atg5	autophagy-related 5 (yeast)	186	186	188
74244	Atg7	autophagy-related 7 (yeast)	651	648	640
245860	Atg9a	autophagy-related 9A (yeast)	15	16	15
213948	Atg9b	ATG9 autophagy related 9 homolog B (S. cerevisiae)	36	34	34
212974	Ath1	ATH1, acid trehalase-like 1 (yeast)	41	39	37
108147	Atic	5-aminoimidazole-4-carboxamide ribonucleotide formyltransferase/	306	304	313
73991	Atl1	atlastin GTPase 1	127	130	131
11920	Atm	ataxia telangiectasia mutated homolog (human)	159	176	170
13498	Atn1	atrophin 1	32	31	29
11921	Atoh1	atonal homolog 1 (Drosophila)	2241	2268	2246
53404	Atoh7	atonal homolog 7 (Drosophila)	185	184	177
71093	Atoh8	atonal homolog 8 (Drosophila)	252	263	264
231287	Atp10d	ATPase, class V, type 10D	432	436	437
192113	Atp12a	ATPase, H+/K+ transporting, nongastric, alpha polypeptide	176	172	179
268878	Atp13a5	ATPase type 13A5	435	430	418
11928	Atp1a1	ATPase, Na+/K+ transporting, alpha 1 polypeptide	590	609	588
98660	Atp1a2	ATPase, Na+/K+ transporting, alpha 2 polypeptide	66	73	65
232975	Atp1a3	ATPase, Na+/K+ transporting, alpha 3 polypeptide	131	121	121
27222	Atp1a4	ATPase, Na+/K+ transporting, alpha 4 polypeptide	103	103	100
11931	Atp1b1	ATPase, Na+/K+ transporting, beta 1 polypeptide	619	641	605
11932	Atp1b2	ATPase, Na+/K+ transporting, beta 2 polypeptide	52	47	46
11933	Atp1b3	ATPase, Na+/K+ transporting, beta 3 polypeptide	292	287	285
67821	Atp1b4	ATPase, (Na+)/K+ transporting, beta 4 polypeptide	251	240	237

11937	Atp2a1	ATPase, Ca ⁺⁺ transporting, cardiac muscle, fast twitch 1	59	60	57
11938	Atp2a2	ATPase, Ca ⁺⁺ transporting, cardiac muscle, slow twitch 2	243	248	245
53313	Atp2a3	ATPase, Ca ⁺⁺ transporting, ubiquitous	266	258	257
11941	Atp2b2	ATPase, Ca ⁺⁺ transporting, plasma membrane 2	678	692	696
235574	Atp2c1	ATPase, Ca ⁺⁺ -sequestering	322	303	311
69047	Atp2c2	ATPase, Ca ⁺⁺ transporting, type 2C, member 2	137	141	148
11944	Atp4a	ATPase, H ⁺ /K ⁺ exchanging, gastric, alpha polypeptide	39	33	40
11945	Atp4b	ATPase, H ⁺ /K ⁺ exchanging, beta polypeptide	92	81	83
11946	Atp5a1	ATP synthase, H ⁺ transporting, mitochondrial F1 complex, alpha s	36	35	37
11947	Atp5b	ATP synthase, H ⁺ transporting mitochondrial F1 complex, beta sut	36	33	32
11949	Atp5c1	ATP synthase, H ⁺ transporting, mitochondrial F1 complex, gamma	42	45	38
66043	Atp5d	ATP synthase, H ⁺ transporting, mitochondrial F1 complex, delta su	11	10	9
67126	Atp5e	ATP synthase, H ⁺ transporting, mitochondrial F1 complex, epsilon	32	28	26
11950	Atp5f1	ATP synthase, H ⁺ transporting, mitochondrial F0 complex, subunit	18	16	20
11951	Atp5g1	ATP synthase, H ⁺ transporting, mitochondrial F0 complex, subunit	59	65	63
228033	Atp5g3	ATP synthase, H ⁺ transporting, mitochondrial F0 complex, subunit	890	892	911
71679	Atp5h	ATP synthase, H ⁺ transporting, mitochondrial F0 complex, subunit	21	19	23
11957	Atp5j	ATP synthase, H ⁺ transporting, mitochondrial F0 complex, subunit	433	440	425
57423	Atp5j2	ATP synthase, H ⁺ transporting, mitochondrial F0 complex, subunit	45	42	42
11958	Atp5k	ATP synthase, H ⁺ transporting, mitochondrial F1F0 complex, subu	75	73	81
27425	Atp5l	ATP synthase, H ⁺ transporting, mitochondrial F0 complex, subunit	119	113	110
28080	Atp5o	ATP synthase, H ⁺ transporting, mitochondrial F1 complex, O subu	420	422	420
68055	Atp5s	ATP synthase, H ⁺ transporting, mitochondrial F0 complex, subunit	54	52	49
70495	Atp6ap2	ATPase, H ⁺ transporting, lysosomal accessory protein 2	616	625	612
140494	Atp6v0a4	ATPase, H ⁺ transporting, lysosomal V0 subunit A4	192	186	186
114143	Atp6v0b	ATPase, H ⁺ transporting, lysosomal V0 subunit B	11	9	9
11984	Atp6v0c	ATPase, H ⁺ transporting, lysosomal V0 subunit C	41	39	38
11972	Atp6v0d1	ATPase, H ⁺ transporting, lysosomal V0 subunit D1	63	61	66
11964	Atp6v1a	ATPase, H ⁺ transporting, lysosomal V1 subunit A	147	153	143
11966	Atp6v1b2	ATPase, H ⁺ transporting, lysosomal V1 subunit B2	261	276	264
66335	Atp6v1c1	ATPase, H ⁺ transporting, lysosomal V1 subunit C1	371	365	382
68775	Atp6v1c2	ATPase, H ⁺ transporting, lysosomal V1 subunit C2	113	101	103
66290	Atp6v1g1	ATPase, H ⁺ transporting, lysosomal V1 subunit G1	84	81	81
66237	Atp6v1g2	ATPase, H ⁺ transporting, lysosomal V1 subunit G2	7	9	8
338375	Atp6v1g3	ATPase, H ⁺ transporting, lysosomal V1 subunit G3	556	569	550
11977	Atp7a	ATPase, Cu ⁺⁺ transporting, alpha polypeptide	163	159	157
11979	Atp7b	ATPase, Cu ⁺⁺ transporting, beta polypeptide	121	120	111
54670	Atp8b1	ATPase, class I, type 8B, member 1	480	481	463
67331	Atp8b3	ATPase, class I, type 8B, member 3	84	76	82
11983	Atpif1	ATPase inhibitory factor 1	30	36	30
245000	Atr	ataxia telangiectasia and Rad3 related	18	17	16
235610	Atrip	ATR interacting protein	32	28	28
22589	Atrx	alpha thalassemia/mental retardation syndrome X-linked homolog	292	297	293
20238	Atxn1	ataxin 1	966	985	979
110616	Atxn3	ataxin 3	82	84	82
246103	Atxn7	ataxin 7	201	211	205
217218	Atxn7l3	ataxin 7-like 3	35	32	37
11992	Auh	AU RNA binding protein/enoyl-coenzyme A hydratase	293	289	289
20878	Aurka	aurora kinase A	32	33	34
66077	Aurkaip1	aurora kinase A interacting protein 1	39	33	36
20877	Aurkb	aurora kinase B	60	55	56
20871	Aurkc	aurora kinase C	185	193	187
11998	Avp	arginine vasopressin	66	67	68
69534	Avpi1	arginine vasopressin-induced 1	75	73	71
12000	Avpr2	arginine vasopressin receptor 2	45	32	37

330361	AW146020	expressed sequence AW146020	88	85	94
245533	Awat1	acyl-CoA wax alcohol acyltransferase 1	86	89	83
245532	Awat2	acyl-CoA wax alcohol acyltransferase 2	62	65	64
12005	Axin1	axin 1	101	101	105
12006	Axin2	axin2	604	567	586
26362	Axl	AXL receptor tyrosine kinase	77	73	80
503692	Aym1	activator of yeast meiotic promoters 1	195	188	188
54375	Azin1	antizyme inhibitor 1	476	469	461
65964	B230120H23Rik	RIKEN cDNA B230120H23 gene	568	550	540
12010	B2m	beta-2 microglobulin	54	57	49
26879	B3galnt1	UDP-GalNAc:betaGlcNAc beta 1,3-galactosaminyltransferase, poly	513	526	533
97884	B3galnt2	UDP-GalNAc:betaGlcNAc beta 1,3-galactosaminyltransferase, poly	332	326	339
26877	B3galt1	UDP-Gal:betaGlcNAc beta 1,3-galactosyltransferase, polypeptide 1	1319	1313	1300
26878	B3galt2	UDP-Gal:betaGlcNAc beta 1,3-galactosyltransferase, polypeptide 2	4267	4285	4209
54218	B3galt4	UDP-Gal:betaGlcNAc beta 1,3-galactosyltransferase, polypeptide 4	19	20	16
93961	B3galt5	UDP-Gal:betaGlcNAc beta 1,3-galactosyltransferase, polypeptide 5	267	262	266
117592	B3galt6	UDP-Gal:betaGal beta 1,3-galactosyltransferase, polypeptide 6	44	44	38
381694	B3galtl	beta 1,3-galactosyltransferase-like	504	502	497
76898	B3gat1	beta-1,3-glucuronyltransferase 1 (glucuronosyltransferase P)	1702	1721	1673
280645	B3gat2	beta-1,3-glucuronyltransferase 2 (glucuronosyltransferase S)	677	685	666
108902	B3gnt1	UDP-GlcNAc:betaGal beta-1,3-N-acetylglucosaminyltransferase 1	23	20	22
53625	B3gnt2	UDP-GlcNAc:betaGal beta-1,3-N-acetylglucosaminyltransferase 2	600	598	594
72297	B3gnt3	UDP-GlcNAc:betaGal beta-1,3-N-acetylglucosaminyltransferase 3	46	42	44
231727	B3gnt4	UDP-GlcNAc:betaGal beta-1,3-N-acetylglucosaminyltransferase 4	41	43	42
108105	B3gnt5	UDP-GlcNAc:betaGal beta-1,3-N-acetylglucosaminyltransferase 5	223	219	237
272411	B3gnt6	UDP-GlcNAc:betaGal beta-1,3-N-acetylglucosaminyltransferase 6	171	171	165
227327	B3gnt7	UDP-GlcNAc:betaGal beta-1,3-N-acetylglucosaminyltransferase 7	260	251	264
232984	B3gnt8	UDP-GlcNAc:betaGal beta-1,3-N-acetylglucosaminyltransferase 8	42	50	45
14421	B4galnt1	beta-1,4-N-acetyl-galactosaminyl transferase 1	70	71	76
14422	B4galnt2	beta-1,4-N-acetyl-galactosaminyl transferase 2	215	216	212
330406	B4galnt3	beta-1,4-N-acetyl-galactosaminyl transferase 3	343	346	335
330671	B4galnt4	beta-1,4-N-acetyl-galactosaminyl transferase 4	81	73	83
14595	B4galt1	UDP-Gal:betaGlcNAc beta 1,4- galactosyltransferase, polypeptide 1	201	207	213
53418	B4galt2	UDP-Gal:betaGlcNAc beta 1,4- galactosyltransferase, polypeptide 2	16	15	14
57370	B4galt3	UDP-Gal:betaGlcNAc beta 1,4-galactosyltransferase, polypeptide 3	41	36	38
56375	B4galt4	UDP-Gal:betaGlcNAc beta 1,4-galactosyltransferase, polypeptide 4	108	106	111
56336	B4galt5	UDP-Gal:betaGlcNAc beta 1,4-galactosyltransferase, polypeptide 5	238	229	236
56386	B4galt6	UDP-Gal:betaGlcNAc beta 1,4-galactosyltransferase, polypeptide 6	285	289	301
218271	B4galt7	xylosylprotein beta1,4-galactosyltransferase, polypeptide 7 (galact	36	35	39
12012	Baat	bile acid-Coenzyme A: amino acid N-acyltransferase	89	95	88
23821	Bace1	beta-site APP cleaving enzyme 1	103	105	101
56175	Bace2	beta-site APP-cleaving enzyme 2	387	364	374
12013	Bach1	BTB and CNC homology 1	940	967	939
12014	Bach2	BTB and CNC homology 2	785	790	780
12017	Bag1	BCL2-associated athanogene 1	36	36	37
213539	Bag2	BCL2-associated athanogene 2	114	123	115
67384	Bag4	BCL2-associated athanogene 4	40	39	41
70369	Bag5	BCL2-associated athanogene 5	43	43	42
224727	Bag6	BCL2-associated athanogene 6	37	39	41
228536	Bahd1	bromo adjacent homology domain containing 1	77	75	79
12018	Bak1	BCL2-antagonist/killer 1	71	75	66
68010	Bambi	BMP and activin membrane-bound inhibitor, homolog (<i>Xenopus lae</i>	1031	996	986
23825	Banf1	barrier to autointegration factor 1	25	18	20
53325	Banp	BTG3 associated nuclear protein	436	451	424
104416	Bap1	Brca1 associated protein 1	92	93	96

12021	Bard1	BRCA1 associated RING domain 1	893	888	874
54422	Barhl1	BarH-like 1 (Drosophila)	282	264	265
104382	Barhl2	BarH-like 2 (Drosophila)	1046	1063	1035
12022	Barx1	BarH-like homeobox 1	295	308	318
12023	Barx2	BarH-like homeobox 2	829	837	815
70350	Basp1	brain abundant, membrane attached signal protein 1	3004	3011	2958
53314	Batf	basic leucine zipper transcription factor, ATF-like	187	188	188
381319	Batf3	basic leucine zipper transcription factor, ATF-like 3	136	125	132
12028	Bax	BCL2-associated X protein	34	32	34
217578	Baz1a	bromodomain adjacent to zinc finger domain 1A	275	272	289
22385	Baz1b	bromodomain adjacent to zinc finger domain, 1B	107	111	104
116848	Baz2a	bromodomain adjacent to zinc finger domain, 2A	117	121	120
170442	Bbox1	butyrobetaine (gamma), 2-oxoglutarate dioxygenase 1 (gamma-bu	439	467	437
52028	Bbs1	Bardet-Biedl syndrome 1 (human)	67	66	64
71769	Bbs10	Bardet-Biedl syndrome 10 (human)	400	394	401
241950	Bbs12	Bardet-Biedl syndrome 12 (human)	46	47	48
70508	Bbx	bobby sox homolog (Drosophila)	940	935	932
226499	BC003331	cDNA sequence BC003331	89	94	85
225994	BC016495	cDNA sequence BC016495	49	54	50
234878	BC021891	cDNA sequence BC021891	123	127	120
226527	BC026585	cDNA sequence BC026585	125	116	125
230234	BC026590	cDNA sequence BC026590	72	71	81
381101	BC048355	cDNA sequence BC048355	82	79	78
218275	BC051665	cDNA sequence BC051665	266	253	259
216454	BC089597	cDNA sequence BC089597	47	51	48
100568459	Bc1	brain cytoplasmic RNA 1	233	239	244
12031	Bc1	brain cytoplasmic RNA 1	3941	239	244
68183	Bcas2	breast carcinoma amplified sequence 2	201	198	203
12035	Bcat1	branched chain aminotransferase 1, cytosolic	1218	1212	1220
12036	Bcat2	branched chain aminotransferase 2, mitochondrial	76	72	73
66165	Bccip	BRCA2 and CDKN1A interacting protein	87	88	85
75284	Bcdin3d	BCDIN3 domain containing	86	92	90
12038	Bche	butyrylcholinesterase	2598	2657	2566
12039	Bckdha	branched chain ketoacid dehydrogenase E1, alpha polypeptide	43	43	42
12040	Bckdhb	branched chain ketoacid dehydrogenase E1, beta polypeptide	1898	1893	1899
12041	Bckdk	branched chain ketoacid dehydrogenase kinase	21	24	22
12042	Bcl10	B-cell leukemia/lymphoma 10	228	223	217
14025	Bcl11a	B-cell CLL/lymphoma 11A (zinc finger protein)	1086	1078	1088
58208	Bcl11b	B-cell leukemia/lymphoma 11B	1835	1851	1871
12043	Bcl2	B-cell leukemia/lymphoma 2	764	768	753
12051	Bcl3	B-cell leukemia/lymphoma 3	86	74	79
12053	Bcl6	B-cell leukemia/lymphoma 6	585	604	585
12029	Bcl6b	B-cell CLL/lymphoma 6, member B	19	15	16
80288	Bcl9l	B-cell CLL/lymphoma 9-like	76	74	83
72567	Bclaf1	BCL2-associated transcription factor 1	155	155	150
63857	Bcmo1	beta-carotene 15,15'-monooxygenase	110	95	100
170752	Bco2	beta-carotene oxygenase 2	44	42	41
71458	Bcor	BCL6 interacting corepressor	1640	1574	1582
320376	Bcorl1	BCL6 co-repressor-like 1	247	250	251
110279	Bcr	breakpoint cluster region	212	226	221
71911	Bdh1	3-hydroxybutyrate dehydrogenase, type 1	471	453	452
69772	Bdh2	3-hydroxybutyrate dehydrogenase, type 2	121	125	116
12061	Bdkrb1	bradykinin receptor, beta 1	167	164	162
12062	Bdkrb2	bradykinin receptor, beta 2	186	194	194
12064	Bdnf	brain derived neurotrophic factor	822	797	801

544971	Bdp1	B double prime 1, subunit of RNA polymerase III transcription initia	120	121	121
56208	Becn1	beclin 1, autophagy related	44	49	49
12097	Bglap2	bone gamma-carboxyglutamate protein 2	18	21	19
12111	Bgn	biglycan	57	47	54
17341	Bhlha15	basic helix-loop-helix family, member a15	158	157	157
320522	Bhlha9	basic helix-loop-helix family, member a9	143	129	127
59058	Bhlhe22	basic helix-loop-helix family, member e22	369	378	357
140489	Bhlhe23	basic helix-loop-helix family, member e23	222	212	218
20893	Bhlhe40	basic helix-loop-helix family, member e40	741	739	739
79362	Bhlhe41	basic helix-loop-helix family, member e41	154	154	169
12116	Bhmt	betaine-homocysteine methyltransferase	224	232	233
64918	Bhmt2	betaine-homocysteine methyltransferase 2	50	47	47
11797	Birc2	baculoviral IAP repeat-containing 2	142	145	146
11796	Birc3	baculoviral IAP repeat-containing 3	222	224	220
12211	Birc6	baculoviral IAP repeat-containing 6	284	299	291
12143	Blk	B lymphoid kinase	243	247	252
12144	Blm	Bloom syndrome, RecQ helicase-like	366	384	370
104184	Blmh	bleomycin hydrolase	119	122	118
73689	Bloc1s2	biogenesis of lysosome-related organelles complex-1, subunit 2	78	71	75
109778	Blvra	biliverdin reductase A	155	159	162
233016	Blvrb	biliverdin reductase B (flavin reductase (NADPH))	32	37	35
12151	Bmi1	Bmi1 polycomb ring finger oncogene	30	32	29
12153	Bmp1	bone morphogenetic protein 1	80	84	83
12154	Bmp10	bone morphogenetic protein 10	143	136	137
12155	Bmp15	bone morphogenetic protein 15	289	274	279
12156	Bmp2	bone morphogenetic protein 2	2070	2076	2047
140780	Bmp2k	BMP2 inducible kinase	408	403	393
110075	Bmp3	bone morphogenetic protein 3	704	711	719
12159	Bmp4	bone morphogenetic protein 4	480	481	491
12161	Bmp6	bone morphogenetic protein 6	421	417	425
12162	Bmp7	bone morphogenetic protein 7	553	533	522
12166	Bmpr1a	bone morphogenetic protein receptor, type 1A	290	273	267
12167	Bmpr1b	bone morphogenetic protein receptor, type 1B	1184	1178	1176
12168	Bmpr2	bone morphogenic protein receptor, type II (serine/threonine kinase)	283	281	261
12169	Bmx	BMX non-receptor tyrosine kinase	154	161	159
242509	Bnc2	basonuclin 2	1719	1770	1699
12176	Bnip3	BCL2/adenovirus E1B interacting protein 3	124	123	126
12177	Bnip3l	BCL2/adenovirus E1B interacting protein 3-like	217	215	206
75388	Boll	bol, boule-like (Drosophila)	209	209	199
12181	Bop1	block of proliferation 1	26	30	25
12183	Bpgm	2,3-bisphosphoglycerate mutase	385	386	369
23827	Bpnt1	bisphosphate 3'-nucleotidase 1	47	44	49
207165	Bptf	bromodomain PHD finger transcription factor	214	218	219
109880	Braf	Braf transforming gene	280	269	275
72399	Brap	BRCA1 associated protein	67	68	64
12189	Brca1	breast cancer 1	120	112	119
12190	Brca2	breast cancer 2	97	102	93
210766	Brcc3	BRCA1/BRCA2-containing complex, subunit 3	111	118	111
223770	Brd1	bromodomain containing 1	199	204	198
57261	Brd4	bromodomain containing 4	178	176	180
26992	Brd7	bromodomain containing 7	297	297	291
78656	Brd8	bromodomain containing 8	1	#N/A	1
114642	Brdt	bromodomain, testis-specific	142	148	141
107976	Bre	brain and reproductive organ-expressed protein	550	569	557
72308	Brf1	BRF1 homolog, subunit of RNA polymerase III transcription initiatic	48	48	44

66653	Brf2	BRF2, subunit of RNA polymerase III transcription initiation factor,	102	113	103
237911	Brip1	BRCA1 interacting protein C-terminal helicase 1	465	467	462
67832	Brix1	BRX1, biogenesis of ribosomes, homolog (S. cerevisiae)	20	21	20
107392	Brms1	breast cancer metastasis-suppressor 1	13	14	12
52592	Brms1l	breast cancer metastasis-suppressor 1-like	678	684	663
78783	Brpf1	bromodomain and PHD finger containing, 1	54	57	56
268936	Brpf3	bromodomain and PHD finger containing, 3	122	106	119
381979	Brsk1	BR serine/threonine kinase 1	54	46	53
75770	Brsk2	BR serine/threonine kinase 2	200	191	195
93871	Brwd1	bromodomain and WD repeat domain containing 1	177	175	174
12182	Bst1	bone marrow stromal cell antigen 1	114	114	101
244813	Bsx	brain specific homeobox	207	209	204
26363	Btd	biotinidase	243	238	251
218490	Btf3	basic transcription factor 3	120	119	117
12226	Btg1	B-cell translocation gene 1, anti-proliferative	1940	2010	1960
12227	Btg2	B-cell translocation gene 2, anti-proliferative	94	92	83
12229	Btk	Bruton agammaglobulinemia tyrosine kinase	54	51	54
12231	Btn1a1	butyrophilin, subfamily 1, member A1	70	67	76
238555	Btn2a2	butyrophilin, subfamily 2, member A2	85	87	82
12234	Btrc	beta-transducin repeat containing protein	422	430	408
12235	Bub1	budding uninhibited by benzimidazoles 1 homolog (S. cerevisiae)	79	78	79
12236	Bub1b	budding uninhibited by benzimidazoles 1 homolog, beta (S. cerevis)	151	145	155
23828	Bves	blood vessel epicardial substance	231	239	227
66882	Bzw1	basic leucine zipper and W2 domains 1	193	189	190
66912	Bzw2	basic leucine zipper and W2 domains 2	85	86	86
57316	C1d	C1D nuclear receptor co-repressor	920	953	934
94192	C1galt1	core 1 synthase, glycoprotein-N-acetylgalactosamine 3-beta-galact	641	650	628
12259	C1qa	complement component 1, q subcomponent, alpha polypeptide	88	88	78
12260	C1qb	complement component 1, q subcomponent, beta polypeptide	68	73	75
69183	C1qtnf2	C1q and tumor necrosis factor related protein 2	132	123	124
50909	C1ra	complement component 1, r subcomponent A	60	63	68
667277	C1rb	complement component 1, r subcomponent B	123	121	125
232371	C1rl	complement component 1, r subcomponent-like	66	67	66
50908	C1s	complement component 1, s subcomponent	70	70	74
12263	C2	complement component 2 (within H-2S)	42	48	42
101831	C230052I12Rik	RIKEN cDNA C230052I12 gene	87	80	81
244895	C230081A13Rik	RIKEN cDNA C230081A13 gene	321	331	334
277939	C2cd3	C2 calcium-dependent domain containing 3	133	130	120
12266	C3	complement component 3	67	67	65
231855	C330006K01Rik	RIKEN cDNA C330006K01 gene	155	157	162
77422	C330018D20Rik	RIKEN cDNA C330018D20 gene	256	255	255
12268	C4b	complement component 4B (Childo blood group)	162	160	158
12269	C4bp	complement component 4 binding protein	72	70	69
12274	C6	complement component 6	656	673	661
245555	C77370	expressed sequence C77370	345	374	351
19777	C80913	expressed sequence C80913	423	445	428
230558	C8a	complement component 8, alpha polypeptide	190	190	189
110382	C8b	complement component 8, beta polypeptide	657	672	649
69379	C8g	complement component 8, gamma polypeptide	7	8	11
12279	C9	complement component 9	248	246	244
12283	Cab39	calcium binding protein 39	202	202	209
12286	Cacna1a	calcium channel, voltage-dependent, P/Q type, alpha 1A subunit	520	520	490
58226	Cacna1h	calcium channel, voltage-dependent, T type, alpha 1H subunit	122	119	119
12298	Cacnb4	calcium channel, voltage-dependent, beta 4 subunit	554	585	567
12301	Cacybp	calyculin binding protein	198	209	205

69719	Cad	carbamoyl-phosphate synthetase 2, aspartate transcarbamylase, a	56	63	58
12310	Calca	calcitonin/calcitonin-related polypeptide, alpha	204	201	196
67488	Calcoco1	calcium binding and coiled coil domain 1	325	326	312
12311	Calcr	calcitonin receptor	316	304	307
12317	Calr	calreticulin	21	18	20
73316	Calr3	calreticulin 3	44	40	40
52163	Camk1	calcium/calmodulin-dependent protein kinase I	63	63	64
227541	Camk1d	calcium/calmodulin-dependent protein kinase ID	902	914	921
215303	Camk1g	calcium/calmodulin-dependent protein kinase I gamma	275	262	277
12322	Camk2a	calcium/calmodulin-dependent protein kinase II alpha	177	189	182
12323	Camk2b	calcium/calmodulin-dependent protein kinase II, beta	284	274	276
108058	Camk2d	calcium/calmodulin-dependent protein kinase II, delta	727	743	741
12325	Camk2g	calcium/calmodulin-dependent protein kinase II gamma	124	126	133
66259	Camk2n1	calcium/calmodulin-dependent protein kinase II inhibitor 1	242	232	239
73047	Camk2n2	calcium/calmodulin-dependent protein kinase II inhibitor 2	19	18	19
12326	Camk4	calcium/calmodulin-dependent protein kinase IV	470	475	458
55984	Camkk1	calcium/calmodulin-dependent protein kinase kinase 1, alpha	62	54	65
207565	Camkk2	calcium/calmodulin-dependent protein kinase kinase 2, beta	141	152	151
235604	Camkv	CaM kinase-like vesicle-associated	29	28	29
12328	Caml	calcium modulating ligand	46	45	45
12796	Camp	cathelicidin antimicrobial peptide	60	56	55
100072	Camta1	calmodulin binding transcription activator 1	1127	1121	1099
216874	Camta2	calmodulin binding transcription activator 2	37	39	38
71902	Cand1	cullin associated and neddylation disassociated 1	760	753	744
67088	Cand2	cullin-associated and neddylation-dissociated 2 (putative)	53	58	60
76025	Cant1	calcium activated nucleotidase 1	35	34	35
12330	Canx	calnexin	81	90	80
12333	Capn1	calpain 1	73	75	67
23830	Capn10	calpain 10	46	53	49
268958	Capn11	calpain 11	115	105	102
60594	Capn12	calpain 12	128	126	127
381122	Capn13	calpain 13	790	786	770
12334	Capn2	calpain 2	183	194	197
12335	Capn3	calpain 3	230	226	228
12337	Capn5	calpain 5	62	66	64
12338	Capn6	calpain 6	287	304	284
12339	Capn7	calpain 7	141	145	147
170725	Capn8	calpain 8	304	306	300
73647	Capn9	calpain 9	118	108	120
12336	Capns1	calpain, small subunit 1	64	66	65
53872	Caprin1	cell cycle associated protein 1	263	257	249
232560	Caprin2	caprin family member 2	157	160	153
12346	Car1	carbonic anhydrase 1	328	322	316
76459	Car12	carbonic anhydrase 12	267	258	267
71934	Car13	carbonic anhydrase 13	217	210	215
12349	Car2	carbonic anhydrase 2	583	604	579
12350	Car3	carbonic anhydrase 3	100	96	106
12351	Car4	carbonic anhydrase 4	294	286	289
12352	Car5a	carbonic anhydrase 5a, mitochondrial	56	57	54
56078	Car5b	carbonic anhydrase 5b, mitochondrial	143	138	141
12353	Car6	carbonic anhydrase 6	115	109	113
12354	Car7	carbonic anhydrase 7	64	66	73
12319	Car8	carbonic anhydrase 8	1947	1972	1920
230099	Car9	carbonic anhydrase 9	31	32	32
108723	Card11	caspase recruitment domain family, member 11	530	520	527

170720	Card14	caspase recruitment domain family, member 14	76	70	71
59035	Carm1	coactivator-associated arginine methyltransferase 1	90	82	90
107239	Carns1	carnosine synthase 1	31	33	34
27267	Cars	cysteinyl-tRNA synthetase	106	104	105
71941	Cars2	cysteinyl-tRNA synthetase 2 (mitochondrial)(putative)	78	72	77
27220	Cartpt	CART prepropeptide	629	645	625
192160	Casc3	cancer susceptibility candidate 3	14	19	23
12361	Cask	calcium/calmodulin-dependent serine protein kinase (MAGUK fami	641	666	614
12362	Casp1	caspase 1	655	642	647
12364	Casp12	caspase 12	1103	1079	1057
12365	Casp14	caspase 14	178	177	172
12366	Casp2	caspase 2	29	29	30
12367	Casp3	caspase 3	159	154	155
12363	Casp4	caspase 4, apoptosis-related cysteine peptidase	55	64	53
12368	Casp6	caspase 6	120	116	118
12369	Casp7	caspase 7	86	87	81
12370	Casp8	caspase 8	340	363	337
26885	Casp8ap2	caspase 8 associated protein 2	73	68	70
12371	Casp9	caspase 9	44	47	44
12380	Cast	calpastatin	567	583	566
69743	Casz1	castor homolog 1, zinc finger (Drosophila)	572	550	558
12359	Cat	catalase	184	176	182
12389	Cav1	caveolin 1, caveolae protein	225	234	226
12391	Cav3	caveolin 3	131	133	136
12396	Cbfa2t2	core-binding factor, runt domain, alpha subunit 2, translocated to, 2	186	185	180
12398	Cbfa2t3	core-binding factor, runt domain, alpha subunit 2, translocated to, 3	219	208	213
12400	Cbfb	core binding factor beta	118	120	125
12402	Cbl	Casitas B-lineage lymphoma	143	135	139
208650	Cblb	Casitas B-lineage lymphoma b	2179	2172	2133
80794	Cblc	Casitas B-lineage lymphoma c	65	68	65
104836	Cbl11	Casitas B-lineage lymphoma-like 1	164	165	157
12408	Cbr1	carbonyl reductase 1	96	100	101
12409	Cbr2	carbonyl reductase 2	76	78	77
109857	Cbr3	carbonyl reductase 3	128	132	129
234309	Cbr4	carbonyl reductase 4	879	876	867
12411	Cbs	cystathionine beta-synthase	118	123	115
12412	Cbx1	chromobox homolog 1 (Drosophila HP1 beta)	25	23	29
12416	Cbx2	chromobox homolog 2 (Drosophila Pc class)	65	67	64
12417	Cbx3	chromobox homolog 3 (Drosophila HP1 gamma)	76	71	68
12418	Cbx4	chromobox homolog 4 (Drosophila Pc class)	224	227	216
12419	Cbx5	chromobox homolog 5 (Drosophila HP1a)	129	134	138
52609	Cbx7	chromobox homolog 7	159	157	157
30951	Cbx8	chromobox homolog 8 (Drosophila Pc class)	71	67	71
73739	Cby1	chibby homolog 1 (Drosophila)	16	14	13
212139	Cc2d1a	coiled-coil and C2 domain containing 1A	26	25	27
67500	Ccar1	cell division cycle and apoptosis regulator 1	204	209	208
70266	Ccbl1	cysteine conjugate-beta lyase 1	80	78	74
229905	Ccbl2	cysteine conjugate-beta lyase 2	183	193	195
75565	Ccdc101	coiled-coil domain containing 101	69	70	74
408022	Ccdc111	coiled-coil domain containing 111	87	88	80
237859	Ccdc55	coiled-coil domain containing 55	145	144	140
52713	Ccdc59	coiled-coil domain containing 59	782	804	777
229780	Ccdc76	coiled-coil domain containing 76	88	95	85
240514	Ccdc85b	coiled-coil domain containing 85B	15	14	14
108686	Ccdc88a	coiled coil domain containing 88A	355	343	342

12424	Cck	cholecystokinin	358	341	337
20296	Ccl2	chemokine (C-C motif) ligand 2	104	96	105
20304	Ccl5	chemokine (C-C motif) ligand 5	75	75	74
12428	Ccna2	cyclin A2	81	80	75
268697	Ccnb1	cyclin B1	72	79	76
51813	Ccnc	cyclin C	107	108	103
12443	Ccnd1	cyclin D1	368	378	374
12444	Ccnd2	cyclin D2	429	429	441
12445	Ccnd3	cyclin D3	252	257	261
12447	Ccne1	cyclin E1	206	213	204
12448	Ccne2	cyclin E2	122	125	128
12449	Ccnf	cyclin F	172	160	165
66671	Ccnh	cyclin H	1328	1370	1331
12454	Ccnk	cyclin K	113	112	117
56706	Ccnl1	cyclin L1	606	597	594
56036	Ccnl2	cyclin L2	35	38	37
218630	Ccno	cyclin O	81	84	85
12455	Ccnt1	cyclin T1	5	4	3
12772	Ccr2	chemokine (C-C motif) receptor 2	124	125	119
12774	Ccr5	chemokine (C-C motif) receptor 5	118	123	129
12775	Ccr7	chemokine (C-C motif) receptor 7	186	186	193
12460	Ccs	copper chaperone for superoxide dismutase	35	36	39
12461	Cct2	chaperonin containing Tcp1, subunit 2 (beta)	131	132	143
12462	Cct3	chaperonin containing Tcp1, subunit 3 (gamma)	38	31	40
12464	Cct4	chaperonin containing Tcp1, subunit 4 (delta)	40	39	42
12465	Cct5	chaperonin containing Tcp1, subunit 5 (epsilon)	45	42	40
12466	Cct6a	chaperonin containing Tcp1, subunit 6a (zeta)	8	9	7
12467	Cct6b	chaperonin containing Tcp1, subunit 6b (zeta)	165	173	173
12469	Cct8	chaperonin containing Tcp1, subunit 8 (theta)	125	127	123
12479	Cd1d1	CD1d1 antigen	245	246	236
12480	Cd1d2	CD1d2 antigen	106	100	105
69165	Cd209b	CD209b antigen	82	85	88
12484	Cd24a	CD24a antigen	69	67	62
21940	Cd27	CD27 antigen	42	43	41
102657	Cd276	CD276 antigen	121	114	117
12487	Cd28	CD28 antigen	439	452	446
12488	Cd2ap	CD2-associated protein	372	353	358
12491	Cd36	CD36 antigen	533	559	543
12494	Cd38	CD38 antigen	214	216	213
12501	Cd3e	CD3 antigen, epsilon polypeptide	80	80	81
70333	Cd3eap	CD3E antigen, epsilon polypeptide associated protein	22	18	22
12504	Cd4	CD4 antigen	59	64	57
21939	Cd40	CD40 antigen	74	73	69
21947	Cd40lg	CD40 ligand	307	314	303
12505	Cd44	CD44 antigen	479	471	476
17221	Cd46	CD46 antigen, complement regulatory protein	119	119	112
13136	Cd55	CD55 antigen	263	257	260
12509	Cd59a	CD59a antigen	66	70	65
333883	Cd59b	CD59b antigen	86	84	94
12511	Cd6	CD6 antigen	132	129	137
16149	Cd74	CD74 antigen (invariant polypeptide of major histocompatibility con	90	95	96
12519	Cd80	CD80 antigen	89	95	88
12520	Cd81	CD81 antigen	62	60	56
72269	Cda	cytidine deaminase	93	87	92
229776	Cdc14a	CDC14 cell division cycle 14 homolog A (S. cerevisiae)	330	319	319

218294	Cdc14b	CDC14 cell division cycle 14 homolog B (<i>S. cerevisiae</i>)	228	239	235
69957	Cdc16	CDC16 cell division cycle 16 homolog (<i>S. cerevisiae</i>)	101	100	101
107995	Cdc20	cell division cycle 20 homolog (<i>S. cerevisiae</i>)	36	36	29
52563	Cdc23	CDC23 (cell division cycle 23, yeast, homolog)	119	119	122
12531	Cdc25b	cell division cycle 25 homolog B (<i>S. pombe</i>)	39	46	38
12532	Cdc25c	cell division cycle 25 homolog C (<i>S. pombe</i>)	47	51	48
66440	Cdc26	cell division cycle 26	62	64	66
217232	Cdc27	cell division cycle 27 homolog (<i>S. cerevisiae</i>)	141	148	143
216150	Cdc34	cell division cycle 34 homolog (<i>S. cerevisiae</i>)	25	24	24
71713	Cdc40	cell division cycle 40 homolog (yeast)	261	260	251
12540	Cdc42	cell division cycle 42 homolog (<i>S. cerevisiae</i>)	161	177	169
226751	Cdc42bpa	CDC42 binding protein kinase alpha	490	493	490
217866	Cdc42bpb	CDC42 binding protein kinase beta	180	166	168
240505	Cdc42bpg	CDC42 binding protein kinase gamma (DMPK-like)	62	68	65
12544	Cdc45	cell division cycle 45 homolog (<i>S. cerevisiae</i>)	45	46	43
71702	Cdc5l	cell division cycle 5-like (<i>S. pombe</i>)	849	853	841
23834	Cdc6	cell division cycle 6 homolog (<i>S. cerevisiae</i>)	100	90	95
12545	Cdc7	cell division cycle 7 (<i>S. cerevisiae</i>)	472	464	466
214498	Cdc73	cell division cycle 73, Paf1/RNA polymerase II complex component	125	134	128
67849	Cdca5	cell division cycle associated 5	29	26	30
66953	Cdca7	cell division cycle associated 7	889	913	899
217946	Cdca7l	cell division cycle associated 7 like	883	889	870
12550	Cdh1	cadherin 1	225	224	236
12554	Cdh13	cadherin 13	2012	2006	1962
52858	Cdipt	CDP-diacylglycerol--inositol 3-phosphatidyltransferase (phosphatid	77	71	79
12534	Cdk1	cyclin-dependent kinase 1	407	419	412
234854	Cdk10	cyclin-dependent kinase 10	30	33	31
12537	Cdk11b	cyclin-dependent kinase 11B	66	68	66
69131	Cdk12	cyclin-dependent kinase 12	172	172	182
69562	Cdk13	cyclin-dependent kinase 13	252	254	239
18647	Cdk14	cyclin-dependent kinase 14	917	918	908
271697	Cdk15	cyclin-dependent kinase 15	328	339	320
18555	Cdk16	cyclin-dependent kinase 16	51	47	49
237459	Cdk17	cyclin-dependent kinase 17	559	570	574
18557	Cdk18	cyclin-dependent kinase 18	158	162	155
78334	Cdk19	cyclin-dependent kinase 19	340	339	346
12566	Cdk2	cyclin-dependent kinase 2	12	9	7
105278	Cdk20	cyclin-dependent kinase 20	164	157	169
12567	Cdk4	cyclin-dependent kinase 4	12	13	12
12568	Cdk5	cyclin-dependent kinase 5	16	13	14
12569	Cdk5r1	cyclin-dependent kinase 5, regulatory subunit 1 (p35)	446	449	468
66971	Cdk5rap1	CDK5 regulatory subunit associated protein 1	135	134	122
214444	Cdk5rap2	CDK5 regulatory subunit associated protein 2	2040	2039	2005
12571	Cdk6	cyclin-dependent kinase 6	699	712	680
12572	Cdk7	cyclin-dependent kinase 7	94	100	97
264064	Cdk8	cyclin-dependent kinase 8	214	218	225
107951	Cdk9	cyclin-dependent kinase 9 (CDC2-related kinase)	21	23	24
68916	Cdkal1	CDK5 regulatory subunit associated protein 1-like 1	1338	1334	1331
71091	Cdkl1	cyclin-dependent kinase-like 1 (CDC2-related kinase)	132	136	133
53886	Cdkl2	cyclin-dependent kinase-like 2 (CDC2-related kinase)	122	121	119
213084	Cdkl3	cyclin-dependent kinase-like 3	129	123	122
381113	Cdkl4	cyclin-dependent kinase-like 4	325	320	316
382253	Cdkl5	cyclin-dependent kinase-like 5	314	314	292
12575	Cdkn1a	cyclin-dependent kinase inhibitor 1A (P21)	74	71	71
12576	Cdkn1b	cyclin-dependent kinase inhibitor 1B	40	38	37

12577	Cdkn1c	cyclin-dependent kinase inhibitor 1C (P57)	214	220	223
12578	Cdkn2a	cyclin-dependent kinase inhibitor 2A	240	235	232
12579	Cdkn2b	cyclin-dependent kinase inhibitor 2B (p15, inhibits CDK4)	411	400	391
12580	Cdkn2c	cyclin-dependent kinase inhibitor 2C (p18, inhibits CDK4)	182	181	178
12581	Cdkn2d	cyclin-dependent kinase inhibitor 2D (p19, inhibits CDK4)	101	101	95
72391	Cdkn3	cyclin-dependent kinase inhibitor 3	520	538	510
12583	Cdo1	cysteine dioxygenase 1, cytosolic	189	183	184
57810	Cdon	cell adhesion molecule-related/down-regulated by oncogenes	378	390	370
74596	Cds1	CDP-diacylglycerol synthase 1	522	516	514
110911	Cds2	CDP-diacylglycerol synthase (phosphatidate cytidyltransferase) 2	181	171	168
67177	Cdt1	chromatin licensing and DNA replication factor 1	34	30	33
12590	Cdx1	caudal type homeobox 1	36	39	38
12591	Cdx2	caudal type homeobox 2	70	58	64
12592	Cdx4	caudal type homeobox 4	123	129	119
12593	Cdyl	chromodomain protein, Y chromosome-like	1278	1295	1261
12606	Cebpa	CCAAT/enhancer binding protein (C/EBP), alpha	158	167	160
12608	Cebpb	CCAAT/enhancer binding protein (C/EBP), beta	34	30	32
12609	Cebpd	CCAAT/enhancer binding protein (C/EBP), delta	352	373	357
110794	Cebpe	CCAAT/enhancer binding protein (C/EBP), epsilon	121	121	126
12611	Cebpg	CCAAT/enhancer binding protein (C/EBP), gamma	261	256	256
12607	Cebpz	CCAAT/enhancer binding protein zeta	33	25	28
214932	Cecr5	cat eye syndrome chromosome region, candidate 5 homolog (hum	224	228	224
12613	Cel	carboxyl ester lipase	66	63	67
109901	Cela1	chymotrypsin-like elastase family, member 1	112	100	106
13706	Cela2a	chymotrypsin-like elastase family, member 2A	68	72	74
67868	Cela3b	chymotrypsin-like elastase family, member 3B	54	53	53
13046	Celf1	CUGBP, Elav-like family member 1	160	162	156
14007	Celf2	CUGBP, Elav-like family member 2	4864	4886	4827
78784	Celf3	VCUGBP, Elav-like family member 3	138	140	137
108013	Celf4	CUGBP, Elav-like family member 4	6431	6505	6439
76183	Celf6	CUGBP, Elav-like family member 6	94	102	101
12615	Cenpa	centromere protein A	83	81	86
108000	Cenpf	centromere protein F	509	510	488
60411	Cenpk	centromere protein K	72	80	73
73139	Cenpv	centromere protein V	123	131	127
214552	Cep164	centrosomal protein 164	518	513	528
216274	Cep290	centrosomal protein 290	126	136	131
99712	Cept1	choline/ethanolaminephosphotransferase 1	76	84	76
99151	Cercam	cerebral endothelial cell adhesion molecule	59	55	59
223753	Cerk	ceramide kinase	200	186	194
228094	Cerkl	ceramide kinase-like	254	256	263
13884	Ces1c	carboxylesterase 1C	152	155	153
104158	Ces1d	carboxylesterase 1D	120	125	117
13897	Ces1e	carboxylesterase 1E	106	108	101
102022	Ces2a	carboxylesterase 2A	245	247	233
234673	Ces2e	carboxylesterase 2E	107	99	99
72361	Ces2g	carboxylesterase 2G	129	125	129
67935	Ces5a	carboxylesterase 5A	607	629	588
26370	Cetn2	centrin 2	118	110	111
14962	Cfb	complement factor B	40	42	45
11537	Cfd	complement factor D (adipsin)	24	26	26
12630	Cfi	complement component factor i	63	60	65
12631	Cfl1	cofilin 1, non-muscle	13	17	15
12633	Cflar	CASP8 and FADD-like apoptosis regulator	134	130	120
18636	Cfp	complement factor properdin	38	36	34

12638	Cftr	cystic fibrosis transmembrane conductance regulator homolog	501	508	494
12640	Cga	glycoprotein hormones, alpha subunit	346	344	358
106143	Cggbp1	CGG triplet repeat binding protein 1	401	415	396
12642	Ch25h	cholesterol 25-hydroxylase	297	303	292
27221	Chaf1a	chromatin assembly factor 1, subunit A (p150)	51	54	51
110749	Chaf1b	chromatin assembly factor 1, subunit B (p60)	123	124	131
12647	Chat	choline acetyltransferase	68	66	68
12648	Chd1	chromodomain helicase DNA binding protein 1	342	334	329
68058	Chd1l	chromodomain helicase DNA binding protein 1-like	291	274	279
107932	Chd4	chromodomain helicase DNA binding protein 4	71	70	72
320790	Chd7	chromodomain helicase DNA binding protein 7	932	939	936
67772	Chd8	chromodomain helicase DNA binding protein 8	87	92	92
109151	Chd9	chromodomain helicase DNA binding protein 9	916	935	933
218865	Chdh	choline dehydrogenase	485	460	467
12649	Chek1	checkpoint kinase 1 homolog (S. pombe)	96	100	99
50883	Chek2	CHK2 checkpoint homolog (S. pombe)	57	57	56
27967	Cherp	calcium homeostasis endoplasmic reticulum protein	58	59	55
231600	Chfr	checkpoint with forkhead and ring finger domains	87	86	82
12654	Chi3l1	chitinase 3-like 1	102	101	113
12655	Chi3l3	chitinase 3-like 3	135	141	139
104183	Chi3l4	chitinase 3-like 4	311	303	308
81600	Chia	chitinase, acidic	194	193	194
68038	Chid1	chitinase domain containing 1	109	116	118
71884	Chit1	chitinase 1 (chitotriosidase)	131	127	141
12660	Chka	choline kinase alpha	176	166	181
12651	Chkb	choline kinase beta	34	32	34
234852	Chmp1a	chromatin modifying protein 1A	32	34	33
66917	Chordc1	cysteine and histidine-rich domain (CHORD)-containing, zinc-binding	2547	2572	2536
212862	Chpt1	choline phosphotransferase 1	186	191	185
12672	Chrm4	cholinergic receptor, muscarinic 4	269	260	261
11438	Chrna4	cholinergic receptor, nicotinic, alpha polypeptide 4	193	189	188
11441	Chrna7	cholinergic receptor, nicotinic, alpha polypeptide 7	1252	1244	1239
76969	Chst1	carbohydrate (keratan sulfate Gal-6) sulfotransferase 1	599	582	589
98388	Chst10	carbohydrate sulfotransferase 10	148	155	150
58250	Chst11	carbohydrate sulfotransferase 11	486	506	492
59031	Chst12	carbohydrate sulfotransferase 12	188	180	188
71797	Chst13	carbohydrate (chondroitin 4) sulfotransferase 13	45	44	47
72136	Chst14	carbohydrate (N-acetylgalactosamine 4-O) sulfotransferase 14	151	151	163
77590	Chst15	carbohydrate (N-acetylgalactosamine 4-sulfate 6-O) sulfotransferase	330	322	341
54371	Chst2	carbohydrate sulfotransferase 2	1077	1092	1060
53374	Chst3	carbohydrate (chondroitin 6/keratan) sulfotransferase 3	222	228	220
26887	Chst4	carbohydrate (chondroitin 6/keratan) sulfotransferase 4	124	117	114
56773	Chst5	carbohydrate (N-acetylglucosamine 6-O) sulfotransferase 5	75	77	74
60322	Chst7	carbohydrate (N-acetylglucosamine) sulfotransferase 7	1428	1390	1381
68947	Chst8	carbohydrate (N-acetylgalactosamine 4-O) sulfotransferase 8	338	333	337
71367	Chst9	carbohydrate (N-acetylgalactosamine 4-O) sulfotransferase 9	1799	1784	1778
269941	Chsy1	chondroitin sulfate synthase 1	413	411	408
214901	Chtf18	CTF18, chromosome transmission fidelity factor 18 homolog (S. ce	11	11	9
214987	Chtf8	CTF8, chromosome transmission fidelity factor 8 homolog (S. cere	29	31	30
12675	Chuk	conserved helix-loop-helix ubiquitous kinase	89	83	87
211151	Churc1	churchill domain containing 1	115	105	117
26371	Ciao1	cytosolic iron-sulfur protein assembly 1 homolog (S. cerevisiae)	49	51	50
71722	Cic	capicua homolog (Drosophila)	44	45	47
12683	Cidea	cell death-inducing DNA fragmentation factor, alpha subunit-like efi	73	71	65
12265	Ciita	class II transactivator	120	119	116

214425	Cilp	cartilage intermediate layer protein, nucleotide pyrophosphohydroly	113	103	105
67236	Cinp	cyclin-dependent kinase 2 interacting protein	51	49	54
66935	Cir1	corepressor interacting with RBPJ, 1	53	54	47
12696	Cirbp	cold inducible RNA binding protein	26	29	26
67006	Cisd2	CDGSH iron sulfur domain 2	114	112	115
12704	Cit	citron	383	390	392
12705	Cited1	Cbp/p300-interacting transactivator with Glu/Asp-rich carboxy-term	390	374	364
17684	Cited2	Cbp/p300-interacting transactivator, with Glu/Asp-rich carboxy-term	899	922	891
56222	Cited4	Cbp/p300-interacting transactivator, with Glu/Asp-rich carboxy-term	202	203	204
68379	Ciz1	CDKN1A interacting zinc finger protein 1	34	31	34
12709	Ckb	creatine kinase, brain	129	128	132
12715	Ckm	creatine kinase, muscle	74	67	68
12716	Ckmt1	creatine kinase, mitochondrial 1, ubiquitous	41	41	37
76722	Ckmt2	creatine kinase, mitochondrial 2	384	397	408
66197	Cks2	CDC28 protein kinase regulatory subunit 2	112	101	102
53609	Clasrp	CLK4-associating serine/arginine rich protein	64	65	68
56708	Clcf1	cardiotrophin-like cytokine factor 1	39	38	37
12745	Clgn	calmegin	131	122	121
76686	Clip3	CAP-GLY domain containing linker protein 3	34	38	40
12747	Clk1	CDC-like kinase 1	71	69	63
12748	Clk2	CDC-like kinase 2	22	22	20
102414	Clk3	CDC-like kinase 3	155	148	162
12750	Clk4	CDC like kinase 4	32	34	34
12752	Cln3	ceroid lipofuscinosis, neuronal 3, juvenile (Batten, Spielmeyer-Vogt)	24	25	26
76524	Cln6	ceroid-lipofuscinosis, neuronal 6	53	59	60
26889	Cln8	ceroid-lipofuscinosis, neuronal 8	1039	1053	1044
12753	Clock	circadian locomotor output cycles kaput	179	190	181
98985	Cip1	CLP1, cleavage and polyadenylation factor I subunit, homolog (S. c	27	26	28
53895	Cipp	caseinolytic peptidase, ATP-dependent, proteolytic subunit homolo	19	18	20
109791	Cips	colipase, pancreatic	38	33	38
270166	Cipx	caseinolytic peptidase X (E.coli)	102	105	105
269582	Cispn	claspin homolog (Xenopus laevis)	101	95	101
67300	Citc	clathrin, heavy polypeptide (Hc)	151	159	163
12759	Clu	clusterin	64	75	69
69634	Clybl	citrate lyase beta like	164	154	159
17228	Cma1	chymase 1, mast cell	69	75	62
545055	Cma2	chymase 2, mast cell	76	78	80
12763	Cmah	cytidine monophospho-N-acetylneuraminic acid hydroxylase	544	529	560
12764	Cmas	cytidine monophospho-N-acetylneuraminic acid synthetase	125	139	128
66116	Cml1	camello-like 1	14	14	14
93673	Cml2	camello-like 2	91	89	85
69049	Cml5	camello-like 5	30	29	27
66588	Cmpk1	cytidine monophosphate (UMP-CMP) kinase 1	107	94	98
22169	Cmpk2	cytidine monophosphate (UMP-CMP) kinase 2, mitochondrial	1144	1157	1134
73381	Cmtm2a	CKLF-like MARVEL transmembrane domain containing 2A	91	90	94
12785	Cnbp	cellular nucleic acid binding protein	66	59	64
338403	Cndp1	carnosine dipeptidase 1 (metallopeptidase M20 family)	113	124	115
66054	Cndp2	CNDP dipeptidase 2 (metallopeptidase M20 family)	98	96	91
30952	Cngb3	cyclic nucleotide gated channel beta 3	2191	2142	2104
194231	Cnksr1	connector enhancer of kinase suppressor of Ras 1	25	21	23
245684	Cnksr2	connector enhancer of kinase suppressor of Ras 2	1743	1747	1645
215748	Cnksr3	Cnksr family member 3	598	598	582
12798	Cnn2	calponin 2	17	14	14
234594	Cnot1	CCR4-NOT transcription complex, subunit 1	63	59	58
72068	Cnot2	CCR4-NOT transcription complex, subunit 2	541	539	541

232791	Cnot3	CCR4-NOT transcription complex, subunit 3	49	40	48
53621	Cnot4	CCR4-NOT transcription complex, subunit 4	262	264	260
104625	Cnot6	CCR4-NOT transcription complex, subunit 6	171	167	166
231464	Cnot6l	CCR4-NOT transcription complex, subunit 6-like	315	305	317
18983	Cnot7	CCR4-NOT transcription complex, subunit 7	118	116	109
69125	Cnot8	CCR4-NOT transcription complex, subunit 8	211	202	211
12799	Cnp	2',3'-cyclic nucleotide 3' phosphodiesterase	98	90	96
12801	Cnr1	cannabinoid receptor 1 (brain)	937	946	939
12803	Cntf	ciliary neurotrophic factor	123	134	128
12805	Cntn1	contactin 1	879	856	847
21367	Cntn2	contactin 2	173	169	172
636808	Cntnap5a	contactin associated protein-like 5A	8199	8313	8090
71743	Coasy	Coenzyme A synthase	10	12	10
58202	Cobra1	cofactor of BRCA1	23	18	23
338337	Cog3	component of oligomeric golgi complex 3	247	255	252
233824	Cog7	component of oligomeric golgi complex 7	214	198	204
12812	Coil	coilin	35	32	33
12814	Col11a1	collagen, type XI, alpha 1	1603	1624	1575
12842	Col1a1	collagen, type I, alpha 1	147	158	146
12824	Col2a1	collagen, type II, alpha 1	161	164	155
12825	Col3a1	collagen, type III, alpha 1	1201	1203	1169
12827	Col4a2	collagen, type IV, alpha 2	210	207	213
68018	Col4a3bp	collagen, type IV, alpha 3 (Goodpasture antigen) binding protein	158	159	171
12831	Col5a1	collagen, type V, alpha 1	513	509	510
382864	Colq	collagen-like tail subunit (single strand of homotrimer) of asymmetr	192	189	187
17846	Commd1	COMM domain containing 1	26	23	24
99311	Commd7	COMM domain containing 7	159	158	158
12846	Comt	catechol-O-methyltransferase	184	191	190
69156	Comtd1	catechol-O-methyltransferase domain containing 1	199	202	193
12848	Cops2	COP9 (constitutive photomorphogenic) homolog, subunit 2 (Arabid	95	105	101
26572	Cops3	COP9 (constitutive photomorphogenic) homolog, subunit 3 (Arabid	48	49	51
26891	Cops4	COP9 (constitutive photomorphogenic) homolog, subunit 4 (Arabid	92	101	92
26754	Cops5	COP9 (constitutive photomorphogenic) homolog, subunit 5 (Arabid	41	36	36
26893	Cops6	COP9 (constitutive photomorphogenic) homolog, subunit 6 (Arabid	13	9	9
26894	Cops7a	COP9 (constitutive photomorphogenic) homolog, subunit 7a (Arabi	88	83	84
26895	Cops7b	COP9 (constitutive photomorphogenic) homolog, subunit 7b (Arabi	117	121	121
108679	Cops8	COP9 (constitutive photomorphogenic) homolog, subunit 8 (Arabid	922	924	928
71883	Coq2	coenzyme Q2 homolog, prenyltransferase (yeast)	196	199	198
230027	Coq3	coenzyme Q3 homolog, methyltransferase (yeast)	106	105	109
227683	Coq4	coenzyme Q4 homolog (yeast)	20	22	20
52064	Coq5	coenzyme Q5 homolog, methyltransferase (yeast)	37	34	40
12850	Coq7	demethyl-Q 7	123	124	125
67914	Coq9	coenzyme Q9 homolog (yeast)	23	25	28
53419	Corin	corin	464	456	449
70383	Cox10	COX10 homolog, cytochrome c oxidase assembly protein, heme A	200	204	196
226139	Cox15	COX15 homolog, cytochrome c oxidase assembly protein (yeast)	82	83	77
12857	Cox4i1	cytochrome c oxidase subunit IV isoform 1	82	88	87
84682	Cox4i2	cytochrome c oxidase subunit IV isoform 2	124	124	126
12858	Cox5a	cytochrome c oxidase, subunit Va	41	38	40
12861	Cox6a1	cytochrome c oxidase, subunit VI a, polypeptide 1	117	115	121
12862	Cox6a2	cytochrome c oxidase, subunit VI a, polypeptide 2	87	81	82
110323	Cox6b1	cytochrome c oxidase, subunit VIb polypeptide 1	35	35	33
333182	Cox6b2	cytochrome c oxidase subunit VIb polypeptide 2	37	37	40
12864	Cox6c	cytochrome c oxidase, subunit VIc	602	613	616
12865	Cox7a1	cytochrome c oxidase, subunit VIIa 1	34	35	32

12866	Cox7a2	cytochrome c oxidase, subunit VIIa 2	100	96	96
20463	Cox7a2l	cytochrome c oxidase subunit VIIa polypeptide 2-like	371	372	370
66142	Cox7b	cytochrome c oxidase subunit VIIb	21	20	14
12867	Cox7c	cytochrome c oxidase, subunit VIIc	4390	4491	4408
12868	Cox8a	cytochrome c oxidase, subunit VIIIA	44	48	46
12869	Cox8b	cytochrome c oxidase, subunit VIIIB	28	33	25
75483	Cox8c	cytochrome c oxidase, subunit VIIIC	93	91	88
12870	Cp	ceruloplasmin	179	179	184
109697	Cpa1	carboxypeptidase A1	112	105	102
232680	Cpa2	carboxypeptidase A2, pancreatic	71	71	69
12873	Cpa3	carboxypeptidase A3, mast cell	151	153	149
71791	Cpa4	carboxypeptidase A4	91	93	97
74649	Cpa5	carboxypeptidase A5	91	89	83
329093	Cpa6	carboxypeptidase A6	1012	975	947
76703	Cpb1	carboxypeptidase B1 (tissue)	163	162	160
56373	Cpb2	carboxypeptidase B2 (plasma)	195	196	188
12874	Cpd	carboxypeptidase D	176	168	173
12876	Cpe	carboxypeptidase E	276	278	284
12877	Cpeb1	cytoplasmic polyadenylation element binding protein 1	187	189	191
70574	Cpm	carboxypeptidase M	431	435	431
93721	Cpn1	carboxypeptidase N, polypeptide 1	160	153	148
70568	Cpne3	copine III	375	383	370
12892	Cpox	coproporphyrinogen oxidase	95	103	98
227231	Cps1	carbamoyl-phosphate synthetase 1	2605	2653	2597
94230	Cpsf1	cleavage and polyadenylation specific factor 1	46	52	51
51786	Cpsf2	cleavage and polyadenylation specific factor 2	221	214	213
54451	Cpsf3	cleavage and polyadenylation specificity factor 3	39	42	43
54188	Cpsf4	cleavage and polyadenylation specific factor 4	33	30	32
432508	Cpsf6	cleavage and polyadenylation specific factor 6	437	428	433
269061	Cpsf7	cleavage and polyadenylation specific factor 7	38	43	44
12894	Cpt1a	carnitine palmitoyltransferase 1a, liver	134	138	131
12895	Cpt1b	carnitine palmitoyltransferase 1b, muscle	28	25	24
78070	Cpt1c	carnitine palmitoyltransferase 1c	52	50	53
12896	Cpt2	carnitine palmitoyltransferase 2	103	101	104
71287	Cpvl	carboxypeptidase, vitellogenic-like	292	276	284
56264	Cpxm1	carboxypeptidase X 1 (M14 family)	133	129	138
55987	Cpxm2	carboxypeptidase X 2 (M14 family)	454	467	432
242939	Cpz	carboxypeptidase Z	236	231	246
12946	Cr1l	complement component (3b/4b) receptor 1-like	109	108	105
12904	Crabp2	cellular retinoic acid binding protein II	55	58	52
12908	Crat	carnitine acetyltransferase	27	33	30
58799	Crbn	cereblon	964	977	972
12909	Crcp	calcitonin gene-related peptide-receptor component protein	64	64	58
12912	Creb1	cAMP responsive element binding protein 1	615	636	621
12913	Creb3	cAMP responsive element binding protein 3	18	23	23
26427	Creb3l1	cAMP responsive element binding protein 3-like 1	272	277	274
208647	Creb3l2	cAMP responsive element binding protein 3-like 2	295	285	287
208677	Creb3l3	cAMP responsive element binding protein 3-like 3	46	44	49
78284	Creb3l4	cAMP responsive element binding protein 3-like 4	22	20	20
231991	Creb5	cAMP responsive element binding protein 5	679	689	668
12914	Crebbp	CREB binding protein	191	197	181
232430	Crebl2	cAMP responsive element binding protein-like 2	123	127	123
233490	Crebzf	CREB/ATF bZIP transcription factor	37	36	38
433375	Creg1	cellular repressor of E1A-stimulated genes 1	103	107	105
263764	Creg2	cellular repressor of E1A-stimulated genes 2	182	182	179

12916	Crem	cAMP responsive element modulator	360	354	356
12918	Crh	corticotropin releasing hormone	319	326	316
12919	Crhbp	corticotropin releasing hormone binding protein	126	136	132
12922	Crhr2	corticotropin releasing hormone receptor 2	177	179	168
12931	Crif1	cytokine receptor-like factor 1	21	17	24
54394	Crif3	cytokine receptor-like factor 3	129	126	131
66586	Crls1	cardiolipin synthase 1	86	89	85
12933	Crmp1	collapsin response mediator protein 1	374	367	383
66877	Crnk1	Crn, crooked neck-like 1 (Drosophila)	40	42	37
74114	Crot	carnitine O-octanoyltransferase	261	266	249
12944	Crp	C-reactive protein, pentraxin-related	335	338	333
382056	Crtc1	CREB regulated transcription coactivator 1	132	111	126
74343	Crtc2	CREB regulated transcription coactivator 2	22	19	19
70461	Crtc3	CREB regulated transcription coactivator 3	342	347	347
12951	Crx	cone-rod homeobox containing gene	68	64	64
12952	Cry1	cryptochrome 1 (photolyase-like)	247	241	236
12953	Cry2	cryptochrome 2 (photolyase-like)	76	73	76
12954	Cryaa	crystallin, alpha A	260	252	264
12955	Cryab	crystallin, alpha B	22	23	21
68631	Cryl1	crystallin, lambda 1	377	370	369
12971	Crym	crystallin, mu	39	39	36
12972	Cryz	crystallin, zeta	337	339	343
66609	Cryz1	crystallin, zeta (quinone reductase)-like 1	53	56	58
12974	Cs	citrate synthase	65	59	64
246277	Csad	cysteine sulfinic acid decarboxylase	81	75	74
56449	Csda	cold shock domain protein A	392	405	400
105859	Csdc2	cold shock domain containing C2, RNA binding	45	40	43
12977	Csf1	colony stimulating factor 1 (macrophage)	238	231	222
12978	Csf1r	colony stimulating factor 1 receptor	167	166	170
12981	Csf2	colony stimulating factor 2 (granulocyte-macrophage)	214	215	206
234356	Csgalnact1	chondroitin sulfate N-acetylgalactosaminyltransferase 1	673	672	654
78752	Csgalnact2	chondroitin sulfate N-acetylgalactosaminyltransferase 2	172	169	168
12988	Csk	c-src tyrosine kinase	77	79	80
71832	Csl	citrate synthase like	470	481	457
93687	Csnk1a1	casein kinase 1, alpha 1	141	140	141
104318	Csnk1d	casein kinase 1, delta	110	117	120
27373	Csnk1e	casein kinase 1, epsilon	127	126	130
214897	Csnk1g1	casein kinase 1, gamma 1	196	196	199
103236	Csnk1g2	casein kinase 1, gamma 2	78	76	71
70425	Csnk1g3	casein kinase 1, gamma 3	1590	1596	1552
12995	Csnk2a1	casein kinase 2, alpha 1 polypeptide	197	197	201
13000	Csnk2a2	casein kinase 2, alpha prime polypeptide	135	126	129
13001	Csnk2b	casein kinase 2, beta polypeptide	6	7	5
121021	Cspg4	chondroitin sulfate proteoglycan 4	102	94	96
215418	Csmp1	cysteine-serine-rich nuclear protein 1	115	103	111
207785	Csmp2	cysteine-serine-rich nuclear protein 2	105	103	106
77771	Csmp3	cysteine-serine-rich nuclear protein 3	596	574	582
228714	Csrp2bp	cysteine and glycine-rich protein 2 binding protein	115	119	115
13010	Cst3	cystatin C	716	709	700
67337	Cstf1	cleavage stimulation factor, 3' pre-RNA, subunit 1	28	31	25
108062	Cstf2	cleavage stimulation factor, 3' pre-RNA subunit 2	118	108	98
83410	Cstf2t	cleavage stimulation factor, 3' pre-RNA subunit 2, tau	360	362	355
228410	Cstf3	cleavage stimulation factor, 3' pre-RNA, subunit 3	284	286	279
13016	Ctbp1	C-terminal binding protein 1	161	150	160
13017	Ctbp2	C-terminal binding protein 2	984	974	986

74245	Ctbs	chitinase, di-N-acetyl-	120	123	119
13018	Ctcf	CCCTC-binding factor	93	90	99
664799	Ctcf1	CCCTC-binding factor (zinc finger protein)-like	175	173	172
227292	Ctdsp1	CTD (carboxy-terminal domain, RNA polymerase II, polypeptide A)	22	15	19
52468	Ctdsp2	CTD (carboxy-terminal domain, RNA polymerase II, polypeptide A)	115	123	122
14219	Ctgf	connective tissue growth factor	627	630	628
107869	Cth	cystathionase (cystathionine gamma-lyase)	482	493	478
269037	Ctif	CBP80/20-dependent translation initiation factor	580	575	588
12387	Ctnnb1	catenin (cadherin associated protein), beta 1	921	921	901
67087	Ctnnbip1	catenin beta interacting protein 1	167	163	165
12388	Ctnnd1	catenin (cadherin associated protein), delta 1	238	228	248
18163	Ctnnd2	catenin (cadherin associated protein), delta 2	3788	3825	3749
83429	Ctns	cystinosis, nephropathic	31	29	31
51797	Ctps	cytidine 5'-triphosphate synthase	72	66	67
55936	Ctps2	cytidine 5'-triphosphate synthase 2	88	99	92
22083	Ctr9	Ctr9, Paf1/RNA polymerase II complex component, homolog (S. ce	133	128	127
66473	Ctrb1	chymotrypsinogen B1	119	117	119
76701	Ctrc	chymotrypsin C (caldecrin)	59	64	64
109660	Ctrl	chymotrypsin-like	53	47	48
56092	Cts7	cathepsin 7	330	332	328
56094	Cts8	cathepsin 8	102	109	100
19025	Ctsa	cathepsin A	8	8	7
13030	Ctsb	cathepsin B	153	162	173
13032	Ctsc	cathepsin C	1074	1074	1059
13033	Ctsd	cathepsin D	78	79	78
13034	Ctse	cathepsin E	116	111	112
56464	Ctsf	cathepsin F	48	44	47
13035	Ctsg	cathepsin G	44	48	44
13036	Ctsh	cathepsin H	263	262	271
26898	Ctsj	cathepsin J	135	128	119
13038	Ctsk	cathepsin K	120	122	120
13039	Ctsl	cathepsin L	162	156	148
70202	Ctsll3	cathepsin L-like 3	95	92	99
64139	Ctsm	cathepsin M	288	285	264
229445	Ctso	cathepsin O	1167	1192	1193
56835	Ctsr	cathepsin R	200	202	213
13040	Ctss	cathepsin S	79	85	86
13041	Ctsw	cathepsin W	18	17	15
64138	Ctsz	cathepsin Z	49	47	42
233189	Ctu1	cytosolic thiouridylase subunit 1 homolog (S. pombe)	38	34	36
66965	Ctu2	cytosolic thiouridylase subunit 2 homolog (S. pombe)	90	90	92
65969	Cubn	cubilin (intrinsic factor-cobalamin receptor)	356	353	342
26965	Cul1	cullin 1	463	452	448
71745	Cul2	cullin 2	215	226	237
26554	Cul3	cullin 3	659	708	666
99375	Cul4a	cullin 4A	70	66	71
72584	Cul4b	cullin 4B	173	169	164
75717	Cul5	cullin 5	127	127	120
66515	Cul7	cullin 7	36	30	30
13047	Cux1	cut-like homeobox 1	397	402	420
13048	Cux2	cut-like homeobox 2	319	316	319
66070	Cwc15	CWC15 homolog (S. cerevisiae)	148	145	155
80744	Cwc22	CWC22 spliceosome-associated protein homolog (S. cerevisiae)	532	541	520
67285	Cwc27	CWC27 spliceosome-associated protein homolog (S. cerevisiae)	671	691	664
231293	Cwh43	cell wall biogenesis 43 C-terminal homolog (S. cerevisiae)	175	183	179

74322	Cxxc1	CXXC finger 1 (PHD domain)	76	80	77
109672	Cyb5	cytochrome b-5	281	278	267
13056	Cyb561	cytochrome b-561	483	487	493
72023	Cyb561d1	cytochrome b-561 domain containing 1	36	26	30
56368	Cyb561d2	cytochrome b-561 domain containing 2	11	12	10
66427	Cyb5b	cytochrome b5 type B	259	260	260
72017	Cyb5r1	cytochrome b5 reductase 1	35	40	39
320635	Cyb5r2	cytochrome b5 reductase 2	253	250	243
109754	Cyb5r3	cytochrome b5 reductase 3	125	132	130
266690	Cyb5r4	cytochrome b5 reductase 4	159	160	171
230582	Cyb5rl	cytochrome b5 reductase-like	41	40	41
13057	Cyba	cytochrome b-245, alpha polypeptide	26	24	24
225912	Cybasc3	cytochrome b, ascorbate dependent 3	35	37	35
13058	Cybb	cytochrome b-245, beta polypeptide	276	278	277
73649	Cybrd1	cytochrome b reductase 1	211	203	193
66445	Cyc1	cytochrome c-1	20	21	21
13063	Cycs	cytochrome c, somatic	138	147	141
13067	Cyct	cytochrome c, testis	41	42	42
114886	Cygb	cytoglobin	30	36	32
54151	Cyhr1	cysteine and histidine rich 1	26	26	25
74256	Cyld	cylindromatosis (turban tumor syndrome)	515	519	504
229697	Cym	chymosin	73	74	73
13070	Cyp11a1	cytochrome P450, family 11, subfamily a, polypeptide 1	214	201	210
110115	Cyp11b1	cytochrome P450, family 11, subfamily b, polypeptide 1	44	50	48
13072	Cyp11b2	cytochrome P450, family 11, subfamily b, polypeptide 2	56	52	51
13074	Cyp17a1	cytochrome P450, family 17, subfamily a, polypeptide 1	86	83	81
13075	Cyp19a1	cytochrome P450, family 19, subfamily a, polypeptide 1	284	274	272
13076	Cyp1a1	cytochrome P450, family 1, subfamily a, polypeptide 1	44	46	45
13077	Cyp1a2	cytochrome P450, family 1, subfamily a, polypeptide 2	61	62	57
13078	Cyp1b1	cytochrome P450, family 1, subfamily b, polypeptide 1	354	351	357
77951	Cyp20a1	cytochrome P450, family 20, subfamily A, polypeptide 1	293	298	290
13079	Cyp21a1	cytochrome P450, family 21, subfamily a, polypeptide 1	100	104	90
13081	Cyp24a1	cytochrome P450, family 24, subfamily a, polypeptide 1	19	19	17
13082	Cyp26a1	cytochrome P450, family 26, subfamily a, polypeptide 1	455	456	444
232174	Cyp26b1	cytochrome P450, family 26, subfamily b, polypeptide 1	1321	1344	1339
546726	Cyp26c1	cytochrome P450, family 26, subfamily c, polypeptide 1	185	187	177
104086	Cyp27a1	cytochrome P450, family 27, subfamily a, polypeptide 1	116	105	122
13115	Cyp27b1	cytochrome P450, family 27, subfamily b, polypeptide 1	25	22	22
13085	Cyp2a12	cytochrome P450, family 2, subfamily a, polypeptide 12	238	234	223
233005	Cyp2a22	cytochrome P450, family 2, subfamily a, polypeptide 22	245	253	259
13086	Cyp2a4	cytochrome P450, family 2, subfamily a, polypeptide 4	169	164	178
13087	Cyp2a5	cytochrome P450, family 2, subfamily a, polypeptide 5	168	166	171
224044	Cyp2ab1	cytochrome P450, family 2, subfamily ab, polypeptide 1	156	157	166
13088	Cyp2b10	cytochrome P450, family 2, subfamily b, polypeptide 10	313	316	320
13089	Cyp2b13	cytochrome P450, family 2, subfamily b, polypeptide 13	356	354	343
13090	Cyp2b19	cytochrome P450, family 2, subfamily b, polypeptide 19	156	157	152
243881	Cyp2b23	cytochrome P450, family 2, subfamily b, polypeptide 23	190	193	183
13094	Cyp2b9	cytochrome P450, family 2, subfamily b, polypeptide 9	258	264	251
13095	Cyp2c29	cytochrome P450, family 2, subfamily c, polypeptide 29	296	290	291
13096	Cyp2c37	cytochrome P450, family 2, subfamily c, polypeptide 37	237	244	237
13097	Cyp2c38	cytochrome P450, family 2, subfamily c, polypeptide 38	284	270	289
13098	Cyp2c39	cytochrome P450, family 2, subfamily c, polypeptide 39	233	241	233
13099	Cyp2c40	cytochrome P450, family 2, subfamily c, polypeptide 40	171	195	169
226143	Cyp2c44	cytochrome P450, family 2, subfamily c, polypeptide 44	108	116	114
107141	Cyp2c50	cytochrome P450, family 2, subfamily c, polypeptide 50	142	145	148

404195	Cyp2c54	cytochrome P450, family 2, subfamily c, polypeptide 54	114	121	120
72082	Cyp2c55	cytochrome P450, family 2, subfamily c, polypeptide 55	167	163	169
72303	Cyp2c65	cytochrome P450, family 2, subfamily c, polypeptide 65	137	137	137
69888	Cyp2c66	cytochrome P450, family 2, subfamily c, polypeptide 66	218	218	209
545288	Cyp2c67	cytochrome P450, family 2, subfamily c, polypeptide 67	287	292	285
433247	Cyp2c68	cytochrome P450, family 2, subfamily c, polypeptide 68	209	209	188
100043108	Cyp2c69	cytochrome P450, family 2, subfamily c, polypeptide 69	232	233	222
226105	Cyp2c70	cytochrome P450, family 2, subfamily c, polypeptide 70	236	238	230
13101	Cyp2d10	cytochrome P450, family 2, subfamily d, polypeptide 10	71	80	70
545123	Cyp2d11	cytochrome P450, family 2, subfamily d, polypeptide 11	36	32	34
380997	Cyp2d12	cytochrome P450, family 2, subfamily d, polypeptide 12	217	228	214
56448	Cyp2d22	cytochrome P450, family 2, subfamily d, polypeptide 22	50	49	47
76279	Cyp2d26	cytochrome P450, family 2, subfamily d, polypeptide 26	176	172	178
223706	Cyp2d34	cytochrome P450, family 2, subfamily d, polypeptide 34	117	117	116
71754	Cyp2d40	cytochrome P450, family 2, subfamily d, polypeptide 40	124	139	134
13105	Cyp2d9	cytochrome P450, family 2, subfamily d, polypeptide 9	190	191	189
13106	Cyp2e1	cytochrome P450, family 2, subfamily e, polypeptide 1	111	115	109
13107	Cyp2f2	cytochrome P450, family 2, subfamily f, polypeptide 2	162	167	162
13108	Cyp2g1	cytochrome P450, family 2, subfamily g, polypeptide 1	102	91	104
100066	Cyp2j11	cytochrome P450, family 2, subfamily j, polypeptide 11	343	344	351
230459	Cyp2j13	cytochrome P450, family 2, subfamily j, polypeptide 13	223	212	213
13109	Cyp2j5	cytochrome P450, family 2, subfamily j, polypeptide 5	255	252	255
13110	Cyp2j6	cytochrome P450, family 2, subfamily j, polypeptide 6	116	111	109
74519	Cyp2j9	cytochrome P450, family 2, subfamily j, polypeptide 9	145	144	141
244209	Cyp2r1	cytochrome P450, family 2, subfamily r, polypeptide 1	280	286	279
74134	Cyp2s1	cytochrome P450, family 2, subfamily s, polypeptide 1	141	144	138
384724	Cyp2t4	cytochrome P450, family 2, subfamily t, polypeptide 4	60	56	57
71519	Cyp2u1	cytochrome P450, family 2, subfamily u, polypeptide 1	91	89	91
545817	Cyp2w1	cytochrome P450, family 2, subfamily w, polypeptide 1	27	24	31
56050	Cyp39a1	cytochrome P450, family 39, subfamily a, polypeptide 1	171	177	175
13112	Cyp3a11	cytochrome P450, family 3, subfamily a, polypeptide 11	267	268	261
13113	Cyp3a13	cytochrome P450, family 3, subfamily a, polypeptide 13	122	111	110
13114	Cyp3a16	cytochrome P450, family 3, subfamily a, polypeptide 16	313	306	304
56388	Cyp3a25	cytochrome P450, family 3, subfamily a, polypeptide 25	251	252	258
53973	Cyp3a41a	cytochrome P450, family 3, subfamily a, polypeptide 41A	416	404	403
337924	Cyp3a44	cytochrome P450, family 3, subfamily a, polypeptide 44	202	206	200
100041449	Cyp3a59	cytochrome P450, subfamily 3A, polypeptide 59	216	236	215
13116	Cyp46a1	cytochrome P450, family 46, subfamily a, polypeptide 1	129	125	132
13117	Cyp4a10	cytochrome P450, family 4, subfamily a, polypeptide 10	85	87	86
277753	Cyp4a12a	cytochrome P450, family 4, subfamily a, polypeptide 12a	222	218	210
13118	Cyp4a12b	cytochrome P450, family 4, subfamily a, polypeptide 12B	195	202	193
13119	Cyp4a14	cytochrome P450, family 4, subfamily a, polypeptide 14	87	85	83
666168	Cyp4a31	cytochrome P450, family 4, subfamily a, polypeptide 31	87	86	81
100040843	Cyp4a32	cytochrome P450, family 4, subfamily a, polypeptide 32	77	82	81
13120	Cyp4b1	cytochrome P450, family 4, subfamily b, polypeptide 1	170	176	169
170716	Cyp4f13	cytochrome P450, family 4, subfamily f, polypeptide 13	62	68	67
64385	Cyp4f14	cytochrome P450, family 4, subfamily f, polypeptide 14	73	80	70
106648	Cyp4f15	cytochrome P450, family 4, subfamily f, polypeptide 15	166	164	171
70101	Cyp4f16	cytochrome P450, family 4, subfamily f, polypeptide 16	146	150	144
72054	Cyp4f18	cytochrome P450, family 4, subfamily f, polypeptide 18	140	139	138
320997	Cyp4f39	cytochrome P450, family 4, subfamily f, polypeptide 39	107	112	117
102294	Cyp4v3	cytochrome P450, family 4, subfamily v, polypeptide 3	110	109	111
81906	Cyp4x1	cytochrome P450, family 4, subfamily x, polypeptide 1	204	193	189
13121	Cyp51	cytochrome P450, family 51	341	344	346
13122	Cyp7a1	cytochrome P450, family 7, subfamily a, polypeptide 1	233	226	220

13123	Cyp7b1	cytochrome P450, family 7, subfamily b, polypeptide 1	1425	1437	1397
13124	Cyp8b1	cytochrome P450, family 8, subfamily b, polypeptide 1	45	52	49
16007	Cyr61	cysteine rich protein 61	232	240	230
231162	Cyt1l	cytokine-like 1	141	135	131
28088	D10Wsu52e	DNA segment, Chr 10, Wayne State University 52, expressed	99	113	101
219132	D14Ertdd668e	DNA segment, Chr 14, ERATO Doi 668, expressed	68	67	69
98314	D2hgdh	D-2-hydroxyglutarate dehydrogenase	80	77	78
269952	D330012F22Rik	RIKEN cDNA D330012F22 gene	14	16	19
229791	D3Bwg0562e	DNA segment, Chr 3, Brigham & Women's Genetics 0562 express	636	639	638
110958	D6Mm5e	DNA segment, Chr 6, Miriam Meisler 5, expressed	111	121	112
68171	D730048I06Rik	RIKEN cDNA D730048I06 gene	86	87	85
244418	D8Ertdd82e	DNA segment, Chr 8, ERATO Doi 82, expressed	546	546	551
13132	Dab2	disabled homolog 2 (Drosophila)	1653	1675	1648
69601	Dab2ip	disabled homolog 2 (Drosophila) interacting protein	836	817	828
13134	Dach1	dachshund 1 (Drosophila)	3178	3181	3137
93837	Dach2	dachshund 2 (Drosophila)	1466	1489	1375
13137	Daf2	decay accelerating factor 2	1513	1521	1498
13138	Dag1	dystroglycan 1	132	120	131
269060	Dagla	diacylglycerol lipase, alpha	189	175	187
231871	Daglb	diacylglycerol lipase, beta	160	154	157
225913	Dak	dihydroxyacetone kinase 2 homolog (yeast)	33	35	35
67789	Dalrd3	DALR anticodon binding domain containing 3	11	13	8
13142	Dao	D-amino acid oxidase	122	123	119
223453	Dap	death-associated protein	1559	1523	1523
69635	Dapk1	death associated protein kinase 1	745	748	755
13143	Dapk2	death-associated protein kinase 2	302	287	289
13144	Dapk3	death-associated protein kinase 3	18	21	21
226414	Dars	aspartyl-tRNA synthetase	304	287	294
226539	Dars2	aspartyl-tRNA synthetase 2 (mitochondrial)	43	41	42
13163	Daxx	Fas death domain-associated protein	30	32	30
13164	Dazl	deleted in azoospermia-like	418	417	413
27214	Dbf4	DBF4 homolog (S. cerevisiae)	75	75	69
13166	Dbh	dopamine beta hydroxylase	136	134	132
13167	Dbi	diazepam binding inhibitor	58	61	60
13170	Dbp	D site albumin promoter binding protein	17	17	17
83703	Dbr1	debranching enzyme homolog 1 (S. cerevisiae)	57	55	55
13171	Dbt	dihydrolipoamide branched chain transacylase E2	73	73	77
223499	Dcaf13	DDB1 and CUL4 associated factor 13	114	109	107
74106	Dcaf6	DDB1 and CUL4 associated factor 6	212	208	209
68087	Dcakd	dephospho-CoA kinase domain containing	79	83	79
13178	Dck	deoxycytidine kinase	212	208	213
13175	Dclk1	doublecortin-like kinase 1	1024	1062	1031
70762	Dclk2	doublecortin-like kinase 2	560	566	568
245038	Dclk3	doublecortin-like kinase 3	491	477	479
55947	Dclre1a	DNA cross-link repair 1A, PSO2 homolog (S. cerevisiae)	112	121	112
140917	Dclre1b	DNA cross-link repair 1B, PSO2 homolog (S. cerevisiae)	25	26	27
227525	Dclre1c	DNA cross-link repair 1C, PSO2 homolog (S. cerevisiae)	69	68	66
13179	Dcn	decorin	1229	1197	1186
75901	Dcp1a	DCP1 decapping enzyme homolog A (S. cerevisiae)	179	182	180
319618	Dcp1b	DCP1 decapping enzyme homolog b (S. cerevisiae)	112	108	101
70640	Dcp2	DCP2 decapping enzyme homolog (S. cerevisiae)	425	422	421
69305	Dcps	decapping enzyme, scavenger	109	104	109
13190	Dct	dopachrome tautomerase	1583	1571	1531
320685	Dctd	dCMP deaminase	895	914	873
22428	Dctn6	dynactin 6	182	180	181

66422	Dctpp1	dCTP pyrophosphatase 1	33	38	40
67880	Dcxr	dicarbonyl L-xylulose reductase	16	11	13
69219	Ddah1	dimethylarginine dimethylaminohydrolase 1	371	351	353
51793	Ddah2	dimethylarginine dimethylaminohydrolase 2	18	14	16
13194	Ddb1	damage specific DNA binding protein 1	39	34	39
107986	Ddb2	damage specific DNA binding protein 2	41	42	42
13195	Ddc	dopa decarboxylase	304	304	305
114874	Ddhd1	DDHD domain containing 1	715	706	714
72108	Ddhd2	DDHD domain containing 2	83	87	87
71829	Ddi1	DDI1, DNA-damage inducible 1, homolog 1 (S. cerevisiae)	1294	1312	1289
68817	Ddi2	DNA-damage inducible protein 2	81	77	80
13198	Ddit3	DNA-damage inducible transcript 3	27	28	28
74747	Ddit4	DNA-damage-inducible transcript 4	159	155	160
70503	Ddo	D-aspartate oxidase	142	144	146
13200	Ddost	dolichyl-di-phosphooligosaccharide-protein glycotransferase	80	82	81
12305	Ddr1	discoïdin domain receptor family, member 1	200	195	197
18214	Ddr2	discoïdin domain receptor family, member 2	268	270	279
13202	Ddt	D-dopachrome tautomerase	22	21	23
104721	Ddx1	DEAD (Asp-Glu-Ala-Asp) box polypeptide 1	419	417	423
320209	Ddx11	DEAD/H (Asp-Glu-Ala-Asp/His) box polypeptide 11 (CHL1-like heli	437	437	442
234733	Ddx19b	DEAD (Asp-Glu-Ala-Asp) box polypeptide 19b	50	52	58
53975	Ddx20	DEAD (Asp-Glu-Ala-Asp) box polypeptide 20	319	323	321
56200	Ddx21	DEAD (Asp-Glu-Ala-Asp) box polypeptide 21	90	95	98
74351	Ddx23	DEAD (Asp-Glu-Ala-Asp) box polypeptide 23	58	55	58
30959	Ddx25	DEAD (Asp-Glu-Ala-Asp) box polypeptide 25	137	135	133
227674	Ddx31	DEAD/H (Asp-Glu-Ala-Asp/His) box polypeptide 31	99	102	97
68278	Ddx39	DEAD (Asp-Glu-Ala-Asp) box polypeptide 39	54	50	50
53817	Ddx39b	DEAD (Asp-Glu-Ala-Asp) box polypeptide 39B	32	36	29
13205	Ddx3x	DEAD/H (Asp-Glu-Ala-Asp/His) box polypeptide 3, X-linked	488	484	467
72935	Ddx41	DEAD (Asp-Glu-Ala-Asp) box polypeptide 41	50	46	45
100048658	Ddx43	DEAD (Asp-Glu-Ala-Asp) box polypeptide 43	81	88	84
212880	Ddx46	DEAD (Asp-Glu-Ala-Asp) box polypeptide 46	89	92	88
67755	Ddx47	DEAD (Asp-Glu-Ala-Asp) box polypeptide 47	107	117	111
13207	Ddx5	DEAD (Asp-Glu-Ala-Asp) box polypeptide 5	5	7	5
69663	Ddx51	DEAD (Asp-Glu-Ala-Asp) box polypeptide 51	151	147	143
71990	Ddx54	DEAD (Asp-Glu-Ala-Asp) box polypeptide 54	26	27	25
52513	Ddx56	DEAD (Asp-Glu-Ala-Asp) box polypeptide 56	59	53	55
230073	Ddx58	DEAD (Asp-Glu-Ala-Asp) box polypeptide 58	164	167	167
234311	Ddx60	DEAD (Asp-Glu-Ala-Asp) box polypeptide 60	281	283	280
54006	Deaf1	deformed epidermal autoregulatory factor 1 (Drosophila)	59	61	60
67460	Decr1	2,4-dienoyl CoA reductase 1, mitochondrial	92	104	94
26378	Decr2	2-4-dienoyl-Coenzyme A reductase 2, peroxisomal	34	35	36
21945	Dedd	death effector domain-containing	67	60	63
67379	Dedd2	death effector domain-containing DNA binding protein 2	116	109	114
13244	Degs1	degenerative spermatocyte homolog 1 (Drosophila)	188	182	182
70059	Degs2	degenerative spermatocyte homolog 2 (Drosophila), lipid desatura	198	215	201
73172	Dem1	defects in morphology 1 homolog (S. cerevisiae)	93	90	92
68184	Denr	density-regulated protein	68	68	66
76131	Depdc1a	DEP domain containing 1a	1307	1333	1280
232449	Dera	2-deoxyribose-5-phosphate aldolase homolog (C. elegans)	451	447	434
67819	Der1	Der1-like domain family, member 1	275	290	274
116891	Der12	Der1-like domain family, member 2	18	19	23
13347	Dffa	DNA fragmentation factor, alpha subunit	38	39	39
13368	Dffb	DNA fragmentation factor, beta subunit	23	22	24
13350	Dgat1	diacylglycerol O-acyltransferase 1	54	54	55

67800	Dgat2	diacylglycerol O-acyltransferase 2	132	126	127
668257	Dgat2l6	diacylglycerol O-acyltransferase 2-like 6	100	95	98
27886	Dgcr14	DiGeorge syndrome critical region gene 14	20	21	22
94223	Dgcr8	DiGeorge syndrome critical region gene 8	53	55	54
13139	Dgka	diacylglycerol kinase, alpha	58	54	55
217480	Dgkb	diacylglycerol kinase, beta	1925	1960	1874
227333	Dgkd	diacylglycerol kinase, delta	271	271	263
56077	Dgke	diacylglycerol kinase, epsilon	98	103	99
110197	Dgkg	diacylglycerol kinase, gamma	469	478	465
380921	Dgkh	diacylglycerol kinase, eta	393	408	402
320127	Dgki	diacylglycerol kinase, iota	816	816	811
331374	Dgkk	diacylglycerol kinase kappa	649	659	637
110524	Dgkq	diacylglycerol kinase, theta	50	49	49
104418	Dgkz	diacylglycerol kinase zeta	127	127	138
27369	Dguok	deoxyguanosine kinase	118	127	121
74754	Dhcr24	24-dehydrocholesterol reductase	162	160	164
13360	Dhcr7	7-dehydrocholesterol reductase	465	447	459
71755	Dhdh	dihydrodiol dehydrogenase (dimeric)	56	57	60
13361	Dhfr	dihydrofolate reductase	288	284	286
13363	Dhh	desert hedgehog	41	46	39
56749	Dhodh	dihydroorotate dehydrogenase	44	47	46
330817	Dhps	deoxyhypusine synthase	17	16	18
52585	Dhrs1	dehydrogenase/reductase (SDR family) member 1	32	33	30
192970	Dhrs11	dehydrogenase/reductase (SDR family) member 11	70	61	64
70451	Dhrs13	dehydrogenase/reductase (SDR family) member 13	75	71	77
71412	Dhrs2	dehydrogenase/reductase member 2	488	468	472
20148	Dhrs3	dehydrogenase/reductase (SDR family) member 3	514	513	534
28200	Dhrs4	dehydrogenase/reductase (SDR family) member 4	364	343	335
66375	Dhrs7	dehydrogenase/reductase (SDR family) member 7	296	299	299
216820	Dhrs7b	dehydrogenase/reductase (SDR family) member 7B	91	93	95
68460	Dhrs7c	dehydrogenase/reductase (SDR family) member 7C	200	202	191
241452	Dhrs9	dehydrogenase/reductase (SDR family) member 9	318	323	313
209692	Dhtkd1	dehydrogenase E1 and transketolase domain containing 1	74	75	73
13204	Dhx15	DEAH (Asp-Glu-Ala-His) box polypeptide 15	815	827	808
218629	Dhx29	DEAH (Asp-Glu-Ala-His) box polypeptide 29	78	82	79
64340	Dhx38	DEAH (Asp-Glu-Ala-His) box polypeptide 38	85	96	88
217207	Dhx8	DEAH (Asp-Glu-Ala-His) box polypeptide 8	155	159	160
13211	Dhx9	DEAH (Asp-Glu-Ala-His) box polypeptide 9	175	165	175
192119	Dicer1	Dicer1, Dcr-1 homolog (Drosophila)	512	504	495
23856	Dido1	death inducer-obliterator 1	95	104	98
66254	Dimt1	DIM1 dimethyladenosine transferase 1-like (S. cerevisiae)	110	106	108
13370	Dio1	deiodinase, iodothyronine, type I	79	80	84
13371	Dio2	deiodinase, iodothyronine, type II	3063	3088	3091
107585	Dio3	deiodinase, iodothyronine type III	207	216	203
64451	Dip2a	DIP2 disco-interacting protein 2 homolog A (Drosophila)	245	236	240
239667	Dip2b	DIP2 disco-interacting protein 2 homolog B (Drosophila)	486	467	489
208666	Diras1	DIRAS family, GTP-binding RAS-like 1	22	22	24
68203	Diras2	DIRAS family, GTP-binding RAS-like 2	944	958	957
72662	Dis3	DIS3 mitotic control homolog (S. cerevisiae)	265	252	250
213550	Dis3l	DIS3 mitotic control homolog (S. cerevisiae)-like	140	138	135
245474	Dkc1	dyskeratosis congenita 1, dyskerin homolog (human)	60	56	58
13380	Dkk1	dickkopf homolog 1 (Xenopus laevis)	487	496	491
50781	Dkk3	dickkopf homolog 3 (Xenopus laevis)	266	264	260
235339	Dlat	dihydrolipoamide S-acetyltransferase (E2 component of pyruvate d	144	141	145
50768	Dlc1	deleted in liver cancer 1	1003	1011	1006

13382	Dld	dihydrolipoamide dehydrogenase	222	233	212
13383	Dlg1	discs, large homolog 1 (Drosophila)	572	585	563
78920	Dlst	dihydrolipoamide S-succinyltransferase (E2 component of 2-oxo-gl	56	57	52
13390	Dlx1	distal-less homeobox 1	109	109	111
13392	Dlx2	distal-less homeobox 2	227	235	224
13395	Dlx5	distal-less homeobox 5	118	108	113
320038	Dlx6os1	Dlx6 opposite strand transcript 1	20	21	19
66233	Dmap1	DNA methyltransferase 1-associated protein 1	274	283	282
140477	Dmbx1	diencephalon/mesencephalon homeobox 1	174	173	167
13404	Dmc1	DMC1 dosage suppressor of mck1 homolog, meiosis-specific hom	149	143	146
13405	Dmd	dystrophin, muscular dystrophy	2323	2404	2217
74129	Dmgdh	dimethylglycine dehydrogenase precursor	135	121	128
13400	Dmpk	dystrophia myotonica-protein kinase	12	9	11
240590	Dmrt3	doublesex and mab-3 related transcription factor 3	214	216	210
242523	Dmrta1	doublesex and mab-3 related transcription factor like family A1	1171	1197	1165
56296	Dmrtdb1	DMRT-like family B with proline-rich C-terminal, 1	478	471	477
70887	Dmrtdc1a	DMRT-like family C1a	87	77	84
71241	Dmrtdc2	doublesex and mab-3 related transcription factor like family C2	20	19	20
23857	Dmtf1	cyclin D binding myb-like transcription factor 1	213	215	220
327762	Dna2	DNA replication helicase 2 homolog (yeast)	75	77	80
110084	Dnahc1	dynein, axonemal, heavy chain 1	107	104	112
56087	Dnahc10	dynein, axonemal, heavy chain 10	225	226	224
13411	Dnahc11	dynein, axonemal, heavy chain 11	590	594	589
110082	Dnahc5	dynein, axonemal, heavy chain 5	2722	2665	2698
432611	Dnaic2	dynein, axonemal, intermediate chain 2	114	119	124
15502	Dnaja1	DnaJ (Hsp40) homolog, subfamily A, member 1	75	66	72
56445	Dnaja2	DnaJ (Hsp40) homolog, subfamily A, member 2	267	262	265
83945	Dnaja3	DnaJ (Hsp40) homolog, subfamily A, member 3	45	49	48
58233	Dnaja4	DnaJ (Hsp40) homolog, subfamily A, member 4	90	94	90
81489	Dnajb1	DnaJ (Hsp40) homolog, subfamily B, member 1	72	75	71
67838	Dnajb11	DnaJ (Hsp40) homolog, subfamily B, member 11	43	42	45
56709	Dnajb12	DnaJ (Hsp40) homolog, subfamily B, member 12	316	312	318
69387	Dnajb13	DnaJ (Hsp40) related, subfamily B, member 13	53	57	52
70604	Dnajb14	DnaJ (Hsp40) homolog, subfamily B, member 14	71	71	70
56812	Dnajb2	DnaJ (Hsp40) homolog, subfamily B, member 2	62	62	62
15504	Dnajb3	DnaJ (Hsp40) homolog, subfamily B, member 3	16	13	13
67035	Dnajb4	DnaJ (Hsp40) homolog, subfamily B, member 4	76	77	77
56323	Dnajb5	DnaJ (Hsp40) homolog, subfamily B, member 5	66	62	62
23950	Dnajb6	DnaJ (Hsp40) homolog, subfamily B, member 6	232	216	233
57755	Dnajb7	DnaJ (Hsp40) homolog, subfamily B, member 7	86	80	88
56691	Dnajb8	DnaJ (Hsp40) homolog, subfamily B, member 8	314	329	315
27362	Dnajb9	DnaJ (Hsp40) homolog, subfamily B, member 9	3921	4006	3903
13418	Dnajc1	DnaJ (Hsp40) homolog, subfamily C, member 1	769	800	780
66861	Dnajc10	DnaJ (Hsp40) homolog, subfamily C, member 10	202	205	199
230935	Dnajc11	DnaJ (Hsp40) homolog, subfamily C, member 11	160	159	170
30045	Dnajc12	DnaJ (Hsp40) homolog, subfamily C, member 12	122	125	120
74330	Dnajc14	DnaJ (Hsp40) homolog, subfamily C, member 14	21	21	20
214063	Dnajc16	DnaJ (Hsp40) homolog, subfamily C, member 16	64	58	61
69408	Dnajc17	DnaJ (Hsp40) homolog, subfamily C, member 17	28	27	29
76594	Dnajc18	DnaJ (Hsp40) homolog, subfamily C, member 18	79	78	84
22791	Dnajc2	DnaJ (Hsp40) homolog, subfamily C, member 2	58	58	65
72778	Dnajc22	DnaJ (Hsp40) homolog, subfamily C, member 22	47	44	45
99349	Dnajc24	DnaJ (Hsp40) homolog, subfamily C, member 24	1011	1008	993
72429	Dnajc25	DnaJ (Hsp40) homolog, subfamily C, member 25	63	63	58
217378	Dnajc27	DnaJ (Hsp40) homolog, subfamily C, member 27	124	129	121

100037258	Dnajc3	DnaJ (Hsp40) homolog, subfamily C, member 3	212	222	237
66114	Dnajc30	DnaJ (Hsp40) homolog, subfamily C, member 30	18	17	14
57431	Dnajc4	DnaJ (Hsp40) homolog, subfamily C, member 4	11	10	10
13002	Dnajc5	DnaJ (Hsp40) homolog, subfamily C, member 5	108	103	99
66326	Dnajc5b	DnaJ (Hsp40) homolog, subfamily C, member 5 beta	463	456	469
56354	Dnajc7	DnaJ (Hsp40) homolog, subfamily C, member 7	63	60	61
68598	Dnajc8	DnaJ (Hsp40) homolog, subfamily C, member 8	41	40	36
108671	Dnajc9	DnaJ (Hsp40) homolog, subfamily C, member 9	59	54	56
13419	Dnase1	deoxyribonuclease I	94	103	97
69537	Dnase111	deoxyribonuclease 1-like 1	11	14	13
66705	Dnase112	deoxyribonuclease 1-like 2	36	30	34
13421	Dnase113	deoxyribonuclease 1-like 3	248	242	238
13423	Dnase2a	deoxyribonuclease II alpha	41	38	40
56629	Dnase2b	deoxyribonuclease II beta	76	69	70
227325	Dner	delta/notch-like EGF-related receptor	718	721	697
13429	Dnm1	dynamamin 1	49	56	57
13430	Dnm2	dynamamin 2	110	111	114
103967	Dnm3	dynamamin 3	422	421	416
13433	Dnmt1	DNA methyltransferase (cytosine-5) 1	112	104	109
13435	Dnmt3a	DNA methyltransferase 3A	606	591	586
13436	Dnmt3b	DNA methyltransferase 3B	135	140	148
54427	Dnmt3l	DNA (cytosine-5-)-methyltransferase 3-like	82	78	77
13437	Dnpep	aspartyl aminopeptidase	104	105	105
21673	Dntt	deoxynucleotidyltransferase, terminal	105	104	112
99480	Dnttp2	deoxynucleotidyltransferase, terminal, interacting protein 2	64	66	57
67299	Dock7	dedicator of cytokinesis 7	206	207	206
102115	Dohh	deoxyhypusine hydroxylase/monooxygenase	17	17	16
231134	Dok7	docking protein 7	79	79	80
227697	Dolk	dolichol kinase	24	25	23
57170	Dolpp1	dolichyl pyrophosphate phosphatase 1	61	63	66
208266	Dot11	DOT1-like, histone H3 methyltransferase (<i>S. cerevisiae</i>)	71	77	69
13478	Dpagt1	dolichyl-phosphate (UDP-N-acetylglucosamine) acetylglucosamine	14	15	18
13479	Dpep1	dipeptidase 1 (renal)	71	69	63
319446	Dpep2	dipeptidase 2	41	40	39
71854	Dpep3	dipeptidase 3	41	35	43
29861	Dpf1	D4, zinc and double PHD fingers family 1	270	255	273
19708	Dpf2	D4, zinc and double PHD fingers family 2	40	39	38
70127	Dpf3	D4, zinc and double PHD fingers, family 3	1322	1303	1302
116905	Dph1	DPH1 homolog (<i>S. cerevisiae</i>)	21	18	17
67728	Dph2	DPH2 homolog (<i>S. cerevisiae</i>)	31	36	32
69740	Dph5	DPH5 homolog (<i>S. cerevisiae</i>)	139	152	146
13480	Dpm1	dolichol-phosphate (beta-D) mannosyltransferase 1	33	33	29
13481	Dpm2	dolichol-phosphate (beta-D) mannosyltransferase 2	52	53	53
68563	Dpm3	dolichyl-phosphate mannosyltransferase polypeptide 3	29	36	32
269109	Dpp10	dipeptidylpeptidase 10	4921	4958	4862
75221	Dpp3	dipeptidylpeptidase 3	47	46	43
13482	Dpp4	dipeptidylpeptidase 4	551	550	547
13483	Dpp6	dipeptidylpeptidase 6	1865	1876	1866
83768	Dpp7	dipeptidylpeptidase 7	38	42	46
74388	Dpp8	dipeptidylpeptidase 8	105	103	96
224897	Dpp9	dipeptidylpeptidase 9	78	72	71
66310	Dpy30	dpy-30 homolog (<i>C. elegans</i>)	66	76	71
99586	Dpyd	dihydropyrimidine dehydrogenase	1691	1718	1671
64705	Dpys	dihydropyrimidinase	260	248	254
12934	Dpysl2	dihydropyrimidinase-like 2	301	298	304

22240	Dpysl3	dihydropyrimidinase-like 3	641	638	634
26757	Dpysl4	dihydropyrimidinase-like 4	240	242	227
65254	Dpysl5	dihydropyrimidinase-like 5	182	195	195
93838	Dqx1	DEAQ RNA-dependent ATPase	19	19	19
13486	Dr1	down-regulator of transcription 1	223	230	234
71712	Dram1	DNA-damage regulated autophagy modulator 1	233	238	233
66556	Drap1	Dr1 associated protein 1 (negative cofactor 2 alpha)	23	20	25
13488	Drd1a	dopamine receptor D1A	773	765	776
13489	Drd2	dopamine receptor D2	224	224	220
13490	Drd3	dopamine receptor D3	289	286	287
13491	Drd4	dopamine receptor D4	64	59	65
13492	Drd5	dopamine receptor D5	259	263	276
14000	Drosha	drosha, ribonuclease type III	456	453	450
72107	Dscc1	defective in sister chromatid cohesion 1 homolog (S. cerevisiae)	52	50	50
212898	Dse	dermatan sulfate epimerase	192	202	194
109620	Dsp	desmoplakin	214	216	214
213452	Dstyk	dual serine/threonine and tyrosine protein kinase	104	121	113
66044	Dtd1	D-tyrosyl-tRNA deacylase 1 homolog (S. cerevisiae)	294	303	310
76843	Dtl	denticleless homolog (Drosophila)	232	221	225
209200	Dtx3l	deltex 3-like (Drosophila)	60	59	61
21915	Dtymk	deoxythymidylate kinase	62	65	60
13531	Dub1	deubiquitinating enzyme 1	50	54	47
381944	Dub1a	deubiquitinating enzyme 1a	198	197	193
384701	Dub2a	deubiquitinating enzyme 2a	47	46	43
99439	Duox1	dual oxidase 1	71	70	75
214593	Duox2	dual oxidase 2	84	81	90
435391	Dupd1	dual specificity phosphatase and pro isomerase domain containing	307	314	306
68730	Dus1l	dihydrouridine synthase 1-like (S. cerevisiae)	51	49	47
66369	Dus2l	dihydrouridine synthase 2-like (SMM1, S. cerevisiae)	65	63	69
224907	Dus3l	dihydrouridine synthase 3-like (S. cerevisiae)	14	16	13
71916	Dus4l	dihydrouridine synthase 4-like (S. cerevisiae)	25	28	28
19252	Dusp1	dual specificity phosphatase 1	191	187	194
63953	Dusp10	dual specificity phosphatase 10	890	909	879
72102	Dusp11	dual specificity phosphatase 11 (RNA/RNP complex 1-interacting)	129	124	134
80915	Dusp12	dual specificity phosphatase 12	59	54	57
27389	Dusp13	dual specificity phosphatase 13	55	53	55
56405	Dusp14	dual specificity phosphatase 14	226	214	219
252864	Dusp15	dual specificity phosphatase-like 15	38	31	37
70686	Dusp16	dual specificity phosphatase 16	239	241	234
75219	Dusp18	dual specificity phosphatase 18	22	28	23
68082	Dusp19	dual specificity phosphatase 19	61	64	64
13537	Dusp2	dual specificity phosphatase 2	87	88	89
73547	Dusp21	dual specificity phosphatase 21	699	723	691
105352	Dusp22	dual specificity phosphatase 22	258	252	263
68440	Dusp23	dual specificity phosphatase 23	120	122	129
66959	Dusp26	dual specificity phosphatase 26 (putative)	2401	2410	2395
240892	Dusp27	dual specificity phosphatase 27 (putative)	169	172	159
67446	Dusp28	dual specificity phosphatase 28	9	9	9
72349	Dusp3	dual specificity phosphatase 3 (vaccinia virus phosphatase VH1-re	26	26	24
319520	Dusp4	dual specificity phosphatase 4	1032	1034	1053
240672	Dusp5	dual specificity phosphatase 5	177	169	171
67603	Dusp6	dual specificity phosphatase 6	637	648	642
235584	Dusp7	dual specificity phosphatase 7	179	180	186
18218	Dusp8	dual specificity phosphatase 8	152	144	139
75590	Dusp9	dual specificity phosphatase 9	196	190	197

13542	Dvl1	dishevelled, dsh homolog 1 (Drosophila)	27	24	29
13543	Dvl2	dishevelled 2, dsh homolog (Drosophila)	16	18	22
13544	Dvl3	dishevelled 3, dsh homolog (Drosophila)	44	42	44
235661	Dync1li1	dynein cytoplasmic 1 light intermediate chain 1	126	115	121
110350	Dync2h1	dynein cytoplasmic 2 heavy chain 1	1174	1201	1124
56455	Dynll1	dynein light chain LC8-type 1	64	64	59
13548	Dyrk1a	dual-specificity tyrosine-(Y)-phosphorylation regulated kinase 1a	440	424	415
13549	Dyrk1b	dual-specificity tyrosine-(Y)-phosphorylation regulated kinase 1b	119	123	129
69181	Dyrk2	dual-specificity tyrosine-(Y)-phosphorylation regulated kinase 2	1028	1043	1024
226419	Dyrk3	dual-specificity tyrosine-(Y)-phosphorylation regulated kinase 3	73	72	75
101320	Dyrk4	dual-specificity tyrosine-(Y)-phosphorylation regulated kinase 4	113	113	114
224170	Dzip3	DAZ interacting protein 3, zinc finger	158	161	136
13555	E2f1	E2F transcription factor 1	67	57	63
242705	E2f2	E2F transcription factor 2	85	85	81
13557	E2f3	E2F transcription factor 3	362	351	355
104394	E2f4	E2F transcription factor 4	12	12	11
13559	E2f5	E2F transcription factor 5	92	100	90
50496	E2f6	E2F transcription factor 6	123	122	126
52679	E2f7	E2F transcription factor 7	413	417	411
108961	E2f8	E2F transcription factor 8	137	143	132
13560	E4f1	E4F transcription factor 1	37	37	37
74427	Eaf1	ELL associated factor 1	110	106	102
106389	Eaf2	ELL associated factor 2	148	144	148
66266	Eapp	E2F-associated phosphoprotein	178	182	179
93725	Ear10	eosinophil-associated, ribonuclease A family, member 10	181	185	176
93726	Ear11	eosinophil-associated, ribonuclease A family, member 11	284	273	262
503845	Ear12	eosinophil-associated, ribonuclease A family, member 12	1	1	1
503847	Ear14	eosinophil-associated, ribonuclease A family, member 14	67	71	66
13587	Ear2	eosinophil-associated, ribonuclease A family, member 2	130	132	130
53876	Ear3	eosinophil-associated, ribonuclease A family, member 3	87	89	82
53877	Ear4	eosinophil-associated, ribonuclease A family, member 4	10	11	10
93719	Ear6	eosinophil-associated, ribonuclease A family, member 6	76	76	70
53873	Ear7	eosinophil-associated, ribonuclease A family, member 7	44	43	41
67417	Ears2	glutamyl-tRNA synthetase 2 (mitochondrial)(putative)	61	64	62
13591	Ebf1	early B-cell factor 1	1706	1714	1721
13592	Ebf2	early B-cell factor 2	315	313	301
13593	Ebf3	early B-cell factor 3	667	674	674
228598	Ebf4	early B-cell factor 4	137	134	141
69072	Ebna1bp2	EBNA1 binding protein 2	8	7	7
13595	Ebp	phenylalkylamine Ca2+ antagonist (emopamil) binding protein	40	37	38
68177	Ebpl	emopamil binding protein-like	172	173	161
70601	Ecd	ecdysoneless homolog (Drosophila)	70	69	73
230857	Ece1	endothelin converting enzyme 1	246	240	243
107522	Ece2	endothelin converting enzyme 2	53	49	55
13599	Ecel1	endothelin converting enzyme-like 1	71	75	79
51798	Ech1	enoyl coenzyme A hydratase 1, peroxisomal	34	28	31
52665	Echdc1	enoyl Coenzyme A hydratase domain containing 1	199	196	194
52430	Echdc2	enoyl Coenzyme A hydratase domain containing 2	129	128	131
67856	Echdc3	enoyl Coenzyme A hydratase domain containing 3	244	244	253
93747	Echs1	enoyl Coenzyme A hydratase, short chain, 1, mitochondrial	31	33	28
13177	Eci1	enoyl-Coenzyme A delta isomerase 1	33	37	36
23986	Eci2	enoyl-Coenzyme A delta isomerase 2	890	913	913
13607	Eda	ectodysplasin-A	661	658	640
192193	Edem1	ER degradation enhancer, mannosidase alpha-like 1	2364	2364	2377
66967	Edem3	ER degradation enhancer, mannosidase alpha-like 3	679	650	667

59022	Edf1	endothelial differentiation-related factor 1	31	29	26
13614	Edn1	endothelin 1	801	814	820
13615	Edn2	endothelin 2	586	608	599
13617	Ednra	endothelin receptor type A	768	761	769
13618	Ednrb	endothelin receptor type B	1008	1043	1015
13626	Eed	embryonic ectoderm development	122	119	114
13627	Eef1a1	eukaryotic translation elongation factor 1 alpha 1	181	184	185
13628	Eef1a2	eukaryotic translation elongation factor 1 alpha 2	63	64	66
55949	Eef1b2	eukaryotic translation elongation factor 1 beta 2	2	2	2
66656	Eef1d	eukaryotic translation elongation factor 1 delta (guanine nucleotide	20	17	16
66143	Eef1e1	eukaryotic translation elongation factor 1 epsilon 1	428	415	416
67160	Eef1g	eukaryotic translation elongation factor 1 gamma	46	47	46
13629	Eef2	eukaryotic translation elongation factor 2	15	13	13
13631	Eef2k	eukaryotic elongation factor-2 kinase	228	221	216
65967	Eefsec	eukaryotic elongation factor, selenocysteine-tRNA-specific	315	317	312
67484	Eepd1	endonuclease/exonuclease/phosphatase family domain containing	1895	1924	1912
77627	Efcab6	EF-hand calcium binding domain 6	616	584	594
216616	Efemp1	epidermal growth factor-containing fibulin-like extracellular matrix p	469	476	458
13636	Efna1	ephrin A1	72	68	69
13640	Efna5	ephrin A5	5581	5695	5558
101592	Eftud1	elongation factor Tu GTP binding domain containing 1	287	279	282
20624	Eftud2	elongation factor Tu GTP binding domain containing 2	61	58	55
13645	Egf	epidermal growth factor	343	346	358
268780	Egflam	EGF-like, fibronectin type III and laminin G domains	859	856	842
13649	Egfr	epidermal growth factor receptor	564	571	558
112405	Egln1	EGL nine homolog 1 (C. elegans)	155	145	143
112406	Egln2	EGL nine homolog 2 (C. elegans)	28	24	26
112407	Egln3	EGL nine homolog 3 (C. elegans)	1474	1467	1465
13653	Egr1	early growth response 1	121	110	109
13654	Egr2	early growth response 2	327	332	320
13655	Egr3	early growth response 3	335	322	330
13656	Egr4	early growth response 4	104	106	108
98878	Ehd4	EH-domain containing 4	285	267	269
13661	Ehf	ets homologous factor	454	444	438
74147	Ehhadh	enoyl-Coenzyme A, hydratase/3-hydroxyacyl Coenzyme A dehydr	128	123	123
77683	Ehmt1	euchromatic histone methyltransferase 1	224	218	222
110147	Ehmt2	euchromatic histone lysine N-methyltransferase 2	20	20	21
13663	Ei24	etoposide induced 2.4 mRNA	104	106	97
58521	Eid1	EP300 interacting inhibitor of differentiation 1	122	128	129
386655	Eid2	EP300 interacting inhibitor of differentiation 2	121	128	121
66341	Eid3	EP300 interacting inhibitor of differentiation 3	123	124	130
20918	Eif1	eukaryotic translation initiation factor 1	76	77	84
13664	Eif1a	eukaryotic translation initiation factor 1A	170	178	176
69860	Eif1ad	eukaryotic translation initiation factor 1A domain containing	29	27	25
66235	Eif1ax	eukaryotic translation initiation factor 1A, X-linked	188	186	185
68969	Eif1b	eukaryotic translation initiation factor 1B	291	304	301
229317	Eif2a	eukaryotic translation initiation factor 2A	142	140	143
15467	Eif2ak1	eukaryotic translation initiation factor 2 alpha kinase 1	82	81	90
19106	Eif2ak2	eukaryotic translation initiation factor 2-alpha kinase 2	67	69	66
13666	Eif2ak3	eukaryotic translation initiation factor 2 alpha kinase 3	176	164	168
27103	Eif2ak4	eukaryotic translation initiation factor 2 alpha kinase 4	138	135	134
209354	Eif2b1	eukaryotic translation initiation factor 2B, subunit 1 (alpha)	36	38	32
217715	Eif2b2	eukaryotic translation initiation factor 2B, subunit 2 beta	126	116	112
108067	Eif2b3	eukaryotic translation initiation factor 2B, subunit 3	134	136	135
13667	Eif2b4	eukaryotic translation initiation factor 2B, subunit 4 delta	16	15	15

224045	Eif2b5	eukaryotic translation initiation factor 2B, subunit 5 epsilon	125	112	121
236511	Eif2c1	eukaryotic translation initiation factor 2C, 1	127	135	129
239528	Eif2c2	eukaryotic translation initiation factor 2C, 2	417	426	435
214150	Eif2c3	eukaryotic translation initiation factor 2C, 3	176	187	185
76850	Eif2c4	eukaryotic translation initiation factor 2C, 4	114	116	118
16865	Eif2d	eukaryotic translation initiation factor 2D	138	138	143
13665	Eif2s1	eukaryotic translation initiation factor 2, subunit 1 alpha	63	60	52
67204	Eif2s2	eukaryotic translation initiation factor 2, subunit 2 (beta)	290	274	281
26905	Eif2s3x	eukaryotic translation initiation factor 2, subunit 3, structural gene χ	139	140	144
26908	Eif2s3y	eukaryotic translation initiation factor 2, subunit 3, structural gene ψ	196	190	186
13669	Eif3a	eukaryotic translation initiation factor 3, subunit A	48	47	43
27979	Eif3b	eukaryotic translation initiation factor 3, subunit B	152	148	157
56347	Eif3c	eukaryotic translation initiation factor 3, subunit C	105	98	111
55944	Eif3d	eukaryotic translation initiation factor 3, subunit D	206	202	203
16341	Eif3e	eukaryotic translation initiation factor 3, subunit E	366	383	391
66085	Eif3f	eukaryotic translation initiation factor 3, subunit F	94	102	98
53356	Eif3g	eukaryotic translation initiation factor 3, subunit G	81	90	76
68135	Eif3h	eukaryotic translation initiation factor 3, subunit H	1267	1282	1256
54709	Eif3i	eukaryotic translation initiation factor 3, subunit I	26	29	28
78655	Eif3j	eukaryotic translation initiation factor 3, subunit J	213	210	210
73830	Eif3k	eukaryotic translation initiation factor 3, subunit K	23	23	28
223691	Eif3l	eukaryotic translation initiation factor 3, subunit L	59	56	64
98221	Eif3m	eukaryotic translation initiation factor 3, subunit M	319	304	298
13681	Eif4a1	eukaryotic translation initiation factor 4A1	18	17	18
13682	Eif4a2	eukaryotic translation initiation factor 4A2	60	62	59
192170	Eif4a3	eukaryotic translation initiation factor 4A3	59	62	58
75705	Eif4b	eukaryotic translation initiation factor 4B	89	94	104
13684	Eif4e	eukaryotic translation initiation factor 4E	49	51	49
218268	Eif4e1b	eukaryotic translation initiation factor 4E family member 1B	30	28	27
26987	Eif4e2	eukaryotic translation initiation factor 4E member 2	81	77	70
66892	Eif4e3	eukaryotic translation initiation factor 4E member 3	322	322	326
13685	Eif4ebp1	eukaryotic translation initiation factor 4E binding protein 1	86	85	85
13688	Eif4ebp2	eukaryotic translation initiation factor 4E binding protein 2	78	73	73
108112	Eif4ebp3	eukaryotic translation initiation factor 4E binding protein 3	146	148	140
74203	Eif4enif1	eukaryotic translation initiation factor 4E nuclear import factor 1	93	97	92
208643	Eif4g1	eukaryotic translation initiation factor 4, gamma 1	40	38	36
13690	Eif4g2	eukaryotic translation initiation factor 4, gamma 2	123	123	119
230861	Eif4g3	eukaryotic translation initiation factor 4 gamma, 3	467	449	464
22384	Eif4h	eukaryotic translation initiation factor 4H	94	88	90
217869	Eif5	eukaryotic translation initiation factor 5	68	69	68
276770	Eif5a	eukaryotic translation initiation factor 5A	31	26	29
208691	Eif5a2	eukaryotic translation initiation factor 5A2	131	138	131
226982	Eif5b	eukaryotic translation initiation factor 5B	173	170	160
16418	Eif6	eukaryotic translation initiation factor 6	22	21	19
114615	Elac1	elaC homolog 1 (E. coli)	137	149	141
68626	Elac2	elaC homolog 2 (E. coli)	964	970	938
50701	Elane	elastase, neutrophil expressed	14	12	14
15568	Elavl1	ELAV (embryonic lethal, abnormal vision, Drosophila)-like 1 (Hu ar)	63	63	65
13709	Elf1	E74-like factor 1	38	39	40
69257	Elf2	E74-like factor 2	224	215	227
13710	Elf3	E74-like factor 3	148	143	141
56501	Elf4	E74-like factor 4 (ets domain transcription factor)	213	196	206
13711	Elf5	E74-like factor 5	243	258	254
13712	Elk1	ELK1, member of ETS oncogene family	36	36	31
13713	Elk3	ELK3, member of ETS oncogene family	223	212	228

13716	EII	elongation factor RNA polymerase II	84	91	85
192657	EII2	elongation factor RNA polymerase II 2	256	251	242
269344	EII3	elongation factor RNA polymerase II-like 3	49	48	46
66126	Elof1	elongation factor 1 homolog (ELF1, <i>S. cerevisiae</i>)	37	40	38
54325	Elovl1	elongation of very long chain fatty acids (FEN1/Elo2, SUR4/Elo3, y	36	34	34
54326	Elovl2	elongation of very long chain fatty acids (FEN1/Elo2, SUR4/Elo3, y	173	181	179
12686	Elovl3	elongation of very long chain fatty acids (FEN1/Elo2, SUR4/Elo3, y	92	90	86
83603	Elovl4	elongation of very long chain fatty acids (FEN1/Elo2, SUR4/Elo3, y	381	364	370
68801	Elovl5	ELOVL family member 5, elongation of long chain fatty acids (yeas	386	377	379
170439	Elovl6	ELOVL family member 6, elongation of long chain fatty acids (yeas	422	436	430
74559	Elovl7	ELOVL family member 7, elongation of long chain fatty acids (yeas	200	209	190
58523	Elp2	elongation protein 2 homolog (<i>S. cerevisiae</i>)	70	66	65
74195	Elp3	elongation protein 3 homolog (<i>S. cerevisiae</i>)	233	227	226
77766	Elp4	elongation protein 4 homolog (<i>S. cerevisiae</i>)	273	289	277
268465	Eme1	essential meiotic endonuclease 1 homolog 1 (<i>S. pombe</i>)	30	33	32
193838	Eme2	essential meiotic endonuclease 1 homolog 2 (<i>S. pombe</i>)	11	9	10
14791	Emg1	EMG1 nucleolar protein homolog (<i>S. cerevisiae</i>)	67	65	67
225898	Eml3	echinoderm microtubule associated protein like 3	17	15	16
13798	En1	engrailed 1	742	743	749
13799	En2	engrailed 2	206	211	214
13804	Endog	endonuclease G	57	54	56
19011	Endou	endonuclease, polyU-specific	93	101	92
13805	Eng	endoglin	85	81	79
217364	Engase	endo-beta-N-acetylglucosaminidase	581	595	567
13806	Eno1	enolase 1, alpha non-neuron	45	46	48
13807	Eno2	enolase 2, gamma neuronal	29	29	28
13808	Eno3	enolase 3, beta muscle	20	15	21
226265	Eno4	enolase 4	221	215	219
67870	Enoph1	enolase-phosphatase 1	156	159	165
239188	Enox1	ecto-NOX disulfide-thiol exchanger 1	608	620	594
209224	Enox2	ecto-NOX disulfide-thiol exchanger 2	714	721	675
13809	Enpep	glutamyl aminopeptidase	285	285	284
18605	Enpp1	ectonucleotide pyrophosphatase/phosphodiesterase 1	309	304	318
18606	Enpp2	ectonucleotide pyrophosphatase/phosphodiesterase 2	414	414	404
209558	Enpp3	ectonucleotide pyrophosphatase/phosphodiesterase 3	197	204	204
224794	Enpp4	ectonucleotide pyrophosphatase/phosphodiesterase 4	139	144	137
83965	Enpp5	ectonucleotide pyrophosphatase/phosphodiesterase 5	200	197	200
320981	Enpp6	ectonucleotide pyrophosphatase/phosphodiesterase 6	697	702	700
238011	Enpp7	ectonucleotide pyrophosphatase/phosphodiesterase 7	140	139	145
12495	Entpd1	ectonucleoside triphosphate diphosphohydrolase 1	286	288	275
12496	Entpd2	ectonucleoside triphosphate diphosphohydrolase 2	40	36	41
215446	Entpd3	ectonucleoside triphosphate diphosphohydrolase 3	103	105	102
67464	Entpd4	ectonucleoside triphosphate diphosphohydrolase 4	122	129	128
12499	Entpd5	ectonucleoside triphosphate diphosphohydrolase 5	63	61	62
93685	Entpd7	ectonucleoside triphosphate diphosphohydrolase 7	91	91	93
72090	Entpd8	ectonucleoside triphosphate diphosphohydrolase 8	54	52	55
223527	Eny2	enhancer of yellow 2 homolog (<i>Drosophila</i>)	283	296	296
13813	Eomes	eomesodermin homolog (<i>Xenopus laevis</i>)	465	458	459
328572	Ep300	E1A binding protein p300	254	266	266
75560	Ep400	E1A binding protein p400	171	161	173
13819	Epas1	endothelial PAS domain protein 1	967	945	952
13828	Epb4.2	erythrocyte protein band 4.2	93	99	97
13831	Epc1	enhancer of polycomb homolog 1 (<i>Drosophila</i>)	178	177	181
227867	Epc2	enhancer of polycomb homolog 2 (<i>Drosophila</i>)	854	863	845
71920	Epgn	epithelial mitogen	197	191	182

13835	Epha1	Eph receptor A1	61	63	66
230735	Epha10	Eph receptor A10	96	91	94
13836	Epha2	Eph receptor A2	158	154	158
13837	Epha3	Eph receptor A3	2001	2062	2006
13838	Epha4	Eph receptor A4	2210	2196	2151
13839	Epha5	Eph receptor A5	3292	3388	3259
13840	Epha6	Eph receptor A6	3848	3934	3805
13841	Epha7	Eph receptor A7	7126	7274	7122
13842	Epha8	Eph receptor A8	189	179	188
270190	Ephb1	Eph receptor B1	1613	1592	1609
13844	Ephb2	Eph receptor B2	352	354	353
13845	Ephb3	Eph receptor B3	344	339	338
13846	Ephb4	Eph receptor B4	191	182	182
13848	Ephb6	Eph receptor B6	152	144	150
13849	Ephx1	epoxide hydrolase 1, microsomal	140	146	139
13850	Ephx2	epoxide hydrolase 2, cytoplasmic	77	81	79
13853	Epm2a	epilepsy, progressive myoclonic epilepsy, type 2 gene alpha	1979	2063	1976
13856	Epo	erythropoietin	29	29	26
107508	Eprs	glutamyl-prolyl-tRNA synthetase	143	142	142
28042	Ept1	ethanolaminophosphotransferase 1 (CDP-ethanolamine-specific)	106	95	99
13861	Epx	eosinophil peroxidase	44	47	42
80898	Erap1	endoplasmic reticulum aminopeptidase 1	402	402	403
353283	Eras	ES cell-expressed Ras	35	32	33
13866	Erbb2	v-erb-b2 erythroblastic leukemia viral oncogene homolog 2, neuro/	48	47	44
13867	Erbb3	v-erb-b2 erythroblastic leukemia viral oncogene homolog 3 (avian)	78	78	85
13869	Erbb4	v-erb-a erythroblastic leukemia viral oncogene homolog 4 (avian)	3212	3251	3131
111173	Erc1	ELKS/RAB6-interacting/CAST family member 1	377	373	375
13870	Ercc1	excision repair cross-complementing rodent repair deficiency, com	57	60	60
13871	Ercc2	excision repair cross-complementing rodent repair deficiency, com	31	30	28
13872	Ercc3	excision repair cross-complementing rodent repair deficiency, com	285	270	280
50505	Ercc4	excision repair cross-complementing rodent repair deficiency, com	1636	1637	1634
22592	Ercc5	excision repair cross-complementing rodent repair deficiency, com	120	123	125
319955	Ercc6	excision repair cross-complementing rodent repair deficiency, com	177	180	175
71991	Ercc8	excision repair cross-complementing rodent repair deficiency, comple	68	75	71
13874	Ereg	epiregulin	147	144	145
13875	Erf	Ets2 repressor factor	48	48	45
13876	Erg	avian erythroblastosis virus E-26 (v-ets) oncogene related	558	561	551
67276	Eri1	exoribonuclease 1	272	268	276
66753	Erlec1	endoplasmic reticulum lectin 1	86	90	90
226144	Erlin1	ER lipid raft associated 1	100	95	96
244373	Erlin2	ER lipid raft associated 2	89	78	87
226090	Ermp1	endoplasmic reticulum metalloproteinase 1	226	227	224
78943	Ern1	endoplasmic reticulum (ER) to nucleus signalling 1	162	164	159
26918	Ern2	endoplasmic reticulum (ER) to nucleus signalling 2	79	76	86
50527	Ero1l	ERO1-like (S. cerevisiae)	153	141	136
67475	Ero1lb	ERO1-like beta (S. cerevisiae)	168	161	175
76299	Erp44	endoplasmic reticulum protein 44	188	197	194
74155	Errfi1	ERBB receptor feedback inhibitor 1	326	320	320
77805	Esco1	establishment of cohesion 1 homolog 1 (S. cerevisiae)	382	387	375
71988	Esco2	establishment of cohesion 1 homolog 2 (S. cerevisiae)	42	41	42
13885	Esd	esterase D/formylglutathione hydrolase	404	403	382
66580	Esf1	ESF1, nucleolar pre-rRNA processing protein, homolog (S. cerevis)	130	131	124
105988	Espl1	extra spindle poles-like 1 (S. cerevisiae)	61	65	59
13982	Esr1	estrogen receptor 1 (alpha)	717	717	715
13983	Esr2	estrogen receptor 2 (beta)	562	548	545

207920	Esrp1	epithelial splicing regulatory protein 1	212	212	206
77411	Esrp2	epithelial splicing regulatory protein 2	114	115	126
26379	Esrra	estrogen related receptor, alpha	16	16	19
26380	Esrrb	estrogen related receptor, beta	672	644	661
26381	Esrrg	estrogen-related receptor gamma	1018	1029	1030
225363	Etf1	eukaryotic translation termination factor 1	124	126	114
110842	Etfa	electron transferring flavoprotein, alpha polypeptide	280	279	275
110826	Etfb	electron transferring flavoprotein, beta polypeptide	57	62	60
66841	Etfdh	electron transferring flavoprotein, dehydrogenase	47	52	46
75320	Etnk1	ethanolamine kinase 1	193	194	193
214253	Etnk2	ethanolamine kinase 2	93	85	86
23871	Ets1	E26 avian leukemia oncogene 1, 5' domain	2457	2486	2442
23872	Ets2	E26 avian leukemia oncogene 2, 3' domain	592	600	576
14009	Etv1	ets variant gene 1	2702	2740	2697
14008	Etv2	ets variant gene 2	29	28	30
27049	Etv3	ets variant gene 3	228	231	238
18612	Etv4	ets variant gene 4 (E1A enhancer binding protein, E1AF)	225	208	209
104156	Etv5	ets variant gene 5	496	525	504
14011	Etv6	ets variant gene 6 (TEL oncogene)	708	699	694
14027	Evpl	envoplakin	69	72	79
14028	Evx1	even skipped homeotic gene 1 homolog	478	471	482
14030	Ewsr1	Ewing sarcoma breakpoint region 1	41	47	39
241624	Exd1	exonuclease 3'-5' domain containing 1	102	92	97
26909	Exo1	exonuclease 1	361	353	360
66583	Exosc1	exosome component 1	26	25	27
50912	Exosc10	exosome component 10	114	116	108
227715	Exosc2	exosome component 2	64	63	60
66362	Exosc3	exosome component 3	58	57	60
109075	Exosc4	exosome component 4	26	26	28
27998	Exosc5	exosome component 5	18	20	21
72544	Exosc6	exosome component 6	61	57	60
69639	Exosc8	exosome component 8	52	51	56
50911	Exosc9	exosome component 9	123	130	125
14042	Ext1	exostoses (multiple) 1	1517	1537	1495
14043	Ext2	exostoses (multiple) 2	266	254	259
58193	Extl2	exostoses (multiple)-like 2	160	160	157
14048	Eya1	eyes absent 1 homolog (Drosophila)	1226	1231	1231
14049	Eya2	eyes absent 2 homolog (Drosophila)	481	499	484
14050	Eya3	eyes absent 3 homolog (Drosophila)	218	220	217
14051	Eya4	eyes absent 4 homolog (Drosophila)	1239	1239	1201
14055	Ezh1	enhancer of zeste homolog 1 (Drosophila)	92	88	97
14056	Ezh2	enhancer of zeste homolog 2 (Drosophila)	251	259	259
14058	F10	coagulation factor X	46	45	45
109821	F11	coagulation factor XI	284	287	287
58992	F12	coagulation factor XII (Hageman factor)	36	40	41
74145	F13a1	coagulation factor XIII, A1 subunit	808	789	774
14061	F2	coagulation factor II	71	63	68
14062	F2r	coagulation factor II (thrombin) receptor	221	226	213
14063	F2r1	coagulation factor II (thrombin) receptor-like 1	191	173	173
14066	F3	coagulation factor III	230	216	220
14068	F7	coagulation factor VII	114	108	114
14069	F8	coagulation factor VIII	264	267	239
14071	F9	coagulation factor IX	1216	1223	1184
338521	Fa2h	fatty acid 2-hydroxylase	244	241	240
14073	Faah	fatty acid amide hydrolase	150	151	142

14079	Fabp2	fatty acid binding protein 2, intestinal	255	257	258
14077	Fabp3	fatty acid binding protein 3, muscle and heart	111	113	106
11770	Fabp4	fatty acid binding protein 4, adipocyte	134	136	137
16592	Fabp5	fatty acid binding protein 5, epidermal	442	456	435
16204	Fabp6	fatty acid binding protein 6, ileal (gastrotropin)	203	189	205
14082	Fadd	Fas (TNFRSF6)-associated via death domain	230	238	234
76267	Fads1	fatty acid desaturase 1	123	134	131
56473	Fads2	fatty acid desaturase 2	180	181	186
60527	Fads3	fatty acid desaturase 3	103	104	109
328035	Fads6	fatty acid desaturase domain family, member 6	40	42	41
14085	Fah	fumarylacetoacetate hydrolase	352	351	347
68636	Fahd1	fumarylacetoacetate hydrolase domain containing 1	62	61	60
68126	Fahd2a	fumarylacetoacetate hydrolase domain containing 2A	74	76	74
231717	Fam109a	family with sequence similarity 109, member A	254	254	252
338368	Fam109b	family with sequence similarity 109, member B	6	7	9
107373	Fam111a	family with sequence similarity 111, member A	117	126	119
67544	Fam120b	family with sequence similarity 120, member B	149	154	159
63913	Fam129a	family with sequence similarity 129, member A	336	335	336
70681	Fam175a	family with sequence similarity 175, member A	62	60	66
215015	Fam20b	family with sequence similarity 20, member B	212	217	218
330554	Fan1	FANCD2/FANCI-associated nuclease 1	139	141	136
14087	Fanca	Fanconi anemia, complementation group A	101	98	100
237211	Fancc	Fanconi anemia, complementation group B	428	413	396
14088	Fancc	Fanconi anemia, complementation group C	359	344	339
211651	Fancc2	Fanconi anemia, complementation group D2	91	94	91
60534	Fancg	Fanconi anemia, complementation group G	34	35	33
208836	Fanci	Fanconi anemia, complementation group I	108	114	114
67030	Fancl	Fanconi anemia, complementation group L	465	477	469
104806	Fancm	Fanconi anemia, complementation group M	130	133	127
14089	Fap	fibroblast activation protein	204	206	207
67420	Far1	fatty acyl CoA reductase 1	483	489	489
330450	Far2	fatty acyl CoA reductase 2	678	672	652
69955	Fars2	phenylalanine-tRNA synthetase 2 (mitochondrial)	802	806	778
66590	Farsa	phenylalanyl-tRNA synthetase, alpha subunit	35	36	30
23874	Farsb	phenylalanyl-tRNA synthetase, beta subunit	257	256	264
14102	Fas	Fas (TNF receptor superfamily member 6)	279	278	277
14104	Fasn	fatty acid synthase	174	167	170
66587	Fastk	Fas-activated serine/threonine kinase	25	28	26
320720	Fastkd1	FAST kinase domains 1	71	66	63
75619	Fastkd2	FAST kinase domains 2	288	298	294
69577	Fastkd3	FAST kinase domains 3	20	22	20
380601	Fastkd5	FAST kinase domains 5	13	13	14
14113	Fbl	fibrillarin	64	60	67
14121	Fbp1	fructose biphosphatase 1	214	215	204
14120	Fbp2	fructose biphosphatase 2	166	170	171
30843	Fbxl12	F-box and leucine-rich repeat protein 12	57	56	54
101358	Fbxl14	F-box and leucine-rich repeat protein 14	167	162	160
68431	Fbxl15	F-box and leucine-rich repeat protein 15	13	14	10
50789	Fbxl3	F-box and leucine-rich repeat protein 3	340	351	335
242960	Fbxl5	F-box and leucine-rich repeat protein 5	203	190	192
225055	Fbxo11	F-box protein 11	198	210	189
50764	Fbxo15	F-box protein 15	138	135	135
50760	Fbxo17	F-box protein 17	60	60	64
230904	Fbxo2	F-box protein 2	173	162	151
71999	Fbxo22	F-box protein 22	166	177	177

66822	Fbxo25	F-box protein 25	114	105	106
233040	Fbxo27	F-box protein 27	114	117	115
71865	Fbxo30	F-box protein 30	238	249	243
76454	Fbxo31	F-box protein 31	60	62	57
106052	Fbxo4	F-box protein 4	529	520	508
207215	Fbxo40	F-box protein 40	102	99	103
230903	Fbxo44	F-box protein 44	7	9	7
268882	Fbxo45	F-box protein 45	87	82	82
67141	Fbxo5	F-box protein 5	241	226	236
50762	Fbxo6	F-box protein 6	24	25	25
50753	Fbxo8	F-box protein 8	980	965	965
103583	Fbxw11	F-box and WD-40 domain protein 11	382	376	361
50754	Fbxw7	F-box and WD-40 domain protein 7	558	560	558
231672	Fbxw8	F-box and WD-40 domain protein 8	183	190	173
14125	Fcer1a	Fc receptor, IgE, high affinity I, alpha polypeptide	68	69	69
14128	Fcer2a	Fc receptor, IgE, low affinity II, alpha polypeptide	52	58	58
73736	Fcf1	FCF1 small subunit (SSU) processome component homolog (S. ce	33	32	33
14131	Fcgr3	Fc receptor, IgG, low affinity III	118	117	114
14134	Fcnb	ficolin B	309	295	308
14137	Fdft1	farnesyl diphosphate farnesyl transferase 1	90	91	93
110196	Fdps	farnesyl diphosphate synthetase	30	32	33
14148	Fdx1	ferredoxin 1	226	225	217
68165	Fdx1l	ferredoxin 1-like	32	32	29
382137	Fdxacb1	ferredoxin-fold anticodon binding domain containing 1	8	7	9
14149	Fdxr	ferredoxin reductase	34	37	36
14151	Fech	ferrochelatase	233	217	216
14155	Fem1b	feminization 1 homolog b (C. elegans)	211	206	207
14156	Fen1	flap structure specific endonuclease 1	29	27	30
114712	Ferd3l	Fer3-like (Drosophila)	660	672	658
14158	Fert2	fer (fms/fps related) protein kinase, testis specific 2	1093	1105	1088
14159	Fes	feline sarcoma oncogene	39	36	37
260298	Fev	FEV (ETS oncogene family)	47	48	46
73191	Fezf1	Fez family zinc finger 1	673	675	664
54713	Fezf2	Fez family zinc finger 2	682	699	693
224014	Fgd4	FYVE, RhoGEF and PH domain containing 4	470	477	458
14164	Fgf1	fibroblast growth factor 1	129	130	134
14165	Fgf10	fibroblast growth factor 10	1276	1324	1272
14168	Fgf13	fibroblast growth factor 13	1076	1099	1066
14170	Fgf15	fibroblast growth factor 15	69	69	72
14173	Fgf2	fibroblast growth factor 2	136	143	138
64654	Fgf23	fibroblast growth factor 23	115	116	116
14175	Fgf4	fibroblast growth factor 4	68	74	71
14178	Fgf7	fibroblast growth factor 7	369	376	366
14179	Fgf8	fibroblast growth factor 8	115	110	104
14180	Fgf9	fibroblast growth factor 9	1456	1468	1458
14182	Fgfr1	fibroblast growth factor receptor 1	506	515	515
14183	Fgfr2	fibroblast growth factor receptor 2	1243	1206	1230
14184	Fgfr3	fibroblast growth factor receptor 3	145	152	157
14186	Fgfr4	fibroblast growth factor receptor 4	126	130	132
116701	Fgfrl1	fibroblast growth factor receptor-like 1	153	156	142
75578	Fggy	FGGY carbohydrate kinase domain containing	1187	1200	1190
14191	Fgr	Gardner-Rasheed feline sarcoma viral (Fgr) oncogene homolog	121	113	114
14194	Fh1	fumarate hydratase 1	180	173	175
14198	Fhit	fragile histidine triad gene	2157	2171	2131
14200	Fhl2	four and a half LIM domains 2	443	445	432

57756	Fhl5	four and a half LIM domains 5	401	395	376
234686	Fhod1	formin homology 2 domain containing 1	28	24	27
231630	Ficd	FIC domain containing	61	57	61
103199	Fig4	FIG4 homolog (S. cerevisiae)	501	480	495
26910	Figla	folliculogenesis specific basic helix-loop-helix	156	146	147
66899	Fip1l1	FIP1 like 1 (S. cerevisiae)	183	190	177
23877	Fiz1	Flt3 interacting zinc finger protein 1	26	24	22
14230	Fkbp10	FK506 binding protein 10	37	33	36
66120	Fkbp11	FK506 binding protein 11	73	73	71
231997	Fkbp14	FK506 binding protein 14	38	38	36
338355	Fkbp15	FK506 binding protein 15	97	93	96
14225	Fkbp1a	FK506 binding protein 1a	104	99	104
14226	Fkbp1b	FK506 binding protein 1b	29	30	32
14227	Fkbp2	FK506 binding protein 2	13	12	14
30795	Fkbp3	FK506 binding protein 3	51	50	45
14228	Fkbp4	FK506 binding protein 4	16	15	18
14229	Fkbp5	FK506 binding protein 5	214	220	225
94244	Fkbp6	FK506 binding protein 6	138	131	126
14231	Fkbp7	FK506 binding protein 7	33	39	35
14232	Fkbp8	FK506 binding protein 8	18	19	18
27055	Fkbp9	FK506 binding protein 9	160	161	156
56299	Fkbp1	FK506 binding protein-like	22	22	22
243853	Fkrp	fukutin related protein	31	35	33
319945	Flad1	RFad1, flavin adenine dinucleotide synthetase, homolog (yeast)	23	19	19
14247	Fli1	Friend leukemia integration 1	392	381	391
14248	Flii	flightless I homolog (Drosophila)	38	35	34
192176	Flna	filamin, alpha	90	87	94
14254	Flt1	FMS-like tyrosine kinase 1	543	569	558
14255	Flt3	FMS-like tyrosine kinase 3	122	133	124
14257	Flt4	FMS-like tyrosine kinase 4	126	126	132
14260	Fmn1	formin 1	620	614	611
14261	Fmo1	flavin containing monooxygenase 1	111	113	112
55990	Fmo2	flavin containing monooxygenase 2	91	91	83
14262	Fmo3	flavin containing monooxygenase 3	196	185	192
226564	Fmo4	flavin containing monooxygenase 4	166	153	153
14263	Fmo5	flavin containing monooxygenase 5	60	63	62
240894	Fmo9	flavin containing monooxygenase 9	459	449	448
14265	Fmr1	fragile X mental retardation syndrome 1 homolog	92	95	83
14268	Fn1	fibronectin 1	439	432	446
63828	Fn3k	fructosamine 3 kinase	44	42	41
238024	Fn3krp	fructosamine 3 kinase related protein	66	62	66
68655	Fndc1	fibronectin type III domain containing 1	678	685	676
329679	Fnip2	folliculin interacting protein 2	313	320	317
14272	Fnta	farnesyltransferase, CAAX box, alpha	152	165	156
110606	Fntb	farnesyltransferase, CAAX box, beta	183	186	189
53320	Folh1	folate hydrolase	136	134	125
14275	Folr1	folate receptor 1 (adult)	52	52	55
14281	Fos	FBJ osteosarcoma oncogene	286	277	290
14282	Fosb	FBJ osteosarcoma oncogene B	66	61	59
14284	Fosl2	fos-like antigen 2	692	694	688
15375	Foxa1	forkhead box A1	419	411	402
15376	Foxa2	forkhead box A2	1317	1344	1339
15377	Foxa3	forkhead box A3	28	25	28
64290	Foxb1	forkhead box B1	692	706	682
14240	Foxb2	forkhead box B2	240	218	213

17300	Foxc1	forkhead box C1	906	939	908
14234	Foxc2	forkhead box C2	19	19	17
15229	Foxd1	forkhead box D1	387	415	402
17301	Foxd2	forkhead box D2	106	116	104
15221	Foxd3	forkhead box D3	673	675	659
14237	Foxd4	forkhead box D4	109	103	103
110805	Foxe1	forkhead box E1	240	245	239
30923	Foxe3	forkhead box E3	98	93	97
15227	Foxf1a	forkhead box F1a	464	451	457
14238	Foxf2	forkhead box F2	284	281	281
15228	Foxg1	forkhead box G1	3217	3258	3182
14106	Foxh1	forkhead box H1	14	11	12
14233	Foxi1	forkhead box I1	364	360	341
270004	Foxi2	forkhead box I2	342	345	324
232077	Foxi3	forkhead box I3	286	295	291
15223	Foxj1	forkhead box J1	132	126	140
60611	Foxj2	forkhead box J2	149	146	150
230700	Foxj3	forkhead box J3	125	126	118
17425	Foxk1	forkhead box K1	1578	1591	1554
68837	Foxk2	forkhead box K2	152	161	154
14241	Foxl1	forkhead box L1	524	543	534
26927	Foxl2	forkhead box L2	38	35	35
14235	Foxm1	forkhead box M1	14	15	16
15218	Foxn1	forkhead box N1	67	69	57
14236	Foxn2	forkhead box N2	527	527	527
71375	Foxn3	forkhead box N3	1226	1227	1254
116810	Foxn4	forkhead box N4	188	188	181
56458	Foxo1	forkhead box O1	800	819	817
56484	Foxo3	forkhead box O3	597	591	565
54601	Foxo4	forkhead box O4	52	46	46
329934	Foxo6	forkhead box O6	302	299	301
108655	Foxp1	forkhead box P1	2201	2255	2212
114142	Foxp2	forkhead box P2	1538	1564	1531
20371	Foxp3	forkhead box P3	39	38	43
74123	Foxp4	forkhead box P4	336	322	336
15220	Foxq1	forkhead box Q1	781	779	769
382074	Foxr1	forkhead box R1	50	49	49
436240	Foxr2	forkhead box R2	122	119	115
235169	Foxred1	FAD-dependent oxidoreductase domain containing 1	13	12	13
239554	Foxred2	FAD-dependent oxidoreductase domain containing 2	52	54	53
14239	Foxs1	forkhead box S1	50	48	50
14287	Fpgs	folylpolyglutamyl synthetase	83	77	80
75540	Fpgt	fucose-1-phosphate guanylyltransferase	46	48	47
14300	Frg1	FSHD region gene 1	918	927	876
14302	Frk	fyn-related kinase	2611	2634	2566
20321	Frrs1	ferric-chelate reductase 1	212	209	211
327826	Frs2	fibroblast growth factor receptor substrate 2	216	212	213
623046	Fscb	fibrous sheath CABYR binding protein	4209	4286	4173
14309	Fshr	follicle stimulating hormone receptor	2894	2943	2900
14313	Fst	follistatin	530	549	530
83554	Fstl3	follistatin-like 3	26	22	24
14317	Ftcd	formiminotransferase cyclodeaminase	76	67	72
14319	Fth1	ferritin heavy chain 1	132	126	133
67634	Ftmt	ferritin mitochondrial	1677	1712	1667
26383	Fto	fat mass and obesity associated	646	602	627

68017	Ftsj2	FtsJ homolog 2 (E. coli)	12	15	16
56095	Ftsj3	FtsJ homolog 3 (E. coli)	50	50	49
234728	Ftsjd1	FtsJ methyltransferase domain containing 1	139	126	133
74157	Ftsjd2	FtsJ methyltransferase domain containing 2	142	130	135
51886	Fubp1	far upstream element (FUZE) binding protein 1	70	70	67
320267	Fubp3	far upstream element (FUZE) binding protein 3	227	228	205
71665	Fuca1	fucosidase, alpha-L- 1, tissue	61	68	64
66848	Fuca2	fucosidase, alpha-L- 2, plasma	103	98	105
234730	Fuk	fucokinase	100	90	91
18550	Furin	furin (paired basic amino acid cleaving enzyme)	197	192	185
14343	Fut1	fucosyltransferase 1	8	8	9
171167	Fut10	fucosyltransferase 10	944	942	942
73068	Fut11	fucosyltransferase 11	34	37	36
14344	Fut2	fucosyltransferase 2	53	52	46
14345	Fut4	fucosyltransferase 4	36	37	38
14347	Fut7	fucosyltransferase 7	37	34	32
53618	Fut8	fucosyltransferase 8	1619	1641	1622
14348	Fut9	fucosyltransferase 9	1335	1360	1330
14297	Fxn	frataxin	334	338	330
14359	Fxr1	fragile X mental retardation gene 1, autosomal homolog	314	307	304
14360	Fyn	Fyn proto-oncogene	581	586	561
14362	Fzd1	frizzled homolog 1 (Drosophila)	1482	1510	1507
57265	Fzd2	frizzled homolog 2 (Drosophila)	91	92	91
14366	Fzd4	frizzled homolog 4 (Drosophila)	228	225	235
14367	Fzd5	frizzled homolog 5 (Drosophila)	351	330	345
14369	Fzd7	frizzled homolog 7 (Drosophila)	326	323	341
14370	Fzd8	frizzled homolog 8 (Drosophila)	1817	1822	1799
56371	Fzr1	fizzy/cell division cycle 20 related 1 (Drosophila)	21	20	26
217558	G2e3	G2/M-phase specific E3 ubiquitin ligase	934	941	915
14377	G6pc	glucose-6-phosphatase, catalytic	115	113	115
14378	G6pc2	glucose-6-phosphatase, catalytic, 2	177	180	172
68401	G6pc3	glucose 6 phosphatase, catalytic, 3	50	53	56
14380	G6pd2	glucose-6-phosphate dehydrogenase 2	6231	6317	6149
14381	G6pdx	glucose-6-phosphate dehydrogenase X-linked	5	4	4
14387	Gaa	glucosidase, alpha, acid	94	93	84
14388	Gab1	growth factor receptor bound protein 2-associated protein 1	363	354	351
54393	Gabbr1	gamma-aminobutyric acid (GABA) B receptor, 1	78	79	74
14390	Gabpa	GA repeat binding protein, alpha	4	4	5
14391	Gabpb1	GA repeat binding protein, beta 1	112	117	110
213054	Gabpb2	GA repeat binding protein, beta 2	80	84	85
14415	Gad1	glutamic acid decarboxylase 1	192	196	192
14417	Gad2	glutamic acid decarboxylase 2	495	474	481
17873	Gadd45b	growth arrest and DNA-damage-inducible 45 beta	105	85	99
23882	Gadd45g	growth arrest and DNA-damage-inducible 45 gamma	936	951	956
73748	Gadl1	glutamate decarboxylase-like 1	1092	1102	1133
231580	Gak	cyclin G associated kinase	98	95	100
53897	Gal3st1	galactose-3-O-sulfotransferase 1	93	102	92
545276	Gal3st3	galactose-3-O-sulfotransferase 3	51	48	49
330217	Gal3st4	galactose-3-O-sulfotransferase 4	18	18	17
14420	Galc	galactosylceramidase	2829	2853	2827
74246	Gale	galactose-4-epimerase, UDP	31	28	31
14635	Galk1	galactokinase 1	58	59	63
69976	Galk2	galactokinase 2	220	225	227
319625	Galm	galactose mutarotase	198	196	192
50917	Galns	galactosamine (N-acetyl)-6-sulfate sulfatase	47	46	50

14423	Galnt1	UDP-N-acetyl-alpha-D-galactosamine:polypeptide N-acetylgalacto:	389	388	404
171212	Galnt10	UDP-N-acetyl-alpha-D-galactosamine:polypeptide N-acetylgalacto:	375	364	366
271786	Galnt13	UDP-N-acetyl-alpha-D-galactosamine:polypeptide N-acetylgalacto:	1679	1698	1684
108148	Galnt2	UDP-N-acetyl-alpha-D-galactosamine:polypeptide N-acetylgalacto:	525	530	513
14425	Galnt3	UDP-N-acetyl-alpha-D-galactosamine:polypeptide N-acetylgalacto:	515	522	516
207839	Galnt6	UDP-N-acetyl-alpha-D-galactosamine:polypeptide N-acetylgalacto:	101	108	106
108150	Galnt7	UDP-N-acetyl-alpha-D-galactosamine: polypeptide N-acetylgalacto	1508	1540	1492
270049	Galnt16	UDP-N-acetyl-alpha-D-galactosamine:polypeptide N-acetylgalacto:	248	272	255
14428	Galr2	galanin receptor 2	43	44	45
14429	Galr3	galanin receptor 3	39	38	39
14430	Galt	galactose-1-phosphate uridyl transferase	25	26	23
14431	Gamt	guanidinoacetate methyltransferase	21	21	19
14376	Ganab	alpha glucosidase 2 alpha neutral subunit	32	34	33
76051	Ganc	glucosidase, alpha; neutral C	67	70	65
14433	Gapdh	glyceraldehyde-3-phosphate dehydrogenase	53	47	53
14447	Gapdhs	glyceraldehyde-3-phosphate dehydrogenase, spermatogenic	27	25	30
68147	Gar1	GAR1 ribonucleoprotein homolog (yeast)	15	20	17
353172	Gars	glycyl-tRNA synthetase	194	190	171
14450	Gart	phosphoribosylglycinamide formyltransferase	35	39	35
78926	Gas2l1	growth arrest-specific 2 like 1	50	49	49
14460	Gata1	GATA binding protein 1	91	85	82
14461	Gata2	GATA binding protein 2	164	166	168
14462	Gata3	GATA binding protein 3	3128	3180	3124
14463	Gata4	GATA binding protein 4	285	299	292
14464	Gata5	GATA binding protein 5	127	136	130
14465	Gata6	GATA binding protein 6	1321	1334	1326
234366	Gatad2a	GATA zinc finger domain containing 2A	203	198	211
229542	Gatad2b	GATA zinc finger domain containing 2B	168	164	161
384281	Gatc	glutamyl-tRNA(Gln) amidotransferase, subunit C homolog (bacteri	19	17	16
67092	Gatm	glycine amidinotransferase (L-arginine:glycine amidinotransferase)	188	190	191
14466	Gba	glucosidase, beta, acid	43	40	39
230101	Gba2	glucosidase beta 2	8	6	5
74185	Gbe1	glucan (1,4-alpha-), branching enzyme 1	3497	3557	3468
227671	Gbgt1	globoside alpha-1,3-N-acetylgalactosaminyltransferase 1	57	61	55
14469	Gbp2	guanylate binding protein 2	133	133	133
55932	Gbp3	guanylate binding protein 3	79	79	78
231044	Gbx1	gastrulation brain homeobox 1	106	108	105
14472	Gbx2	gastrulation brain homeobox 2	412	412	406
14473	Gc	group specific component	808	801	793
270076	Gcdh	glutaryl-Coenzyme A dehydrogenase	39	34	37
14526	Gcg	glucagon	204	206	201
14528	Gch1	GTP cyclohydrolase 1	348	356	346
320415	Gchfr	GTP cyclohydrolase I feedback regulator	23	21	18
103988	Gck	glucokinase	78	73	80
231103	Gckr	glucokinase regulatory protein	205	206	211
14629	Gclc	glutamate-cysteine ligase, catalytic subunit	355	362	357
14630	Gclm	glutamate-cysteine ligase, modifier subunit	297	301	291
14531	Gcm1	glial cells missing homolog 1 (Drosophila)	246	255	255
107889	Gcm2	glial cells missing homolog 2 (Drosophila)	184	194	187
14538	Gcnt2	glucosaminyl (N-acetyl) transferase 2, I-branching enzyme	418	412	414
72077	Gcnt3	glucosaminyl (N-acetyl) transferase 3, mucin type	173	165	165
218476	Gcnt4	glucosaminyl (N-acetyl) transferase 4, core 2 (beta-1,6-N-acetylglu	480	465	464
68133	Gcsh	glycine cleavage system protein H (aminomethyl carrier)	137	130	137
56209	Gde1	glycerophosphodiester phosphodiesterase 1	112	106	108
12165	Gdf2	growth differentiation factor 2	37	37	40

242316	Gdf6	growth differentiation factor 6	183	183	193
238057	Gdf7	growth differentiation factor 7	131	128	130
14573	Gdnf	glial cell line derived neurotrophic factor	881	909	894
66569	Gdpd1	glycerophosphodiester phosphodiesterase domain containing 1	127	122	121
71584	Gdpd2	glycerophosphodiester phosphodiesterase domain containing 2	180	170	174
68616	Gdpd3	glycerophosphodiester phosphodiesterase domain containing 3	24	22	23
233537	Gdpd4	glycerophosphodiester phosphodiesterase domain containing 4	343	374	351
233552	Gdpd5	glycerophosphodiester phosphodiesterase domain containing 5	146	155	140
14579	Gem	GTP binding protein (gene overexpressed in skeletal muscle)	261	262	253
216766	Gemin5	gem (nuclear organelle) associated protein 5	85	85	88
67242	Gemin6	gem (nuclear organelle) associated protein 6	103	94	98
69731	Gemin7	gem (nuclear organelle) associated protein 7	24	15	18
237221	Gemin8	gem (nuclear organelle) associated protein 8	1109	1133	1097
209334	Gen1	Gen homolog 1, endonuclease (Drosophila)	76	81	70
11692	Gfer	growth factor, erv1 (S. cerevisiae)-like (augmenter of liver regenera	6	8	6
14581	Gfi1	growth factor independent 1	291	302	294
14582	Gfi1b	growth factor independent 1B	75	79	76
28030	Gfm1	G elongation factor, mitochondrial 1	113	109	113
320806	Gfm2	G elongation factor, mitochondrial 2	84	81	79
328232	Gfod1	glucose-fructose oxidoreductase domain containing 1	256	265	256
70575	Gfod2	glucose-fructose oxidoreductase domain containing 2	156	152	145
14583	Gfpt1	glutamine fructose-6-phosphate transaminase 1	124	122	122
14584	Gfpt2	glutamine fructose-6-phosphate transaminase 2	171	181	181
14586	Gfra2	glial cell line derived neurotrophic factor family receptor alpha 2	2501	2522	2491
56316	Ggcx	gamma-glutamyl carboxylase	63	63	59
14590	Ggh	gamma-glutamyl hydrolase	965	988	962
14593	Ggps1	geranylgeranyl diphosphate synthase 1	33	32	35
14598	Ggt1	gamma-glutamyltransferase 1	37	38	38
23887	Ggt5	gamma-glutamyltransferase 5	90	85	85
71522	Ggt6	gamma-glutamyltransferase 6	35	40	33
207182	Ggt7	gamma-glutamyltransferase 7	100	103	100
14594	Ggta1	glycoprotein galactosyltransferase alpha 1, 3	210	216	215
14599	Gh	growth hormone	49	44	45
14600	Ghr	growth hormone receptor	988	1003	980
14601	Ghrh	growth hormone releasing hormone	107	109	117
14602	Ghrhr	growth hormone releasing hormone receptor	147	146	150
58991	Ghrl	ghrelin	58	57	53
208188	Ghsr	growth hormone secretagogue receptor	337	334	329
14603	Gif	gastric intrinsic factor	94	97	102
227331	Gigyf2	GRB10 interacting GYF protein 2	166	171	164
317757	Gimap5	GTPase, IMAP family member 5	42	41	46
252876	Gin1	gypsy retrotransposon integrase 1	353	351	341
69270	Gins1	GINS complex subunit 1 (Psf1 homolog)	140	135	132
272551	Gins2	GINS complex subunit 2 (Psf2 homolog)	116	113	121
78833	Gins3	GINS complex subunit 3 (Psf3 homolog)	166	165	173
109145	Gins4	GINS complex subunit 4 (Sld5 homolog)	64	61	67
67903	Gipc1	GIPC PDZ domain containing family, member 1	74	76	75
216963	Git1	G protein-coupled receptor kinase-interactor 1	30	28	27
26431	Git2	G protein-coupled receptor kinase-interactor 2	81	86	81
14609	Gja1	gap junction protein, alpha 1	1603	1618	1594
14626	Gk2	glycerol kinase 2	807	795	807
235533	Gk5	glycerol kinase 5 (putative)	305	311	328
11605	Gla	galactosidase, alpha	17	20	17
12091	Glb1	galactosidase, beta 1	120	129	115
74577	Glb11	galactosidase, beta 1-like	23	25	22

244757	Glb112	galactosidase, beta 1-like 2	134	129	135
70893	Glb113	galactosidase, beta 1 like 3	145	139	143
93683	Glce	glucuronyl C5-epimerase	327	342	319
104174	Gldc	glycine decarboxylase	268	276	262
14632	Gli1	GLI-Kruppel family member GLI1	32	33	32
14633	Gli2	GLI-Kruppel family member GLI2	1044	1026	1032
14634	Gli3	GLI-Kruppel family member GLI3	1733	1775	1727
230587	Glis1	GLIS family zinc finger 1	407	420	413
83396	Glis2	GLIS family zinc finger 2	75	84	78
226075	Glis3	GLIS family zinc finger 3	937	961	967
170823	Glmn	glomulin, FKBP associated protein	166	160	165
109801	Glo1	glyoxalase 1	66	70	67
14652	Glp1r	glucagon-like peptide 1 receptor	435	434	406
93692	Glrx	glutaredoxin	307	312	301
69367	Glrx2	glutaredoxin 2 (thioltransferase)	95	97	88
30926	Glrx3	glutaredoxin 3	39	38	36
73046	Glrx5	glutaredoxin 5 homolog (S. cerevisiae)	159	148	146
14660	Gls	glutaminase	481	485	475
216456	Gls2	glutaminase 2 (liver, mitochondrial)	40	34	41
319804	Glt1d1	glycosyltransferase 1 domain containing 1	1106	1117	1111
234407	Glt25d1	glycosyltransferase 25 domain containing 1	96	87	88
269132	Glt25d2	glycosyltransferase 25 domain containing 2	307	309	306
71103	Glt6d1	glycosyltransferase 6 domain containing 1	63	60	63
14661	Glud1	glutamate dehydrogenase 1	47	45	45
14645	Glul	glutamate-ammonia ligase (glutamine synthetase)	395	405	396
235582	Glyctk	glycerate kinase	21	22	22
74022	Glyr1	glyoxylate reductase 1 homolog (Arabidopsis)	49	44	47
100040233	Gm10334	predicted gene 10334	55	52	57
100042314	Gm10639	predicted gene 10639	106	107	111
381835	Gm1078	predicted gene 1078	39	43	41
382064	Gm1110	predicted gene 1110	176	176	168
242711	Gm13011	predicted gene 13011	97	91	91
100039042	Gm2016	predicted gene 2016	43	46	43
100039133	Gm2058	predicted gene 2058	1839	1879	1827
100040208	Gm2663	predicted gene 2663	93	94	95
14667	Gm2a	GM2 ganglioside activator protein	95	101	103
100041294	Gm3258	predicted gene 3258	178	180	173
212225	Gm4776	sperm motility kinase W	72	74	67
225058	Gm4832	predicted gene 4832	483	480	488
226601	Gm4846	predicted gene 4846	310	305	307
237300	Gm4922	predicted gene 4922	113	112	113
317677	Gm5077	predicted gene 5077	122	120	121
368203	Gm5136	predicted gene 5136	863	859	873
384244	Gm5294	predicted gene 5294	307	301	300
433016	Gm5483	predicted gene 5483	67	74	73
435337	Gm5662	predicted gene 5662	134	139	133
436523	Gm5771	predicted gene 5771	46	47	52
239789	Gm606	predicted gene 606	890	907	904
619597	Gm6086	predicted gene 6086	135	143	133
622408	Gm6320	predicted gene 6320	62	57	67
279029	Gm711	predicted gene 711	38	42	40
635895	Gm7168	predicted gene 7168	569	572	567
328788	Gm749	predicted gene 749	45	38	42
332942	Gm853	predicted gene 853	134	120	129
668137	Gm8994	predicted gene 8994	235	233	244

677156	Gm9705	predicted gene 9705	158	155	161
225908	Gm98	predicted gene 98	123	123	122
408192	Gm9839	predicted gene 9839	465	465	461
100041596	Gm9994	predicted gene 9994	173	172	170
218138	Gmids	GDP-mannose 4, 6-dehydratase	1228	1241	1243
56809	Gmeb1	glucocorticoid modulatory element binding protein 1	73	66	68
229004	Gmeb2	glucocorticoid modulatory element binding protein 2	83	94	94
57441	Gmnn	geminin	218	216	214
69080	Gmppa	GDP-mannose pyrophosphorylase A	66	56	59
331026	Gmppb	GDP-mannose pyrophosphorylase B	67	64	67
66355	Gmpr	guanosine monophosphate reductase	754	753	751
105446	Gmpr2	guanosine monophosphate reductase 2	12	12	12
229363	Gmps	guanine monophosphate synthetase	150	154	152
14672	Gna11	guanine nucleotide binding protein, alpha 11	37	35	39
14673	Gna12	guanine nucleotide binding protein, alpha 12	361	356	352
14674	Gna13	guanine nucleotide binding protein, alpha 13	18	23	20
14675	Gna14	guanine nucleotide binding protein, alpha 14	804	809	797
14676	Gna15	guanine nucleotide binding protein, alpha 15	56	56	55
14677	Gnai1	guanine nucleotide binding protein (G protein), alpha inhibiting 1	1575	1581	1551
14678	Gnai2	guanine nucleotide binding protein (G protein), alpha inhibiting 2	73	71	74
14679	Gnai3	guanine nucleotide binding protein (G protein), alpha inhibiting 3	79	79	80
14680	Gnal	guanine nucleotide binding protein, alpha stimulating, olfactory type	511	493	486
14681	Gnao1	guanine nucleotide binding protein, alpha O	355	359	348
14682	Gnaq	guanine nucleotide binding protein, alpha q polypeptide	231	230	226
14683	Gnas	GNAS (guanine nucleotide binding protein, alpha stimulating) complex	223	223	217
14685	Gnat1	guanine nucleotide binding protein, alpha transducing 1	48	52	52
14686	Gnat2	guanine nucleotide binding protein, alpha transducing 2	74	73	71
242851	Gnat3	guanine nucleotide binding protein, alpha transducing 3	594	577	576
14687	Gnaz	guanine nucleotide binding protein, alpha z subunit	1514	1552	1518
14688	Gnb1	guanine nucleotide binding protein (G protein), beta 1	117	116	117
14693	Gnb2	guanine nucleotide binding protein (G protein), beta 2	40	41	41
14694	Gnb2l1	guanine nucleotide binding protein (G protein), beta polypeptide 2 l	1825	1827	1818
14695	Gnb3	guanine nucleotide binding protein (G protein), beta 3	35	34	29
14696	Gnb4	guanine nucleotide binding protein (G protein), beta 4	224	238	226
50798	Gne	glucosamine	219	212	214
14702	Gng2	guanine nucleotide binding protein (G protein), gamma 2	329	334	328
14704	Gng3	guanine nucleotide binding protein (G protein), gamma 3	3	3	2
14706	Gng4	guanine nucleotide binding protein (G protein), gamma 4	460	480	449
14699	Gngt1	guanine nucleotide binding protein (G protein), gamma transducing	42	47	46
14710	Gngt2	guanine nucleotide binding protein (G protein), gamma transducing	117	115	117
14711	Gnmt	glycine N-methyltransferase	50	46	46
14712	Gnpat	glyceronephosphate O-acyltransferase	45	45	45
26384	Gnpda1	glucosamine-6-phosphate deaminase 1	164	159	164
67980	Gnpda2	glucosamine-6-phosphate deaminase 2	1644	1651	1600
54342	Gnpnat1	glucosamine-phosphate N-acetyltransferase 1	242	236	230
432486	Gnptab	N-acetylglucosamine-1-phosphate transferase, alpha and beta sub	143	128	141
214505	Gnptg	N-acetylglucosamine-1-phosphotransferase, gamma subunit	20	22	19
75612	Gns	glucosamine (N-acetyl)-6-sulfatase	206	204	216
94221	Gopc	golgi associated PDZ and coiled-coil motif containing	193	199	205
14718	Got1	glutamate oxaloacetate transaminase 1, soluble	225	218	239
76615	Got1l1	glutamic-oxaloacetic transaminase 1-like 1	72	74	77
14719	Got2	glutamate oxaloacetate transaminase 2, mitochondrial	146	146	132
14731	Gpaa1	GPI anchor attachment protein 1	22	18	21
14732	Gpam	glycerol-3-phosphate acyltransferase, mitochondrial	1449	1415	1432
215456	Gpat2	glycerol-3-phosphate acyltransferase 2, mitochondrial	105	96	99

73274	Gbbp1	GC-rich promoter binding protein 1	539	555	564
77110	Gbbp111	GC-rich promoter binding protein 1-like 1	50	53	51
14734	Gpc3	glypican 3	390	389	378
74182	Gpcpd1	glycerophosphocholine phosphodiesterase GDE1 homolog (S. ceri	138	136	142
14555	Gpd1	glycerol-3-phosphate dehydrogenase 1 (soluble)	29	33	30
333433	Gpd1l	glycerol-3-phosphate dehydrogenase 1-like	300	294	299
14571	Gpd2	glycerol phosphate dehydrogenase 2, mitochondrial	1119	1138	1135
268566	Gphn	gephyrin	1820	1860	1829
14751	Gpi1	glucose phosphate isomerase 1	114	111	110
14756	Gpld1	glycosylphosphatidylinositol specific phospholipase D1	112	110	108
14764	Gpr44	G protein-coupled receptor 44	37	36	38
209318	Gps1	G protein pathway suppressor 1	15	15	15
56310	Gps2	G protein pathway suppressor 2	22	23	24
76282	Gpt	glutamic pyruvic transaminase, soluble	33	37	33
108682	Gpt2	glutamic pyruvate transaminase (alanine aminotransferase) 2	160	163	151
14775	Gpx1	glutathione peroxidase 1	50	58	55
14776	Gpx2	glutathione peroxidase 2	78	70	80
14778	Gpx3	glutathione peroxidase 3	113	114	117
625249	Gpx4	glutathione peroxidase 4	76	69	74
14780	Gpx5	glutathione peroxidase 5	171	163	169
75512	Gpx6	glutathione peroxidase 6	77	74	70
67305	Gpx7	glutathione peroxidase 7	103	94	93
69590	Gpx8	glutathione peroxidase 8 (putative)	82	81	81
14783	Grb10	growth factor receptor bound protein 10	747	728	717
14784	Grb2	growth factor receptor bound protein 2	187	172	174
14786	Grb7	growth factor receptor bound protein 7	141	137	137
23892	Grem1	gremlin 1	663	678	639
195733	Grhl1	grainyhead-like 1 (Drosophila)	215	208	209
252973	Grhl2	grainyhead-like 2 (Drosophila)	580	579	581
230824	Grhl3	grainyhead-like 3 (Drosophila)	166	163	162
76238	Grhpr	glyoxylate reductase/hydroxypyruvate reductase	325	316	316
14799	Gria1	glutamate receptor, ionotropic, AMPA1 (alpha 1)	1953	1926	1909
14800	Gria2	glutamate receptor, ionotropic, AMPA2 (alpha 2)	1290	1292	1278
14807	Grik3	glutamate receptor, ionotropic, kainate 3	464	481	486
14810	Grin1	glutamate receptor, ionotropic, NMDA1 (zeta 1)	53	54	50
14811	Grin2a	glutamate receptor, ionotropic, NMDA2A (epsilon 1)	1731	1734	1730
14813	Grin2c	glutamate receptor, ionotropic, NMDA2C (epsilon 3)	107	104	105
24013	Grk1	G protein-coupled receptor kinase 1	47	49	51
14772	Grk4	G protein-coupled receptor kinase 4	131	133	131
14773	Grk5	G protein-coupled receptor kinase 5	388	384	378
26385	Grk6	G protein-coupled receptor kinase 6	46	44	49
232906	Grfl1	glucocorticoid receptor DNA binding factor 1	230	223	233
14816	Grm1	glutamate receptor, metabotropic 1	677	685	678
108068	Grm2	glutamate receptor, metabotropic 2	71	65	78
108069	Grm3	glutamate receptor, metabotropic 3	1886	1912	1831
268934	Grm4	glutamate receptor, metabotropic 4	458	442	454
108071	Grm5	glutamate receptor, metabotropic 5	978	993	953
108072	Grm6	glutamate receptor, metabotropic 6	61	52	55
108073	Grm7	glutamate receptor, metabotropic 7	4268	4270	4275
14823	Grm8	glutamate receptor, metabotropic 8	392	407	403
17713	Grpel1	GrpE-like 1, mitochondrial	117	102	112
17714	Grpel2	GrpE-like 2, mitochondrial	24	23	25
433899	Grxcr1	glutaredoxin, cysteine rich 1	1867	1887	1857
14836	Gsc	goosecoid homeobox	446	440	427
14841	Gsg2	germ cell-specific gene 2	97	85	91

606496	Gsk3a	glycogen synthase kinase 3 alpha	35	37	34
56637	Gsk3b	glycogen synthase kinase 3 beta	218	227	226
14852	Gspt1	G1 to S phase transition 1	66	64	63
14853	Gspt2	G1 to S phase transition 2	214	214	202
14782	Gsr	glutathione reductase	126	129	116
14854	Gss	glutathione synthetase	123	121	114
14857	Gsta1	glutathione S-transferase, alpha 1 (Ya)	127	130	129
14858	Gsta2	glutathione S-transferase, alpha 2 (Yc2)	55	51	55
14859	Gsta3	glutathione S-transferase, alpha 3	102	102	105
14860	Gsta4	glutathione S-transferase, alpha 4	154	146	147
67553	Gstcd	glutathione S-transferase, C-terminal domain containing	175	176	167
76263	Gstk1	glutathione S-transferase kappa 1	61	62	56
14862	Gstm1	glutathione S-transferase, mu 1	70	68	73
14863	Gstm2	glutathione S-transferase, mu 2	65	59	65
14864	Gstm3	glutathione S-transferase, mu 3	57	55	54
14865	Gstm4	glutathione S-transferase, mu 4	88	93	89
14866	Gstm5	glutathione S-transferase, mu 5	25	24	24
14867	Gstm6	glutathione S-transferase, mu 6	50	49	45
68312	Gstm7	glutathione S-transferase, mu 7	62	60	65
14873	Gsto1	glutathione S-transferase omega 1	38	39	35
68214	Gsto2	glutathione S-transferase omega 2	82	83	83
14870	Gstp1	glutathione S-transferase, pi 1	41	42	33
14869	Gstp2	glutathione S-transferase, pi 2	30	28	30
14871	Gstt1	glutathione S-transferase, theta 1	51	50	56
14872	Gstt2	glutathione S-transferase, theta 2	50	51	52
103140	Gstt3	glutathione S-transferase, theta 3	33	37	33
14874	Gstz1	glutathione transferase zeta 1 (maleylacetoacetate isomerase)	56	54	62
14842	Gsx1	GS homeobox 1	247	236	240
14843	Gsx2	GS homeobox 2	143	141	141
227835	Gtdc1	glycosyltransferase-like domain containing 1	1729	1742	1693
83602	Gtf2a1	general transcription factor II A, 1	321	330	314
71828	Gtf2a1l	general transcription factor IIA, 1-like	213	216	209
235459	Gtf2a2	general transcription factor II A, 2	56	57	55
229906	Gtf2b	general transcription factor IIB	231	233	232
74197	Gtf2e1	general transcription factor II E, polypeptide 1 (alpha subunit)	201	208	202
68153	Gtf2e2	general transcription factor II E, polypeptide 2 (beta subunit)	352	373	360
98053	Gtf2f1	general transcription factor IIF, polypeptide 1	42	40	36
68705	Gtf2f2	general transcription factor IIF, polypeptide 2	207	202	203
14884	Gtf2h1	general transcription factor II H, polypeptide 1	69	68	66
23894	Gtf2h2	general transcription factor II H, polypeptide 2	133	133	125
209357	Gtf2h3	general transcription factor IIH, polypeptide 3	27	29	27
14885	Gtf2h4	general transcription factor II H, polypeptide 4	37	38	48
66467	Gtf2h5	general transcription factor IIH, polypeptide 5	38	33	37
14886	Gtf2i	general transcription factor II I	295	293	285
57080	Gtf2ird1	general transcription factor II I repeat domain-containing 1	306	307	304
114674	Gtf2ird2	GTF2I repeat domain containing 2	74	75	69
66596	Gtf3a	general transcription factor III A	150	152	160
233863	Gtf3c1	general transcription factor III C 1	134	136	134
71752	Gtf3c2	general transcription factor IIIC, polypeptide 2, beta	48	52	52
269252	Gtf3c4	general transcription factor IIIC, polypeptide 4	134	134	136
70239	Gtf3c5	general transcription factor IIIC, polypeptide 5	81	67	80
67371	Gtf3c6	general transcription factor IIIC, polypeptide 6, alpha	80	69	79
14904	Gtpbp1	GTP binding protein 1	68	69	66
70359	Gtpbp3	GTP binding protein 3	29	28	29
69237	Gtpbp4	GTP binding protein 4	185	179	191

14916	Guca2b	guanylate cyclase activator 2b (retina)	223	219	220
234889	Gucy1a2	guanylate cyclase 1, soluble, alpha 2	1133	1130	1135
60596	Gucy1a3	guanylate cyclase 1, soluble, alpha 3	347	369	360
54195	Gucy1b3	guanylate cyclase 1, soluble, beta 3	180	182	183
14917	Gucy2c	guanylate cyclase 2c	176	186	176
14918	Gucy2d	guanylate cyclase 2d	170	174	175
14919	Gucy2e	guanylate cyclase 2e	161	160	158
245650	Gucy2f	guanylate cyclase 2f	609	627	605
73707	Gucy2g	guanylate cyclase 2g	89	96	91
231279	Guf1	GUF1 GTPase homolog (S. cerevisiae)	64	65	63
14923	Guk1	guanylate kinase 1	28	31	30
268756	Gulo	gulonolactone (L-) oxidase	137	137	141
110006	Gusb	glucuronidase, beta	114	105	107
223827	Gxylt1	glucoside xylosyltransferase 1	938	937	932
232313	Gxylt2	glucoside xylosyltransferase 2	213	205	216
27357	Gyg	glycogenin	230	235	238
14933	Gyk	glycerol kinase	358	367	353
14625	Gykl1	glycerol kinase-like 1	151	159	150
14936	Gys1	glycogen synthase 1, muscle	36	32	37
232493	Gys2	glycogen synthase 2	162	154	164
74533	Gzfi	GDNF-inducible zinc finger protein 1	73	76	77
14938	Gzma	granzyme A	162	175	178
14939	Gzmb	granzyme B	160	167	162
14940	Gzmc	granzyme C	63	67	67
14941	Gzmd	granzyme D	52	52	47
14942	Gzme	granzyme E	36	41	44
14943	Gzmf	granzyme F	68	73	72
14944	Gzmg	granzyme G	56	56	58
14945	Gzmk	granzyme K	140	147	136
16904	Gzmm	granzyme M (lymphocyte met-ase 1)	28	25	30
245839	Gzmn	granzyme N	61	64	66
14950	H13	histocompatibility 13	76	78	77
14958	H1f0	H1 histone family, member 0	62	62	62
70069	H1fnt	H1 histone family, member N, testis-specific	76	74	78
171506	H1foo	H1 histone family, member O, oocyte-specific	83	73	79
232440	H2afj	H2A histone family, member J	30	28	28
77605	H2afv	H2A histone family, member V	83	76	78
15270	H2afx	H2A histone family, member X	17	17	17
26914	H2afy	H2A histone family, member Y	438	447	436
404634	H2afy2	H2A histone family, member Y2	349	338	326
51788	H2afz	H2A histone family, member Z	329	318	316
14998	H2-DMa	histocompatibility 2, class II, locus DMA	31	30	30
14999	H2-DMb1	histocompatibility 2, class II, locus Mb1	54	50	57
15000	H2-DMb2	histocompatibility 2, class II, locus Mb2	24	24	24
14976	H2-Ke2	H2-K region expressed gene 2	13	17	12
14979	H2-Ke6	H2-K region expressed gene 6	8	5	5
109815	H47	histocompatibility 47	59	67	66
100198	H6pd	hexose-6-phosphate dehydrogenase (glucose 1-dehydrogenase)	139	144	147
107766	Hao	3-hydroxyanthranilate 3,4-dioxygenase	627	611	626
226243	Habp2	hyaluronic acid binding protein 2	640	635	630
56541	Habp4	hyaluronic acid binding protein 4	125	128	121
209462	Hace1	HECT domain and ankyrin repeat containing, E3 ubiquitin protein li	5459	5506	5389
56794	Hacl1	2-hydroxyacyl-CoA lyase 1	83	76	83
15107	Hadh	hydroxyacyl-Coenzyme A dehydrogenase	258	249	262
97212	Hadha	hydroxyacyl-Coenzyme A dehydrogenase/3-ketoacyl-Coenzyme A	69	67	64

231086	Hadhb	hydroxyacyl-Coenzyme A dehydrogenase/3-ketoacyl-Coenzyme A	20	17	23
14651	Hagh	hydroxyacyl glutathione hydrolase	39	37	34
15109	Hal	histidine ammonia lyase	105	108	103
15110	Hand1	heart and neural crest derivatives expressed transcript 1	268	255	265
15111	Hand2	heart and neural crest derivatives expressed transcript 2	1142	1153	1135
15112	Hao1	hydroxyacid oxidase 1, liver	1366	1390	1395
56185	Hao2	hydroxyacid oxidase 2	361	348	352
15115	Hars	histidyl-tRNA synthetase	24	25	22
70791	Hars2	histidyl-tRNA synthetase 2, mitochondrial (putative)	15	13	11
15116	Has1	hyaluronan synthase1	64	64	68
15118	Has3	hyaluronan synthase 3	275	282	272
107435	Hat1	histone aminotransferase 1	110	116	110
110257	Hba-a2	hemoglobin alpha, adult chain 2	8	6	7
15126	Hba-x	hemoglobin X, alpha-like embryonic chain in Hba complex	20	22	19
15132	Hbb-bh1	hemoglobin Z, beta-like embryonic chain	14	15	17
15135	Hbb-y	hemoglobin Y, beta-like embryonic chain	53	51	46
15200	Hbegf	heparin-binding EGF-like growth factor	100	95	99
73389	Hbp1	high mobility group box transcription factor 1	455	460	443
15139	Hc	hemolytic complement	179	186	171
15161	Hcfc1	host cell factor C1	120	108	114
67933	Hcfc2	host cell factor C2	97	98	94
15162	Hck	hemopoietic cell kinase	123	132	130
15163	Hcls1	hematopoietic cell specific Lyn substrate 1	117	122	118
15171	Hcrt	hypocretin	14	13	15
433759	Hdac1	histone deacetylase 1	58	53	56
170787	Hdac10	histone deacetylase 10	22	21	24
232232	Hdac11	histone deacetylase 11	116	125	121
15182	Hdac2	histone deacetylase 2	801	794	802
15183	Hdac3	histone deacetylase 3	26	26	27
208727	Hdac4	histone deacetylase 4	865	841	845
15184	Hdac5	histone deacetylase 5	74	68	73
15185	Hdac6	histone deacetylase 6	49	51	47
56233	Hdac7	histone deacetylase 7	188	187	184
70315	Hdac8	histone deacetylase 8	492	488	475
79221	Hdac9	histone deacetylase 9	1330	1319	1276
15186	Hdc	histidine decarboxylase	167	159	157
68695	Hddc3	HD domain containing 3	42	35	41
15191	Hdgf	hepatoma-derived growth factor	42	45	37
15193	Hdgfrp2	hepatoma-derived growth factor, related protein 2	49	48	47
67365	Hdhd1a	haloacid dehalogenase-like hydrolase domain containing 1A	1062	1078	1061
76987	Hdhd2	haloacid dehalogenase-like hydrolase domain containing 2	153	152	149
72748	Hdhd3	haloacid dehalogenase-like hydrolase domain containing 3	50	54	50
110611	Hdlbp	high density lipoprotein (HDL) binding protein	140	130	137
15199	Hebp1	heme binding protein 1	98	101	100
207304	Hectd1	HECT domain containing 1	366	358	371
226098	Hectd2	HECT domain containing 2	402	389	395
76608	Hectd3	HECT domain containing 3	30	30	30
94253	Hecw1	HECT, C2 and WW domain containing E3 ubiquitin protein ligase 1	682	699	691
329152	Hecw2	HECT, C2 and WW domain containing E3 ubiquitin protein ligase 2	575	597	591
117599	Helb	helicase (DNA) B	503	509	486
15201	Hells	helicase, lymphoid specific	230	224	226
191578	Helq	helicase, POLQ-like	103	103	109
234219	Helt	Hey-like transcription factor (zebrafish)	330	322	330
69536	Hemk1	HemK methyltransferase family member 1	51	62	52
15203	Heph	hephaestin	422	439	419

244698	Heph11	hephaestin-like 1	252	250	238
15204	Herc2	hect (homologous to the E6-AP (UBE3A) carboxyl terminus) domai	273	279	280
73998	Herc3	hect domain and RLD 3	397	396	383
67345	Herc4	hect domain and RLD 4	181	174	171
67138	Herc6	hect domain and RLD 6	191	201	187
15205	Hes1	hairy and enhancer of split 1 (Drosophila)	333	301	332
15206	Hes2	hairy and enhancer of split 2 (Drosophila)	33	33	28
15207	Hes3	hairy and enhancer of split 3 (Drosophila)	26	18	22
15208	Hes5	hairy and enhancer of split 5 (Drosophila)	43	40	38
55927	Hes6	hairy and enhancer of split 6 (Drosophila)	59	69	61
84653	Hes7	hairy and enhancer of split 7 (Drosophila)	30	25	24
15209	Hesx1	homeobox gene expressed in ES cells	89	92	87
15211	Hexa	hexosaminidase A	71	67	66
15212	Hexb	hexosaminidase B	135	128	132
238023	Hexdc	hexosaminidase (glycosyl hydrolase family 20, catalytic domain) cc	90	82	85
192231	Hexim1	hexamethylene bis-acetamide inducible 1	39	39	42
71059	Hexim2	hexamthylene bis-acetamide inducible 2	63	62	71
15213	Hey1	hairy/enhancer-of-split related with YRPW motif 1	531	520	518
15214	Hey2	hairy/enhancer-of-split related with YRPW motif 2	634	660	644
56198	Heyl	hairy/enhancer-of-split related with YRPW motif-like	98	97	102
15216	Hfe	hemochromatosis	52	51	52
15233	Hgd	homogentisate 1, 2-dioxygenase	153	152	161
15234	Hgf	hepatocyte growth factor	1880	1946	1873
54426	Hgfac	hepatocyte growth factor activator	42	42	46
15239	Hgs	HGF-regulated tyrosine kinase substrate	20	25	23
52120	Hgsnat	heparan-alpha-glucosaminide N-acetyltransferase	191	188	198
226861	Hhat	hedgehog acyltransferase	862	853	850
74770	Hhatl	hedgehog acyltransferase-like	81	82	72
15242	Hhex	hematopoietically expressed homeobox	220	223	223
214305	Hhip1	hedgehog interacting protein-like 1	75	71	69
58875	Hibadh	3-hydroxyisobutyrate dehydrogenase	509	517	492
227095	Hibch	3-hydroxyisobutyryl-Coenzyme A hydrolase	177	180	177
15248	Hic1	hypermethylated in cancer 1	128	133	129
58180	Hic2	hypermethylated in cancer 2	87	88	92
15251	Hif1a	hypoxia inducible factor 1, alpha subunit	484	486	494
319594	Hif1an	hypoxia-inducible factor 1, alpha subunit inhibitor	251	264	262
53417	Hif3a	hypoxia inducible factor 3, alpha subunit	69	56	66
54388	Hils1	histone H1-like protein in spermatids 1	44	49	48
102423	Hinfp	histone H4 transcription factor	39	41	40
68917	Hint2	histidine triad nucleotide binding protein 2	20	19	16
215114	Hip1	huntingtin interacting protein 1	222	211	222
15257	Hipk1	homeodomain interacting protein kinase 1	89	91	91
15258	Hipk2	homeodomain interacting protein kinase 2	367	365	367
15259	Hipk3	homeodomain interacting protein kinase 3	207	202	207
233020	Hipk4	homeodomain interacting protein kinase 4	67	70	68
15260	Hira	histone cell cycle regulation defective homolog A (S. cerevisiae)	523	527	511
80838	Hist1h1a	histone cluster 1, H1a	26	27	27
56702	Hist1h1b	histone cluster 1, H1b	38	36	40
50708	Hist1h1c	histone cluster 1, H1c	44	44	36
14957	Hist1h1d	histone cluster 1, H1d	14	12	12
50709	Hist1h1e	histone cluster 1, H1e	79	77	74
107970	Hist1h1t	histone cluster 1, H1t	19	19	21
319173	Hist1h2af	histone cluster 1, H2af	5	6	5
319168	Hist1h2ah	histone cluster 1, H2ah	33	34	34
319169	Hist1h2ak	histone cluster 1, H2ak	3	5	2

319177	Hist1h2ba	histone cluster 1, H2ba	25	26	24
319178	Hist1h2bb	histone cluster 1, H2bb	8	7	6
319182	Hist1h2bh	histone cluster 1, H2bh	8	8	9
319184	Hist1h2bk	histone cluster 1, H2bk	9	7	7
319186	Hist1h2bm	histone cluster 1, H2bm	22	23	24
319188	Hist1h2bp	histone cluster 1, H2bp	28	29	28
621893	Hist2h2ab	histone cluster 2, H2ab	32	26	29
319189	Hist2h2bb	histone cluster 2, H2bb	29	34	35
319190	Hist2h2be	histone cluster 2, H2be	24	22	22
15077	Hist2h3c1	histone cluster 2, H3c1	41	47	38
319162	Hist3h2a	histone cluster 3, H2a	12	12	12
78303	Hist3h2ba	histone cluster 3, H2ba	20	18	21
110521	Hivep1	human immunodeficiency virus type I enhancer binding protein 1	551	545	547
15273	Hivep2	human immunodeficiency virus type I enhancer binding protein 2	853	880	865
16656	Hivep3	human immunodeficiency virus type I enhancer binding protein 3	642	652	645
381280	Hjurp	Holliday junction recognition protein	36	35	40
15275	Hk1	hexokinase 1	220	210	213
15277	Hk2	hexokinase 2	376	364	373
212032	Hk3	hexokinase 3	193	189	193
216019	Hkdc1	hexokinase domain containing 1	95	86	93
110948	Hlcs	holocarboxylase synthetase (biotin- [propionyl-Coenzyme A-carbo:	462	457	466
217082	Hlf	hepatic leukemia factor	503	490	491
20585	Hlhf	helicase-like transcription factor	159	152	153
15284	Hlx	H2.0-like homeobox	969	979	981
219150	Hmbox1	homeobox containing 1	388	384	385
15288	Hmbs	hydroxymethylbilane synthase	34	38	39
66867	Hmg20a	high mobility group 20A	343	349	358
15353	Hmg20b	high mobility group 20 B	14	18	14
15361	Hmga1	high mobility group AT-hook 1	67	59	68
15364	Hmga2	high mobility group AT-hook 2	398	411	405
15289	Hmgb1	high mobility group box 1	294	283	284
97165	Hmgb2	high mobility group box 2	216	207	207
15356	Hmgcl	3-hydroxy-3-methylglutaryl-Coenzyme A lyase	58	58	61
15357	Hmgcr	3-hydroxy-3-methylglutaryl-Coenzyme A reductase	480	485	484
15360	Hmgcs2	3-hydroxy-3-methylglutaryl-Coenzyme A synthase 2	157	158	144
15312	Hmgn1	high mobility group nucleosomal binding domain 1	78	78	82
94353	Hmgn3	high mobility group nucleosomal binding domain 3	582	617	589
50887	Hmgn5	high-mobility group nucleosome binding domain 5	111	107	101
15368	Hmox1	heme oxygenase (decycling) 1	100	102	101
15369	Hmox2	heme oxygenase (decycling) 2	111	117	109
15371	Hmx1	H6 homeobox 1	311	313	304
15372	Hmx2	H6 homeobox 2	17	19	17
15373	Hmx3	H6 homeobox 3	173	190	176
21405	Hnf1a	HNF1 homeobox A	88	79	84
21410	Hnf1b	HNF1 homeobox B	247	242	237
15378	Hnf4a	hepatic nuclear factor 4, alpha	78	78	82
30942	Hnf4g	hepatocyte nuclear factor 4, gamma	3450	3466	3402
140483	Hnmt	histamine N-methyltransferase	665	681	649
53379	Hnrnpa2b1	heterogeneous nuclear ribonucleoprotein A2/B1	44	44	46
229279	Hnrnpa3	heterogeneous nuclear ribonucleoprotein A3	1082	1100	1068
15384	Hnrnpab	heterogeneous nuclear ribonucleoprotein A/B	38	41	40
15381	Hnrnpc	heterogeneous nuclear ribonucleoprotein C	56	58	56
11991	Hnrnpd	heterogeneous nuclear ribonucleoprotein D	411	406	395
98758	Hnrnpf	heterogeneous nuclear ribonucleoprotein F	115	109	118
59013	HnrnpH1	heterogeneous nuclear ribonucleoprotein H1	100	92	94

15388	Hnrnpl	heterogeneous nuclear ribonucleoprotein L	47	44	42
76936	Hnrnrm	heterogeneous nuclear ribonucleoprotein M	102	96	105
51810	Hnrnpu	heterogeneous nuclear ribonucleoprotein U	107	105	115
232989	Hnrnpul1	heterogeneous nuclear ribonucleoprotein U-like 1	85	84	88
50926	Hnrpdl	heterogeneous nuclear ribonucleoprotein D-like	74	76	73
72692	Hnrpll	heterogeneous nuclear ribonucleoprotein L-like	299	300	293
67432	Hoga1	4-hydroxy-2-oxoglutarate aldolase 1	22	19	22
239099	Homez	homeodomain leucine zipper-encoding gene	130	132	130
74318	Hopx	HOP homeobox	273	281	274
67981	Hormad1	HORMA domain containing 1	86	81	81
15394	Hoxa1	homeobox A1	194	193	197
15395	Hoxa10	homeobox A10	20	26	25
15396	Hoxa11	homeobox A11	18	18	21
15398	Hoxa13	homeobox A13	86	82	92
15399	Hoxa2	homeobox A2	35	35	33
15400	Hoxa3	homeobox A3	13	12	10
15401	Hoxa4	homeobox A4	47	46	45
15402	Hoxa5	homeobox A5	9	7	8
15403	Hoxa6	homeobox A6	11	9	12
15404	Hoxa7	homeobox A7	14	15	15
15405	Hoxa9	homeobox A9	12	14	14
15407	Hoxb1	homeobox B1	149	146	153
15408	Hoxb13	homeobox B13	153	150	152
103889	Hoxb2	homeobox B2	23	25	26
15410	Hoxb3	homeobox B3	67	64	70
15412	Hoxb4	homeobox B4	7	6	6
15413	Hoxb5	homeobox B5	20	24	22
15414	Hoxb6	homeobox B6	20	19	20
15415	Hoxb7	homeobox B7	17	20	16
15416	Hoxb8	homeobox B8	16	16	16
15417	Hoxb9	homeobox B9	18	17	19
209448	Hoxc10	homeobox C10	21	24	23
15421	Hoxc12	homeobox C12	38	44	34
15422	Hoxc13	homeobox C13	268	274	272
15423	Hoxc4	homeobox C4	192	191	183
15424	Hoxc5	homeobox C5	4	3	5
15425	Hoxc6	homeobox C6	28	25	28
15426	Hoxc8	homeobox C8	37	40	35
15427	Hoxc9	homeobox C9	21	20	19
15430	Hoxd10	homeobox D10	19	17	18
15431	Hoxd11	homeobox D11	16	17	15
15432	Hoxd12	homeobox D12	17	18	19
15433	Hoxd13	homeobox D13	21	19	17
15434	Hoxd3	homeobox D3	15	10	11
15436	Hoxd4	homeobox D4	13	13	10
15437	Hoxd8	homeobox D8	15	17	13
15438	Hoxd9	homeobox D9	17	12	15
15439	Hp	haptoglobin	54	58	56
15441	Hp1bp3	heterochromatin protein 1, binding protein 3	329	319	326
15445	Hpd	4-hydroxyphenylpyruvic acid dioxygenase	112	129	120
242642	Hpdl	4-hydroxyphenylpyruvate dioxygenase-like	89	85	89
15446	Hpgd	hydroxyprostaglandin dehydrogenase 15 (NAD)	745	778	768
54486	Hpgds	hematopoietic prostaglandin D synthase	428	430	435
15451	Hpn	hepsin	62	59	64
15452	Hprt	hypoxanthine guanine phosphoribosyl transferase	162	177	162

15442	Hpse	heparanase	161	165	159
15458	Hpx	hemopexin	66	66	65
15460	Hr	hairless	35	34	36
15461	Hras1	Harvey rat sarcoma virus oncogene 1	26	24	25
15465	Hrh1	histamine receptor H1	466	438	461
99296	Hrh3	histamine receptor H3	53	57	56
23908	Hs2st1	heparan sulfate 2-O-sulfotransferase 1	464	469	475
54710	Hs3st3b1	heparan sulfate (glucosamine) 3-O-sulfotransferase 3B1	1244	1210	1228
319415	Hs3st5	heparan sulfate (glucosamine) 3-O-sulfotransferase 5	3164	3209	3093
328779	Hs3st6	heparan sulfate (glucosamine) 3-O-sulfotransferase 6	91	85	87
50785	Hs6st1	heparan sulfate 6-O-sulfotransferase 1	1805	1788	1767
50786	Hs6st2	heparan sulfate 6-O-sulfotransferase 2	731	725	720
50787	Hs6st3	heparan sulfate 6-O-sulfotransferase 3	1185	1242	1201
100900	Hscb	HscB iron-sulfur cluster co-chaperone homolog (E. coli)	46	35	39
15483	Hsd11b1	hydroxysteroid 11-beta dehydrogenase 1	124	116	125
15484	Hsd11b2	hydroxysteroid 11-beta dehydrogenase 2	90	85	94
15485	Hsd17b1	hydroxysteroid (17-beta) dehydrogenase 1	19	18	18
15108	Hsd17b10	hydroxysteroid (17-beta) dehydrogenase 10	125	136	130
114664	Hsd17b11	hydroxysteroid (17-beta) dehydrogenase 11	93	98	87
56348	Hsd17b12	hydroxysteroid (17-beta) dehydrogenase 12	303	289	286
243168	Hsd17b13	hydroxysteroid (17-beta) dehydrogenase 13	144	142	137
66065	Hsd17b14	hydroxysteroid (17-beta) dehydrogenase 14	56	53	58
15486	Hsd17b2	hydroxysteroid (17-beta) dehydrogenase 2	169	167	161
15487	Hsd17b3	hydroxysteroid (17-beta) dehydrogenase 3	407	410	403
15488	Hsd17b4	hydroxysteroid (17-beta) dehydrogenase 4	294	284	287
27400	Hsd17b6	hydroxysteroid (17-beta) dehydrogenase 6	146	157	152
15490	Hsd17b7	hydroxysteroid (17-beta) dehydrogenase 7	216	207	201
15492	Hsd3b1	hydroxy-delta-5-steroid dehydrogenase, 3 beta- and steroid delta-i:	103	106	105
15493	Hsd3b2	hydroxy-delta-5-steroid dehydrogenase, 3 beta- and steroid delta-i:	145	158	145
15494	Hsd3b3	hydroxy-delta-5-steroid dehydrogenase, 3 beta- and steroid delta-i:	120	114	117
15496	Hsd3b5	hydroxy-delta-5-steroid dehydrogenase, 3 beta- and steroid delta-i:	206	216	198
15497	Hsd3b6	hydroxy-delta-5-steroid dehydrogenase, 3 beta- and steroid delta-i:	126	123	127
101502	Hsd3b7	hydroxy-delta-5-steroid dehydrogenase, 3 beta- and steroid delta-i:	58	57	59
72552	Hsd11	hydroxysteroid dehydrogenase like 1	20	19	18
72479	Hsd12	hydroxysteroid dehydrogenase like 2	105	104	96
15499	Hsf1	heat shock factor 1	43	46	41
15500	Hsf2	heat shock factor 2	1466	1480	1448
245525	Hsf3	heat shock transcription factor 3	193	209	187
26386	Hsf4	heat shock transcription factor 4	11	14	12
327992	Hsf5	heat shock transcription factor family member 5	92	92	93
15519	Hsp90aa1	heat shock protein 90, alpha (cytosolic), class A member 1	76	71	71
15516	Hsp90ab1	heat shock protein 90 alpha (cytosolic), class B member 1	31	31	31
22027	Hsp90b1	heat shock protein 90, beta (Grp94), member 1	22	25	26
193740	Hspa1a	heat shock protein 1A	11	12	14
15511	Hspa1b	heat shock protein 1B	22	19	23
15512	Hspa2	heat shock protein 2	58	60	57
18415	Hspa4l	heat shock protein 4 like	118	110	110
14828	Hspa5	heat shock protein 5	64	54	60
15481	Hspa8	heat shock protein 8	149	146	158
15526	Hspa9	heat shock protein 9	264	246	249
15507	Hspb1	heat shock protein 1	143	146	145
66245	Hspbp1	HSPA (heat shock 70kDa) binding protein, cytoplasmic cochaperon	39	40	39
15510	Hspd1	heat shock protein 1 (chaperonin)	45	43	45
15528	Hspe1	heat shock protein 1 (chaperonin 10)	57	53	51
15505	Hsph1	heat shock 105kDa/110kDa protein 1	198	191	193

53415	Htati2	HIV-1 tat interactive protein 2, homolog (human)	189	181	179
72459	Htatsf1	HIV TAT specific factor 1	49	52	54
15550	Htr1a	5-hydroxytryptamine (serotonin) receptor 1A	2065	2084	2044
15551	Htr1b	5-hydroxytryptamine (serotonin) receptor 1B	1768	1786	1734
15558	Htr2a	5-hydroxytryptamine (serotonin) receptor 2A	1489	1481	1474
15559	Htr2b	5-hydroxytryptamine (serotonin) receptor 2B	113	115	117
15560	Htr2c	5-hydroxytryptamine (serotonin) receptor 2C	1743	1805	1639
56213	Htra1	HtrA serine peptidase 1	210	214	212
64704	Htra2	HtrA serine peptidase 2	26	29	24
78558	Htra3	HtrA serine peptidase 3	194	187	176
15194	Htt	huntingtin	322	333	330
26559	Hunk	hormonally upregulated Neu-associated kinase	571	578	582
15574	Hus1	Hus1 homolog (S. pombe)	498	507	487
59026	Huwe1	HECT, UBA and WWE domain containing 1	474	482	464
15586	Hyal1	hyaluronoglucosaminidase 1	14	15	14
15587	Hyal2	hyaluronoglucosaminidase 2	17	17	14
109685	Hyal3	hyaluronoglucosaminidase 3	11	9	9
77042	Hyal4	hyaluronoglucosaminidase 4	72	71	74
74468	Hyal5	hyaluronoglucosaminidase 5	204	204	206
67732	lah1	isoamyl acetate-hydrolyzing esterase 1 homolog (S. cerevisiae)	120	116	113
105148	lars	isoleucine-tRNA synthetase	770	786	777
381314	lars2	isoleucine-tRNA synthetase 2, mitochondrial	21	23	21
108837	lbtk	inhibitor of Bruton agammaglobulinemia tyrosine kinase	667	667	655
56542	lck	intestinal cell kinase	112	102	121
57295	lcmt	isoprenylcysteine carboxyl methyltransferase	33	30	32
50723	lcosl	icos ligand	160	156	158
68572	lct1	immature colon carcinoma transcript 1	48	49	47
15901	ld1	inhibitor of DNA binding 1	82	82	81
15902	ld2	inhibitor of DNA binding 2	1843	1828	1807
15903	ld3	inhibitor of DNA binding 3	148	149	151
15904	ld4	inhibitor of DNA binding 4	631	617	610
15925	lde	insulin degrading enzyme	217	213	223
15926	ldh1	isocitrate dehydrogenase 1 (NADP+), soluble	92	94	94
269951	ldh2	isocitrate dehydrogenase 2 (NADP+), mitochondrial	160	161	159
67834	ldh3a	isocitrate dehydrogenase 3 (NAD+) alpha	138	129	129
170718	ldh3b	isocitrate dehydrogenase 3 (NAD+) beta	24	25	23
15929	ldh3g	isocitrate dehydrogenase 3 (NAD+), gamma	18	14	17
319554	ldi1	isopentenyl-diphosphate delta isomerase	106	107	102
15930	ldo1	indoleamine 2,3-dioxygenase 1	131	122	118
209176	ldo2	indoleamine 2,3-dioxygenase 2	200	199	202
15931	lds	iduronate 2-sulfatase	292	288	287
15932	ldua	iduronidase, alpha-L-	21	21	20
15937	ler3	immediate early response 3	169	155	155
15951	lfi204	interferon activated gene 204	179	171	178
226695	lfi205	interferon activated gene 205	71	77	72
65972	lfi30	interferon gamma inducible protein 30	19	18	20
15975	lfnar1	interferon (alpha and beta) receptor 1	183	178	193
15977	lfnb1	interferon beta 1, fibroblast	154	160	157
15978	lfng	interferon gamma	733	745	719
67661	lft172	intraflagellar transport 172 homolog (Chlamydomonas)	60	52	56
245866	lft52	intraflagellar transport 52 homolog (Chlamydomonas)	92	84	83
73916	lft57	intraflagellar transport 57 homolog (Chlamydomonas)	1006	1016	991
21821	lft88	intraflagellar transport 88 homolog (Chlamydomonas)	154	169	161
18518	lgbp1	immunoglobulin (CD79A) binding protein 1	130	120	110
16000	lgf1	insulin-like growth factor 1	587	581	577

16001	Igf1r	insulin-like growth factor I receptor	645	640	623
16002	Igf2	insulin-like growth factor 2	23	29	24
140486	Igf2bp1	insulin-like growth factor 2 mRNA binding protein 1	131	134	132
16009	Igfbp3	insulin-like growth factor binding protein 3	1861	1889	1834
16011	Igfbp5	insulin-like growth factor binding protein 5	245	238	255
20589	Ighmbp2	immunoglobulin mu binding protein 2	717	714	715
242050	Igsf10	immunoglobulin superfamily, member 10	592	594	571
16145	Igtp	interferon gamma induced GTPase	40	39	40
16147	Ihh	Indian hedgehog	171	181	173
60440	Iigp1	interferon inducible GTPase 1	267	279	256
230233	Ikbkap	inhibitor of kappa light polypeptide enhancer in B-cells, kinase com	81	82	79
16150	Ikbkb	inhibitor of kappaB kinase beta	134	142	127
56489	Ikbke	inhibitor of kappaB kinase epsilon	358	357	340
16151	Ikbkg	inhibitor of kappaB kinase gamma	161	150	161
22778	Ikzf1	IKAROS family zinc finger 1	404	403	413
22779	Ikzf2	IKAROS family zinc finger 2	916	911	899
22780	Ikzf3	IKAROS family zinc finger 3	130	131	135
22781	Ikzf4	IKAROS family zinc finger 4	60	62	62
67143	Ikzf5	IKAROS family zinc finger 5	51	50	47
16153	Il10	interleukin 10	205	215	199
16156	Il11	interleukin 11	14	11	11
16159	Il12a	interleukin 12a	382	386	383
16160	Il12b	interleukin 12b	843	809	822
16161	Il12rb1	interleukin 12 receptor, beta 1	58	52	62
16162	Il12rb2	interleukin 12 receptor, beta 2	281	292	290
16168	Il15	interleukin 15	1332	1376	1342
16170	Il16	interleukin 16	210	208	213
16171	Il17a	interleukin 17A	135	125	136
257630	Il17f	interleukin 17F	115	114	113
16173	Il18	interleukin 18	55	55	54
329244	Il19	interleukin 19	129	134	136
16175	Il1a	interleukin 1 alpha	92	95	93
16176	Il1b	interleukin 1 beta	211	203	203
16180	Il1rap	interleukin 1 receptor accessory protein	581	592	581
16181	Il1rn	interleukin 1 receptor antagonist	136	134	135
16183	Il2	interleukin 2	227	216	210
60505	Il21	interleukin 21	236	235	242
50929	Il22	interleukin 22	196	202	198
83430	Il23a	interleukin 23, alpha subunit p19	52	46	41
93672	Il24	interleukin 24	57	57	57
140806	Il25	interleukin 25	14	12	11
246779	Il27	interleukin 27	51	52	53
16185	Il2rb	interleukin 2 receptor, beta chain	77	75	76
16186	Il2rg	interleukin 2 receptor, gamma chain	14	12	14
16187	Il3	interleukin 3	74	70	70
77125	Il33	interleukin 33	271	259	261
76527	Il34	interleukin 34	153	154	158
16189	Il4	interleukin 4	88	79	89
14204	Il4i1	interleukin 4 induced 1	39	37	37
16191	Il5	interleukin 5	80	86	84
16193	Il6	interleukin 6	435	432	438
16194	Il6ra	interleukin 6 receptor, alpha	163	168	169
16195	Il6st	interleukin 6 signal transducer	355	387	366
16197	Il7r	interleukin 7 receptor	403	407	405
16198	Il9	interleukin 9	103	108	101

67781	Ilf2	interleukin enhancer binding factor 2	29	28	34
16201	Ilf3	interleukin enhancer binding factor 3	99	97	101
67444	Ilkap	integrin-linked kinase-associated serine/threonine phosphatase 2C	53	48	50
66541	Imp1	IMP1 inner mitochondrial membrane peptidase-like (<i>S. cerevisiae</i>)	132	129	122
93757	Imp2	IMP2 inner mitochondrial membrane peptidase-like (<i>S. cerevisiae</i>)	1322	1333	1312
102462	Imp3	IMP3, U3 small nucleolar ribonucleoprotein, homolog (yeast)	31	28	30
27993	Imp4	IMP4, U3 small nucleolar ribonucleoprotein, homolog (yeast)	26	27	21
55980	Impa1	inositol (myo)-1(or 4)-monophosphatase 1	42	43	42
114663	Impa2	inositol (myo)-1(or 4)-monophosphatase 2	127	119	127
16210	Impact	imprinted and ancient	81	80	84
242291	Impad1	inositol monophosphatase domain containing 1	1903	1949	1906
23917	Impdh1	inosine 5'-phosphate dehydrogenase 1	115	118	117
23918	Impdh2	inosine 5'-phosphate dehydrogenase 2	64	63	66
26356	Ing1	inhibitor of growth family, member 1	105	96	108
69260	Ing2	inhibitor of growth family, member 2	218	230	226
71777	Ing3	inhibitor of growth family, member 3	164	167	166
28019	Ing4	inhibitor of growth family, member 4	54	50	55
66262	Ing5	inhibitor of growth family, member 5	29	27	28
16322	Inha	inhibin alpha	18	20	19
16323	Inhba	inhibin beta-A	2808	2864	2738
16324	Inhbb	inhibin beta-B	586	567	587
21743	Inmt	indolethylamine N-methyltransferase	89	90	95
68142	Ino80	INO80 homolog (<i>S. cerevisiae</i>)	249	245	246
70020	Ino80b	INO80 complex subunit B	16	20	19
225280	Ino80c	INO80 complex subunit C	242	240	235
227195	Ino80d	INO80 complex subunit D	619	620	621
16329	Inpp1	inositol polyphosphate-1-phosphatase	148	151	144
269180	Inpp4a	inositol polyphosphate-4-phosphatase, type I	362	374	363
234515	Inpp4b	inositol polyphosphate-4-phosphatase, type II	1737	1758	1713
212111	Inpp5a	inositol polyphosphate-5-phosphatase A	447	430	433
16330	Inpp5b	inositol polyphosphate-5-phosphatase B	13	16	10
16331	Inpp5d	inositol polyphosphate-5-phosphatase D	210	203	212
64436	Inpp5e	inositol polyphosphate-5-phosphatase E	68	62	71
170835	Inpp5j	inositol polyphosphate 5-phosphatase J	33	31	32
19062	Inpp5k	inositol polyphosphate 5-phosphatase K	81	83	79
16332	Inpp1	inositol polyphosphate phosphatase-like 1	55	53	50
16333	Ins1	insulin I	2833	2838	2778
16334	Ins2	insulin II	307	319	315
231070	Insig1	insulin induced gene 1	426	415	424
72999	Insig2	insulin induced gene 2	452	456	435
16336	Insl3	insulin-like 3	28	26	26
56856	Insm2	insulinoma-associated 2	311	328	310
16337	Insr	insulin receptor	799	806	799
23920	Insrr	insulin receptor-related receptor	70	66	64
68510	Ints1	integrator complex subunit 1	72	62	71
70885	Ints10	integrator complex subunit 10	180	197	198
71793	Ints12	integrator complex subunit 12	176	177	177
70422	Ints2	integrator complex subunit 2	204	201	202
229543	Ints3	integrator complex subunit 3	100	91	100
101861	Ints4	integrator complex subunit 4	174	164	164
109077	Ints5	integrator complex subunit 5	10	12	10
18130	Ints6	integrator complex subunit 6	217	209	215
77065	Ints7	integrator complex subunit 7	190	185	196
72656	Ints8	integrator complex subunit 8	169	170	170
210925	Ints9	integrator complex subunit 9	197	199	192

27399	Ip6k1	inositol hexaphosphate kinase 1	68	69	70
76500	Ip6k2	inositol hexaphosphate kinase 2	152	163	151
271424	Ip6k3	inositol hexaphosphate kinase 3	89	89	94
69718	lpmk	inositol polyphosphate multikinase	799	829	804
320727	Ipo8	importin 8	596	592	584
75678	Ippk	inositol 1,3,4,5,6-pentakisphosphate 2-kinase	207	200	205
404710	Iqgap3	IQ motif containing GTPase activating protein 3	91	83	85
16179	Irak1	interleukin-1 receptor-associated kinase 1	75	69	65
65099	Irak1bp1	interleukin-1 receptor-associated kinase 1 binding protein 1	1395	1423	1385
108960	Irak2	interleukin-1 receptor-associated kinase 2	98	95	94
73914	Irak3	interleukin-1 receptor-associated kinase 3	115	119	123
266632	Irak4	interleukin-1 receptor-associated kinase 4	56	58	61
64602	Ireb2	iron responsive element binding protein 2	199	203	204
16362	Irf1	interferon regulatory factor 1	176	178	170
16363	Irf2	interferon regulatory factor 2	473	470	467
272359	Irf2bp1	interferon regulatory factor 2 binding protein 1	32	29	34
270110	Irf2bp2	interferon regulatory factor 2 binding protein 2	597	602	586
54131	Irf3	interferon regulatory factor 3	22	19	22
16364	Irf4	interferon regulatory factor 4	371	369	365
27056	Irf5	interferon regulatory factor 5	135	121	127
54139	Irf6	interferon regulatory factor 6	56	53	53
54123	Irf7	interferon regulatory factor 7	64	64	63
15900	Irf8	interferon regulatory factor 8	526	514	530
16391	Irf9	interferon regulatory factor 9	36	39	34
16365	Irg1	immunoresponse gene 1	114	112	108
15944	Irgm1	immunity-related GTPase family M member 1	96	104	87
54396	Irgm2	immunity-related GTPase family M member 2	146	136	138
16367	Irs1	insulin receptor substrate 1	1595	1571	1561
384783	Irs2	insulin receptor substrate 2	486	493	495
16373	Irx3	Iroquois related homeobox 3 (Drosophila)	1344	1325	1322
74316	Isca2	iron-sulfur cluster assembly 2 homolog (S. cerevisiae)	137	135	142
66383	Iscu	IscU iron-sulfur cluster scaffold homolog (E. coli)	37	36	33
100038882	Isg15	ISG15 ubiquitin-like modifier	21	19	23
57444	Isg20	interferon-stimulated protein	200	194	202
16392	Isl1	ISL1 transcription factor, LIM/homeodomain	2405	2424	2362
66307	Isoc1	isochorismatase domain containing 1	346	346	354
664994	Isoc2a	isochorismatase domain containing 2a	58	62	62
67441	Isoc2b	isochorismatase domain containing 2b	40	40	41
75847	Ispd	isoprenoid synthase domain containing	988	1016	990
71597	Isx	intestine specific homeobox	2121	2118	2091
57905	Isy1	ISY1 splicing factor homolog (S. cerevisiae)	54	48	49
71780	Isyna1	myo-inositol 1-phosphate synthase A1	83	75	86
16396	Itch	itchy, E3 ubiquitin protein ligase	214	217	219
109700	Itga1	integrin alpha 1	1520	1522	1498
16398	Itga2	integrin alpha 2	344	363	344
16400	Itga3	integrin alpha 3	97	104	104
16402	Itga5	integrin alpha 5 (fibronectin receptor alpha)	110	114	119
16403	Itga6	integrin alpha 6	199	204	192
16410	Itgav	integrin alpha V	208	214	218
16412	Itgb1	integrin beta 1 (fibronectin receptor beta)	916	923	907
69564	Itgb1bp3	integrin beta 1 binding protein 3	46	47	44
16416	Itgb3	integrin beta 3	677	688	680
67733	Itgb3bp	integrin beta 3 binding protein (beta3-endonexin)	142	145	139
320910	Itgb8	integrin beta 8	622	616	587
16424	Itih1	inter-alpha trypsin inhibitor, heavy chain 1	37	37	36

16425	Itih2	inter-alpha trypsin inhibitor, heavy chain 2	95	98	97
16426	Itih3	inter-alpha trypsin inhibitor, heavy chain 3	81	78	75
209378	Itih5	inter-alpha (globulin) inhibitor H5	315	320	319
16428	Itk	IL2-inducible T-cell kinase	118	121	109
16429	Itln1	intelectin 1 (galactofuranose binding)	68	71	69
16434	Itpa	inosine triphosphatase (nucleoside triphosphate pyrophosphatase)	36	40	43
217837	Itpk1	inositol 1,3,4-triphosphate 5/6 kinase	71	76	68
228550	Itpka	inositol 1,4,5-triphosphate 3-kinase A	105	107	107
320404	Itpkb	inositol 1,4,5-triphosphate 3-kinase B	97	100	89
233011	Itpkc	inositol 1,4,5-triphosphate 3-kinase C	49	44	45
56357	Ivd	isovaleryl coenzyme A dehydrogenase	121	114	123
16447	Ivl	involucrin	111	107	110
73473	Iws1	IWS1 homolog (<i>S. cerevisiae</i>)	128	128	129
70337	Iyd	iodotyrosine deiodinase	484	489	470
16451	Jak1	Janus kinase 1	351	374	353
16452	Jak2	Janus kinase 2	239	235	247
16453	Jak3	Janus kinase 3	16	20	18
16468	Jarid2	jumonji, AT rich interactive domain 2	1560	1570	1594
231986	Jazf1	JAZF zinc finger 1	946	957	948
81703	Jdp2	Jun dimerization protein 2	275	279	279
338523	Jhdm1d	jumonji C domain-containing histone demethylase 1 homolog D (<i>S.</i>	348	330	333
104771	Jkamp	JNK1/MAPK8-associated membrane protein	127	122	123
108829	Jmjd1c	jumonji domain containing 1C	236	244	236
77035	Jmjd5	jumonji domain containing 5	152	169	153
107817	Jmjd6	jumonji domain containing 6	22	20	20
57748	Jmy	junction-mediating and regulatory protein	428	430	419
74158	Josd1	Josephin domain containing 1	25	28	27
66124	Josd2	Josephin domain containing 2	35	34	30
16475	Jub	ajuba	68	67	63
16476	Jun	Jun oncogene	728	737	738
16477	Junb	Jun-B oncogene	22	20	24
16478	Jund	Jun proto-oncogene related gene d	50	50	44
16480	Jup	junction plakoglobin	71	72	76
545156	Kalrn	kalirin, RhoGEF kinase	873	872	875
85305	Kars	lysyl-tRNA synthetase	23	24	24
14534	Kat2a	K(lysine) acetyltransferase 2A	11	11	10
18519	Kat2b	K(lysine) acetyltransferase 2B	209	219	218
81601	Kat5	K(lysine) acetyltransferase 5	48	46	43
23924	Katna1	katanin p60 (ATPase-containing) subunit A1	122	132	131
74287	Kcmf1	potassium channel modulatory factor 1	226	223	210
16510	Kcnh1	potassium voltage-gated channel, subfamily H (eag-related), memt	809	807	842
238271	Kcnh5	potassium voltage-gated channel, subfamily H (eag-related), memt	1294	1305	1255
211468	Kcnh8	potassium voltage-gated channel, subfamily H (eag-related), memt	2081	2091	2047
56461	Kcnip3	Kv channel interacting protein 3, calsenilin	172	162	171
16514	Kcnj11	potassium inwardly rectifying channel, subfamily J, member 11	191	188	179
16522	Kcnj6	potassium inwardly-rectifying channel, subfamily J, member 6	1058	1062	1025
16535	Kcnq1	potassium voltage-gated channel, subfamily Q, member 1	259	255	265
63830	Kcnq1ot1	KCNQ1 overlapping transcript 1	453	454	431
106931	Kctd1	potassium channel tetramerisation domain containing 1	890	907	888
233877	Kctd13	potassium channel tetramerisation domain containing 13	67	62	65
99982	Kdm1a	lysine (K)-specific demethylase 1A	178	191	181
218214	Kdm1b	lysine (K)-specific demethylase 1B	81	76	85
225876	Kdm2a	lysine (K)-specific demethylase 2A	172	172	170
30841	Kdm2b	lysine (K)-specific demethylase 2B	325	320	321
104263	Kdm3a	lysine (K)-specific demethylase 3A	214	207	209

277250	Kdm3b	KDM3B lysine (K)-specific demethylase 3B	107	99	105
230674	Kdm4a	lysine (K)-specific demethylase 4A	211	199	200
193796	Kdm4b	lysine (K)-specific demethylase 4B	216	217	208
76804	Kdm4c	lysine (K)-specific demethylase 4C	1627	1647	1607
244694	Kdm4d	lysine (K)-specific demethylase 4D	156	158	154
214899	Kdm5a	lysine (K)-specific demethylase 5A	136	130	129
75605	Kdm5b	lysine (K)-specific demethylase 5B	117	123	127
20591	Kdm5c	lysine (K)-specific demethylase 5C	201	186	193
20592	Kdm5d	lysine (K)-specific demethylase 5D	230	226	216
22289	Kdm6a	4lysine (K)-specific demethylase 6A	349	356	311
216850	Kdm6b	KDM1 lysine (K)-specific demethylase 6B	180	185	194
16542	Kdr	kinase insert domain protein receptor	763	789	763
70750	Kdsr	3-ketodihydrosphingosine reductase	109	110	104
50868	Keap1	kelch-like ECH-associated protein 1	62	64	61
23925	Kel	Kell blood group	109	114	107
20218	Khdrbs1	KH domain containing, RNA binding, signal transduction associate	163	167	161
170771	Khdrbs2	KH domain containing, RNA binding, signal transduction associate	1567	1593	1533
13992	Khdrbs3	KH domain containing, RNA binding, signal transduction associate	4263	4352	4255
16548	Khk	ketohehexokinase	41	39	38
16549	Khsrp	KH-type splicing regulatory protein	37	35	30
16558	Kif16b	kinesin family member 16B	3065	3067	3069
16559	Kif17	kinesin family member 17	66	68	68
16561	Kif1b	kinesin family member 1B	338	338	331
240641	Kif20b	kinesin family member 20B	1484	1494	1507
110033	Kif22	kinesin family member 22	38	32	33
16572	Kif5a	kinesin family member 5A	78	73	70
16573	Kif5b	kinesin family member 5B	472	458	467
16574	Kif5c	kinesin family member 5C	437	428	439
100042970	Kifc1	kinesin family member C1	85	82	83
16582	Kifc3	kinesin family member C3	337	323	329
16588	Kin	antigenic determinant of rec-A protein	68	60	60
114229	Kiss1r	KISS1 receptor	8	9	8
16590	Kit	kit oncogene	1077	1078	1059
17311	Kitl	kit ligand	733	737	726
16591	Kl	klotho	670	665	670
83379	Klb	klotho beta	70	83	76
232943	Klc3	kinesin light chain 3	34	30	31
16596	Klf1	Kruppel-like factor 1 (erythroid)	15	16	17
21847	Klf10	Kruppel-like factor 10	383	395	383
194655	Klf11	Kruppel-like factor 11	122	129	134
16597	Klf12	Kruppel-like factor 12	2413	2414	2368
50794	Klf13	Kruppel-like factor 13	905	892	907
619665	Klf14	Kruppel-like factor 14	184	186	170
66277	Klf15	Kruppel-like factor 15	156	144	156
118445	Klf16	Kruppel-like factor 16	31	30	30
75753	Klf17	Kruppel-like factor 17	207	204	198
16598	Klf2	Kruppel-like factor 2 (lung)	232	232	239
16599	Klf3	Kruppel-like factor 3 (basic)	985	988	977
16600	Klf4	Kruppel-like factor 4 (gut)	1777	1800	1792
12224	Klf5	Kruppel-like factor 5	1355	1364	1345
23849	Klf6	Kruppel-like factor 6	2467	2511	2435
93691	Klf7	Kruppel-like factor 7 (ubiquitous)	721	736	731
245671	Klf8	Kruppel-like factor 8	445	437	421
67455	Klh13	kelch-like 13 (Drosophila)	1502	1479	1419
226541	Klh20	kelch-like 20 (Drosophila)	89	91	93

242785	Klh21	kelch-like 21 (Drosophila)	40	36	41
244923	Klh31	kelch-like 31 (Drosophila)	270	263	269
242521	Klh9	kelch-like 9 (Drosophila)	72	80	78
16612	Klk1	kallikrein 1	25	25	20
56538	Klk11	kallikrein related-peptidase 11	18	16	16
69511	Klk12	kallikrein related-peptidase 12	76	76	80
626834	Klk13	kallikrein related-peptidase 13	97	101	109
317653	Klk14	kallikrein related-peptidase 14	51	53	50
317652	Klk15	kallikrein related-peptidase 15	83	84	83
16623	Klk1b1	kallikrein 1-related peptidase b1	31	31	36
16613	Klk1b11	kallikrein 1-related peptidase b11	44	52	48
16615	Klk1b16	kallikrein 1-related peptidase b16	99	98	96
16616	Klk1b21	kallikrein 1-related peptidase b21	76	80	79
13646	Klk1b22	kallikrein 1-related peptidase b22	46	47	47
16617	Klk1b24	kallikrein 1-related peptidase b24	78	85	81
16618	Klk1b26	kallikrein 1-related peptidase b26	22	22	21
16619	Klk1b27	kallikrein 1-related peptidase b27	112	112	111
18050	Klk1b3	kallikrein 1-related peptidase b3	21	25	21
18048	Klk1b4	kallikrein 1-related peptidase b4	21	21	20
16622	Klk1b5	kallikrein 1-related peptidase b5	24	27	24
16624	Klk1b8	kallikrein 1-related peptidase b8	27	27	27
13648	Klk1b9	kallikrein 1-related peptidase b9	41	37	37
56640	Klk4	kallikrein related-peptidase 4 (prostase, enamel matrix, prostate)	121	117	116
68668	Klk5	kallikrein related-peptidase 5	72	73	69
19144	Klk6	kallikrein related-peptidase 6	43	40	44
23993	Klk7	kallikrein related-peptidase 7 (chymotryptic, stratum corneum)	36	32	35
259277	Klk8	kallikrein related-peptidase 8	26	23	25
101533	Klk9	kallikrein related-peptidase 9	23	20	21
16621	Klkb1	kallikrein B, plasma 1	91	97	89
98256	Kmo	kynurenine 3-monooxygenase (kynurenine 3-hydroxylase)	83	86	81
76484	Kndc1	kinase non-catalytic C-lobe domain (KIND) containing 1	143	141	141
16644	Kng1	kininogen 1	105	108	103
433619	Kprp	keratinocyte expressed, proline-rich	92	92	92
16653	Kras	v-Ki-ras2 Kirsten rat sarcoma viral oncogene homolog	228	223	223
52705	Krr1	KRR1, small subunit (SSU) processome component, homolog (yea	622	633	614
16678	Krt1	keratin 1	64	59	60
16667	Krt17	keratin 17	26	24	27
110310	Krt7	keratin 7	86	83	90
66059	Krtcap2	keratinocyte associated protein 2	30	25	25
16706	Ksr1	kinase suppressor of ras 1	340	329	349
333050	Ksr2	kinase suppressor of ras 2	618	610	630
70789	Kynu	kynureninase (L-kynurenine hydrolase)	1395	1399	1368
217666	L2hgdh	L-2-hydroxyglutarate dehydrogenase	53	53	57
241764	L3mbtl1	l(3)mbt-like (Drosophila)	71	74	69
214669	L3mbtl2	l(3)mbt-like 2 (Drosophila)	150	151	143
237339	L3mbtl3	l(3)mbt-like 3 (Drosophila)	566	567	541
320858	L3mbtl4	l(3)mbt-like 4 (Drosophila)	1476	1496	1465
16768	Lag3	lymphocyte-activation gene 3	39	37	34
16770	Lalba	lactalbumin, alpha	54	57	55
83409	Lamtor2	late endosomal/lysosomal adaptor, MAPK and MTOR activator 2	5	6	5
56692	Lamtor3	late endosomal/lysosomal adaptor, MAPK and MTOR activator 3	143	154	152
71835	Lancl2	LanC (bacterial lantibiotic synthetase component C)-like 2	169	174	163
100470	Lao1	L-amino acid oxidase 1	227	229	230
66988	Lap3	leucine aminopeptidase 3	83	84	81
16795	Large	like-glycosyltransferase	2674	2687	2682

67557	Larp6	La ribonucleoprotein domain family, member 6	142	135	138
28036	Larp7	La ribonucleoprotein domain family, member 7	9	10	9
107045	Lars	leucyl-tRNA synthetase	100	99	104
102436	Lars2	leucyl-tRNA synthetase, mitochondrial	287	277	281
93898	Lass1	LAG1 homolog, ceramide synthase 1	17	19	17
76893	Lass2	LAG1 homolog, ceramide synthase 2	61	65	64
545975	Lass3	LAG1 homolog, ceramide synthase 3	197	198	192
67260	Lass4	LAG1 homolog, ceramide synthase 4	330	334	340
71949	Lass5	LAG1 homolog, ceramide synthase 5	120	125	121
241447	Lass6	LAG1 homolog, ceramide synthase 6	614	620	610
16797	Lat	linker for activation of T cells	135	143	137
16798	Lats1	large tumor suppressor	57	58	51
50523	Lats2	large tumor suppressor 2	194	189	188
77889	Lbh	limb-bud and heart	355	342	337
16803	Lbp	lipopolysaccharide binding protein	135	138	135
98386	Lbr	lamin B receptor	661	657	656
16814	Lbx1	ladybird homeobox homolog 1 (Drosophila)	261	271	269
16815	Lbx2	ladybird homeobox homolog 2 (Drosophila)	30	28	29
16816	Lcat	lecithin cholesterol acyltransferase	33	37	32
16818	Lck	lymphocyte protein tyrosine kinase	67	62	66
225010	Lclat1	lysocardiolipin acyltransferase 1	628	620	622
30949	Lcmt1	leucine carboxyl methyltransferase 1	119	121	120
329504	Lcmt2	leucine carboxyl methyltransferase 2	45	38	37
16819	Lcn2	lipocalin 2	18	18	18
13863	Lcn5	lipocalin 5	31	27	26
212391	Lcor	ligand dependent nuclear receptor corepressor	464	464	462
209707	Lcorl	ligand dependent nuclear receptor corepressor-like	2839	2852	2831
226413	Lct	lactase	150	148	145
235435	Lctl	lactase-like	204	199	204
16825	Ldb1	LIM domain binding 1	69	70	69
16826	Ldb2	LIM domain binding 2	1590	1573	1530
16828	Ldha	lactate dehydrogenase A	84	83	86
106557	Ldhal6b	lactate dehydrogenase A-like 6B	567	571	572
16832	Ldhb	lactate dehydrogenase B	133	129	126
16833	Ldhc	lactate dehydrogenase C	95	97	91
52815	Ldhd	lactate dehydrogenase D	127	137	144
16835	Ldlr	low density lipoprotein receptor	190	185	188
100017	Ldlrap1	low density lipoprotein receptor adaptor protein 1	188	185	191
16842	Lef1	lymphoid enhancer binding factor 1	727	694	714
13590	Lefty1	left right determination factor 1	47	49	53
235497	Leo1	Leo1, Paf1/RNA polymerase II complex component, homolog (S. c	201	195	198
16846	Lep	leptin	185	184	188
16847	Lepr	leptin receptor	251	252	249
56401	Lepre1	leprecan 1	35	29	33
210530	Leprel1	leprecan-like 1	734	727	721
14789	Leprel2	leprecan-like 2	27	29	30
19141	Lgmn	legumain	237	240	241
107515	Lgr4	leucine-rich repeat-containing G protein-coupled receptor 4	130	138	130
266744	Lgsn	lengsin, lens protein with glutamine synthetase domain	344	334	335
76429	Lhpp	phospholysine phosphohistidine inorganic pyrophosphate phospho	236	238	234
16869	Lhx1	LIM homeobox protein 1	14	10	12
16870	Lhx2	LIM homeobox protein 2	288	279	294
16871	Lhx3	LIM homeobox protein 3	137	141	148
16872	Lhx4	LIM homeobox protein 4	319	326	312
16873	Lhx5	LIM homeobox protein 5	441	441	444

16874	Lhx6	LIM homeobox protein 6	108	115	115
16875	Lhx8	LIM homeobox protein 8	783	798	798
79464	Lias	lipoic acid synthetase	65	56	56
16878	Lif	leukemia inhibitory factor	278	271	272
16881	Lig1	ligase I, DNA, ATP-dependent	133	133	133
16882	Lig3	ligase III, DNA, ATP-dependent	82	83	81
319583	Lig4	ligase IV, DNA, ATP-dependent	254	274	264
29806	Limd1	LIM domains containing 1	213	208	202
16885	Limk1	LIM-domain containing, protein kinase	142	142	141
16886	Limk2	LIM motif-containing protein kinase 2	227	223	222
110829	Lims1	LIM and senescent cell antigen-like domains 1	332	353	336
83557	Lin28a	lin-28 homolog A (C. elegans)	85	87	87
380669	Lin28b	lin-28 homolog B (C. elegans)	316	300	307
231506	Lin54	lin-54 homolog (C. elegans)	120	118	122
72568	Lin9	lin-9 homolog (C. elegans)	163	161	161
16889	Lipa	lysosomal acid lipase A	101	97	94
15450	Lipc	lipase, hepatic	618	639	621
16890	Lipe	lipase, hormone sensitive	60	52	55
67717	Lipf	lipase, gastric	534	541	526
16891	Lipg	lipase, endothelial	291	275	264
239759	Liph	lipase, member H	79	82	81
320355	Lipi	lipase, member I	1474	1525	1456
240633	Lipk	lipase, family member K	135	133	127
78753	Lipm	lipase, family member M	129	136	125
70166	Lipn	lipase, family member N	113	120	112
623661	Lipt1	lipoyltransferase 1	34	35	33
67164	Lipt2	lipoyl(octanoyl) transferase 2 (putative)	69	69	76
56722	Litaf	LPS-induced TN factor	295	286	301
30937	Lmcd1	LIM and cysteine-rich domains 1	231	225	230
76483	Lmf1	lipase maturation factor 1	187	185	189
239833	Lmln	leishmanolysin-like (metallopeptidase M8 family)	60	64	67
109594	Lmo1	LIM domain only 1	456	443	461
16909	Lmo2	LIM domain only 2	310	328	310
109593	Lmo3	LIM domain only 3	661	669	660
16911	Lmo4	LIM domain only 4	2175	2188	2125
231876	Lmtk2	lemur tyrosine kinase 2	181	175	183
381983	Lmtk3	lemur tyrosine kinase 3	58	60	55
110648	Lmx1a	LIM homeobox transcription factor 1 alpha	1042	1069	1030
16917	Lmx1b	LIM homeobox transcription factor 1 beta	531	518	506
240028	Lnpep	leucyl/cystinyl aminopeptidase	387	385	362
16924	Lnx1	ligand of numb-protein X 1	688	687	694
74142	Lonp1	lon peptidase 1, mitochondrial	20	19	18
66887	Lonp2	lon peptidase 2, peroxisomal	275	267	264
74365	Lonrf3	LON peptidase N-terminal domain and ring finger 3	511	490	481
16939	Lor	loricrin	140	139	135
16948	Lox	lysyl oxidase	191	194	178
16949	Loxl1	lysyl oxidase-like 1	150	147	146
94352	Loxl2	lysyl oxidase-like 2	197	195	193
16950	Loxl3	lysyl oxidase-like 3	26	29	31
67573	Loxl4	lysyl oxidase-like 4	298	300	302
14745	Lpar1	lysophosphatidic acid receptor 1	440	431	425
53978	Lpar2	lysophosphatidic acid receptor 2	34	27	29
65086	Lpar3	lysophosphatidic acid receptor 3	290	299	303
210992	Lpcat1	lysophosphatidylcholine acyltransferase 1	253	265	254
270084	Lpcat2	lysophosphatidylcholine acyltransferase 2	100	98	96

70902	Lpcat2b	lysophosphatidylcholine acyltransferase 2B	124	118	124
14792	Lpcat3	lysophosphatidylcholine acyltransferase 3	102	102	102
99010	Lpcat4	lysophosphatidylcholine acyltransferase 4	132	125	130
226856	Lpgat1	lysophosphatidylglycerol acyltransferase 1	304	322	314
14245	Lpin1	lipin 1	1064	1090	1067
64898	Lpin2	lipin 2	402	404	385
64899	Lpin3	lipin 3	66	64	66
16956	Lpl	lipoprotein lipase	371	368	371
76113	Lpo	lactoperoxidase	78	74	80
79235	Lrat	lecithin-retinol acyltransferase (phosphatidylcholine-retinol-O-acyltr	174	178	172
231798	Lrch4	leucine-rich repeats and calponin homology (CH) domain containin	5	3	3
74354	Lrguk	leucine-rich repeats and guanylate kinase domain containing	1178	1196	1174
65107	Lrp10	low-density lipoprotein receptor-related protein 10	52	55	59
14725	Lrp2	low density lipoprotein receptor-related protein 2	345	352	352
16973	Lrp5	low density lipoprotein receptor-related protein 5	167	163	167
16974	Lrp6	low density lipoprotein receptor-related protein 6	302	304	289
72416	Lrpprc	leucine-rich PPR-motif containing	345	359	348
68732	Lrrc16a	leucine rich repeat containing 16A	442	448	419
434215	Lrrc32	leucine rich repeat containing 32	275	268	284
72946	Lrrc47	leucine rich repeat containing 47	60	61	63
16978	Lrrfip1	leucine rich repeat (in FLII) interacting protein 1	290	290	285
233328	Lrrk1	leucine-rich repeat kinase 1	406	402	402
66725	Lrrk2	leucine-rich repeat kinase 2	332	342	328
16981	Lrrn3	leucine rich repeat protein 3, neuronal	3560	3513	3485
227738	Lrsam1	leucine rich repeat and sterile alpha motif containing 1	113	100	108
71735	Lrwd1	leucine-rich repeats and WD repeat domain containing 1	26	27	28
67207	Lsm1	LSM1 homolog, U6 small nuclear RNA associated (S. cerevisiae)	32	33	34
116748	Lsm10	U7 snRNP-specific Sm-like protein LSM10	61	61	65
72290	Lsm11	U7 snRNP-specific Sm-like protein LSM11	137	134	135
27756	Lsm2	LSM2 homolog, U6 small nuclear RNA associated (S. cerevisiae)	36	35	34
67678	Lsm3	LSM3 homolog, U6 small nuclear RNA associated (S. cerevisiae)	230	211	218
50783	Lsm4	LSM4 homolog, U6 small nuclear RNA associated (S. cerevisiae)	49	45	41
66373	Lsm5	LSM5 homolog, U6 small nuclear RNA associated (S. cerevisiae)	436	436	430
78651	Lsm6	LSM6 homolog, U6 small nuclear RNA associated (S. cerevisiae)	663	665	672
66094	Lsm7	LSM7 homolog, U6 small nuclear RNA associated (S. cerevisiae)	13	15	11
16987	Lss	lanosterol synthase	121	114	116
16993	Lta4h	leukotriene A4 hydrolase	186	194	193
16994	Ltb	lymphotoxin B	16	14	14
17001	Ltc4s	leukotriene C4 synthase	90	83	90
17002	Ltf	lactotransferrin	85	90	86
17005	Ltk	leukocyte tyrosine kinase	63	55	61
78913	Ltn1	listerin E3 ubiquitin protein ligase 1	110	115	110
67684	Luc7l3	LUC7-like 3 (S. cerevisiae)	117	112	117
17069	Ly6e	lymphocyte antigen 6 complex, locus E	131	131	135
69541	Lyg1	lysozyme G-like 1	107	116	103
332427	Lyg2	lysozyme G-like 2	88	86	90
17095	Lyl1	lymphoblastomic leukemia 1	104	99	109
17096	Lyn	Yamaguchi sarcoma viral (v-yes-1) oncogene homolog	180	179	164
18777	Lypla1	lysophospholipase 1	92	93	98
26394	Lypla2	lysophospholipase 2	28	27	29
80289	Lysmd3	LysM, putative peptidoglycan-binding, domain containing 3	97	108	103
75099	Lysmd4	LysM, putative peptidoglycan-binding, domain containing 4	685	677	669
17101	Lyst	lysosomal trafficking regulator	443	436	445
114332	Lyve1	lymphatic vessel endothelial hyaluronan receptor 1	131	132	131
17110	Lyz1	lysozyme 1	122	127	124

17105	Lyz2	lysozyme 2	68	75	68
67328	Lyz1l	lysozyme-like 1	1087	1110	1084
69032	Lyz14	lysozyme-like 4	191	186	186
69444	Lyz16	lysozyme-like 6	44	48	45
11426	Macf1	microtubule-actin crosslinking factor 1	393	405	401
107227	Macrocl1	MACRO domain containing 1	82	82	77
72899	Macrocl2	MACRO domain containing 2	347	356	337
56150	Mad21l	MAD2 mitotic arrest deficient-like 1 (yeast)	775	774	757
71890	Mad212	MAD2 mitotic arrest deficient-like 2 (yeast)	27	27	30
228355	Madd	MAP-kinase activating death domain	102	106	100
98558	Mael	maelstrom homolog (Drosophila)	153	156	146
17132	Maf	avian musculoaponeurotic fibrosarcoma (v-maf) AS42 oncogene h	2657	2655	2674
68877	Maf1	MAF1 homolog (S. cerevisiae)	19	22	20
378435	Mafa	v-maf musculoaponeurotic fibrosarcoma oncogene family, protein /	173	170	175
16658	Mafb	v-maf musculoaponeurotic fibrosarcoma oncogene family, protein f	406	408	423
17133	Maff	v-maf musculoaponeurotic fibrosarcoma oncogene family, protein f	58	54	57
17134	Mafg	v-maf musculoaponeurotic fibrosarcoma oncogene family, protein c	25	21	20
17135	Mafk	v-maf musculoaponeurotic fibrosarcoma oncogene family, protein l	45	42	44
94275	Maged1	melanoma antigen, family D, 1	310	300	300
17149	Magoh	mago-nashi homolog, proliferation-associated (Drosophila)	113	112	104
66441	Magohb	mago-nashi homolog B (Drosophila)	88	84	91
17152	Mak	male germ cell-associated kinase	138	129	137
240354	Malt1	mucosa associated lymphoid tissue lymphoma translocation gene	239	241	235
71738	Mamdc2	MAM domain containing 2	489	493	478
103806	Maml1	mastermind like 1 (Drosophila)	106	113	112
270118	Maml2	mastermind like 2 (Drosophila)	473	468	457
433586	Maml3	mastermind like 3 (Drosophila)	780	767	780
333639	Mamld1	mastermind-like domain containing 1	816	802	803
74490	Mamstr	MEF2 activating motif and SAP domain containing transcriptional r	44	40	50
17155	Man1a	mannosidase 1, alpha	413	406	416
17156	Man1a2	mannosidase, alpha, class 1A, member 2	427	415	416
227619	Man1b1	mannosidase, alpha, class 1B, member 1	30	28	32
230815	Man1c1	mannosidase, alpha, class 1C, member 1	279	269	283
17158	Man2a1	mannosidase 2, alpha 1	1516	1589	1548
140481	Man2a2	mannosidase 2, alpha 2	52	53	57
17159	Man2b1	mannosidase 2, alpha B1	51	51	56
17160	Man2b2	mannosidase 2, alpha B2	86	90	95
73744	Man2c1	mannosidase, alpha, class 2C, member 1	92	89	92
110173	Manba	mannosidase, beta A, lysosomal	339	333	329
17161	Maoa	monoamine oxidase A	362	350	353
109731	Maob	monoamine oxidase B	344	353	341
66734	Map1lc3a	microtubule-associated protein 1 light chain 3 alpha	156	155	156
67443	Map1lc3b	microtubule-associated protein 1 light chain 3 beta	90	85	91
26395	Map2k1	mitogen-activated protein kinase kinase 1	55	59	57
26396	Map2k2	mitogen-activated protein kinase kinase 2	37	44	46
26397	Map2k3	mitogen-activated protein kinase kinase 3	168	168	178
26398	Map2k4	mitogen-activated protein kinase kinase 4	92	97	90
23938	Map2k5	mitogen-activated protein kinase kinase 5	323	324	323
26399	Map2k6	mitogen-activated protein kinase kinase 6	799	798	789
26400	Map2k7	mitogen-activated protein kinase kinase 7	26	27	25
26401	Map3k1	mitogen-activated protein kinase kinase kinase 1	754	770	763
269881	Map3k10	mitogen-activated protein kinase kinase kinase 10	21	22	23
26403	Map3k11	mitogen-activated protein kinase kinase kinase 11	16	11	16
26404	Map3k12	mitogen-activated protein kinase kinase kinase 12	56	55	58
71751	Map3k13	mitogen-activated protein kinase kinase kinase 13	202	190	201

53859	Map3k14	mitogen-activated protein kinase kinase kinase 14	163	158	162
270672	Map3k15	mitogen-activated protein kinase kinase kinase 15	366	380	353
26405	Map3k2	mitogen-activated protein kinase kinase kinase 2	124	131	124
26406	Map3k3	mitogen-activated protein kinase kinase kinase 3	115	120	125
26407	Map3k4	mitogen-activated protein kinase kinase kinase 4	331	334	331
26408	Map3k5	mitogen-activated protein kinase kinase kinase 5	302	300	292
53608	Map3k6	mitogen-activated protein kinase kinase kinase 6	52	48	51
26409	Map3k7	mitogen-activated protein kinase kinase kinase 7	4635	4673	4586
26410	Map3k8	mitogen-activated protein kinase kinase kinase 8	265	275	267
338372	Map3k9	mitogen-activated protein kinase kinase kinase 9	288	291	304
26411	Map4k1	mitogen-activated protein kinase kinase kinase kinase 1	132	124	133
26412	Map4k2	mitogen-activated protein kinase kinase kinase kinase 2	34	35	32
225028	Map4k3	mitogen-activated protein kinase kinase kinase kinase 3	502	488	483
26921	Map4k4	mitogen-activated protein kinase kinase kinase kinase 4	354	350	357
399510	Map4k5	mitogen-activated protein kinase kinase kinase kinase 5	90	91	94
208158	Map6d1	MAP6 domain containing 1	162	157	158
26413	Mapk1	mitogen-activated protein kinase 1	227	225	223
26414	Mapk10	mitogen-activated protein kinase 10	1226	1227	1197
19094	Mapk11	mitogen-activated protein kinase 11	43	42	40
29857	Mapk12	mitogen-activated protein kinase 12	24	26	25
26415	Mapk13	mitogen-activated protein kinase 13	135	131	144
26416	Mapk14	mitogen-activated protein kinase 14	189	191	193
332110	Mapk15	mitogen-activated protein kinase 15	34	31	28
26417	Mapk3	mitogen-activated protein kinase 3	80	78	80
225724	Mapk4	mitogen-activated protein kinase 4	472	455	455
50772	Mapk6	mitogen-activated protein kinase 6	126	122	126
23939	Mapk7	mitogen-activated protein kinase 7	25	25	22
26419	Mapk8	mitogen-activated protein kinase 8	460	474	464
19099	Mapk8ip1	mitogen-activated protein kinase 8 interacting protein 1	67	77	73
60597	Mapk8ip2	mitogen-activated protein kinase 8 interacting protein 2	60	61	63
30957	Mapk8ip3	mitogen-activated protein kinase 8 interacting protein 3	86	83	89
26420	Mapk9	mitogen-activated protein kinase 9	137	139	140
227743	Mapkap1	mitogen-activated protein kinase associated protein 1	489	505	504
17164	Mapkapk2	MAP kinase-activated protein kinase 2	146	145	148
102626	Mapkapk3	mitogen-activated protein kinase-activated protein kinase 3	79	81	82
17165	Mapkapk5	MAP kinase-activated protein kinase 5	93	88	89
26390	Mapkbp1	mitogen-activated protein kinase binding protein 1	166	165	166
100732	Mapre3	microtubule-associated protein, RP/EB family, member 3	202	206	210
226778	Mark1	MAP/microtubule affinity-regulating kinase 1	413	411	416
13728	Mark2	MAP/microtubule affinity-regulating kinase 2	211	208	212
17169	Mark3	MAP/microtubule affinity-regulating kinase 3	179	175	182
232944	Mark4	MAP/microtubule affinity-regulating kinase 4	120	119	121
216443	Mars	methionine-tRNA synthetase	44	39	36
212679	Mars2	methionine-tRNA synthetase 2 (mitochondrial)	173	169	168
17171	Mas1	MAS1 oncogene	140	129	137
17174	Masp1	mannan-binding lectin serine peptidase 1	228	227	241
17175	Masp2	mannan-binding lectin serine peptidase 2	44	45	44
56527	Mast1	microtubule associated serine/threonine kinase 1	49	46	48
17776	Mast2	microtubule associated serine/threonine kinase 2	373	372	364
546071	Mast3	microtubule associated serine/threonine kinase 3	32	34	33
328329	Mast4	microtubule associated serine/threonine kinase family member 4	1354	1363	1328
67121	Mastl	microtubule associated serine/threonine kinase-like	120	107	115
11720	Mat1a	methionine adenosyltransferase I, alpha	71	73	74
232087	Mat2a	methionine adenosyltransferase II, alpha	173	161	154
108645	Mat2b	methionine adenosyltransferase II, beta	4751	4810	4771

17179	Matk	megakaryocyte-associated tyrosine kinase	39	40	40
228607	Mavs	mitochondrial antiviral signaling protein	66	68	63
17187	Max	Max protein	516	536	531
17188	Maz	MYC-associated zinc finger protein (purine-binding transcription factor)	21	19	21
17190	Mbd1	methyl-CpG binding domain protein 1	87	83	84
17191	Mbd2	methyl-CpG binding domain protein 2	2310	2371	2277
17192	Mbd3	methyl-CpG binding domain protein 3	18	24	21
73503	Mbd3l1	methyl-CpG binding domain protein 3-like 1	362	370	360
17193	Mbd4	methyl-CpG binding domain protein 4	21	21	21
217588	Mbip	MAP3K12 binding inhibitory protein 1	876	917	875
17194	Mbl1	mannose-binding lectin (protein A) 1	66	74	63
17195	Mbl2	mannose-binding lectin (protein C) 2	456	461	456
56758	Mbnl1	muscleblind-like 1 (Drosophila)	1175	1177	1132
105559	Mbnl2	muscleblind-like 2	557	552	573
171170	Mbnl3	muscleblind-like 3 (Drosophila)	798	827	760
218121	Mboat1	membrane bound O-acyltransferase domain containing 1	434	440	438
67216	Mboat2	membrane bound O-acyltransferase domain containing 2	349	344	352
234155	Mboat4	membrane bound O-acyltransferase domain containing 4	49	47	51
77582	Mboat7	membrane bound O-acyltransferase domain containing 7	22	20	20
103537	Mbtd1	mbt domain containing 1	89	89	87
56453	Mbtps1	membrane-bound transcription factor peptidase, site 1	90	102	91
270669	Mbtps2	membrane-bound transcription factor peptidase, site 2	162	152	151
17199	Mc1r	melanocortin 1 receptor	53	56	52
17202	Mc4r	melanocortin 4 receptor	809	791	801
223722	Mcat	malonyl CoA:ACP acyltransferase (mitochondrial)	46	43	45
72039	Mccc1	methylcrotonoyl-Coenzyme A carboxylase 1 (alpha)	63	67	59
78038	Mccc2	methylcrotonoyl-Coenzyme A carboxylase 2 (beta)	260	261	271
73724	Mcee	methylmalonyl CoA epimerase	141	147	140
193813	Mcfd2	multiple coagulation factor deficiency 2	233	222	229
70024	Mcm10	minichromosome maintenance deficient 10 (S. cerevisiae)	114	112	120
17216	Mcm2	minichromosome maintenance deficient 2 mitotin (S. cerevisiae)	36	36	38
17215	Mcm3	minichromosome maintenance deficient 3 (S. cerevisiae)	135	132	139
17217	Mcm4	minichromosome maintenance deficient 4 homolog (S. cerevisiae)	55	59	53
17218	Mcm5	minichromosome maintenance deficient 5, cell division cycle 46 (S. cerevisiae)	161	163	165
17219	Mcm6	minichromosome maintenance deficient 6 (MIS5 homolog, S. pombe)	122	113	115
17220	Mcm7	minichromosome maintenance deficient 7 (S. cerevisiae)	8	7	8
66634	Mcm8	minichromosome maintenance deficient 8 (S. cerevisiae)	39	35	41
71567	Mcm9	minichromosome maintenance complex component 9	197	193	199
210711	Mcmbp	MCM (minichromosome maintenance deficient) binding protein	169	173	178
17224	Mcpt1	mast cell protease 1	28	26	23
17225	Mcpt2	mast cell protease 2	40	38	44
17227	Mcpt4	mast cell protease 4	55	59	51
17231	Mcpt8	mast cell protease 8	50	51	56
17232	Mcpt9	mast cell protease 9	37	31	35
51812	Mcrs1	microspherule protein 1	87	78	80
68995	Mcts1	malignant T cell amplified sequence 1	68	76	73
66405	Mcts2	malignant T cell amplified sequence 2	89	81	82
240087	Mdc1	mediator of DNA damage checkpoint 1	29	32	31
17240	Mdfi	MyoD family inhibitor	172	168	177
16543	Mdfic	MyoD family inhibitor domain containing	2162	2170	2121
17449	Mdh1	malate dehydrogenase 1, NAD (soluble)	84	80	73
76668	Mdh1b	malate dehydrogenase 1B, NAD (soluble)	61	55	56
17448	Mdh2	malate dehydrogenase 2, NAD (mitochondrial)	49	48	48
17242	Mdk	midkine	32	32	32
17246	Mdm2	transformed mouse 3T3 cell double minute 2	150	159	150

17248	Mdm4	transformed mouse 3T3 cell double minute 4	215	217	214
67881	Mdp1	magnesium-dependent phosphatase 1	32	28	28
17436	Me1	malic enzyme 1, NADP(+)-dependent, cytosolic	226	231	227
107029	Me2	malic enzyme 2, NAD(+)-dependent, mitochondrial	141	131	134
109264	Me3	malic enzyme 3, NADP(+)-dependent, mitochondrial	507	495	477
70088	Meaf6	MYST/Esa1-associated factor 6	83	78	83
14013	Mecom	MDS1 and EVI1 complex locus	2133	2183	2142
17257	Mecp2	methyl CpG binding protein 2	122	133	121
26922	Mecr	mitochondrial trans-2-enoyl-CoA reductase	36	43	45
19014	Med1	mediator complex subunit 1	70	62	69
28077	Med10	mediator of RNA polymerase II transcription, subunit 10 homolog (l	1145	1150	1156
66172	Med11	mediator of RNA polymerase II transcription, subunit 11 homolog (l	36	34	33
59024	Med12	mediator of RNA polymerase II transcription, subunit 12 homolog (l	37	38	38
329650	Med12l	mediator of RNA polymerase II transcription, subunit 12 homolog (l	277	276	269
327987	Med13	mediator complex subunit 13	294	295	297
76199	Med13l	mediator complex subunit 13-like	1828	1851	1819
26896	Med14	mediator complex subunit 14	500	489	486
216154	Med16	mediator complex subunit 16	29	30	32
234959	Med17	mediator complex subunit 17	86	82	78
67219	Med18	mediator of RNA polymerase II transcription, subunit 18 homolog (l	124	115	114
381379	Med19	mediator of RNA polymerase II transcription, subunit 19 homolog (l	46	47	48
108098	Med21	mediator complex subunit 21	16	16	14
20933	Med22	mediator complex subunit 22	11	10	9
70208	Med23	mediator complex subunit 23	119	112	114
23989	Med24	mediator complex subunit 24	57	55	53
75613	Med25	mediator of RNA polymerase II transcription, subunit 25 homolog (l	30	33	31
70625	Med26	mediator complex subunit 26	96	105	102
68975	Med27	mediator complex subunit 27	468	466	480
66999	Med28	mediator of RNA polymerase II transcription, subunit 28 homolog (l	194	185	175
67224	Med29	mediator complex subunit 29	16	19	20
69790	Med30	mediator complex subunit 30	1349	1351	1342
67279	Med31	mediator of RNA polymerase II transcription, subunit 31 homolog (l	65	72	64
67381	Med4	mediator of RNA polymerase II transcription, subunit 4 homolog (ye	204	216	208
69792	Med6	mediator of RNA polymerase II transcription, subunit 6 homolog (ye	80	80	79
66213	Med7	mediator complex subunit 7	65	65	57
80509	Med8	mediator of RNA polymerase II transcription, subunit 8 homolog (ye	25	25	24
192191	Med9	mediator of RNA polymerase II transcription, subunit 9 homolog (ye	158	147	148
17258	Mef2a	myocyte enhancer factor 2A	527	522	520
17260	Mef2c	myocyte enhancer factor 2C	2447	2465	2416
17261	Mef2d	myocyte enhancer factor 2D	167	167	171
17263	Meg3	maternally expressed 3	137	137	138
17268	Meis1	Meis homeobox 1	2544	2535	2495
17536	Meis2	Meis homeobox 2	564	575	576
17279	Melk	maternal embryonic leucine zipper kinase	711	703	703
17283	Men1	multiple endocrine neoplasia 1	42	41	39
17285	Meox1	mesenchyme homeobox 1	229	239	229
17287	Mep1a	meprin 1 alpha	230	226	233
17288	Mep1b	meprin 1 beta	400	392	385
231803	Mepce	methylphosphate capping enzyme	8	8	9
17289	Mertk	c-mer proto-oncogene tyrosine kinase	167	174	158
67943	Mesdc2	mesoderm development candidate 2	255	262	249
17292	Mesp1	mesoderm posterior 1	91	87	83
17293	Mesp2	mesoderm posterior 2	65	62	62
17295	Met	met proto-oncogene	423	400	429
75624	Metap1	methionyl aminopeptidase 1	106	107	105

66559	Metap1d	methionyl aminopeptidase type 1D (mitochondrial)	182	183	173
56307	Metap2	methionine aminopeptidase 2	167	169	162
17299	Mettl1	methyltransferase like 1	9	6	7
72096	Mettl10	methyltransferase like 10	58	62	58
66617	Mettl11a	methyltransferase like 11A	30	31	33
240879	Mettl11b	methyltransferase like 11B	489	475	468
71449	Mettl13	methyltransferase like 13	119	118	125
210529	Mettl14	methyltransferase like 14	227	236	219
76894	Mettl15	methyltransferase like 15	2492	2577	2482
67493	Mettl16	methyltransferase like 16	144	145	152
52535	Mettl17	methyltransferase like 17	55	53	48
52686	Mettl2	methyltransferase like 2	116	113	111
67099	Mettl21a	methyltransferase like 21A	196	200	204
207965	Mettl21d	methyltransferase like 21D	264	265	277
239706	Mettl22	methyltransferase like 22	113	115	106
56335	Mettl3	methyltransferase like 3	58	60	61
76781	Mettl4	methyltransferase like 4	1948	2014	1946
75422	Mettl5	methyltransferase like 5	46	46	42
67011	Mettl6	methyltransferase like 6	78	79	76
70152	Mettl7a1	methyltransferase like 7A1	67	69	71
71664	Mettl7b	methyltransferase like 7B	70	65	68
228019	Mettl8	methyltransferase like 8	355	340	344
237400	Mex3d	mex3 homolog D (<i>C. elegans</i>)	49	46	47
67414	Mfn1	mitofusin 1	134	136	139
170731	Mfn2	mitofusin 2	85	87	87
29808	Mga	MAX gene associated	226	223	220
232714	Mgam	maltase-glucoamylase	347	356	339
17308	Mgat1	mannoside acetylglucosaminyltransferase 1	105	98	107
217664	Mgat2	mannoside acetylglucosaminyltransferase 2	15	16	12
17309	Mgat3	mannoside acetylglucosaminyltransferase 3	134	124	131
269181	Mgat4a	mannoside acetylglucosaminyltransferase 4, isoenzyme A	285	309	289
103534	Mgat4b	mannoside acetylglucosaminyltransferase 4, isoenzyme B	32	35	33
67569	Mgat4c	mannosyl (alpha-1,3-)-glycoprotein beta-1,4-N-acetylglucosaminylt	2604	2610	2556
107895	Mgat5	mannoside acetylglucosaminyltransferase 5	1108	1101	1102
76055	Mgea5	meningioma expressed antigen 5 (hyaluronidase)	85	85	83
23945	Mgll	monoglyceride lipase	284	283	276
17314	Mgmt	O-6-methylguanine-DNA methyltransferase	2054	2050	2057
17237	Mgrn1	mahogunin, ring finger 1	82	79	78
56615	Mgst1	microsomal glutathione S-transferase 1	642	631	645
211666	Mgst2	microsomal glutathione S-transferase 2	698	716	717
66447	Mgst3	microsomal glutathione S-transferase 3	160	154	151
225164	Mib1	mindbomb homolog 1 (<i>Drosophila</i>)	99	92	97
76580	Mib2	mindbomb homolog 2 (<i>Drosophila</i>)	53	53	53
171580	Mical1	microtubule associated monooxygenase, calponin and LIM domain c	49	48	51
320878	Mical2	microtubule associated monooxygenase, calponin and LIM domain c	264	268	267
194401	Mical3	microtubule associated monooxygenase, calponin and LIM domain c	333	338	340
68041	Mid1ip1	Mid1 interacting protein 1 (gastrulation specific G12-like (zebrafish)	1006	976	959
71148	Mier1	mesoderm induction early response 1 homolog (<i>Xenopus laevis</i>	132	133	129
70427	Mier2	mesoderm induction early response 1, family member 2	68	67	64
218613	Mier3	mesoderm induction early response 1, family member 3	411	420	407
17319	Mif	macrophage migration inhibitory factor	74	74	75
69674	Mif4gd	MIF4G domain containing	32	27	30
50932	Mink1	misshapen-like kinase 1 (zebrafish)	97	100	94
56727	Miox	myo-inositol oxygenase	38	43	43
70478	Mipep	mitochondrial intermediate peptidase	345	350	345

723893	Mir10a	microRNA 10a	18	17	20
387136	Mir1-1	microRNA 1-1	81	74	84
723959	Mir1-2	microRNA 1-2	362	357	353
387233	Mir124a-1	microRNA 124a-1	171	169	178
723950	Mir124a-2	microRNA 124a-2	212	203	206
723951	Mir124a-3	microRNA 124a-3	180	179	183
387151	Mir133a-1	microRNA 133a-1	74	82	80
723954	Mir133a-2	microRNA 133a-2	96	88	95
387173	Mir155	microRNA 155	4371	4420	4343
723905	Mir17	microRNA 17	4161	4228	4153
387191	Mir196a-1	microRNA 196a-1	24	22	24
723958	Mir196a-2	microRNA 196a-2	13	13	14
387242	Mir200a	microRNA 200a	2	3	2
387243	Mir200b	microRNA 200b	67	66	69
387199	Mir203	microRNA 203	42	41	41
723814	Mir223	microRNA 223	59	70	63
387225	Mir30a	microRNA 30a	229	236	242
723902	Mir7-1	microRNA 7-1	24	22	20
723884	Mir7-2	microRNA 7-2	58	67	64
387244	Mirlet7a-1	microRNA let7a-1	112	117	110
723965	Mirlet7a-2	microRNA let7a-2	64	67	64
387246	Mirlet7c-1	microRNA let7c-1	58	62	57
723966	Mirlet7c-2	microRNA let7c-2	144	152	151
387248	Mirlet7e	microRNA let7e	1	#N/A	1
17342	Mitf	microphthalmia-associated transcription factor	1160	1134	1130
27217	Mixl1	Mix1 homeobox-like 1 (<i>Xenopus laevis</i>)	113	113	112
59030	Mkks	McKusick-Kaufman syndrome protein	1	1	1
223701	Mkl1	MKL (megakaryoblastic leukemia)/myocardin-like 1	403	397	406
239719	Mkl2	MKL/myocardin-like 2	567	572	565
17346	Mknk1	MAP kinase-interacting serine/threonine kinase 1	74	72	74
17347	Mknk2	MAP kinase-interacting serine/threonine kinase 2	52	54	54
109154	Mlec	malectin	67	62	60
17349	Mlf1	myeloid leukemia factor 1	535	565	537
71876	Mlf1ip	myeloid leukemia factor 1 interacting protein	182	188	203
17350	Mlh1	mutL homolog 1 (<i>E. coli</i>)	197	207	205
217716	Mlh3	mutL homolog 3 (<i>E. coli</i>)	86	82	81
74568	Mlkl	mixed lineage kinase domain-like	122	120	131
214162	Mll1	myeloid/lymphoid or mixed-lineage leukemia 1	157	155	148
381022	Mll2	myeloid/lymphoid or mixed-lineage leukemia 2	61	56	61
231051	Mll3	myeloid/lymphoid or mixed-lineage leukemia 3	345	346	333
69188	Mll5	myeloid/lymphoid or mixed-lineage leukemia 5	1099	1129	1098
17354	Mllt10	myeloid/lymphoid or mixed-lineage leukemia (trithorax homolog, <i>D.</i>	440	433	420
56772	Mllt11	myeloid/lymphoid or mixed-lineage leukemia (trithorax homolog, <i>D.</i>	15	16	15
70122	Mllt3	myeloid/lymphoid or mixed-lineage leukemia (trithorax homolog, <i>D.</i>	1391	1416	1395
56716	Mlst8	MTOR associated protein, LST8 homolog (<i>S. cerevisiae</i>)	19	18	19
21428	Mlx	MAX-like protein X	14	14	15
208104	Mlxip	MLX interacting protein	184	174	181
58805	Mlxip1	MLX interacting protein-like	87	89	99
56690	Mlycd	malonyl-CoA decarboxylase	115	117	119
77697	Mmab	methylmalonic aciduria (cobalamin deficiency) type B homolog (<i>hu</i>	82	75	80
17380	Mme	membrane metallo endopeptidase	1567	1591	1560
27390	Mmel1	membrane metallo-endopeptidase-like 1	52	49	47
17384	Mmp10	matrix metalloproteinase 10	130	127	124
17385	Mmp11	matrix metalloproteinase 11	17	18	18
17381	Mmp12	matrix metalloproteinase 12	162	149	152

17386	Mmp13	matrix metallopeptidase 13	214	205	207
17387	Mmp14	matrix metallopeptidase 14 (membrane-inserted)	45	44	41
17388	Mmp15	matrix metallopeptidase 15	126	132	128
17389	Mmp16	matrix metallopeptidase 16	3892	3931	3862
23948	Mmp17	matrix metallopeptidase 17	219	217	214
58223	Mmp19	matrix metallopeptidase 19	75	74	70
83995	Mmp1a	matrix metallopeptidase 1a (interstitial collagenase)	80	77	73
83996	Mmp1b	matrix metallopeptidase 1b (interstitial collagenase)	124	129	121
17390	Mmp2	matrix metallopeptidase 2	245	233	238
30800	Mmp20	matrix metallopeptidase 20 (enamelysin)	154	157	157
214766	Mmp21	matrix metallopeptidase 21	92	93	94
26561	Mmp23	matrix metallopeptidase 23	51	49	50
17391	Mmp24	matrix metallopeptidase 24	91	88	87
240047	Mmp25	matrix metallopeptidase 25	80	75	77
234911	Mmp27	matrix metallopeptidase 27	94	87	89
118453	Mmp28	matrix metallopeptidase 28 (epilysin)	43	42	42
17392	Mmp3	matrix metallopeptidase 3	99	105	94
17393	Mmp7	matrix metallopeptidase 7	177	190	174
17394	Mmp8	matrix metallopeptidase 8	90	89	87
17395	Mmp9	matrix metallopeptidase 9	77	76	77
72199	Mms19	MMS19 (MET18 <i>S. cerevisiae</i>)	60	61	60
212377	Mms22l	MMS22-like, DNA repair protein	2963	3004	2978
17420	Mnat1	menage a trois 1	215	225	211
76915	Mnd1	meiotic nuclear divisions 1 homolog (<i>S. cerevisiae</i>)	167	173	169
17428	Mnt	max binding protein	158	155	150
15285	Mnx1	motor neuron and pancreas homeobox 1	178	175	170
68473	Mobkl1a	MOB1, Mps One Binder kinase activator-like 1A (yeast)	106	110	114
214944	Mobkl2b	MOB1, Mps One Binder kinase activator-like 2B (yeast)	94	96	98
100465	Mobkl2c	MOB1, Mps One Binder kinase activator-like 2C (yeast)	67	69	66
68591	Mocos	molybdenum cofactor sulfurase	140	141	133
56738	Mocs1	molybdenum cofactor synthesis 1	329	317	333
17434	Mocs2	molybdenum cofactor synthesis 2	601	602	602
69372	Mocs3	molybdenum cofactor synthesis 3	49	50	46
68393	Mogat1	monoacylglycerol O-acyltransferase 1	213	216	218
233549	Mogat2	monoacylglycerol O-acyltransferase 2	114	107	108
57377	Mogs	mannosyl-oligosaccharide glucosidase	16	15	16
338467	Morc3	microrchidia 3	234	220	220
21761	Morf4l1	mortality factor 4 like 1	140	137	142
56397	Morf4l2	mortality factor 4 like 2	91	76	86
17451	Mos	Moloney sarcoma oncogene	136	134	130
66112	Mosc1	MOCO sulphurase C-terminal domain containing 1	116	117	119
67247	Mosc2	MOCO sulphurase C-terminal domain containing 2	71	74	80
70380	Mospd1	motile sperm domain containing 1	202	203	196
17454	Mov10	Moloney leukemia virus 10	92	98	103
59012	Moxd1	monooxygenase, DBH-like 1	578	577	568
194357	Moxd2	monooxygenase, DBH-like 2	353	344	342
24070	Mpdu1	mannose-P-dolichol utilization defect 1	8	11	11
268395	Mpg	N-methylpurine-DNA glycosylase	61	61	57
67973	Mphosph10	M-phase phosphoprotein 10 (U3 small nucleolar ribonucleoprotein)	28	24	26
68533	Mphosph6	M phase phosphoprotein 6	753	749	755
110119	Mpi	mannose phosphate isomerase	33	28	29
68047	Mpnd	MPN domain containing	40	36	36
17523	Mpo	myeloperoxidase	91	87	82
13384	Mpp3	membrane protein, palmitoylated 3 (MAGUK p55 subfamily membe	71	71	63
56217	Mpp5	membrane protein, palmitoylated 5 (MAGUK p55 subfamily membe	217	218	219

56524	Mpp6	membrane protein, palmitoylated 6 (MAGUK p55 subfamily membe	567	558	559
225651	Mppe1	metallophosphoesterase 1	105	115	106
17527	Mpv17	MpV17 mitochondrial inner membrane protein	52	51	54
17532	Mras	muscle and microspikes RAS	126	123	114
17535	Mre11a	meiotic recombination 11 homolog A (<i>S. cerevisiae</i>)	78	82	84
67873	Mri1	methylthioribose-1-phosphate isomerase homolog (<i>S. cerevisiae</i>)	24	26	25
217038	Mrm1	mitochondrial rRNA methyltransferase 1 homolog (<i>S. cerevisiae</i>)	391	390	396
67840	Mrp63	mitochondrial ribosomal protein 63	78	80	75
94061	Mrpl1	mitochondrial ribosomal protein L1	278	270	274
66419	Mrpl11	mitochondrial ribosomal protein L11	54	56	59
56282	Mrpl12	mitochondrial ribosomal protein L12	28	34	32
68537	Mrpl13	mitochondrial ribosomal protein L13	319	326	317
68463	Mrpl14	mitochondrial ribosomal protein L14	444	422	421
27395	Mrpl15	mitochondrial ribosomal protein L15	403	408	397
94063	Mrpl16	mitochondrial ribosomal protein L16	93	89	91
27397	Mrpl17	mitochondrial ribosomal protein L17	102	86	97
67681	Mrpl18	mitochondrial ribosomal protein L18	7	8	8
56284	Mrpl19	mitochondrial ribosomal protein L19	154	145	159
27398	Mrpl2	mitochondrial ribosomal protein L2	7	7	4
66448	Mrpl20	mitochondrial ribosomal protein L20	40	35	34
353242	Mrpl21	mitochondrial ribosomal protein L21	54	46	49
216767	Mrpl22	mitochondrial ribosomal protein L22	21	22	21
19935	Mrpl23	mitochondrial ribosomal protein L23	71	70	65
67707	Mrpl24	mitochondrial ribosomal protein L24	34	30	36
94064	Mrpl27	mitochondrial ribosomal protein L27	32	30	30
68611	Mrpl28	mitochondrial ribosomal protein L28	33	35	29
94062	Mrpl3	mitochondrial ribosomal protein L3	720	730	725
107734	Mrpl30	mitochondrial ribosomal protein L30	36	33	33
75398	Mrpl32	mitochondrial ribosomal protein L32	115	122	109
66845	Mrpl33	mitochondrial ribosomal protein L33	226	221	226
94065	Mrpl34	mitochondrial ribosomal protein L34	6	5	7
66223	Mrpl35	mitochondrial ribosomal protein L35	166	159	164
94066	Mrpl36	mitochondrial ribosomal protein L36	176	190	189
56280	Mrpl37	mitochondrial ribosomal protein L37	209	203	199
27393	Mrpl39	mitochondrial ribosomal protein L39	79	80	77
66163	Mrpl4	mitochondrial ribosomal protein L4	53	57	47
107733	Mrpl41	mitochondrial ribosomal protein L41	15	18	14
94067	Mrpl43	mitochondrial ribosomal protein L43	16	17	19
69163	Mrpl44	mitochondrial ribosomal protein L44	130	138	120
74600	Mrpl47	mitochondrial ribosomal protein L47	37	35	32
52443	Mrpl48	mitochondrial ribosomal protein L48	151	158	156
18120	Mrpl49	mitochondrial ribosomal protein L49	13	12	12
66493	Mrpl51	mitochondrial ribosomal protein L51	31	33	30
78523	Mrpl9	mitochondrial ribosomal protein L9	41	45	46
24030	Mrps12	mitochondrial ribosomal protein S12	29	32	31
64659	Mrps14	mitochondrial ribosomal protein S14	77	73	78
66407	Mrps15	mitochondrial ribosomal protein S15	44	45	48
66242	Mrps16	mitochondrial ribosomal protein S16	76	77	78
66258	Mrps17	mitochondrial ribosomal protein S17	18	23	21
68565	Mrps18a	mitochondrial ribosomal protein S18A	148	145	145
66973	Mrps18b	mitochondrial ribosomal protein S18B	7	9	7
68735	Mrps18c	mitochondrial ribosomal protein S18C	27	27	32
118451	Mrps2	mitochondrial ribosomal protein S2	36	41	38
66292	Mrps21	mitochondrial ribosomal protein S21	40	38	35
64656	Mrps23	mitochondrial ribosomal protein S23	161	147	157

59054	Mrps30	mitochondrial ribosomal protein S30	1392	1422	1399
77721	Mrps5	mitochondrial ribosomal protein S5	88	89	95
121022	Mrps6	mitochondrial ribosomal protein S6	305	302	302
50529	Mrps7	mitochondrial ribosomal protein S7	12	9	10
69527	Mrps9	mitochondrial ribosomal protein S9	332	331	326
67871	Mrrf	mitochondrial ribosome recycling factor	41	38	44
17681	Msc	musculin	779	790	770
56184	Msgn1	mesogenin 1	150	137	135
17685	Msh2	mutS homolog 2 (E. coli)	214	208	218
17686	Msh3	mutS homolog 3 (E. coli)	85	90	86
55993	Msh4	mutS homolog 4 (E. coli)	85	86	90
17687	Msh5	mutS homolog 5 (E. coli)	29	29	29
17688	Msh6	mutS homolog 6 (E. coli)	335	359	351
74026	Msl1	male-specific lethal 1 homolog (Drosophila)	37	40	41
77853	Msl2	male-specific lethal 2 homolog (Drosophila)	192	192	187
17692	Msl3	male-specific lethal 3 homolog (Drosophila)	265	264	270
110265	Msra	methionine sulfoxide reductase A	623	631	631
76467	MsrB2	methionine sulfoxide reductase B2	328	320	311
320183	MsrB3	methionine sulfoxide reductase B3	149	153	155
15235	Mst1	macrophage stimulating 1 (hepatocyte growth factor-like)	20	18	20
19882	Mst1r	macrophage stimulating 1 receptor (c-met-related tyrosine kinase)	53	55	49
17700	Mstn	myostatin	292	306	298
17701	Msx1	homeobox, msh-like 1	279	275	276
93895	Msx1as	homeobox, msh-like 1 antisense	107	115	114
17702	Msx2	homeobox, msh-like 2	841	837	853
17703	Msx3	homeobox, msh-like 3	53	60	57
17751	Mt3	metallothionein 3	45	45	44
23942	Mta2	metastasis-associated gene family, member 2	31	29	33
66902	Mtap	methylthioadenosine phosphorylase	306	290	295
17756	Mtap2	microtubule-associated protein 2	679	702	683
17761	Mtap7	microtubule-associated protein 7	346	355	339
67154	Mtdh	metadherin	712	702	713
545725	Mterf	mitochondrial transcription termination factor	102	99	100
66410	Mterfd1	MTERF domain containing 1	168	172	151
74238	Mterfd3	MTERF domain containing 3	108	114	102
17764	Mtf1	metal response element binding transcription factor 1	138	146	146
69606	Mtfmt	mitochondrial methionyl-tRNA formyltransferase	49	50	51
108156	Mthfd1	methylenetetrahydrofolate dehydrogenase (NADP+ dependent), m	105	102	103
270685	Mthfd1l	methylenetetrahydrofolate dehydrogenase (NADP+ dependent) 1-l	515	521	500
17768	Mthfd2	methylenetetrahydrofolate dehydrogenase (NAD+ dependent), mei	118	121	118
665563	Mthfd2l	methylenetetrahydrofolate dehydrogenase (NADP+ dependent) 2-l	149	159	155
17769	Mthfr	5,10-methylenetetrahydrofolate reductase	67	66	66
107885	Mthfs	5, 10-methenyltetrahydrofolate synthetase	543	550	535
234814	Mthfsd	methenyltetrahydrofolate synthetase domain containing	42	38	43
76784	Mtif2	mitochondrial translational initiation factor 2	43	41	43
76366	Mtif3	mitochondrial translational initiation factor 3	173	165	161
17772	Mtm1	X-linked myotubular myopathy gene 1	407	370	394
53332	Mtmr1	myotubularin related protein 1	353	340	325
233315	Mtmr10	myotubularin related protein 10	217	215	214
194126	Mtmr11	myotubularin related protein 11	86	91	90
268783	Mtmr12	myotubularin related protein 12	198	184	195
97287	Mtmr14	myotubularin related protein 14	113	109	117
77116	Mtmr2	myotubularin related protein 2	209	219	217
74302	Mtmr3	myotubularin related protein 3	241	243	230
170749	Mtmr4	myotubularin related protein 4	42	43	46

219135	Mtmr6	myotubularin related protein 6	160	165	172
54384	Mtmr7	myotubularin related protein 7	191	206	201
210376	Mtmr9	myotubularin related protein 9	125	127	127
68291	Mto1	mitochondrial translation optimization 1 homolog (<i>S. cerevisiae</i>)	53	50	52
56717	Mtor	mechanistic target of rapamycin (serine/threonine kinase)	79	74	68
67440	Mtpap	mitochondrial poly(A) polymerase	369	371	356
238505	Mtr	5-methyltetrahydrofolate-homocysteine methyltransferase	306	289	308
211253	Mtrf1	mitochondrial translational release factor 1	51	49	44
108853	Mtrf1l	mitochondrial translational release factor 1-like	154	156	158
210009	Mtrr	5-methyltetrahydrofolate-homocysteine methyltransferase reductase	961	979	968
17777	Mttp	microsomal triglyceride transfer protein	121	114	117
224116	Muc20	mucin 20	169	172	174
68350	Mul1	mitochondrial ubiquitin ligase activator of NFKB 1	67	75	77
68114	Mum1	melanoma associated antigen (mutated) 1	87	86	85
100039054	Mup12	major urinary protein 12	147	151	142
68016	Murc	muscle-related coiled-coil protein	609	618	593
71711	Mus81	MUS81 endonuclease homolog (yeast)	17	18	20
18198	Musk	muscle, skeletal, receptor tyrosine kinase	299	307	299
17850	Mut	methylmalonyl-Coenzyme A mutase	1744	1791	1721
70603	Mutyh	mutY homolog (<i>E. coli</i>)	20	19	19
192156	Mvd	mevalonate (diphospho) decarboxylase	22	23	20
17855	Mvk	mevalonate kinase	154	155	165
17857	Mx1	myxovirus (influenza virus) resistance 1	191	193	189
17858	Mx2	myxovirus (influenza virus) resistance 2	135	138	143
17121	Mxd3	Max dimerization protein 3	56	47	50
17122	Mxd4	Max dimerization protein 4	156	155	145
17859	Mxi1	Max interacting protein 1	201	198	191
17863	Myb	myeloblastosis oncogene	329	328	335
18432	Mybbp1a	MYB binding protein (P160) 1a	69	70	66
17864	Mybl1	myeloblastosis oncogene-like 1	154	147	143
17865	Mybl2	myeloblastosis oncogene-like 2	90	98	97
17869	Myc	myelocytomatosis oncogene	1408	1436	1415
105689	Mycbp2	MYC binding protein 2	509	523	499
18109	Mycn	v-myc myelocytomatosis viral related oncogene, neuroblastoma de	1266	1274	1275
17874	Myd88	myeloid differentiation primary response gene 88	47	42	47
17877	Myf5	myogenic factor 5	282	286	289
17878	Myf6	myogenic factor 6	295	294	285
17879	Myh1	myosin, heavy polypeptide 1, skeletal muscle, adult	84	84	86
77579	Myh10	myosin, heavy polypeptide 10, non-muscle	353	344	348
17880	Myh11	myosin, heavy polypeptide 11, smooth muscle	204	200	202
71960	Myh14	myosin, heavy polypeptide 14	142	144	151
17884	Myh4	myosin, heavy polypeptide 4, skeletal muscle	93	94	95
17888	Myh6	myosin, heavy polypeptide 6, cardiac muscle, alpha	25	23	25
140781	Myh7	myosin, heavy polypeptide 7, cardiac muscle, beta	51	46	53
17885	Myh8	myosin, heavy polypeptide 8, skeletal muscle, perinatal	111	108	108
17886	Myh9	myosin, heavy polypeptide 9, non-muscle	223	226	216
17904	Myl6	myosin, light polypeptide 6, alkali, smooth muscle and non-muscle	49	50	50
216459	Myl6b	myosin, light polypeptide 6B	42	37	38
218203	Myliip	myosin regulatory light chain interacting protein	653	636	659
107589	Mylk	myosin, light polypeptide kinase	433	423	429
228785	Mylk2	myosin, light polypeptide kinase 2, skeletal muscle	106	111	114
213435	Mylk3	myosin light chain kinase 3	165	166	174
238564	Mylk4	myosin light chain kinase family, member 4	601	603	601
80732	Mynn	myoneurin	59	55	51
71602	Myo1e	myosin IE	364	366	373

231646	Myo1h	myosin 1H	139	133	132
667663	Myo3a	myosin IIIA	1514	1537	1529
329421	Myo3b	myosin IIIB	756	747	750
17918	Myo5a	myosin VA	249	244	250
17920	Myo6	myosin VI	554	552	580
17925	Myo9b	myosin IXb	125	125	119
214384	Myocd	myocardin	742	725	730
17927	Myod1	myogenic differentiation 1	198	195	194
17928	Myog	myogenin	128	124	132
232934	Mypop	Myb-related transcription factor, partner of profilin	22	21	19
320713	Mysm1	myb-like, SWIRM and MPN domains 1	160	156	147
67773	Myst1	MYST histone acetyltransferase 1	34	33	37
217127	Myst2	MYST histone acetyltransferase 2	102	96	102
244349	Myst3	MYST histone acetyltransferase (monocytic leukemia) 3	205	213	214
54169	Myst4	MYST histone acetyltransferase monocytic leukemia 4	868	881	859
17932	Myt1	myelin transcription factor 1	206	209	199
17933	Myt11	myelin transcription factor 1-like	1534	1538	1550
109889	Mzf1	myeloid zinc finger 1	58	60	60
80750	N4bp1	NEDD4 binding protein 1	959	955	970
333789	N4bp2	NEDD4 binding protein 2	211	215	209
67768	N6amt1	N-6 adenine-specific DNA methyltransferase 1 (putative)	1931	1973	1919
68043	N6amt2	N-6 adenine-specific DNA methyltransferase 2 (putative)	178	190	178
56292	Naa10	N(alpha)-acetyltransferase 10, NatA catalytic subunit	26	25	21
74838	Naa15	N(alpha)-acetyltransferase 15, NatA auxiliary subunit	93	94	94
76522	Naa38	N(alpha)-acetyltransferase 38, NatC auxiliary subunit	439	455	443
72117	Naa50	N(alpha)-acetyltransferase 50, NatE catalytic subunit	47	47	39
67111	Naaa	N-acyl ethanolamine acid amidase	77	71	75
72560	Naalad2	N-acetylated alpha-linked acidic dipeptidase 2	135	150	141
381204	Naaladl1	N-acetylated alpha-linked acidic dipeptidase-like 1	43	42	47
17936	Nab1	Ngfi-A binding protein 1	505	507	492
17937	Nab2	Ngfi-A binding protein 2	47	47	37
17938	Naca	nascent polypeptide-associated complex alpha polypeptide	52	54	49
66830	Nacc1	nucleus accumbens associated 1, BEN and BTB (POZ) domain co	35	31	34
192185	Nadk	NAD kinase	148	142	146
78914	Nadsyn1	NAD synthetase 1	52	49	51
234664	Nae1	NEDD8 activating enzyme E1 subunit 1	41	38	41
234344	Naf1	nuclear assembly factor 1 homolog (S. cerevisiae)	1005	1011	989
17939	Naga	N-acetyl galactosaminidase, alpha	56	51	57
56174	Nagk	N-acetylglucosamine kinase	78	73	75
217214	Nags	N-acetylglutamate synthase	63	64	60
17940	Naip1	NLR family, apoptosis inhibitory protein 1	226	227	228
59027	Nampt	nicotinamide phosphoribosyltransferase	739	714	710
71950	Nanog	Nanog homeobox	107	114	107
67311	Nanp	N-acetylneuraminic acid phosphatase	102	111	111
94181	Nans	N-acetylneuraminic acid synthase (sialic acid synthase)	108	110	106
53605	Nap111	nucleosome assembly protein 1-like 1	279	266	269
17954	Nap112	nucleosome assembly protein 1-like 2	406	394	372
54561	Nap113	nucleosome assembly protein 1-like 3	3358	3420	3196
17955	Nap114	nucleosome assembly protein 1-like 4	127	133	126
58243	Nap115	nucleosome assembly protein 1-like 5	233	250	240
242864	Napepld	N-acyl phosphatidylethanolamine phospholipase D	117	115	117
223646	Naprt1	nicotinate phosphoribosyltransferase domain containing 1	54	56	58
16541	Napsa	napsin A aspartic peptidase	50	44	47
67563	Narfl	nuclear prelamin A recognition factor-like	45	38	43
70223	Nars	asparaginyl-tRNA synthetase	228	235	220

244141	Nars2	asparaginyl-tRNA synthetase 2 (mitochondrial)(putative)	1066	1073	1070
50927	Nasp	nuclear autoantigenic sperm protein (histone-binding)	68	73	77
17960	Nat1	N-acetyl transferase 1	803	791	811
269854	Nat14	N-acetyltransferase 14	11	10	9
74763	Nat15	N-acetyltransferase 15 (GCN5-related, putative)	45	42	46
17961	Nat2	N-acetyltransferase 2 (arylamine N-acetyltransferase)	43	48	45
17962	Nat3	N-acetyltransferase 3	416	416	412
68396	Nat8	N-acetyltransferase 8 (GCN5-related, putative)	68	60	62
269642	Nat8l	N-acetyltransferase 8-like	238	229	233
27354	Nbn	nibrin	90	95	87
17966	Nbr1	neighbor of Brca1 gene 1	40	43	40
68298	Ncapd2	non-SMC condensin I complex, subunit D2	7	6	5
78658	Ncapd3	non-SMC condensin II complex, subunit D3	159	166	167
54392	Ncapg	non-SMC condensin I complex, subunit G	112	109	103
76044	Ncapg2	non-SMC condensin II complex, subunit G2	109	104	102
215387	Ncaph	non-SMC condensin I complex, subunit H	91	89	92
52683	Ncaph2	non-SMC condensin II complex, subunit H2	25	25	26
433702	Ncbp1	nuclear cap binding protein subunit 1	73	75	78
68092	Ncbp2	nuclear cap binding protein subunit 2	77	72	71
320024	Nceh1	arylacetamide deacetylase-like 1	220	213	215
17969	Ncf1	neutrophil cytosolic factor 1	162	173	169
17970	Ncf2	neutrophil cytosolic factor 2	146	141	151
17973	Nck1	non-catalytic region of tyrosine kinase adaptor protein 1	116	107	100
17974	Nck2	non-catalytic region of tyrosine kinase adaptor protein 2	727	726	709
105855	Nckap1l	NCK associated protein 1 like	64	71	71
103425	Ncln	nicalin homolog (zebrafish)	19	20	21
17977	Ncoa1	nuclear receptor coactivator 1	448	432	441
17978	Ncoa2	nuclear receptor coactivator 2	604	587	596
17979	Ncoa3	nuclear receptor coactivator 3	346	347	369
228869	Ncoa5	nuclear receptor coactivator 5	113	115	114
56406	Ncoa6	nuclear receptor coactivator 6	166	167	165
211329	Ncoa7	nuclear receptor coactivator 7	466	481	461
20185	Ncor1	nuclear receptor co-repressor 1	238	225	223
20602	Ncor2	nuclear receptor co-repressor 2	447	407	410
59287	Ncstn	nicastrin	57	59	59
65113	Ndfip1	Nedd4 family interacting protein 1	353	347	338
76273	Ndfip2	Nedd4 family interacting protein 2	933	926	904
17984	Ndn	necdin	413	422	416
78797	Ndor1	NADPH dependent diflavin oxidoreductase 1	17	14	14
17986	Ndp	Norrie disease (pseudoglioma) (human)	617	634	575
15531	Ndst1	N-deacetylase/N-sulfotransferase (heparan glucosaminyl) 1	197	200	201
17423	Ndst2	N-deacetylase/N-sulfotransferase (heparan glucosaminyl) 2	109	113	103
83398	Ndst3	N-deacetylase/N-sulfotransferase (heparan glucosaminyl) 3	1042	1023	1034
64580	Ndst4	N-deacetylase/N-sulfotransferase (heparin glucosaminyl) 4	1707	1716	1653
54405	Ndufa1	NADH dehydrogenase (ubiquinone) 1 alpha subcomplex, 1	31	31	27
67273	Ndufa10	NADH dehydrogenase (ubiquinone) 1 alpha subcomplex 10	431	421	423
66414	Ndufa12	NADH dehydrogenase (ubiquinone) 1 alpha subcomplex, 12	195	196	196
67184	Ndufa13	NADH dehydrogenase (ubiquinone) 1 alpha subcomplex, 13	87	93	91
17991	Ndufa2	NADH dehydrogenase (ubiquinone) 1 alpha subcomplex, 2	12	10	11
66091	Ndufa3	NADH dehydrogenase (ubiquinone) 1 alpha subcomplex, 3	19	18	18
17992	Ndufa4	NADH dehydrogenase (ubiquinone) 1 alpha subcomplex, 4	1205	1219	1181
68202	Ndufa5	NADH dehydrogenase (ubiquinone) 1 alpha subcomplex, 5	16	14	14
67130	Ndufa6	NADH dehydrogenase (ubiquinone) 1 alpha subcomplex, 6 (B14)	40	42	44
66416	Ndufa7	NADH dehydrogenase (ubiquinone) 1 alpha subcomplex, 7 (B14.5)	24	22	25
68375	Ndufa8	NADH dehydrogenase (ubiquinone) 1 alpha subcomplex, 8	93	85	88

66108	Ndufa9	NADH dehydrogenase (ubiquinone) 1 alpha subcomplex, 9	150	147	147
70316	Ndufab1	NADH dehydrogenase (ubiquinone) 1, alpha/beta subcomplex, 1	89	88	90
69702	Ndufaf1	NADH dehydrogenase (ubiquinone) 1 alpha subcomplex, assembly	71	79	72
75597	Ndufaf2	NADH dehydrogenase (ubiquinone) 1 alpha subcomplex, assembly	148	149	141
68342	Ndufb10	NADH dehydrogenase (ubiquinone) 1 beta subcomplex, 10	7	8	7
68198	Ndufb2	NADH dehydrogenase (ubiquinone) 1 beta subcomplex, 2	197	191	200
66495	Ndufb3	NADH dehydrogenase (ubiquinone) 1 beta subcomplex 3	142	141	137
66046	Ndufb5	NADH dehydrogenase (ubiquinone) 1 beta subcomplex, 5	94	105	102
230075	Ndufb6	NADH dehydrogenase (ubiquinone) 1 beta subcomplex, 6	265	268	253
66916	Ndufb7	NADH dehydrogenase (ubiquinone) 1 beta subcomplex, 7	52	62	59
66218	Ndufb9	NADH dehydrogenase (ubiquinone) 1 beta subcomplex, 9	188	190	193
66377	Ndufc1	NADH dehydrogenase (ubiquinone) 1, subcomplex unknown, 1	26	27	29
68197	Ndufc2	NADH dehydrogenase (ubiquinone) 1, subcomplex unknown, 2	63	63	57
227197	Ndufs1	NADH dehydrogenase (ubiquinone) Fe-S protein 1	83	80	78
226646	Ndufs2	NADH dehydrogenase (ubiquinone) Fe-S protein 2	20	20	20
68349	Ndufs3	NADH dehydrogenase (ubiquinone) Fe-S protein 3	24	23	25
17993	Ndufs4	NADH dehydrogenase (ubiquinone) Fe-S protein 4	848	871	857
595136	Ndufs5	NADH dehydrogenase (ubiquinone) Fe-S protein 5	43	43	40
407785	Ndufs6	NADH dehydrogenase (ubiquinone) Fe-S protein 6	89	96	93
75406	Ndufs7	NADH dehydrogenase (ubiquinone) Fe-S protein 7	43	41	47
225887	Ndufs8	NADH dehydrogenase (ubiquinone) Fe-S protein 8	28	30	31
17995	Ndufv1	NADH dehydrogenase (ubiquinone) flavoprotein 1	41	43	42
72900	Ndufv2	NADH dehydrogenase (ubiquinone) flavoprotein 2	42	49	46
78330	Ndufv3	NADH dehydrogenase (ubiquinone) flavoprotein 3	64	68	67
56846	Necab3	N-terminal EF-hand calcium binding protein 3	20	21	23
17999	Nedd4	neural precursor cell expressed, developmentally down-regulated 4	360	361	352
83814	Nedd4l	neural precursor cell expressed, developmentally down-regulated 4	924	927	921
18002	Nedd8	neural precursor cell expressed, developmentally down-regulated 8	16	16	15
72774	Neil1	nei endonuclease VIII-like 1 (E. coli)	29	33	32
234258	Neil3	nei like 3 (E. coli)	705	703	703
18004	Nek1	NIMA (never in mitosis gene a)-related expressed kinase 1	296	305	293
208583	Nek11	NIMA (never in mitosis gene a)-related expressed kinase 11	326	326	330
18005	Nek2	NIMA (never in mitosis gene a)-related expressed kinase 2	241	236	242
23954	Nek3	NIMA (never in mitosis gene a)-related expressed kinase 3	90	89	90
23955	Nek4	NIMA (never in mitosis gene a)-related expressed kinase 4	71	71	77
330721	Nek5	NIMA (never in mitosis gene a)-related expressed kinase 5	127	132	134
59126	Nek6	NIMA (never in mitosis gene a)-related expressed kinase 6	388	386	380
59125	Nek7	NIMA (never in mitosis gene a)-related expressed kinase 7	721	727	721
140859	Nek8	NIMA (never in mitosis gene a)-related expressed kinase 8	16	14	17
217718	Nek9	NIMA (never in mitosis gene a)-related expressed kinase 9	109	119	118
66650	Nepn	nephrocan	48	49	42
56802	Nespas	neuroendocrine secretory protein antisense	17	15	17
18010	Neu1	neuraminidase 1	44	50	44
23956	Neu2	neuraminidase 2	80	80	83
50877	Neu3	neuraminidase 3	121	119	113
241159	Neu4	sialidase 4	83	83	86
18012	Neurod1	neurogenic differentiation 1	267	269	250
18013	Neurod2	neurogenic differentiation 2	174	176	165
11923	Neurod4	neurogenic differentiation 4	133	140	136
11922	Neurod6	neurogenic differentiation 6	484	490	484
18014	Neurog1	neurogenin 1	150	145	141
11924	Neurog2	neurogenin 2	274	273	275
11925	Neurog3	neurogenin 3	157	155	151
18016	Nf2	neurofibromatosis 2	173	167	171
54446	Nfat5	nuclear factor of activated T-cells 5	321	322	304

18018	Nfatc1	nuclear factor of activated T-cells, cytoplasmic, calcineurin-depend	486	491	481
18019	Nfatc2	nuclear factor of activated T-cells, cytoplasmic, calcineurin-depend	619	607	599
18021	Nfatc3	nuclear factor of activated T-cells, cytoplasmic, calcineurin-depend	177	171	167
73181	Nfatc4	nuclear factor of activated T-cells, cytoplasmic, calcineurin-depend	83	76	75
18022	Nfe2	nuclear factor, erythroid derived 2	40	39	42
18024	Nfe2l2	nuclear factor, erythroid derived 2, like 2	216	229	226
18025	Nfe2l3	nuclear factor, erythroid derived 2, like 3	257	256	253
18027	Nfia	nuclear factor I/A	2033	2028	2023
18028	Nfib	nuclear factor I/B	1813	1813	1793
18029	Nfic	nuclear factor I/C	106	103	105
18030	Nfil3	nuclear factor, interleukin 3, regulated	480	466	451
18032	Nfix	nuclear factor I/X	183	162	174
18033	Nfkb1	nuclear factor of kappa light polypeptide gene enhancer in B-cells	427	433	426
18034	Nfkb2	nuclear factor of kappa light polypeptide gene enhancer in B-cells	229	227	226
18035	Nfkbia	nuclear factor of kappa light polypeptide gene enhancer in B-cells i	212	208	212
18037	Nfkbie	nuclear factor of kappa light polypeptide gene enhancer in B-cells i	17	16	15
80859	Nfkbiz	nuclear factor of kappa light polypeptide gene enhancer in B-cells i	788	805	789
235134	Nfrkb	nuclear factor related to kappa B binding protein	202	193	200
56748	Nfu1	NFU1 iron-sulfur cluster scaffold homolog (<i>S. cerevisiae</i>)	254	253	254
74164	Nfx1	nuclear transcription factor, X-box binding 1	59	52	60
18044	Nfya	nuclear transcription factor-Y alpha	66	63	64
18045	Nfyb	nuclear transcription factor-Y beta	147	143	139
18046	Nfyc	nuclear transcription factor-Y gamma	150	143	138
18049	Ngf	nerve growth factor	681	678	679
59007	Ngly1	N-glycanase 1	1037	1041	1044
75570	Nhej1	nonhomologous end-joining factor 1	138	131	132
18071	Nhlh1	nescient helix loop helix 1	69	70	67
105193	Nhlrc1	NHL repeat containing 1	149	143	146
52530	Nhp2	NHP2 ribonucleoprotein homolog (yeast)	37	38	38
80885	Niacr1	niacin receptor 1	173	171	167
65102	Nif3l1	Ngg1 interacting factor 3-like 1 (<i>S. pombe</i>)	79	79	79
71175	Nipbl	Nipped-B homolog (<i>Drosophila</i>)	688	696	671
64652	Nisch	nischarin	53	54	52
27045	Nit1	nitrilase 1	19	19	20
52633	Nit2	nitrilase family, member 2	146	143	142
67050	Nkap	NFKB activating protein	70	73	73
69721	Nkiras1	NFKB inhibitor interacting Ras-like protein 1	76	80	79
71966	Nkiras2	NFKB inhibitor interacting Ras-like protein 2	41	36	37
77286	Nkrf	NF-kappaB repressing factor	151	151	137
18087	Nktr	natural killer tumor recognition sequence	61	69	60
21869	Nkx2-1	NK2 homeobox 1	338	344	342
18088	Nkx2-2	NK2 transcription factor related, locus 2 (<i>Drosophila</i>)	232	223	227
100313531	Nkx2-2as	NK2 transcription factor related, locus 2 (<i>Drosophila</i>), antisense	136	130	126
18089	Nkx2-3	NK2 transcription factor related, locus 3 (<i>Drosophila</i>)	189	191	197
18091	Nkx2-5	NK2 transcription factor related, locus 5 (<i>Drosophila</i>)	168	160	169
18092	Nkx2-6	NK2 transcription factor related, locus 6 (<i>Drosophila</i>)	211	203	203
18094	Nkx2-9	NK2 transcription factor related, locus 9 (<i>Drosophila</i>)	203	206	197
18095	Nkx3-1	NK-3 transcription factor, locus 1 (<i>Drosophila</i>)	151	153	147
12020	Nkx3-2	NK3 homeobox 2	170	168	167
18096	Nkx6-1	NK6 homeobox 1	1174	1150	1145
14912	Nkx6-2	NK6 homeobox 2	563	567	570
74561	Nkx6-3	NK6 homeobox 3	77	75	84
18099	Nlk	nemo like kinase	261	264	251
75805	Nln	neurolysin (metallopeptidase M3 family)	244	257	245
434341	Nlrc5	NLR family, CARD domain containing 5	119	117	125

378425	Nlrp12	NLR family, pyrin domain containing 12	76	67	72
18102	Nme1	non-metastatic cells 1, protein (NM23A) expressed in	52	51	51
18103	Nme2	non-metastatic cells 2, protein (NM23B) expressed in	108	109	105
79059	Nme3	non-metastatic cells 3, protein expressed in	52	52	51
56520	Nme4	non-metastatic cells 4, protein expressed in	30	27	28
75533	Nme5	non-metastatic cells 5, protein expressed in (nucleoside-diphospha	71	66	74
54369	Nme6	non-metastatic cells 6, protein expressed in (nucleoside-diphospha	26	21	24
66454	Nmnat1	nicotinamide nucleotide adenyllyltransferase 1	37	37	43
226518	Nmnat2	nicotinamide nucleotide adenyllyltransferase 2	380	358	371
74080	Nmnat3	nicotinamide nucleotide adenyllyltransferase 3	491	509	486
18107	Nmt1	N-myristoyltransferase 1	116	119	109
18108	Nmt2	N-myristoyltransferase 2	279	278	274
18113	Nnmt	nicotinamide N-methyltransferase	450	446	437
67619	Nob1	NIN1/RPN12 binding protein 1 homolog (S. cerevisiae)	42	43	37
18291	Nobox	NOBOX oogenesis homeobox	526	524	516
107607	Nod1	nucleotide-binding oligomerization domain containing 1	241	236	234
257632	Nod2	nucleotide-binding oligomerization domain containing 2	75	76	76
18119	Nodal	nodal	89	88	90
18121	Nog	noggin	443	439	438
78688	Nol3	nucleolar protein 3 (apoptosis repressor with CARD domain)	20	25	20
70930	Nol8	nucleolar protein 8	37	35	33
74035	Nol9	nucleolar protein 9	80	74	78
70769	Nolc1	nucleolar and coiled-body phosphoprotein 1	96	98	102
433864	Nom1	nucleolar protein with MIF4G domain 1	130	131	137
53610	Nono	non-POU-domain-containing, octamer binding protein	31	32	34
66181	Nop10	NOP10 ribonucleoprotein homolog (yeast)	10	10	10
75416	Nop14	NOP14 nucleolar protein homolog (yeast)	25	28	26
18125	Nos1	nitric oxide synthase 1, neuronal	722	709	727
18126	Nos2	nitric oxide synthase 2, inducible	201	206	201
18127	Nos3	nitric oxide synthase 3, endothelial cell	52	49	48
329416	Nostrin	nitric oxide synthase trafficker	444	453	434
18128	Notch1	Notch gene homolog 1 (Drosophila)	166	165	168
18129	Notch2	Notch gene homolog 2 (Drosophila)	295	310	310
18131	Notch3	Notch gene homolog 3 (Drosophila)	124	124	121
18132	Notch4	Notch gene homolog 4 (Drosophila)	54	52	50
384452	Noto	notochord homolog (Xenopus laevis)	74	67	72
664883	Nova1	neuro-oncological ventral antigen 1	5353	5477	5338
237038	Nox1	NADPH oxidase 1	108	106	103
224480	Nox3	NADPH oxidase 3	1835	1861	1824
50490	Nox4	NADPH oxidase 4	615	644	612
241275	Noxa1	NADPH oxidase activator 1	121	124	131
71893	Noxo1	NADPH oxidase organizer 1	11	11	15
18142	Npas1	neuronal PAS domain protein 1	218	205	208
18143	Npas2	neuronal PAS domain protein 2	486	487	486
27386	Npas3	neuronal PAS domain protein 3	1902	1949	1859
225872	Npas4	neuronal PAS domain protein 4	81	71	81
244879	Npat	nuclear protein in the AT region	92	92	98
208990	Npb	neuropeptide B	25	22	23
18145	Npc1	Niemann Pick type C1	176	177	178
237636	Npc1l1	NPC1-like 1	87	86	91
228961	Npepl1	aminopeptidase-like 1	235	239	239
19155	Npepps	aminopeptidase puromycin sensitive	164	172	169
74025	Nphp3	nephronophthisis 3 (adolescent)	386	407	384
74091	Npl	N-acetylneuraminatate pyruvate lyase	209	213	221
18148	Npm1	nucleophosmin 1	70	65	72

328440	Npm2	nucleophosmin/nucleoplasmin 2	162	168	160
18150	Npm3	nucleoplasmin 3	48	50	52
230899	Nppa	natriuretic peptide type A	64	64	66
18158	Nppb	natriuretic peptide type B	79	80	79
18159	Nppc	natriuretic peptide type C	154	154	143
18160	Npr1	natriuretic peptide receptor 1	53	52	55
230103	Npr2	natriuretic peptide receptor 2	90	82	97
18162	Npr3	natriuretic peptide receptor 3	758	764	766
56032	Nprl2	nitrogen permease regulator-like 2 (<i>S. cerevisiae</i>)	7	7	7
20320	Nptn	neuroplastin	268	260	265
18166	Npy1r	neuropeptide Y receptor Y1	216	231	227
18167	Npy2r	neuropeptide Y receptor Y2	687	665	660
18104	Nqo1	NAD(P)H dehydrogenase, quinone 1	179	179	177
18105	Nqo2	NAD(P)H dehydrogenase, quinone 2	91	92	84
11614	Nr0b1	nuclear receptor subfamily 0, group B, member 1	252	252	232
23957	Nr0b2	nuclear receptor subfamily 0, group B, member 2	39	37	34
217166	Nr1d1	nuclear receptor subfamily 1, group D, member 1	68	59	59
353187	Nr1d2	nuclear receptor subfamily 1, group D, member 2	367	372	372
22260	Nr1h2	nuclear receptor subfamily 1, group H, member 2	23	25	29
22259	Nr1h3	nuclear receptor subfamily 1, group H, member 3	23	26	23
20186	Nr1h4	nuclear receptor subfamily 1, group H, member 4	269	265	269
381463	Nr1h5	nuclear receptor subfamily 1, group H, member 5	78	80	74
18171	Nr1i2	nuclear receptor subfamily 1, group I, member 2	316	318	319
12355	Nr1i3	nuclear receptor subfamily 1, group I, member 3	35	38	36
22025	Nr2c1	nuclear receptor subfamily 2, group C, member 1	217	204	203
22026	Nr2c2	nuclear receptor subfamily 2, group C, member 2	248	257	254
21907	Nr2e1	nuclear receptor subfamily 2, group E, member 1	223	217	225
23958	Nr2e3	nuclear receptor subfamily 2, group E, member 3	259	261	255
13865	Nr2f1	nuclear receptor subfamily 2, group F, member 1	3549	3681	3542
11819	Nr2f2	nuclear receptor subfamily 2, group F, member 2	4526	4523	4533
13864	Nr2f6	nuclear receptor subfamily 2, group F, member 6	27	24	28
14815	Nr3c1	nuclear receptor subfamily 3, group C, member 1	999	994	980
110784	Nr3c2	nuclear receptor subfamily 3, group C, member 2	781	771	774
15370	Nr4a1	nuclear receptor subfamily 4, group A, member 1	70	74	77
18227	Nr4a2	nuclear receptor subfamily 4, group A, member 2	2266	2266	2226
18124	Nr4a3	nuclear receptor subfamily 4, group A, member 3	811	811	813
26423	Nr5a1	nuclear receptor subfamily 5, group A, member 1	173	171	179
26424	Nr5a2	nuclear receptor subfamily 5, group A, member 2	1679	1658	1640
14536	Nr6a1	nuclear receptor subfamily 6, group A, member 1	291	294	288
67122	Nrarp	Notch-regulated ankyrin repeat protein	132	128	130
18176	Nras	neuroblastoma ras oncogene	74	72	72
641340	Nrbf2	nuclear receptor binding factor 2	517	528	515
192292	Nrbp1	nuclear receptor binding protein 1	35	41	36
223649	Nrbp2	nuclear receptor binding protein 2	47	49	43
230598	Nrd1	nardilysin, N-arginine dibasic convertase, NRD convertase 1	179	178	179
18181	Nrf1	nuclear respiratory factor 1	365	370	358
211323	Nrg1	neuregulin 1	2268	2294	2242
100042150	Nrg2	neuregulin 2	219	226	234
268903	Nrip1	nuclear receptor interacting protein 1	1433	1420	1379
60345	Nrip2	nuclear receptor interacting protein 2	69	64	62
78593	Nrip3	nuclear receptor interacting protein 3	148	152	146
27206	Nrk	Nik related kinase	1050	1052	1004
18185	Nrl	neural retina leucine zipper gene	41	41	38
18186	Nrp1	neuropilin 1	1381	1377	1382
18193	Nsd1	nuclear receptor-binding SET-domain protein 1	217	217	217

18194	Nsdhl	NAD(P) dependent steroid dehydrogenase-like	92	84	87
18195	Nsf	N-ethylmaleimide sensitive fusion protein	247	253	256
67711	Nsmce1	non-SMC element 1 homolog (<i>S. cerevisiae</i>)	138	136	146
68501	Nsmce2	non-SMC element 2 homolog (MMS21, <i>S. cerevisiae</i>)	350	353	348
28114	Nsun2	NOL1/NOP2/Sun domain family member 2	167	162	169
106338	Nsun3	NOL1/NOP2/Sun domain family member 3	2783	2851	2773
72181	Nsun4	NOL1/NOP2/Sun domain family, member 4	72	75	81
100609	Nsun5	NOL1/NOP2/Sun domain family, member 5	51	51	50
74455	Nsun6	NOL1/NOP2/Sun domain family member 6	415	441	434
70918	Nsun7	NOL1/NOP2/Sun domain family, member 7	247	244	230
50773	Nt5c	5',3'-nucleotidase, cytosolic	53	45	55
230718	Nt5c1a	5'-nucleotidase, cytosolic IA	65	62	64
70881	Nt5c1b	5'-nucleotidase, cytosolic IB	1016	1041	1015
76952	Nt5c2	5'-nucleotidase, cytosolic II	386	383	375
107569	Nt5c3	5'-nucleotidase, cytosolic III	155	160	157
68106	Nt5c3l	5'-nucleotidase, cytosolic III-like	31	29	30
23959	Nt5e	5' nucleotidase, ecto	931	909	904
103850	Nt5m	5',3'-nucleotidase, mitochondrial	138	135	145
18203	Ntan1	N-terminal Asn amidase	160	151	162
18205	Ntf3	neurotrophin 3	1077	1092	1086
18207	Nthl1	nth (endonuclease III)-like 1 (<i>E.coli</i>)	15	14	16
66566	Ntpcr	nucleoside-triphosphatase, cancer-related	287	290	297
18211	Ntrk1	neurotrophic tyrosine kinase, receptor, type 1	31	33	31
18212	Ntrk2	neurotrophic tyrosine kinase, receptor, type 2	1228	1232	1219
18213	Ntrk3	neurotrophic tyrosine kinase, receptor, type 3	3160	3176	3146
77976	Nuak1	NUAK family, SNF1-like kinase, 1	1039	1042	1032
74137	Nuak2	NUAK family, SNF1-like kinase, 2	117	121	116
53312	Nub1	negative regulator of ubiquitin-like proteins 1	108	110	115
26425	Nubp1	nucleotide binding protein 1	69	66	72
17766	Nudt1	nudix (nucleoside diphosphate linked moiety X)-type motif 1	78	76	75
102954	Nudt10	nudix (nucleoside diphosphate linked moiety X)-type motif 10	280	281	264
58242	Nudt11	nudix (nucleoside diphosphate linked moiety X)-type motif 11	497	502	468
67993	Nudt12	nudix (nucleoside diphosphate linked moiety X)-type motif 12	5048	5130	4940
214254	Nudt15	nudix (nucleoside diphosphate linked moiety X)-type motif 15	62	59	57
66401	Nudt2	nudix (nucleoside diphosphate linked moiety X)-type motif 2	51	48	46
68219	Nudt21	nudix (nucleoside diphosphate linked moiety X)-type motif 21	30	33	30
68323	Nudt22	nudix (nucleoside diphosphate linked moiety X)-type motif 22	5	3	4
56409	Nudt3	nudix (nucleotide diphosphate linked moiety X)-type motif 3	92	91	84
53893	Nudt5	nudix (nucleoside diphosphate linked moiety X)-type motif 5	63	70	64
67528	Nudt7	nudix (nucleoside diphosphate linked moiety X)-type motif 7	456	461	458
74167	Nudt9	nudix (nucleoside diphosphate linked moiety X)-type motif 9	71	71	71
27275	Nufip1	nuclear fragile X mental retardation protein interacting protein 1	397	399	391
18223	Numb1	numb-like	118	124	131
269966	Nup98	nucleoporin 98	139	143	147
108907	Nusap1	nucleolar and spindle associated protein 1	30	29	29
18230	Nxn	nucleoredoxin	222	213	220
277154	Nynrin	NYN domain and retroviral integrase containing	80	79	74
246730	Oas1a	2'-5' oligoadenylate synthetase 1A	33	31	32
23960	Oas1g	2'-5' oligoadenylate synthetase 1G	59	55	56
246728	Oas2	2'-5' oligoadenylate synthetase 2	92	95	88
23962	Oasl2	2'-5' oligoadenylate synthetase-like 2	86	93	84
18245	Oaz1	ornithine decarboxylase antizyme 1	19	15	18
53814	Oaz3	ornithine decarboxylase antizyme 3	40	42	41
108689	Obfc1	oligonucleotide/oligosaccharide-binding fold containing 1	147	157	150
109019	Obfc2a	oligonucleotide/oligosaccharide-binding fold containing 2A	819	812	795

69917	Obfc2b	oligonucleotide/oligosaccharide-binding fold containing 2B	12	15	12
380698	Obscn	obscurin, cytoskeletal calmodulin and titin-interacting RhoGEF	243	236	221
18256	Oc90	otoconin 90	251	243	237
18431	Oca2	oculocutaneous albinism II	1700	1707	1662
18260	Ocln	occludin	161	154	152
320634	Ocrl	oculocerebrorenal syndrome of Lowe	171	171	169
18263	Odc1	ornithine decarboxylase, structural 1	423	428	437
18293	Ogdh	oxoglutarate dehydrogenase (lipoamide)	148	147	153
270086	Ogfod1	2-oxoglutarate and iron-dependent oxygenase domain containing 1	79	79	79
66627	Ogfod2	2-oxoglutarate and iron-dependent oxygenase domain containing 2	22	24	22
18294	Ogg1	8-oxoguanine DNA-glycosylase 1	47	39	45
108155	Ogt	O-linked N-acetylglucosamine (GlcNAc) transferase (UDP-N-acety	252	259	245
67059	Ola1	Obg-like ATPase 1	386	374	373
99035	Olah	oleoyl-ACP hydrolase	106	110	112
50914	Olig1	oligodendrocyte transcription factor 1	185	183	179
50913	Olig2	oligodendrocyte transcription factor 2	264	248	254
94222	Olig3	oligodendrocyte transcription factor 3	539	552	545
108078	Olr1	oxidized low density lipoprotein (lectin-like) receptor 1	57	56	49
67013	Oma1	OMA1 homolog, zinc metallopeptidase (<i>S. cerevisiae</i>)	1382	1390	1382
15379	Onecut1	one cut domain, family member 1	1102	1090	1070
225631	Onecut2	one cut domain, family member 2	302	309	286
246086	Onecut3	one cut domain, family member 3	126	123	120
67968	Ooep	oocyte expressed protein homolog (dog)	36	35	34
75475	Oplah	5-oxoprolinase (ATP-hydrolysing)	44	43	40
14539	Opn1mw	opsin 1 (cone pigments), medium-wave-sensitive (color blindness,	99	98	102
12057	Opn1sw	opsin 1 (cone pigments), short-wave-sensitive (color blindness, trit	71	67	67
13603	Opn3	opsin 3	12	11	11
30044	Opn4	opsin 4 (melanopsin)	116	111	117
353344	Opn5	opsin 5	482	493	485
18386	Oprd1	opioid receptor, delta 1	180	179	174
18390	Oprm1	opioid receptor, mu 1	1361	1335	1311
18392	Orc1	origin recognition complex, subunit 1	51	50	52
18393	Orc2	origin recognition complex, subunit 2	190	191	193
50793	Orc3	origin recognition complex, subunit 3	82	82	76
26428	Orc4	origin recognition complex, subunit 4	177	171	166
26429	Orc5	origin recognition complex, subunit 5	280	283	281
227102	Ormdl1	ORM1-like 1 (<i>S. cerevisiae</i>)	19	20	18
66844	Ormdl2	ORM1-like 2 (<i>S. cerevisiae</i>)	23	21	21
66612	Ormdl3	ORM1-like 3 (<i>S. cerevisiae</i>)	64	58	61
216440	Os9	amplified in osteosarcoma	116	117	108
66246	Osgep	O-sialoglycoprotein endopeptidase	39	38	37
72085	Osgepl1	O-sialoglycoprotein endopeptidase-like 1	70	71	71
18413	Osm	oncostatin M	50	49	49
23967	Osr1	odd-skipped related 1 (<i>Drosophila</i>)	1709	1698	1671
107587	Osr2	odd-skipped related 2 (<i>Drosophila</i>)	283	281	275
18416	Otc	ornithine transcarbamylase	317	325	302
18419	Otog	otogelin	174	165	170
18420	Otp	orthopedia homolog (<i>Drosophila</i>)	230	230	234
107260	Otub1	OTU domain, ubiquitin aldehyde binding 1	133	130	133
68149	Otub2	OTU domain, ubiquitin aldehyde binding 2	102	107	100
54644	Otud5	OTU domain containing 5	71	66	64
170711	Otud7a	OTU domain containing 7A	924	937	923
229603	Otud7b	OTU domain containing 7B	128	135	135
18424	Otx2	orthodenticle homolog 2 (<i>Drosophila</i>)	286	297	284
244199	Ovch2	ovochymase 2	70	74	77

12659	Ovgp1	oviductal glycoprotein 1	52	51	53
18426	Ovol1	OVO homolog-like 1 (Drosophila)	71	70	74
107586	Ovol2	ovo-like 2 (Drosophila)	128	131	128
69089	Oxa1l	oxidase assembly 1-like	169	171	168
67041	Oxct1	3-oxoacid CoA transferase 1	38	39	37
64059	Oxct2a	3-oxoacid CoA transferase 2A	72	73	77
353371	Oxct2b	3-oxoacid CoA transferase 2B	43	45	45
218885	Oxnad1	oxidoreductase NAD-binding domain containing 1	73	78	75
170719	Oxr1	oxidation resistance 1	2045	2073	2014
71147	Oxsm	3-oxoacyl-ACP synthase, mitochondrial	147	157	142
108737	Oxsr1	oxidative-stress responsive 1	143	138	131
18436	P2rx1	purinergic receptor P2X, ligand-gated ion channel, 1	76	79	79
18438	P2rx4	purinergic receptor P2X, ligand-gated ion channel 4	185	171	185
18439	P2rx7	purinergic receptor P2X, ligand-gated ion channel, 7	120	118	123
18441	P2ry1	purinergic receptor P2Y, G-protein coupled 1	1103	1106	1070
18451	P4ha1	procollagen-proline, 2-oxoglutarate 4-dioxygenase (proline 4-hydro	245	231	223
18452	P4ha2	procollagen-proline, 2-oxoglutarate 4-dioxygenase (proline 4-hydro	232	240	235
320452	P4ha3	procollagen-proline, 2-oxoglutarate 4-dioxygenase (proline 4-hydro	131	144	145
18453	P4hb	prolyl 4-hydroxylase, beta polypeptide	36	37	39
74443	P4htm	prolyl 4-hydroxylase, transmembrane (endoplasmic reticulum)	96	89	91
18813	Pa2g4	proliferation-associated 2G4	48	46	51
18458	Pabpc1	poly(A) binding protein, cytoplasmic 1	312	307	301
18459	Pabpc2	poly(A) binding protein, cytoplasmic 2	929	938	939
54196	Pabpn1	poly(A) binding protein, nuclear 1	37	36	34
23969	Pacsin1	protein kinase C and casein kinase substrate in neurons 1	164	162	165
23970	Pacsin2	protein kinase C and casein kinase substrate in neurons 2	235	225	220
80708	Pacsin3	protein kinase C and casein kinase substrate in neurons 3	37	36	33
18599	Padi1	peptidyl arginine deiminase, type I	125	120	128
18600	Padi2	peptidyl arginine deiminase, type II	150	143	149
18601	Padi3	peptidyl arginine deiminase, type III	92	82	96
18602	Padi4	peptidyl arginine deiminase, type IV	83	86	84
242726	Padi6	peptidyl arginine deiminase, type VI	101	92	92
54624	Paf1	Paf1, RNA polymerase II associated factor, homolog (S. cerevisiae)	51	55	54
18472	Pafah1b1	platelet-activating factor acetylhydrolase, isoform 1b, subunit 1	161	168	168
18475	Pafah1b2	platelet-activating factor acetylhydrolase, isoform 1b, subunit 2	73	68	71
18476	Pafah1b3	platelet-activating factor acetylhydrolase, isoform 1b, subunit 3	22	23	24
100163	Pafah2	platelet-activating factor acetylhydrolase 2	124	127	126
18478	Pah	phenylalanine hydroxylase	456	476	461
67054	Paics	phosphoribosylaminoimidazole carboxylase, phosphoribosylamino	56	62	58
218693	Paip1	polyadenylate binding protein-interacting protein 1	67	69	65
67869	Paip2	polyadenylate-binding protein-interacting protein 2	82	80	84
232164	Paip2b	poly(A) binding protein interacting protein 2B	150	155	163
18479	Pak1	p21 protein (Cdc42/Rac)-activated kinase 1	235	239	232
224105	Pak2	p21 protein (Cdc42/Rac)-activated kinase 2	128	130	121
18481	Pak3	p21 protein (Cdc42/Rac)-activated kinase 3	744	748	694
70584	Pak4	p21 protein (Cdc42/Rac)-activated kinase 4	103	106	98
214230	Pak6	p21 protein (Cdc42/Rac)-activated kinase 6	146	150	156
241656	Pak7	p21 protein (Cdc42/Rac)-activated kinase 7	598	625	589
233826	Palb2	partner and localizer of BRCA2	42	39	41
18483	Palm	paralemmin	34	38	34
18484	Pam	peptidylglycine alpha-amidating monooxygenase	472	461	470
210622	Pamr1	peptidase domain containing associated with muscle regeneration	272	274	267
103135	Pan2	PAN2 polyA specific ribonuclease subunit homolog (S. cerevisiae)	33	32	31
72587	Pan3	PAN3 polyA specific ribonuclease subunit homolog (S. cerevisiae)	383	399	389
75735	Pank1	pantothenate kinase 1	136	132	135

74450	Pank2	pantothenate kinase 2	70	74	70
211347	Pank3	pantothenate kinase 3	213	210	215
269614	Pank4	pantothenate kinase 4	57	52	56
212503	Paox	polyamine oxidase (exo-N4-amino)	25	28	26
100715	Papd4	PAP associated domain containing 4	195	195	200
214627	Papd5	PAP associated domain containing 5	173	171	173
210106	Papd7	PAP associated domain containing 7	797	774	777
18789	Papola	poly (A) polymerase alpha	408	394	397
56522	Papolb	poly (A) polymerase beta (testis specific)	113	112	106
216578	Papolg	poly(A) polymerase gamma	396	410	397
18491	Pappa	pregnancy-associated plasma protein A	1977	1982	1978
23850	Pappa2	pappalysin 2	943	934	943
23971	Papss1	3'-phosphoadenosine 5'-phosphosulfate synthase 1	887	918	910
23972	Papss2	3'-phosphoadenosine 5'-phosphosulfate synthase 2	332	335	328
26430	Parg	poly (ADP-ribose) glycohydrolase	151	159	148
50873	Park2	Parkinson disease (autosomal recessive, juvenile) 2, parkin	1655	1651	1646
57320	Park7	Parkinson disease (autosomal recessive, early onset) 7	78	79	80
381038	Parl	presenilin associated, rhomboid-like	107	107	111
74108	Parn	poly(A)-specific ribonuclease (deadenylation nuclease)	204	201	197
11545	Parp1	poly (ADP-ribose) polymerase family, member 1	196	204	205
547253	Parp14	poly (ADP-ribose) polymerase family, member 14	222	219	234
11546	Parp2	poly (ADP-ribose) polymerase family, member 2	78	85	85
328417	Parp4	poly (ADP-ribose) polymerase family, member 4	129	125	125
230577	Pars2	prolyl-tRNA synthetase (mitochondrial)(putative)	68	72	77
269224	Pask	PAS domain containing serine/threonine kinase	45	49	51
225929	Pat11	protein associated with topoisomerase II homolog 1 (yeast)	83	88	91
56218	Patz1	POZ (BTB) and AT hook containing zinc finger 1	74	76	84
114774	Pawr	PRKC, apoptosis, WT1, regulator	686	688	689
18503	Pax1	paired box gene 1	1097	1108	1095
18504	Pax2	paired box gene 2	456	443	447
18505	Pax3	paired box gene 3	1026	1025	1008
18506	Pax4	paired box gene 4	71	66	70
18507	Pax5	paired box gene 5	582	597	598
18508	Pax6	paired box gene 6	290	300	277
18509	Pax7	paired box gene 7	388	385	387
18510	Pax8	paired box gene 8	498	484	483
18511	Pax9	paired box gene 9	700	676	697
55982	Paxip1	PAX interacting (with transcription-activation domain) protein 1	455	436	446
52033	Pbk	PDZ binding kinase	219	220	212
68371	Pbld1	phenazine biosynthesis-like protein domain containing 1	102	95	104
67307	Pbld2	phenazine biosynthesis-like protein domain containing 2	47	51	51
66923	Pbrm1	polybromo 1	146	137	139
18514	Pbx1	pre B-cell leukemia transcription factor 1	2339	2350	2352
18515	Pbx2	pre B-cell leukemia transcription factor 2	6	8	9
18516	Pbx3	pre B-cell leukemia transcription factor 3	695	701	681
80720	Pbx4	pre-B-cell leukemia homeobox 4	90	86	90
229534	Pbxip1	pre-B-cell leukemia transcription factor interacting protein 1	37	36	35
13180	Pcbd1	pterin 4 alpha carbinolamine dehydratase/dimerization cofactor of I	271	278	264
72562	Pcbd2	pterin 4 alpha carbinolamine dehydratase/dimerization cofactor of I	85	83	97
23983	Pcbp1	poly(rC) binding protein 1	121	118	114
18521	Pcbp2	poly(rC) binding protein 2	72	78	69
110821	Pcca	propionyl-Coenzyme A carboxylase, alpha polypeptide	561	558	555
66904	Pccb	propionyl Coenzyme A carboxylase, beta polypeptide	567	559	566
53601	Pcdh12	protocadherin 12	65	58	60
69837	Pcgf1	polycomb group ring finger 1	23	16	18

22658	Pcgf2	polycomb group ring finger 2	17	20	20
69587	Pcgf3	polycomb group ring finger 3	132	129	136
76073	Pcgf5	polycomb group ring finger 5	535	562	540
71041	Pcgf6	polycomb group ring finger 6	67	62	66
234069	Pcid2	PCI domain containing 2	57	57	54
18534	Pck1	phosphoenolpyruvate carboxykinase 1, cytosolic	128	123	136
74551	Pck2	phosphoenolpyruvate carboxykinase 2 (mitochondrial)	41	39	45
18537	Pcmt1	protein-L-isoaspartate (D-aspartate) O-methyltransferase 1	5	7	6
319263	Pcmt1d1	protein-L-isoaspartate (D-aspartate) O-methyltransferase domain c	3296	3294	3268
245867	Pcmt1d2	protein-L-isoaspartate (D-aspartate) O-methyltransferase domain c	89	89	84
18538	Pcna	proliferating cell nuclear antigen	19	24	20
76302	Pcnp	PEST proteolytic signal containing nuclear protein	78	86	76
18542	Pcolce	procollagen C-endopeptidase enhancer protein	29	25	30
18548	Pcsk1	proprotein convertase subtilisin/kexin type 1	1083	1083	1060
30052	Pcsk1n	proprotein convertase subtilisin/kexin type 1 inhibitor	36	32	34
18549	Pcsk2	proprotein convertase subtilisin/kexin type 2	993	1006	991
18551	Pcsk4	proprotein convertase subtilisin/kexin type 4	14	11	10
18552	Pcsk5	proprotein convertase subtilisin/kexin type 5	1602	1567	1593
18553	Pcsk6	proprotein convertase subtilisin/kexin type 6	485	482	472
18554	Pcsk7	proprotein convertase subtilisin/kexin type 7	90	87	87
100102	Pcsk9	proprotein convertase subtilisin/kexin type 9	239	220	227
18559	Pctp	phosphatidylcholine transfer protein	627	616	608
18563	Pcx	pyruvate carboxylase	256	268	264
66881	Pcyox1	prenylcysteine oxidase 1	46	42	44
240334	Pcyox1l	prenylcysteine oxidase 1 like	50	50	49
13026	Pcyt1a	phosphate cytidyltransferase 1, choline, alpha isoform	90	90	86
236899	Pcyt1b	phosphate cytidyltransferase 1, choline, beta isoform	269	244	260
68671	Pcyt2	phosphate cytidyltransferase 2, ethanolamine	20	20	18
18572	Pdcd11	programmed cell death 11	66	64	65
18569	Pdcd4	programmed cell death 4	357	353	356
67466	Pdcl	phosducin-like	87	90	89
23984	Pde10a	phosphodiesterase 10A	703	708	712
241489	Pde11a	phosphodiesterase 11A	484	481	484
18573	Pde1a	phosphodiesterase 1A, calmodulin-dependent	1006	1016	1008
18574	Pde1b	phosphodiesterase 1B, Ca2+-calmodulin dependent	105	108	112
18575	Pde1c	phosphodiesterase 1C	902	883	869
207728	Pde2a	phosphodiesterase 2A, cGMP-stimulated	139	134	144
54611	Pde3a	phosphodiesterase 3A, cGMP inhibited	930	928	913
18576	Pde3b	phosphodiesterase 3B, cGMP-inhibited	180	185	171
18577	Pde4a	phosphodiesterase 4A, cAMP specific	154	146	146
18578	Pde4b	phosphodiesterase 4B, cAMP specific	1423	1392	1405
110385	Pde4c	phosphodiesterase 4C, cAMP specific	44	48	45
238871	Pde4d	phosphodiesterase 4D, cAMP specific	1292	1285	1272
242202	Pde5a	phosphodiesterase 5A, cGMP-specific	329	349	352
225600	Pde6a	phosphodiesterase 6A, cGMP-specific, rod, alpha	245	231	250
18587	Pde6b	phosphodiesterase 6B, cGMP, rod receptor, beta polypeptide	156	156	156
18582	Pde6d	phosphodiesterase 6D, cGMP-specific, rod, delta	82	88	81
18588	Pde6g	phosphodiesterase 6G, cGMP-specific, rod, gamma	19	20	19
78600	Pde6h	phosphodiesterase 6H, cGMP-specific, cone, gamma	289	302	291
18583	Pde7a	phosphodiesterase 7A	468	469	456
29863	Pde7b	phosphodiesterase 7B	777	758	767
18584	Pde8a	phosphodiesterase 8A	291	295	290
18585	Pde9a	phosphodiesterase 9A	280	283	266
68023	Pdf	peptide deformylase (mitochondrial)	35	31	31
18590	Pdgfa	platelet derived growth factor, alpha	369	374	360

18591	Pdgfb	platelet derived growth factor, B polypeptide	181	177	185
54635	Pdgfc	platelet-derived growth factor, C polypeptide	1302	1289	1259
18595	Pdgfra	platelet derived growth factor receptor, alpha polypeptide	659	655	651
18596	Pdgfrb	platelet derived growth factor receptor, beta polypeptide	89	89	82
18597	Pdha1	pyruvate dehydrogenase E1 alpha 1	516	497	490
18598	Pdha2	pyruvate dehydrogenase E1 alpha 2	2836	2863	2801
68263	Pdhb	pyruvate dehydrogenase (lipoamide) beta	148	155	153
27402	Pd hx	pyruvate dehydrogenase complex, component X	230	221	231
69191	Pdia2	protein disulfide isomerase associated 2	79	85	76
14827	Pdia3	protein disulfide isomerase associated 3	41	40	39
12304	Pdia4	protein disulfide isomerase associated 4	30	34	33
72599	Pdia5	protein disulfide isomerase associated 5	226	224	228
71853	Pdia6	protein disulfide isomerase associated 6	197	191	191
230809	Pdik11	PDLIM1 interacting kinase 1 like	74	79	77
228026	Pdk1	pyruvate dehydrogenase kinase, isoenzyme 1	272	249	263
18604	Pdk2	pyruvate dehydrogenase kinase, isoenzyme 2	89	86	87
236900	Pdk3	pyruvate dehydrogenase kinase, isoenzyme 3	355	353	361
27273	Pdk4	pyruvate dehydrogenase kinase, isoenzyme 4	429	432	426
381511	Pdp1	pyruvate dehydrogenase phosphatase catalytic subunit 1	423	429	412
382051	Pdp2	pyruvate dehydrogenase phosphatase catalytic subunit 2	110	106	108
18607	Pd pk1	3-phosphoinositide dependent protein kinase 1	120	119	113
14726	Pd pn	podoplanin	171	180	181
319518	Pd pr	pyruvate dehydrogenase phosphatase regulatory subunit	224	230	235
68559	Pd rg1	p53 and DNA damage regulated 1	87	86	90
71521	Pds5a	PDS5, regulator of cohesion maintenance, homolog A (S. cerevisiae)	304	310	286
56075	Pdss1	prenyl (solaneyl) diphosphate synthase, subunit 1	338	348	331
71365	Pdss2	prenyl (solaneyl) diphosphate synthase, subunit 2	377	397	388
18609	Pdx1	pancreatic and duodenal homeobox 1	157	147	157
94184	Pdx dc1	pyridoxal-dependent decarboxylase domain containing 1	154	153	152
216134	Pd xk	pyridoxal (pyridoxine, vitamin B6) kinase	197	196	188
57028	Pd xp	pyridoxal (pyridoxine, vitamin B6) phosphatase	32	30	28
55983	Pd zrn3	PDZ domain containing RING finger 3	1211	1215	1205
23980	Pebp1	phosphatidylethanolamine binding protein 1	240	227	242
18613	Pecam1	platelet/endothelial cell adhesion molecule 1	176	177	175
111175	Pecr	peroxisomal trans-2-enoyl-CoA reductase	98	91	97
67245	Peli1	pellino 1	524	521	523
93834	Peli2	pellino 2	677	681	694
240518	Peli3	pellino 3	42	40	46
105083	Pelo	pelota homolog (Drosophila)	211	213	217
75273	Pelp1	proline, glutamic acid and leucine rich protein 1	105	109	103
18618	Pemt	phosphatidylethanolamine N-methyltransferase	179	180	186
226153	Peo1	progressive external ophthalmoplegia 1 (human)	8	10	13
18624	Pepd	peptidase D	311	313	301
18626	Per1	period homolog 1 (Drosophila)	35	40	35
18627	Per2	period homolog 2 (Drosophila)	106	107	106
18628	Per3	period homolog 3 (Drosophila)	84	82	77
64934	Pes1	pescadillo homolog 1, containing BRCT domain (zebrafish)	64	71	64
229487	Pet112l	PET112-like (yeast)	994	1016	1000
56273	Pex14	peroxisomal biogenesis factor 14	384	393	373
19305	Pex5	peroxisomal biogenesis factor 5	136	139	139
224824	Pex6	peroxisomal biogenesis factor 6	30	29	32
18634	Pex7	peroxisomal biogenesis factor 7	105	106	105
56744	Pf4	platelet factor 4	22	22	21
237823	Pfas	phosphoribosylformylglycinamide synthase (FGAR amidotransferase)	34	33	33
18637	Pfdn2	prefoldin 2	21	19	17

56612	Pfdn5	prefoldin 5	46	44	48
18639	Pfkfb1	6-phosphofructo-2-kinase/fructose-2,6-biphosphatase 1	89	83	80
18640	Pfkfb2	6-phosphofructo-2-kinase/fructose-2,6-biphosphatase 2	70	64	71
170768	Pfkfb3	6-phosphofructo-2-kinase/fructose-2,6-biphosphatase 3	624	633	619
270198	Pfkfb4	6-phosphofructo-2-kinase/fructose-2,6-biphosphatase 4	70	68	73
18641	Pfkl	phosphofructokinase, liver, B-type	85	85	81
18642	Pfkm	phosphofructokinase, muscle	182	191	181
56421	Pfkp	phosphofructokinase, platelet	2090	2133	2089
18643	Pfn1	profilin 1	9	10	8
58803	Pga5	pepsinogen 5, group I	75	74	69
18648	Pgam1	phosphoglycerate mutase 1	49	46	42
56012	Pgam2	phosphoglycerate mutase 2	67	62	63
241062	Pgap1	post-GPI attachment to proteins 1	621	625	625
233575	Pgap2	post-GPI attachment to proteins 2	52	53	50
320655	Pgap3	post-GPI attachment to proteins 3	31	33	32
109820	Pgc	progastricsin (pepsinogen C)	58	54	53
54381	Pgcp	plasma glutamate carboxypeptidase	616	626	609
110208	Pgd	phosphogluconate dehydrogenase	231	223	225
225467	Pggt1b	protein geranylgeranyltransferase type I, beta subunit	133	127	127
18655	Pgk1	phosphoglycerate kinase 1	96	101	99
18663	Pgk2	phosphoglycerate kinase 2	500	515	499
66171	Pgls	6-phosphogluconolactonase	37	33	36
21946	Pglyrp1	peptidoglycan recognition protein 1	101	92	91
57757	Pglyrp2	peptidoglycan recognition protein 2	62	59	58
242100	Pglyrp3	peptidoglycan recognition protein 3	1265	1290	1283
384997	Pglyrp4	peptidoglycan recognition protein 4	482	484	487
66681	Pgm1	phosphoglucomutase 1	233	241	242
72157	Pgm2	phosphoglucomutase 2	350	356	348
70974	Pgm2l1	phosphoglucomutase 2-like 1	104	102	104
109785	Pgm3	phosphoglucomutase 3	133	130	134
226041	Pgm5	phosphoglucomutase 5	280	295	290
67078	Pgp	phosphoglycolate phosphatase	20	20	16
66522	Pgpep1	pyroglutamyl-peptidase I	53	52	55
78444	Pgpep1l	pyroglutamyl-peptidase I-like	419	420	418
18667	Pgr	progesterone receptor	884	873	872
74451	Pgs1	phosphatidylglycerophosphate synthase 1	199	202	215
18673	Phb	prohibitin	180	166	187
12034	Phb2	prohibitin 2	6	5	7
18675	Phex	phosphate regulating gene with homologies to endopeptidases on	1149	1161	1106
21652	Phf1	PHD finger protein 1	30	25	31
72057	Phf10	PHD finger protein 10	39	37	36
268448	Phf12	PHD finger protein 12	128	129	132
230936	Phf13	PHD finger protein 13	21	20	21
76901	Phf15	PHD finger protein 15	266	256	253
382207	Phf16	PHD finger protein 16	216	210	209
269424	Phf17	PHD finger protein 17	867	877	859
74016	Phf19	PHD finger protein 19	108	110	108
18676	Phf2	PHD finger protein 2	380	383	376
228829	Phf20	PHD finger protein 20	175	177	172
192285	Phf21a	PHD finger protein 21A	448	446	460
68479	Phf5a	PHD finger protein 5A	21	23	21
70998	Phf6	PHD finger protein 6	244	238	232
320595	Phf8	PHD finger protein 8	559	563	555
236539	Phgdh	3-phosphoglycerate dehydrogenase	137	135	131
83946	Phip	pleckstrin homology domain interacting protein	412	397	389

18679	Phka1	phosphorylase kinase alpha 1	240	241	244
110094	Phka2	phosphorylase kinase alpha 2	408	396	403
102093	Phkb	phosphorylase kinase beta	902	916	911
18682	Phkg1	phosphorylase kinase gamma 1	55	57	54
68961	Phkg2	phosphorylase kinase, gamma 2 (testis)	74	76	75
21664	Phlda1	pleckstrin homology-like domain, family A, member 1	620	596	594
98432	Phlpp1	PH domain and leucine rich repeat protein phosphatase 1	916	919	922
244650	Phlpp2	PH domain and leucine rich repeat protein phosphatase 2	151	159	155
237928	Phospho1	phosphatase, orphan 1	121	114	115
73373	Phospho2	phosphatase, orphan 2	42	48	41
11859	Phox2a	paired-like homeobox 2a	216	220	228
18935	Phox2b	paired-like homeobox 2b	659	670	648
75454	Phpt1	phosphohistidine phosphatase 1	10	8	9
101471	Phrf1	PHD and ring finger domains 1	61	62	57
18685	Phtf1	putative homeodomain transcription factor 1	69	69	63
68770	Phtf2	putative homeodomain transcription factor 2	1237	1249	1255
16922	Phyh	phytanoyl-CoA hydroxylase	124	121	127
227696	Phyh1	phytanoyl-CoA dioxygenase domain containing 1	62	62	59
84095	Pi4k2a	phosphatidylinositol 4-kinase type 2 alpha	58	54	52
67073	Pi4k2b	phosphatidylinositol 4-kinase type 2 beta	140	143	145
224020	Pi4ka	phosphatidylinositol 4-kinase, catalytic, alpha polypeptide	56	62	62
107650	Pi4kb	phosphatidylinositol 4-kinase, catalytic, beta polypeptide	78	81	79
56469	Pias1	protein inhibitor of activated STAT 1	375	380	366
17344	Pias2	protein inhibitor of activated STAT 2	175	170	171
229615	Pias3	protein inhibitor of activated STAT 3	47	51	45
59004	Pias4	protein inhibitor of activated STAT 4	48	48	46
233489	Picalm	phosphatidylinositol binding clathrin assembly protein	319	317	298
18693	Pick1	protein interacting with C kinase 1	110	112	112
18700	Piga	phosphatidylinositol glycan anchor biosynthesis, class A	82	80	72
55981	Pigb	phosphatidylinositol glycan anchor biosynthesis, class B	82	81	75
67292	Pigc	phosphatidylinositol glycan anchor biosynthesis, class C	15	14	12
18701	Pigf	phosphatidylinositol glycan anchor biosynthesis, class F	80	78	78
433931	Pigg	phosphatidylinositol glycan anchor biosynthesis, class G	152	153	151
329777	Pigk	phosphatidylinositol glycan anchor biosynthesis, class K	402	401	407
327942	Pigl	phosphatidylinositol glycan anchor biosynthesis, class L	114	110	109
67556	Pigm	phosphatidylinositol glycan anchor biosynthesis, class M	163	178	169
27392	Pign	phosphatidylinositol glycan anchor biosynthesis, class N	393	408	383
56703	Pigo	phosphatidylinositol glycan anchor biosynthesis, class O	25	22	28
56176	Pigp	phosphatidylinositol glycan anchor biosynthesis, class P	250	243	249
14755	Pigq	phosphatidylinositol glycan anchor biosynthesis, class Q	30	30	28
276846	Pigs	phosphatidylinositol glycan anchor biosynthesis, class S	28	26	26
78928	Pigt	phosphatidylinositol glycan anchor biosynthesis, class T	90	93	91
228812	Pigu	phosphatidylinositol glycan anchor biosynthesis, class U	35	31	34
230801	Pigv	phosphatidylinositol glycan anchor biosynthesis, class V	160	149	155
70325	Pigw	phosphatidylinositol glycan anchor biosynthesis, class W	59	59	66
72084	Pigx	phosphatidylinositol glycan anchor biosynthesis, class X	31	24	25
66459	Pigy	phosphatidylinositol glycan anchor biosynthesis, class Y	157	149	147
66268	Pigyl	phosphatidylinositol glycan anchor biosynthesis, class Y-like	71	67	63
239827	Pigz	phosphatidylinositol glycan anchor biosynthesis, class Z	86	93	81
18704	Pik3c2a	phosphatidylinositol 3-kinase, C2 domain containing, alpha polypeptide	230	227	236
240752	Pik3c2b	phosphoinositide-3-kinase, class 2, beta polypeptide	135	131	135
18705	Pik3c2g	phosphatidylinositol 3-kinase, C2 domain containing, gamma polypeptide	881	896	865
225326	Pik3c3	phosphoinositide-3-kinase, class 3	7028	7097	7012
18706	Pik3ca	phosphatidylinositol 3-kinase, catalytic, alpha polypeptide	166	158	162
74769	Pik3cb	phosphatidylinositol 3-kinase, catalytic, beta polypeptide	266	281	269

18707	Pik3cd	phosphatidylinositol 3-kinase catalytic delta polypeptide	249	243	237
30955	Pik3cg	phosphoinositide-3-kinase, catalytic, gamma polypeptide	401	413	401
18708	Pik3r1	phosphatidylinositol 3-kinase, regulatory subunit, polypeptide 1 (p8	2507	2487	2468
18710	Pik3r3	phosphatidylinositol 3 kinase, regulatory subunit, polypeptide 3 (p5	375	393	372
75669	Pik3r4	phosphatidylinositol 3 kinase, regulatory subunit, polypeptide 4, p1	410	380	397
320207	Pik3r5	phosphoinositide-3-kinase, regulatory subunit 5, p101	151	150	150
18711	Pikfyve	phosphoinositide kinase, FYVE finger containing	157	157	161
18712	Pim1	proviral integration site 1	244	227	238
18715	Pim2	proviral integration site 2	54	48	48
223775	Pim3	proviral integration site 3	162	171	172
23988	Pin1	protein (peptidyl-prolyl cis/trans isomerase) NIMA-interacting 1	103	101	105
69713	Pin4	protein (peptidyl-prolyl cis/trans isomerase) NIMA-interacting, 4 (pæ	111	110	107
68943	Pink1	PTEN induced putative kinase 1	79	80	77
72400	Pinx1	PIN2/TERF1 interacting, telomerase inhibitor 1	266	292	277
212167	Pion	pigeon homolog (Drosophila)	388	416	411
18718	Pip4k2a	phosphatidylinositol-5-phosphate 4-kinase, type II, alpha	377	395	381
108083	Pip4k2b	phosphatidylinositol-5-phosphate 4-kinase, type II, beta	82	76	73
117150	Pip4k2c	phosphatidylinositol-5-phosphate 4-kinase, type II, gamma	92	86	86
18720	Pip5k1a	phosphatidylinositol-4-phosphate 5-kinase, type 1 alpha	93	91	96
18719	Pip5k1b	phosphatidylinositol-4-phosphate 5-kinase, type 1 beta	249	253	245
18717	Pip5k1c	phosphatidylinositol-4-phosphate 5-kinase, type 1 gamma	34	33	36
227733	Pip5k1l	phosphatidylinositol-4-phosphate 5-kinase-like 1	22	22	17
19193	Pipox	pipecolic acid oxidase	198	183	197
69656	Pir	pirin	140	137	137
320951	Pisd	phosphatidylserine decarboxylase	257	261	258
71795	Pitpnc1	phosphatidylinositol transfer protein, cytoplasmic 1	387	376	375
69617	Pitrm1	pitrilysin metalloproteinase 1	981	999	1003
18740	Pitx1	paired-like homeodomain transcription factor 1	445	445	435
18741	Pitx2	paired-like homeodomain transcription factor 2	1812	1832	1813
18742	Pitx3	paired-like homeodomain transcription factor 3	25	26	23
57749	Piwil1	piwi-like homolog 1 (Drosophila)	468	451	461
57746	Piwil2	piwi-like homolog 2 (Drosophila)	124	118	121
330890	Piwil4	piwi-like homolog 4 (Drosophila)	179	181	193
18744	Pja1	praja1, RING-H2 motif containing	467	472	461
224938	Pja2	praja 2, RING-H2 motif containing	838	838	841
18763	Pkd1	polycystic kidney disease 1 homolog	128	127	125
18764	Pkd2	polycystic kidney disease 2	95	99	92
106522	Pkdcc	protein kinase domain containing, cytoplasmic	2031	2068	2048
18767	Pkia	protein kinase inhibitor, alpha	1128	1112	1102
18768	Pkib	protein kinase inhibitor beta, cAMP dependent, testis specific	350	343	354
18769	Pkig	protein kinase inhibitor, gamma	192	179	182
18770	Pklr	pyruvate kinase liver and red blood cell	59	53	52
18746	Pkm2	pyruvate kinase, muscle	112	122	119
268930	Pkmyt1	protein kinase, membrane associated tyrosine/threonine 1	75	73	72
320795	Pkn1	protein kinase N1	71	69	67
109333	Pkn2	protein kinase N2	1830	1852	1834
263803	Pkn3	protein kinase N3	32	31	35
18771	Pknx1	Pbx/knotted 1 homeobox	152	154	150
85031	Pla1a	phospholipase A1 member A	117	124	115
26565	Pla2g10	phospholipase A2, group X	145	138	142
66350	Pla2g12a	phospholipase A2, group XIIA	89	86	86
69836	Pla2g12b	phospholipase A2, group XIIIB	150	153	155
192654	Pla2g15	phospholipase A2, group XV	40	43	41
225845	Pla2g16	phospholipase A2, group XVI	141	141	153
18778	Pla2g1b	phospholipase A2, group IB, pancreas	67	74	67

18780	Pla2g2a	phospholipase A2, group IIA (platelets, synovial fluid)	59	63	57
18781	Pla2g2c	phospholipase A2, group IIC	43	38	46
18782	Pla2g2d	phospholipase A2, group IID	79	76	79
26970	Pla2g2e	phospholipase A2, group IIE	67	68	67
26971	Pla2g2f	phospholipase A2, group IIF	69	65	63
18783	Pla2g4a	phospholipase A2, group IVA (cytosolic, calcium-dependent)	4467	4532	4450
211429	Pla2g4b	phospholipase A2, group IVB (cytosolic)	160	154	158
232889	Pla2g4c	phospholipase A2, group IVC (cytosolic, calcium-independent)	163	154	155
78390	Pla2g4d	phospholipase A2, group IVD	93	94	90
329502	Pla2g4e	phospholipase A2, group IVE	175	178	175
271844	Pla2g4f	phospholipase A2, group IVF	83	80	85
18784	Pla2g5	phospholipase A2, group V	132	130	130
53357	Pla2g6	phospholipase A2, group VI	82	79	82
27226	Pla2g7	phospholipase A2, group VII (platelet-activating factor acetylhydrolase)	170	160	169
18779	Pla2r1	phospholipase A2 receptor 1	379	375	356
56711	Plag1	pleiomorphic adenoma gene 1	79	82	82
22634	Plagl1	pleiomorphic adenoma gene-like 1	211	208	217
54711	Plagl2	pleiomorphic adenoma gene-like 2	19	17	23
18791	Plat	plasminogen activator, tissue	127	124	124
18792	Plau	plasminogen activator, urokinase	172	180	177
18793	Plaur	plasminogen activator, urokinase receptor	43	47	45
665270	Plb1	phospholipase B1	581	562	577
66857	Plbd1	phospholipase B domain containing 1	343	347	343
71772	Plbd2	phospholipase B domain containing 2	38	40	38
18795	Plcb1	phospholipase C, beta 1	1205	1195	1186
18796	Plcb2	phospholipase C, beta 2	54	52	52
18797	Plcb3	phospholipase C, beta 3	41	41	42
18799	Plcd1	phospholipase C, delta 1	65	53	57
72469	Plcd3	phospholipase C, delta 3	86	84	92
18802	Plcd4	phospholipase C, delta 4	102	106	109
74055	Plce1	phospholipase C, epsilon 1	540	545	530
18803	Plcg1	phospholipase C, gamma 1	295	280	279
234779	Plcg2	phospholipase C, gamma 2	414	414	422
269437	Plch1	phospholipase C, eta 1	801	831	799
269615	Plch2	phospholipase C, eta 2	126	133	138
227120	Plcl1	phospholipase C-like 1	1631	1611	1579
224860	Plcl2	phospholipase C-like 2	1113	1113	1118
403178	Plcxd1	phosphatidylinositol-specific phospholipase C, X domain containing 1	148	140	140
239318	Plcxd3	phosphatidylinositol-specific phospholipase C, X domain containing 3	876	902	868
114875	Plcz1	phospholipase C, zeta 1	245	258	257
18805	Pld1	phospholipase D1	542	540	531
18806	Pld2	phospholipase D2	51	46	41
18807	Pld3	phospholipase D family, member 3	40	41	38
104759	Pld4	phospholipase D family, member 4	82	87	80
319455	Pld5	phospholipase D family, member 5	1084	1078	1071
194908	Pld6	phospholipase D family, member 6	191	181	188
56193	Plek	pleckstrin	135	131	134
101476	Plekha1	pleckstrin homology domain containing, family A (phosphoinositide 3-kinase)	212	217	209
18815	Plg	plasminogen	257	250	242
103968	Plin1	perilipin 1	38	37	37
18817	Plk1	polo-like kinase 1 (Drosophila)	70	68	66
20620	Plk2	polo-like kinase 2 (Drosophila)	1147	1177	1137
12795	Plk3	polo-like kinase 3 (Drosophila)	35	30	31
20873	Plk4	polo-like kinase 4 (Drosophila)	127	129	125
216166	Plk5	polo-like kinase 5 (Drosophila)	48	47	46

18822	Plod1	procollagen-lysine, 2-oxoglutarate 5-dioxygenase 1	44	44	45
26432	Plod2	procollagen lysine, 2-oxoglutarate 5-dioxygenase 2	111	116	108
26433	Plod3	procollagen-lysine, 2-oxoglutarate 5-dioxygenase 3	27	22	25
18823	Plp1	proteolipid protein (myelin) 1	110	108	110
53317	Plrg1	pleiotropic regulator 1, PRL1 homolog (Arabidopsis)	675	668	662
22038	Plscr1	phospholipid scramblase 1	100	106	103
18830	Pltp	phospholipid transfer protein	62	58	62
212933	Pm20d1	peptidase M20 domain containing 1	110	113	107
242377	Pm20d2	peptidase M20 domain containing 2	95	90	95
58801	Pmaip1	phorbol-12-myristate-13-acetate-induced protein 1	740	744	749
20431	Pmel	premelanosome protein	54	54	48
67037	Pmf1	polyamine-modulated factor 1	51	51	46
18854	Pml	promyelocytic leukemia	63	62	61
29858	Pmm1	phosphomannomutase 1	59	56	54
54128	Pmm2	phosphomannomutase 2	46	45	45
66865	Pmpca	peptidase (mitochondrial processing) alpha	28	22	26
73078	Pmpcb	peptidase (mitochondrial processing) beta	108	106	108
227099	Pms1	postmeiotic segregation increased 1 (S. cerevisiae)	140	140	136
18861	Pms2	postmeiotic segregation increased 2 (S. cerevisiae)	141	130	148
68603	Pmvk	phosphomevalonate kinase	107	110	114
93843	Pnck	pregnancy upregulated non-ubiquitously expressed CaM kinase	42	43	40
59047	Pnkp	polynucleotide kinase 3'- phosphatase	20	22	22
69060	Pnlip	pancreatic lipase	277	266	281
18946	Pnliprp1	pancreatic lipase related protein 1	124	114	117
18947	Pnliprp2	pancreatic lipase-related protein 2	88	82	84
18948	Pnmt	phenylethanolamine-N-methyltransferase	17	19	19
18949	Pnn	pinin	47	45	43
18950	Pnp	purine-nucleoside phosphorylase	35	30	34
433091	Pnpla1	patatin-like phospholipase domain containing 1	154	137	152
66853	Pnpla2	patatin-like phospholipase domain containing 2	15	12	19
116939	Pnpla3	patatin-like phospholipase domain containing 3	87	93	93
75772	Pnpla5	patatin-like phospholipase domain containing 5	85	82	82
50767	Pnpla6	patatin-like phospholipase domain containing 6	86	86	89
241274	Pnpla7	patatin-like phospholipase domain containing 7	106	101	111
67452	Pnpla8	patatin-like phospholipase domain containing 8	145	155	155
103711	Pnpo	pyridoxine 5'-phosphate oxidase	22	20	21
71701	Pnpt1	polyribonucleotide nucleotidyltransferase 1	412	424	409
52830	Pnrc2	proline-rich nuclear receptor coactivator 2	48	54	48
140484	Pofut1	protein O-fucosyltransferase 1	64	62	67
80294	Pofut2	protein O-fucosyltransferase 2	215	200	207
224143	Poglut1	protein O-glucosyltransferase 1	48	49	50
18968	Pola1	polymerase (DNA directed), alpha 1	429	426	401
18969	Pola2	polymerase (DNA directed), alpha 2	83	79	83
18970	Polb	polymerase (DNA directed), beta	90	88	90
18971	Pold1	polymerase (DNA directed), delta 1, catalytic subunit	29	22	27
18972	Pold2	polymerase (DNA directed), delta 2, regulatory subunit	52	48	44
67967	Pold3	polymerase (DNA-directed), delta 3, accessory subunit	203	201	192
69745	Pold4	polymerase (DNA-directed), delta 4	72	71	73
73826	Poldip3	polymerase (DNA-directed), delta interacting protein 3	32	35	32
18973	Pole	polymerase (DNA directed), epsilon	71	79	78
18974	Pole2	polymerase (DNA directed), epsilon 2 (p59 subunit)	58	55	57
59001	Pole3	polymerase (DNA directed), epsilon 3 (p17 subunit)	6	6	6
66979	Pole4	polymerase (DNA-directed), epsilon 4 (p12 subunit)	489	488	472
18975	Polg	polymerase (DNA directed), gamma	146	142	146
50776	Polg2	polymerase (DNA directed), gamma 2, accessory subunit	37	40	40

80905	Polh	polymerase (DNA directed), eta (RAD 30 related)	51	59	60
26447	Poli	polymerase (DNA directed), iota	122	123	125
27015	Polk	polymerase (DNA directed), kappa	88	92	91
56626	Poll	polymerase (DNA directed), lambda	257	258	249
54125	Polm	polymerase (DNA directed), mu	76	76	76
272158	Poln	DNA polymerase N	23	22	25
77782	Polq	polymerase (DNA directed), theta	505	509	496
20019	Polr1a	polymerase (RNA) I polypeptide A	256	247	242
20017	Polr1b	polymerase (RNA) I polypeptide B	88	82	85
20016	Polr1c	polymerase (RNA) I polypeptide C	22	20	19
64424	Polr1e	polymerase (RNA) I polypeptide E	89	90	87
20020	Polr2a	polymerase (RNA) II (DNA directed) polypeptide A	93	90	91
231329	Polr2b	polymerase (RNA) II (DNA directed) polypeptide B	135	124	134
20021	Polr2c	polymerase (RNA) II (DNA directed) polypeptide C	44	48	54
69241	Polr2d	polymerase (RNA) II (DNA directed) polypeptide D	58	57	59
66420	Polr2e	polymerase (RNA) II (DNA directed) polypeptide E	49	44	45
69833	Polr2f	polymerase (RNA) II (DNA directed) polypeptide F	28	29	30
67710	Polr2g	polymerase (RNA) II (DNA directed) polypeptide G	19	22	23
245841	Polr2h	polymerase (RNA) II (DNA directed) polypeptide H	16	16	15
69920	Polr2i	polymerase (RNA) II (DNA directed) polypeptide I	70	60	61
20022	Polr2j	polymerase (RNA) II (DNA directed) polypeptide J	70	67	64
17749	Polr2k	polymerase (RNA) II (DNA directed) polypeptide K	18	18	21
66491	Polr2l	polymerase (RNA) II (DNA directed) polypeptide L	8	9	7
218832	Polr3a	polymerase (RNA) III (DNA directed) polypeptide A	260	254	262
70428	Polr3b	polymerase (RNA) III (DNA directed) polypeptide B	223	235	222
74414	Polr3c	polymerase (RNA) III (DNA directed) polypeptide C	28	27	27
67065	Polr3d	polymerase (RNA) III (DNA directed) polypeptide D	20	18	20
26939	Polr3e	polymerase (RNA) III (DNA directed) polypeptide E	182	170	180
70408	Polr3f	polymerase (RNA) III (DNA directed) polypeptide F	29	32	31
67486	Polr3g	polymerase (RNA) III (DNA directed) polypeptide G	73	69	70
78929	Polr3h	polymerase (RNA) III (DNA directed) polypeptide H	87	80	85
67005	Polr3k	polymerase (RNA) III (DNA directed) polypeptide K	192	189	195
216151	Polrmt	polymerase (RNA) mitochondrial (DNA directed)	45	43	44
18976	Pomc	pro-opiomelanocortin-alpha	195	189	187
68273	Pomgnt1	protein O-linked mannose beta 1,2-N-acetylglucosaminyltransferase	27	29	30
99011	Pomt1	protein-O-mannosyltransferase 1	138	136	141
217734	Pomt2	protein-O-mannosyltransferase 2	69	70	71
18979	Pon1	paraoxonase 1	460	458	449
330260	Pon2	paraoxonase 2	167	156	160
269823	Pon3	paraoxonase 3	128	135	131
67724	Pop1	processing of precursor 1, ribonuclease P/MRP family, (S. cerevisiae)	236	235	228
66161	Pop4	processing of precursor 4, ribonuclease P/MRP family, (S. cerevisiae)	390	388	384
117109	Pop5	processing of precursor 5, ribonuclease P/MRP family (S. cerevisiae)	112	106	115
74097	Pop7	processing of precursor 7, ribonuclease P family, (S. cerevisiae)	45	40	42
18984	Por	P450 (cytochrome) oxidoreductase	147	148	146
53627	Porcn	porcupine homolog (Drosophila)	79	68	69
101185	Pot1a	protection of telomeres 1A	2777	2794	2727
72836	Pot1b	protection of telomeres 1B	170	163	157
18736	Pou1f1	POU domain, class 1, transcription factor 1	565	580	558
18985	Pou2af1	POU domain, class 2, associating factor 1	210	220	202
18986	Pou2f1	POU domain, class 2, transcription factor 1	521	529	519
18987	Pou2f2	POU domain, class 2, transcription factor 2	171	172	179
18988	Pou2f3	POU domain, class 2, transcription factor 3	157	154	156
18991	Pou3f1	POU domain, class 3, transcription factor 1	999	972	999
18992	Pou3f2	POU domain, class 3, transcription factor 2	2661	2699	2655

18993	Pou3f3	POU domain, class 3, transcription factor 3	4	2	3
18994	Pou3f4	POU domain, class 3, transcription factor 4	847	862	812
18996	Pou4f1	POU domain, class 4, transcription factor 1	857	850	847
18997	Pou4f2	POU domain, class 4, transcription factor 2	382	364	368
18999	Pou5f1	POU domain, class 5, transcription factor 1	58	60	62
75507	Pou5f2	POU domain class 5, transcription factor 2	612	624	610
19009	Pou6f1	POU domain, class 6, transcription factor 1	84	75	83
218030	Pou6f2	POU domain, class 6, transcription factor 2	932	929	935
67895	Ppa1	pyrophosphatase (inorganic) 1	112	117	98
74776	Ppa2	pyrophosphatase (inorganic) 2	392	396	398
19012	Ppap2a	phosphatidic acid phosphatase type 2A	335	353	341
67916	Ppap2b	phosphatidic acid phosphatase type 2B	1543	1555	1538
50784	Ppap2c	phosphatidic acid phosphatase type 2C	99	105	106
381925	Ppapdc1a	phosphatidic acid phosphatase type 2 domain containing 1A	1108	1097	1087
71910	Ppapdc1b	phosphatidic acid phosphatase type 2 domain containing 1B	139	149	146
19013	Ppara	peroxisome proliferator activated receptor alpha	136	126	124
19015	Ppard	peroxisome proliferator activator receptor delta	142	137	134
19016	Pparg	peroxisome proliferator activated receptor gamma	459	460	471
19017	Ppargc1a	peroxisome proliferative activated receptor, gamma, coactivator 1 alpha	2674	2757	2689
170826	Ppargc1b	peroxisome proliferative activated receptor, gamma, coactivator 1 beta	401	406	409
231327	Ppat	phosphoribosyl pyrophosphate amidotransferase	32	29	30
66812	Ppcdc	phosphopantothenoylecysteine decarboxylase	268	261	271
237178	Ppef1	protein phosphatase with EF hand calcium-binding domain 1	323	324	312
19023	Ppef2	protein phosphatase, EF hand calcium-binding domain 2	81	78	80
19024	Ppfibp2	PTPRF interacting protein, binding protein 2 (liprin beta 2)	260	271	265
19035	Ppib	peptidylprolyl isomerase B	218	203	212
19038	Ppic	peptidylprolyl isomerase C	280	275	281
67738	Ppid	peptidylprolyl isomerase D (cyclophilin D)	81	76	79
56031	Ppie	peptidylprolyl isomerase E (cyclophilin E)	91	89	81
105675	Ppif	peptidylprolyl isomerase F (cyclophilin F)	147	155	142
228005	Ppig	peptidyl-prolyl isomerase G (cyclophilin G)	93	98	98
66101	Ppih	peptidyl prolyl isomerase H	157	152	164
68816	Ppil1	peptidylprolyl isomerase (cyclophilin)-like 1	41	42	44
66053	Ppil2	peptidylprolyl isomerase (cyclophilin)-like 2	71	72	74
70225	Ppil3	peptidylprolyl isomerase (cyclophilin)-like 3	33	34	30
67418	Ppil4	peptidylprolyl isomerase (cyclophilin)-like 4	62	62	70
73075	Ppil6	peptidylprolyl isomerase (cyclophilin)-like 6	38	36	34
327655	Ppip5k1	diphosphoinositol pentakisphosphate kinase 1	85	86	90
227399	Ppip5k2	diphosphoinositol pentakisphosphate kinase 2	134	138	141
19042	Ppm1a	protein phosphatase 1A, magnesium dependent, alpha isoform	337	325	331
19043	Ppm1b	protein phosphatase 1B, magnesium dependent, beta isoform	332	325	325
53892	Ppm1d	protein phosphatase 1D magnesium-dependent, delta isoform	158	155	152
320472	Ppm1e	protein phosphatase 1E (PP2C domain containing)	363	356	359
68606	Ppm1f	protein phosphatase 1F (PP2C domain containing)	156	153	147
14208	Ppm1g	protein phosphatase 1G (formerly 2C), magnesium-dependent, gamma isoform	50	50	49
71887	Ppm1j	protein phosphatase 1J	12	11	15
243382	Ppm1k	protein phosphatase 1K (PP2C domain containing)	193	189	184
242083	Ppm1l	protein phosphatase 1 (formerly 2C)-like	485	490	485
67905	Ppm1m	protein phosphatase 1M	27	34	31
72590	Ppme1	protein phosphatase methylesterase 1	108	108	109
19044	Ppox	protoporphyrinogen oxidase	21	20	25
19045	Ppp1ca	protein phosphatase 1, catalytic subunit, alpha isoform	9	13	11
19046	Ppp1cb	protein phosphatase 1, catalytic subunit, beta isoform	338	333	335
19047	Ppp1cc	protein phosphatase 1, catalytic subunit, gamma isoform	92	92	88
52040	Ppp1r10	protein phosphatase 1, regulatory subunit 10	1	2	2

17931	Ppp1r12a	protein phosphatase 1, regulatory (inhibitor) subunit 12A	532	533	519
333654	Ppp1r13l	protein phosphatase 1, regulatory (inhibitor) subunit 13 like	27	26	26
108954	Ppp1r15b	protein phosphatase 1, regulatory (inhibitor) subunit 15b	260	267	253
58200	Ppp1r1a	protein phosphatase 1, regulatory (inhibitor) subunit 1A	78	81	81
19049	Ppp1r1b	protein phosphatase 1, regulatory (inhibitor) subunit 1B	33	34	32
66849	Ppp1r2	protein phosphatase 1, regulatory (inhibitor) subunit 2	144	149	153
140491	Ppp1r3a	protein phosphatase 1, regulatory (inhibitor) subunit 3A	1285	1300	1277
244416	Ppp1r3b	protein phosphatase 1, regulatory (inhibitor) subunit 3B	678	687	667
53412	Ppp1r3c	protein phosphatase 1, regulatory (inhibitor) subunit 3C	182	183	182
100336	Ppp1r8	protein phosphatase 1, regulatory (inhibitor) subunit 8	113	121	115
19052	Ppp2ca	protein phosphatase 2 (formerly 2A), catalytic subunit, alpha isoform	165	166	158
19053	Ppp2cb	protein phosphatase 2 (formerly 2A), catalytic subunit, beta isoform	87	91	93
51792	Ppp2r1a	protein phosphatase 2 (formerly 2A), regulatory subunit A (PR 65),	105	104	104
71978	Ppp2r2a	protein phosphatase 2 (formerly 2A), regulatory subunit B (PR 52),	294	291	291
110854	Ppp2r4	protein phosphatase 2A, regulatory subunit B (PR 53)	74	74	83
226849	Ppp2r5a	protein phosphatase 2, regulatory subunit B (B56), alpha isoform	321	327	310
225849	Ppp2r5b	protein phosphatase 2, regulatory subunit B (B56), beta isoform	22	16	17
26931	Ppp2r5c	protein phosphatase 2, regulatory subunit B (B56), gamma isoform	451	458	442
21770	Ppp2r5d	protein phosphatase 2, regulatory subunit B (B56), delta isoform	39	37	41
19055	Ppp3ca	protein phosphatase 3, catalytic subunit, alpha isoform	1255	1276	1280
19056	Ppp3cb	protein phosphatase 3, catalytic subunit, beta isoform	98	97	94
19058	Ppp3r1	protein phosphatase 3, regulatory subunit B, alpha isoform (calcine	191	205	198
19059	Ppp3r2	protein phosphatase 3, regulatory subunit B, alpha isoform (calcine	283	277	277
56420	Ppp4c	protein phosphatase 4, catalytic subunit	21	21	22
232314	Ppp4r2	protein phosphatase 4, regulatory subunit 2	872	893	859
19060	Ppp5c	protein phosphatase 5, catalytic subunit	77	81	79
67857	Ppp6c	protein phosphatase 6, catalytic subunit	4328	4414	4296
226169	Pprc1	peroxisome proliferative activated receptor, gamma, coactivator-rel	42	38	42
19063	Ppt1	palmitoyl-protein thioesterase 1	277	250	256
54397	Ppt2	palmitoyl-protein thioesterase 2	15	15	18
238831	Ppwd1	peptidylprolyl isomerase domain and WD repeat containing 1	63	64	64
54633	Pqbp1	polyglutamine binding protein 1	16	15	16
72461	Prcp	prolylcarboxypeptidase (angiotensinase C)	261	269	266
12142	Prdm1	PR domain containing 1, with ZNF domain	918	920	888
382066	Prdm10	PR domain containing 10	151	142	147
70673	Prdm16	PR domain containing 16	473	452	460
72843	Prdm4	PR domain containing 4	68	73	69
70779	Prdm5	PR domain containing 5	355	350	347
225518	Prdm6	PR domain containing 6	416	423	411
77630	Prdm8	PR domain containing 8	281	289	283
213389	Prdm9	PR domain containing 9	228	227	232
18477	Prdx1	peroxiredoxin 1	75	74	74
21672	Prdx2	peroxiredoxin 2	16	18	17
11757	Prdx3	peroxiredoxin 3	39	39	40
53381	Prdx4	peroxiredoxin 4	417	432	422
54683	Prdx5	peroxiredoxin 5	68	65	63
11758	Prdx6	peroxiredoxin 6	307	299	311
50907	Preb	prolactin regulatory element binding	21	24	25
19072	Prep	prolyl endopeptidase	1065	1078	1067
213760	Prepl	prolyl endopeptidase-like	82	81	89
53856	Prg3	proteoglycan 3	73	73	68
231903	Prhoxnb	parahox cluster neighbor	128	127	129
106042	Prickle1	prickle homolog 1 (Drosophila)	1294	1293	1243
19075	Prim1	DNA primase, p49 subunit	43	36	36
19076	Prim2	DNA primase, p58 subunit	1443	1445	1407

170952	Prima1	proline rich membrane anchor 1	483	497	478
105787	Prkaa1	protein kinase, AMP-activated, alpha 1 catalytic subunit	86	80	92
108079	Prkaa2	protein kinase, AMP-activated, alpha 2 catalytic subunit	310	310	287
19079	Prkab1	protein kinase, AMP-activated, beta 1 non-catalytic subunit	301	304	300
108097	Prkab2	protein kinase, AMP-activated, beta 2 non-catalytic subunit	180	176	173
18747	Prkaca	protein kinase, cAMP dependent, catalytic, alpha	56	51	48
18749	Prkacb	protein kinase, cAMP dependent, catalytic, beta	309	319	305
19082	Prkag1	protein kinase, AMP-activated, gamma 1 non-catalytic subunit	75	73	80
108099	Prkag2	protein kinase, AMP-activated, gamma 2 non-catalytic subunit	583	589	568
241113	Prkag3	protein kinase, AMP-activated, gamma 3 non-catalytic subunit	80	80	79
19084	Prkar1a	protein kinase, cAMP dependent regulatory, type I, alpha	137	135	144
19085	Prkar1b	protein kinase, cAMP dependent regulatory, type I beta	189	203	199
19087	Prkar2a	protein kinase, cAMP dependent regulatory, type II alpha	172	170	174
19088	Prkar2b	protein kinase, cAMP dependent regulatory, type II beta	334	333	322
18750	Prkca	protein kinase C, alpha	606	603	627
18751	Prkcb	protein kinase C, beta	599	563	577
18752	Prkcc	protein kinase C, gamma	54	49	47
18753	Prkcd	protein kinase C, delta	125	119	137
18754	Prkce	protein kinase C, epsilon	773	783	780
18755	Prkch	protein kinase C, eta	463	466	455
18759	Prkci	protein kinase C, iota	163	158	161
18761	Prkck	protein kinase C, theta	1233	1241	1244
19089	Prkcsh	protein kinase C substrate 80K-H	60	61	66
18762	Prkcz	protein kinase C, zeta	219	212	217
18760	Prkd1	protein kinase D1	2458	2479	2419
101540	Prkd2	protein kinase D2	82	71	75
75292	Prkd3	protein kinase D3	157	159	157
19090	Prkdc	protein kinase, DNA activated, catalytic polypeptide	292	290	285
19091	Prkg1	protein kinase, cGMP-dependent, type I	936	952	942
19092	Prkg2	protein kinase, cGMP-dependent, type II	510	524	515
23992	Prkra	protein kinase, interferon inducible double stranded RNA dependent	298	315	306
66801	Prkrip1	Prkr interacting protein 1 (IL11 inducible)	92	93	100
72981	Prkrir	protein-kinase, interferon-inducible double stranded RNA dependent	220	231	224
19108	Prkx	protein kinase, X-linked	216	218	211
18811	Prl2c2	prolactin family 2, subfamily c, member 2	491	482	485
623503	Prlh	prolactin releasing hormone	61	71	59
226278	Prlhr	prolactin releasing hormone receptor	469	468	457
19118	Prm1	protamine 1	54	55	56
19119	Prm2	protamine 2	6	9	6
19120	Prm3	protamine 3	5	4	4
15469	Prmt1	protein arginine N-methyltransferase 1	24	29	26
102182	Prmt10	protein arginine methyltransferase 10 (putative)	119	120	109
15468	Prmt2	protein arginine N-methyltransferase 2	61	58	59
71974	Prmt3	protein arginine N-methyltransferase 3	197	188	193
27374	Prmt5	protein arginine N-methyltransferase 5	102	93	101
99890	Prmt6	protein arginine N-methyltransferase 6	3773	3836	3714
214572	Prmt7	protein arginine N-methyltransferase 7	166	157	166
381813	Prmt8	protein arginine N-methyltransferase 8	401	394	404
19122	Prnp	prion protein	116	116	113
19123	Proc	protein C	121	125	121
19125	Prodh	proline dehydrogenase	91	96	91
56189	Prodh2	proline dehydrogenase (oxidase) 2	66	67	69
246691	Prok1	prokineticin 1	74	74	72
19127	Prop1	paired like homeodomain factor 1	45	52	49
19130	Prox1	prospero-related homeobox 1	1264	1293	1256

73422	Prox2	prospero homeobox 2	152	151	148
66901	Proz	protein Z, vitamin K-dependent plasma glycoprotein	91	87	92
67229	Prpf18	PRP18 pre-mRNA processing factor 18 homolog (yeast)	197	215	209
28000	Prpf19	PRP19/PSO4 pre-mRNA processing factor 19 homolog (S. cerevis)	49	54	53
70767	Prpf3	PRP3 pre-mRNA processing factor 3 homolog (yeast)	73	65	65
68988	Prpf31	PRP31 pre-mRNA processing factor 31 homolog (yeast)	22	22	19
230596	Prpf38a	PRP38 pre-mRNA processing factor 38 (yeast) domain containing	146	153	149
66921	Prpf38b	PRP38 pre-mRNA processing factor 38 (yeast) domain containing	62	59	65
328110	Prpf39	PRP39 pre-mRNA processing factor 39 homolog (yeast)	133	141	137
70052	Prpf4	PRP4 pre-mRNA processing factor 4 homolog (yeast)	33	34	31
56194	Prpf40a	PRP40 pre-mRNA processing factor 40 homolog A (yeast)	421	428	427
54614	Prpf40b	PRP40 pre-mRNA processing factor 40 homolog B (yeast)	99	104	100
19134	Prpf4b	PRP4 pre-mRNA processing factor 4 homolog B (yeast)	226	230	224
68879	Prpf6	PRP6 pre-mRNA splicing factor 6 homolog (yeast)	97	97	96
192159	Prpf8	pre-mRNA processing factor 8	49	57	53
19139	Prps1	phosphoribosyl pyrophosphate synthetase 1	203	193	194
75456	Prps111	phosphoribosyl pyrophosphate synthetase 1-like 1	663	666	660
328099	Prps113	phosphoribosyl pyrophosphate synthetase 1-like 3	40	47	43
110639	Prps2	phosphoribosyl pyrophosphate synthetase 2	1504	1549	1469
67763	Prpsap1	phosphoribosyl pyrophosphate synthetase-associated protein 1	105	99	99
212627	Prpsap2	phosphoribosyl pyrophosphate synthetase-associated protein 2	182	191	174
66151	Prr13	proline rich 13	32	39	33
18933	Prrx1	paired related homeobox 1	409	407	384
107751	Prrx11	paired related homeobox protein-like 1	214	217	211
114228	Prss1	protease, serine, 1 (trypsin 1)	93	99	98
19142	Prss12	protease, serine, 12 neurotrypsin (motopsin)	155	158	162
54373	Prss16	protease, serine, 16 (thymus)	76	66	70
22072	Prss2	protease, serine, 2	186	179	186
57256	Prss21	protease, serine, 21	33	39	38
70835	Prss22	protease, serine, 22	80	85	78
76453	Prss23	protease, serine, 23	296	305	292
213171	Prss27	protease, serine, 27	100	90	98
114661	Prss28	protease, serine, 28	27	24	26
114662	Prss29	protease, serine, 29	50	50	50
22073	Prss3	protease, serine, 3	50	48	46
30943	Prss30	protease, serine, 30	57	57	54
69814	Prss32	protease, serine, 32	30	33	31
353130	Prss33	protease, serine, 33	19	19	20
328780	Prss34	protease, serine, 34	47	50	46
244954	Prss35	protease, serine, 35	183	192	193
77613	Prss36	protease, serine, 36	50	44	46
67690	Prss37	protease, serine, 37	66	68	68
216797	Prss38	protease, serine, 38	178	175	185
21755	Prss39	protease, serine, 39	98	88	94
21756	Prss40	protease, serine, 40	57	58	54
71003	Prss41	protease, serine, 41	20	20	25
235628	Prss42	protease, serine, 42	63	66	64
73336	Prss44	protease, serine, 44	38	35	40
260408	Prss45	protease, serine, 45	23	22	23
368202	Prss48	protease, serine, 48	255	265	261
235631	Prss50	protease, serine, 50	42	41	44
73382	Prss52	protease, serine, 52	453	467	460
330657	Prss53	protease, serine, 53	24	25	27
70993	Prss54	protease, serine, 54	128	131	123
73106	Prss57	protease, serine 57	22	21	21

232717	Prss58	protease, serine 58	68	68	63
76560	Prss8	protease, serine, 8 (prostasin)	41	42	40
19152	Prtn3	proteinase 3	11	14	14
19156	Psap	prosaposin	173	166	169
76943	Psapl1	prosaposin-like 1	639	647	654
107272	Psat1	phosphoserine aminotransferase 1	1775	1768	1752
19164	Psen1	presenilin 1	171	169	167
19165	Psen2	presenilin 2	175	181	181
66340	Psenen	presenilin enhancer 2 homolog (C. elegans)	4	5	5
26438	Psg18	pregnancy specific glycoprotein 18	242	243	236
56868	Psg23	pregnancy-specific glycoprotein 23	114	110	114
101739	Psip1	PC4 and SFRS1 interacting protein 1	139	137	134
244631	Pskh1	protein serine kinase H1	53	51	48
26440	Psma1	proteasome (prosome, macropain) subunit, alpha type 1	199	217	214
19166	Psma2	proteasome (prosome, macropain) subunit, alpha type 2	22	23	22
19167	Psma3	proteasome (prosome, macropain) subunit, alpha type 3	105	104	90
26441	Psma4	proteasome (prosome, macropain) subunit, alpha type 4	41	47	41
26442	Psma5	proteasome (prosome, macropain) subunit, alpha type 5	72	68	73
26443	Psma6	proteasome (prosome, macropain) subunit, alpha type 6	248	254	259
26444	Psma7	proteasome (prosome, macropain) subunit, alpha type 7	22	22	22
73677	Psma8	proteasome (prosome, macropain) subunit, alpha type, 8	127	131	129
19170	Psemb1	proteasome (prosome, macropain) subunit, beta type 1	133	143	134
19171	Psemb10	proteasome (prosome, macropain) subunit, beta type 10	13	14	15
73902	Psemb11	proteasome (prosome, macropain) subunit, beta type, 11	27	27	25
26445	Psemb2	proteasome (prosome, macropain) subunit, beta type 2	160	168	165
26446	Psemb3	proteasome (prosome, macropain) subunit, beta type 3	56	56	57
19172	Psemb4	proteasome (prosome, macropain) subunit, beta type 4	116	129	123
19173	Psemb5	proteasome (prosome, macropain) subunit, beta type 5	7	9	9
19175	Psemb6	proteasome (prosome, macropain) subunit, beta type 6	28	25	28
19177	Psemb7	proteasome (prosome, macropain) subunit, beta type 7	259	257	262
16913	Psemb8	proteasome (prosome, macropain) subunit, beta type 8 (large multi	22	17	22
16912	Psemb9	proteasome (prosome, macropain) subunit, beta type 9 (large multi	43	44	45
19179	Psmc1	protease (prosome, macropain) 26S subunit, ATPase 1	247	249	246
19181	Psmc2	proteasome (prosome, macropain) 26S subunit, ATPase 2	111	101	103
19182	Psmc3	proteasome (prosome, macropain) 26S subunit, ATPase 3	50	48	44
19183	Psmc3ip	proteasome (prosome, macropain) 26S subunit, ATPase 3, interac	42	46	43
23996	Psmc4	proteasome (prosome, macropain) 26S subunit, ATPase, 4	125	117	126
19184	Psmc5	protease (prosome, macropain) 26S subunit, ATPase 5	13	14	16
67089	Psmc6	proteasome (prosome, macropain) 26S subunit, ATPase, 6	46	41	44
53380	Psmc10	proteasome (prosome, macropain) 26S subunit, non-ATPase, 10	46	42	40
23997	Psmc13	proteasome (prosome, macropain) 26S subunit, non-ATPase, 13	21	26	24
59029	Psmc14	proteasome (prosome, macropain) 26S subunit, non-ATPase, 14	264	267	253
19185	Psmc4	proteasome (prosome, macropain) 26S subunit, non-ATPase, 4	120	124	122
66998	Psmc5	proteasome (prosome, macropain) 26S subunit, non-ATPase, 5	60	64	65
57296	Psmc8	proteasome (prosome, macropain) 26S subunit, non-ATPase, 8	57	60	61
67151	Psmc9	proteasome (prosome, macropain) 26S subunit, non-ATPase, 9	207	212	214
19192	Psme3	proteasome (prosome, macropain) 28 subunit, 3	31	27	31
66645	Pspc1	paraspeckle protein 1	187	183	189
100678	Psph	phosphoserine phosphatase	85	80	80
56742	Psrc1	proline/serine-rich coiled-coil 1	61	56	61
214580	Pstk	phosphoseryl-tRNA kinase	62	63	63
19200	Pstpip1	proline-serine-threonine phosphatase-interacting protein 1	152	153	159
19204	Ptafr	platelet-activating factor receptor	132	134	136
19205	Ptbp1	polypyrimidine tract binding protein 1	43	43	38
56195	Ptbp2	polypyrimidine tract binding protein 2	3347	3358	3224

19206	Ptch1	patched homolog 1	480	489	481
19210	Ptdss1	phosphatidylserine synthase 1	33	38	34
27388	Ptdss2	phosphatidylserine synthase 2	74	64	71
19211	Pten	phosphatase and tensin homolog	900	864	898
19212	Pter	phosphotriesterase related	726	747	738
19213	Ptf1a	pancreas specific transcription factor, 1a	234	228	227
19214	Ptgr	prostaglandin D receptor	335	343	335
19215	Ptgs	prostaglandin D2 synthase (brain)	47	42	44
64292	Ptges	prostaglandin E synthase	139	131	136
96979	Ptges2	prostaglandin E synthase 2	52	53	56
56351	Ptges3	prostaglandin E synthase 3 (cytosolic)	59	58	62
19223	Ptgis	prostaglandin I2 (prostacyclin) synthase	204	211	213
67103	Ptgr1	prostaglandin reductase 1	82	80	85
77219	Ptgr2	prostaglandin reductase 2	134	130	136
19224	Ptgs1	prostaglandin-endoperoxide synthase 1	295	295	298
19225	Ptgs2	prostaglandin-endoperoxide synthase 2	275	270	259
19226	Pth	parathyroid hormone	182	185	198
114640	Pth2	parathyroid hormone 2	33	28	34
19227	Pthlh	parathyroid hormone-like peptide	391	387	379
14083	Ptk2	PTK2 protein tyrosine kinase 2	420	417	430
19229	Ptk2b	PTK2 protein tyrosine kinase 2 beta	296	292	299
20459	Ptk6	PTK6 protein tyrosine kinase 6	32	37	33
71461	Ptk7	PTK7 protein tyrosine kinase 7	116	105	114
84113	Ptov1	prostate tumor over expressed gene 1	36	34	40
19243	Ptp4a1	protein tyrosine phosphatase 4a1	299	289	289
19244	Ptp4a2	protein tyrosine phosphatase 4a2	330	315	320
19245	Ptp4a3	protein tyrosine phosphatase 4a3	204	199	200
218232	Ptpdc1	protein tyrosine phosphatase domain containing 1	170	163	170
30963	Ptpla	protein tyrosine phosphatase-like (proline instead of catalytic argini	352	354	358
57874	Ptplad1	protein tyrosine phosphatase-like A domain containing 1	91	93	93
66775	Ptplad2	protein tyrosine phosphatase-like A domain containing 2	501	500	511
70757	Ptplb	protein tyrosine phosphatase-like (proline instead of catalytic argini	469	472	487
66461	Ptpmt1	protein tyrosine phosphatase, mitochondrial 1	47	44	51
19246	Ptpn1	protein tyrosine phosphatase, non-receptor type 1	408	380	398
19247	Ptpn11	protein tyrosine phosphatase, non-receptor type 11	251	248	261
19248	Ptpn12	protein tyrosine phosphatase, non-receptor type 12	304	301	299
19249	Ptpn13	protein tyrosine phosphatase, non-receptor type 13	522	532	519
19253	Ptpn18	protein tyrosine phosphatase, non-receptor type 18	78	74	71
19255	Ptpn2	protein tyrosine phosphatase, non-receptor type 2	173	180	170
19256	Ptpn20	protein tyrosine phosphatase, non-receptor type 20	608	608	607
24000	Ptpn21	protein tyrosine phosphatase, non-receptor type 21	150	163	154
19260	Ptpn22	protein tyrosine phosphatase, non-receptor type 22 (lymphoid)	108	108	97
104831	Ptpn23	protein tyrosine phosphatase, non-receptor type 23	102	101	106
545622	Ptpn3	protein tyrosine phosphatase, non-receptor type 3	566	559	549
19258	Ptpn4	protein tyrosine phosphatase, non-receptor type 4	331	326	327
19259	Ptpn5	protein tyrosine phosphatase, non-receptor type 5	171	173	175
15170	Ptpn6	protein tyrosine phosphatase, non-receptor type 6	36	38	37
320139	Ptpn7	protein tyrosine phosphatase, non-receptor type 7	17	16	17
56294	Ptpn9	protein tyrosine phosphatase, non-receptor type 9	160	157	154
19262	Ptpra	protein tyrosine phosphatase, receptor type, A	178	174	178
19263	Ptprb	protein tyrosine phosphatase, receptor type, B	313	304	299
19264	Ptprc	protein tyrosine phosphatase, receptor type, C	379	389	370
19266	Ptprd	protein tyrosine phosphatase, receptor type, D	7623	7711	7501
19267	Ptpre	protein tyrosine phosphatase, receptor type, E	49	51	49
19268	Ptprf	protein tyrosine phosphatase, receptor type, F	222	219	230

19270	Ptprg	protein tyrosine phosphatase, receptor type, G	1414	1439	1423
19271	Ptprj	protein tyrosine phosphatase, receptor type, J	475	456	473
19272	Ptprk	protein tyrosine phosphatase, receptor type, K	1327	1324	1343
19274	Ptprm	protein tyrosine phosphatase, receptor type, M	1303	1343	1336
19275	Ptprn	protein tyrosine phosphatase, receptor type, N	53	52	59
19276	Ptprn2	protein tyrosine phosphatase, receptor type, N polypeptide 2	973	979	962
19277	Ptpro	protein tyrosine phosphatase, receptor type, O	839	828	811
237523	Ptprq	protein tyrosine phosphatase, receptor type, Q	530	527	517
19279	Ptprr	protein tyrosine phosphatase, receptor type, R	659	662	647
19280	Ptprs	protein tyrosine phosphatase, receptor type, S	214	212	219
19281	Ptprt	protein tyrosine phosphatase, receptor type, T	2011	1993	1965
19273	Ptpru	protein tyrosine phosphatase, receptor type, U	1146	1137	1150
13924	Ptprv	protein tyrosine phosphatase, receptor type, V	31	35	35
19285	Ptrf	polymerase I and transcript release factor	87	91	82
329384	Ptrh1	peptidyl-tRNA hydrolase 1 homolog (<i>S. cerevisiae</i>)	8	12	10
217057	Ptrh2	peptidyl-tRNA hydrolase 2	99	93	95
19286	Pts	6-pyruvoyl-tetrahydropterin synthase	75	82	77
30939	Pttg1	pituitary tumor-transforming gene 1	79	79	74
67959	Puf60	poly-U binding splicing factor 60	29	22	24
19290	Pura	purine rich element binding protein A	196	200	183
19291	Purb	purine rich element binding protein B	97	95	102
56361	Pus1	pseudouridine synthase 1	50	51	46
74467	Pus10	pseudouridylate synthase 10	176	177	172
67049	Pus3	pseudouridine synthase 3	13	18	15
78895	Pus7l	pseudouridylate synthase 7 homolog (<i>S. cerevisiae</i>)-like	173	182	179
433813	Pusl1	pseudouridylate synthase-like 1	26	27	29
69675	Pxdn	peroxidase homolog (<i>Drosophila</i>)	767	763	765
218699	Pxk	PX domain containing serine/threonine kinase	117	116	127
19302	Pxmp3	peroxisomal membrane protein 3	1767	1778	1743
19303	Pxn	paxillin	89	95	102
209027	Pycr1	pyrroline-5-carboxylate reductase 1	19	16	20
69051	Pycr2	pyrroline-5-carboxylate reductase family, member 2	55	53	52
66194	Pycl	pyrroline-5-carboxylate reductase-like	25	27	24
110078	Pygb	brain glycogen phosphorylase	202	196	193
110095	Pygl	liver glycogen phosphorylase	251	253	248
19309	Pygm	muscle glycogen phosphorylase	47	42	46
232491	Pyroxd1	pyridine nucleotide-disulphide oxidoreductase domain 1	86	80	80
74580	Pyroxd2	pyridine nucleotide-disulphide oxidoreductase domain 2	215	212	205
97541	Qars	glutaminyl-tRNA synthetase	33	38	37
110391	Qdpr	quinoid dihydropteridine reductase	829	839	837
19317	Qk	quaking	853	814	835
70536	Qpct	glutaminyl-peptide cyclotransferase (glutaminyl cyclase)	440	440	425
67369	Qpctl	glutaminyl-peptide cyclotransferase-like	37	35	38
67375	Qprt	quinolate phosphoribosyltransferase	71	63	57
76563	Qrs1	glutaminyl-tRNA synthase (glutamine-hydrolyzing)-like 1	399	394	400
104009	Qsox1	quiescin Q6 sulfhydryl oxidase 1	305	305	309
227638	Qsox2	quiescin Q6 sulfhydryl oxidase 2	121	111	116
60507	Qtrt1	queuine tRNA-ribosyltransferase 1	69	71	65
106248	Qtrtd1	queuine tRNA-ribosyltransferase domain containing 1	168	163	162
53869	Rab11a	RAB11a, member RAS oncogene family	552	547	544
19326	Rab11b	RAB11B, member RAS oncogene family	78	80	78
68328	Rab13	RAB13, member RAS oncogene family	24	22	27
68365	Rab14	RAB14, member RAS oncogene family	163	153	149
216344	Rab21	RAB21, member RAS oncogene family	139	149	150
19334	Rab22a	RAB22A, member RAS oncogene family	75	76	75

19335	Rab23	RAB23, member RAS oncogene family	117	109	117
19336	Rab24	RAB24, member RAS oncogene family	148	153	155
59021	Rab2a	RAB2A, member RAS oncogene family	567	587	582
19376	Rab34	RAB34, member of RAS oncogene family	9	10	10
58222	Rab37	RAB37, member of RAS oncogene family	132	125	134
19339	Rab3a	RAB3A, member RAS oncogene family	45	40	43
69908	Rab3b	RAB3B, member RAS oncogene family	198	202	196
19340	Rab3d	RAB3D, member RAS oncogene family	104	93	102
19341	Rab4a	RAB4A, member RAS oncogene family	267	265	264
271457	Rab5a	RAB5A, member RAS oncogene family	100	96	101
19344	Rab5b	RAB5B, member RAS oncogene family	41	38	39
19345	Rab5c	RAB5C, member RAS oncogene family	58	57	60
19346	Rab6	RAB6, member RAS oncogene family	31	32	29
19349	Rab7	RAB7, member RAS oncogene family	136	131	136
56382	Rab9	RAB9, member RAS oncogene family	81	81	79
56187	Rabgga	Rab geranylgeranyl transferase, a subunit	35	36	42
19352	Rabggb	RAB geranylgeranyl transferase, b subunit	49	43	49
19353	Rac1	RAS-related C3 botulinum substrate 1	113	106	116
19354	Rac2	RAS-related C3 botulinum substrate 2	63	67	65
170758	Rac3	RAS-related C3 botulinum substrate 3	16	14	13
19355	Rad1	RAD1 homolog (S. pombe)	91	94	96
19356	Rad17	RAD17 homolog (S. pombe)	47	49	50
58186	Rad18	RAD18 homolog (S. cerevisiae)	583	592	579
19357	Rad21	RAD21 homolog (S. pombe)	210	221	212
19358	Rad23a	RAD23a homolog (S. cerevisiae)	21	16	16
19359	Rad23b	RAD23b homolog (S. cerevisiae)	778	770	767
19360	Rad50	RAD50 homolog (S. cerevisiae)	111	120	115
19361	Rad51	RAD51 homolog (S. cerevisiae)	143	139	146
19362	Rad51ap1	RAD51 associated protein 1	27	23	23
114714	Rad51c	RAD51 homolog c (S. cerevisiae)	62	62	58
19363	Rad5111	RAD51-like 1 (S. cerevisiae)	1055	1047	1040
19364	Rad5113	RAD51-like 3 (S. cerevisiae)	27	28	28
19365	Rad52	RAD52 homolog (S. cerevisiae)	250	246	245
623474	Rad54b	RAD54 homolog B (S. cerevisiae)	283	295	282
19366	Rad54l	RAD54 like (S. cerevisiae)	92	89	94
19367	Rad9	RAD9 homolog (S. pombe)	30	24	29
231724	Rad9b	RAD9 homolog B (S. cerevisiae)	92	94	92
110157	Raf1	v-raf-leukemia viral oncogene 1	181	171	171
19373	Rag1	recombination activating gene 1	65	65	64
19374	Rag2	recombination activating gene 2	5235	5279	5186
54351	Rai12	retinoic acid induced 12	34	35	33
56044	Rala	v-ral simian leukemia viral oncogene homolog A (ras related)	246	242	234
64143	Ralb	v-ral simian leukemia viral oncogene homolog B (ras related)	139	134	131
19765	Ralbp1	ralA binding protein 1	223	218	211
19384	Ran	RAN, member RAS oncogene family	110	107	115
19386	Ranbp2	RAN binding protein 2	131	131	128
109905	Rap1a	RAS-related protein-1a	210	228	215
215449	Rap1b	RAS related protein 1b	449	447	456
76108	Rap2a	RAS related protein 2a	801	815	797
74012	Rap2b	RAP2B, member of RAS oncogene family	1679	1729	1670
72065	Rap2c	RAP2C, member of RAS oncogene family	325	319	317
19401	Rara	retinoic acid receptor, alpha	113	118	103
218772	Rarb	retinoic acid receptor, beta	1695	1686	1622
19411	Rarg	retinoic acid receptor, gamma	73	71	72
71660	Rarres2	retinoic acid receptor responder (tazarotene induced) 2	46	43	43

104458	Rars	arginyl-tRNA synthetase	232	249	236
109093	Rars2	arginyl-tRNA synthetase 2, mitochondrial	91	89	94
19416	Rasd1	RAS, dexamethasone-induced 1	105	113	112
75141	Rasd2	RASD family, member 2	431	434	417
75668	Rasl10a	RAS-like, family 10, member A	92	94	98
276952	Rasl10b	RAS-like, family 10, member B	166	160	163
68895	Rasl11a	RAS-like, family 11, member A	151	149	153
68939	Rasl11b	RAS-like, family 11, member B	576	559	579
70784	Rasl12	RAS-like, family 12	39	41	36
56289	Rassf1	Ras association (RalGDS/AF-6) domain family member 1	18	17	15
19434	Rax	retina and anterior neural fold homeobox	123	128	125
19645	Rb1	retinoblastoma 1	185	189	178
12421	Rb1cc1	RB1-inducible coiled-coil 1	555	579	562
57782	Rbak	RB-associated KRAB repressor	86	89	86
19646	Rbbp4	retinoblastoma binding protein 4	67	61	68
213464	Rbbp5	retinoblastoma binding protein 5	114	111	110
19647	Rbbp6	retinoblastoma binding protein 6	590	580	598
245688	Rbbp7	retinoblastoma binding protein 7	230	242	224
225182	Rbbp8	retinoblastoma binding protein 8	1195	1236	1199
24105	Rbck1	RanBP-type and C3HC4-type zinc finger containing 1	63	61	64
68731	Rbfa	ribosome binding factor A	69	75	75
268859	Rbfox1	RNA binding protein, fox-1 homolog (C. elegans) 1	5579	5627	5621
93686	Rbfox2	RNA binding protein, fox-1 homolog (C. elegans) 2	647	635	651
52897	Rbfox3	RNA binding protein, fox-1 homolog (C. elegans) 3	661	626	662
71336	Rbks	ribokinase	111	107	111
19650	Rbl1	retinoblastoma-like 1 (p107)	180	186	181
19651	Rbl2	retinoblastoma-like 2	397	406	385
56275	Rbm14	RNA binding motif protein 14	60	57	58
229700	Rbm15	RNA binding motif protein 15	217	213	207
109095	Rbm15b	RNA binding motif protein 15B	85	82	80
76938	Rbm17	RNA binding motif protein 17	114	119	118
66810	Rbm22	RNA binding motif protein 22	89	90	88
666794	Rbm24	RNA binding motif protein 24	300	289	288
67039	Rbm25	RNA binding motif protein 25	126	121	117
74213	Rbm26	RNA binding motif protein 26	798	798	758
225432	Rbm27	RNA binding motif protein 27	150	157	153
68272	Rbm28	RNA binding motif protein 28	157	155	154
19652	Rbm3	RNA binding motif protein 3	41	44	37
56190	Rbm38	RNA binding motif protein 38	146	139	148
170791	Rbm39	RNA binding motif protein 39	67	68	62
19653	Rbm4	RNA binding motif protein 4	74	64	69
66704	Rbm4b	RNA binding motif protein 4B	112	102	104
83486	Rbm5	RNA binding motif protein 5	213	214	209
60365	Rbm8a	RNA binding motif protein 8a	7	8	5
56878	Rbms1	RNA binding motif, single stranded interacting protein 1	1200	1193	1192
19655	Rbmx	RNA binding motif protein, X chromosome	20	20	17
19656	Rbmxrt	RNA binding motif protein, X chromosome retrogene	94	92	94
19657	Rbmy1a1	RNA binding motif protein, Y chromosome, family 1, member A1	1571	1600	1554
19659	Rbp1	retinol binding protein 1, cellular	242	243	241
19660	Rbp2	retinol binding protein 2, cellular	184	183	188
19661	Rbp3	retinol binding protein 3, interstitial	45	47	42
19662	Rbp4	retinol binding protein 4, plasma	47	43	40
19664	Rbpj	recombination signal binding protein for immunoglobulin kappa J re	617	618	611
19668	Rbpjl	recombination signal binding protein for immunoglobulin kappa J re	56	62	59
19663	Rbpms	RNA binding protein gene with multiple splicing	434	418	428

56438	Rbx1	ring-box 1	244	241	243
381305	Rc3h1	RING CCCH (C3H) domains 1	249	244	241
71330	Rcbtb1	regulator of chromosome condensation (RCC1) and BTB (POZ) dc	106	103	102
68098	Rchy1	ring finger and CHY zinc finger domain containing 1	33	33	30
59028	Rcl1	RNA terminal phosphate cyclase-like 1	117	104	113
217864	Rcor1	REST corepressor 1	251	250	245
104383	Rcor2	REST corepressor 2	65	61	62
214742	Rcor3	REST corepressor 3	52	46	44
27632	Rdbp	RD RNA-binding protein	14	13	17
107605	Rdh1	retinol dehydrogenase 1 (all trans)	34	33	32
98711	Rdh10	retinol dehydrogenase 10 (all-trans)	530	546	499
17252	Rdh11	retinol dehydrogenase 11	52	48	50
77974	Rdh12	retinol dehydrogenase 12	142	137	138
108841	Rdh13	retinol dehydrogenase 13 (all-trans and 9-cis)	84	94	85
105014	Rdh14	retinol dehydrogenase 14 (all-trans and 9-cis)	993	992	961
19683	Rdh16	retinol dehydrogenase 16	64	60	64
216453	Rdh19	retinol dehydrogenase 19	57	53	51
19682	Rdh5	retinol dehydrogenase 5	19	19	20
54150	Rdh7	retinol dehydrogenase 7	44	43	42
235033	Rdh8	retinol dehydrogenase 8	67	67	68
103142	Rdh9	retinol dehydrogenase 9	54	55	52
19691	Recql	RecQ protein-like	53	53	55
79456	Recql4	RecQ protein-like 4	13	9	10
56009	Refbp2	RNA and export factor binding protein 2	125	129	127
19696	Rel	reticuloendotheliosis oncogene	295	301	289
19697	Rela	v-rel reticuloendotheliosis viral oncogene homolog A (avian)	65	68	70
19698	Relb	avian reticuloendotheliosis viral (v-rel) oncogene related B	75	73	74
19699	Reln	reelin	833	856	841
19700	Rem1	rad and gem related GTP binding protein 1	53	56	62
140743	Rem2	rad and gem related GTP binding protein 2	63	64	65
19701	Ren1	renin 1 structural	19	18	20
19702	Ren2	renin 2 tandem duplication of Ren1	32	29	32
19703	Renbp	renin binding protein	61	54	54
58887	Repin1	replication initiator 1	27	21	26
68703	Rere	arginine glutamic acid dipeptide (RE) repeats	531	539	548
232441	Rerg	RAS-like, estrogen-regulated, growth-inhibitor	381	383	369
19712	Rest	RE1-silencing transcription factor	130	126	128
19713	Ret	ret proto-oncogene	363	369	345
67442	Retsat	retinol saturase (all trans retinol 13,14 reductase)	26	25	26
56210	Rev1	REV1 homolog (S. cerevisiae)	857	865	873
19714	Rev3l	REV3-like, catalytic subunit of DNA polymerase zeta RAD54 like (ζ)	204	208	212
104444	Rexo2	REX2, RNA exonuclease 2 homolog (S. cerevisiae)	49	60	52
19687	Rfc1	replication factor C (activator 1) 1	186	186	187
19718	Rfc2	replication factor C (activator 1) 2	69	73	70
69263	Rfc3	replication factor C (activator 1) 3	309	307	301
106344	Rfc4	replication factor C (activator 1) 4	50	49	45
72151	Rfc5	replication factor C (activator 1) 5	76	69	71
218341	Rfesd	Rieske (Fe-S) domain containing	118	117	113
54391	Rfk	riboflavin kinase	599	612	598
234736	Rfwd3	ring finger and WD repeat domain 3	112	110	104
19724	Rfx1	regulatory factor X, 1 (influences HLA class II expression)	55	44	48
19725	Rfx2	regulatory factor X, 2 (influences HLA class II expression)	131	133	132
19726	Rfx3	regulatory factor X, 3 (influences HLA class II expression)	1625	1626	1612
71137	Rfx4	regulatory factor X, 4 (influences HLA class II expression)	488	479	487
53970	Rfx5	regulatory factor X, 5 (influences HLA class II expression)	57	50	48

320995	Rfx6	regulatory factor X, 6	496	509	491
619289	Rfx8	regulatory factor X 8	195	196	202
19727	Rfxank	regulatory factor X-associated ankyrin-containing protein	12	12	10
170767	Rfxap	regulatory factor X-associated protein	211	204	209
52575	Rg9mtd1	RNA (guanine-9-) methyltransferase domain containing 1	59	61	58
108943	Rg9mtd2	RNA (guanine-9-) methyltransferase domain containing 2	56	50	54
69934	Rg9mtd3	RNA (guanine-9-) methyltransferase domain containing 3	182	179	177
244058	Rgma	RGM domain family, member A	1572	1596	1557
68799	Rgmb	RGM domain family, member B	1731	1710	1689
19733	Rgn	regucalcin	202	199	196
57811	Rgr	retinal G protein coupled receptor	114	119	112
76867	Rhbdd1	rhomboid domain containing 1	407	406	396
13650	Rhbdf1	rhomboid family 1 (Drosophila)	21	21	22
217344	Rhbdf2	rhomboid 5 homolog 2 (Drosophila)	78	81	75
214951	Rhbdl1	rhomboid, veinlet-like 1 (Drosophila)	14	12	13
230726	Rhbdl2	rhomboid, veinlet-like 2 (Drosophila)	209	202	197
246104	Rhbdl3	rhomboid, veinlet-like 3 (Drosophila)	217	209	218
19744	Rheb	Ras homolog enriched in brain	196	190	184
69159	Rhebl1	Ras homolog enriched in brain like 1	34	34	36
212541	Rho	rhodopsin	125	117	116
11848	Rhoa	ras homolog gene family, member A	42	42	42
73296	Rhobtb3	Rho-related BTB domain containing 3	162	162	164
56212	Rhog	ras homolog gene family, member G	53	52	53
74734	Rhoh	ras homolog gene family, member H	277	258	272
80837	Rhoj	ras homolog gene family, member J	303	308	303
104215	Rhoq	ras homolog gene family, member Q	96	103	100
59040	Rhot1	ras homolog gene family, member T1	160	156	145
214952	Rhot2	ras homolog gene family, member T2	30	26	29
69581	Rhou	ras homolog gene family, member U	336	334	333
75199	Rhox2a	reproductive homeobox 2A	6	6	5
382209	Rhox3a	reproductive homeobox 3A	14	12	12
78757	Rictor	RPTOR independent companion of MTOR, complex 2	374	383	360
194237	Rimkla	ribosomal modification protein rimK-like family member A	145	142	153
108653	Rimklb	ribosomal modification protein rimK-like family member B	229	226	214
19763	Ring1	ring finger protein 1	34	29	31
71340	Riok1	RIO kinase 1 (yeast)	146	149	144
67045	Riok2	RIO kinase 2 (yeast)	364	372	355
66878	Riok3	RIO kinase 3 (yeast)	57	60	60
19766	Ripk1	receptor (TNFRSF)-interacting serine-threonine kinase 1	42	41	44
192656	Ripk2	receptor (TNFRSF)-interacting serine-threonine kinase 2	2294	2339	2293
56532	Ripk3	receptor-interacting serine-threonine kinase 3	47	55	51
72388	Ripk4	receptor-interacting serine-threonine kinase 4	316	322	318
622473	Ripply1	rippy1 homolog (zebrafish)	145	140	137
170765	Ripply3	rippy3 homolog (zebrafish)	114	112	106
19769	Rit1	Ras-like without CAAX 1	116	112	115
19762	Rit2	Ras-like without CAAX 2	1478	1494	1436
109263	Rlf	rearranged L-myc fusion sequence	278	282	274
19820	Rlim	ring finger protein, LIM domain interacting	362	361	365
74386	Rmi1	RMI1, RecQ mediated genome instability 1, homolog (S. cerevisiae)	276	273	272
19819	Rnaseh1	ribonuclease H1	49	50	59
69724	Rnaseh2a	ribonuclease H2, large subunit	31	30	32
67153	Rnaseh2b	ribonuclease H2, subunit B	203	216	209
68209	Rnaseh2c	ribonuclease H2, subunit C	55	50	52
52898	Rnasek	ribonuclease, RNase K	26	21	24
24014	Rnasel	ribonuclease L (2', 5'-oligoadenylate synthetase-dependent)	131	142	145

50849	Rnf10	ring finger protein 10	58	53	56
22644	Rnf103	ring finger protein 103	125	126	125
29864	Rnf11	ring finger protein 11	154	147	146
93836	Rnf111	ring finger 111	168	165	155
67845	Rnf115	ring finger protein 115	101	112	110
66889	Rnf128	ring finger protein 128	251	242	232
24017	Rnf13	ring finger protein 13	187	186	196
59044	Rnf130	ring finger protein 130	215	213	205
386611	Rnf133	ring finger protein 133	506	511	516
71956	Rnf135	ring finger protein 135	78	66	69
75841	Rnf139	ring finger protein 139	71	82	77
56736	Rnf14	ring finger protein 14	67	70	66
218215	Rnf144b	ring finger protein 144B	1254	1263	1256
68031	Rnf146	ring finger protein 146	295	292	289
67504	Rnf151	ring finger protein 151	13	16	15
320311	Rnf152	ring finger protein 152	1166	1154	1143
70510	Rnf167	ring finger protein 167	11	9	10
70238	Rnf168	ring finger protein 168	78	80	79
71816	Rnf180	ring finger protein 180	464	469	467
328234	Rnf182	ring finger protein 182	287	294	295
108660	Rnf187	ring finger protein 187	39	38	39
19821	Rnf2	ring finger protein 2	192	190	191
109331	Rnf20	ring finger protein 20	114	114	109
108086	Rnf216	ring finger protein 216	287	293	299
66743	Rnf220	ring finger protein 220	379	375	391
57751	Rnf25	ring finger protein 25	22	15	19
268749	Rnf31	ring finger protein 31	16	14	14
80751	Rnf34	ring finger protein 34	100	104	102
19822	Rnf4	ring finger protein 4	175	174	170
233900	Rnf40	ring finger protein 40	21	19	22
67588	Rnf41	ring finger protein 41	63	60	65
54197	Rnf5	ring finger protein 5	8	10	7
74132	Rnf6	ring finger protein (C3H2C3 type) 6	58	59	61
19823	Rnf7	ring finger protein 7	344	341	348
58230	Rnf8	ring finger protein 8	140	140	150
24018	Rngtt	RNA guanylyltransferase and 5'-phosphatase	879	869	860
67795	Rnls	renalase, FAD-dependent amine oxidase	1064	1078	1039
67897	Rnmt	RNA (guanine-7-) methyltransferase	46	48	51
67390	Rnmtl1	RNA methyltransferase like 1	204	215	208
215615	Rnpep	arginyl aminopeptidase (aminopeptidase B)	74	73	74
19826	Rnps1	ribonucleic acid binding protein S1	17	13	13
19866	Rnu7	U7 small nuclear RNA	19	17	13
19877	Rock1	Rho-associated coiled-coil containing protein kinase 1	377	386	378
19878	Rock2	Rho-associated coiled-coil containing protein kinase 2	244	235	249
230257	Rod1	ROD1 regulator of differentiation 1 (S. pombe)	197	182	183
26563	Ror1	receptor tyrosine kinase-like orphan receptor 1	715	717	682
26564	Ror2	receptor tyrosine kinase-like orphan receptor 2	508	501	515
19883	Rora	RAR-related orphan receptor alpha	1187	1210	1174
225998	Rorb	RAR-related orphan receptor beta	2213	2255	2183
19885	Rorc	RAR-related orphan receptor gamma	46	43	48
19886	Ros1	Ros1 proto-oncogene	278	266	263
19889	Rp2h	retinitis pigmentosa 2 homolog (human)	198	208	198
68275	Rpa1	replication protein A1	206	201	196
68240	Rpa3	replication protein A3	64	58	66
69723	Rpain	RPA interacting protein	17	18	18

68925	Rpap1	RNA polymerase II associated protein 1	51	53	52
66646	Rpe	ribulose-5-phosphate-3-epimerase	448	445	446
19892	Rpe65	retinal pigment epithelium 65	433	441	428
70285	Rpf1	ribosome production factor 1 homolog (S. cerevisiae)	128	130	123
19895	Rpia	ribose 5-phosphate isomerase A	1905	1953	1940
110954	Rpl10	ribosomal protein 10	26	26	22
238217	Rpl10l	ribosomal protein L10-like	2481	2506	2457
67025	Rpl11	ribosomal protein L11	162	155	154
67115	Rpl14	ribosomal protein L14	521	510	509
66480	Rpl15	ribosomal protein L15	42	41	46
19899	Rpl18	ribosomal protein L18	4	3	3
76808	Rpl18a	ribosomal protein L18A	10	13	12
19921	Rpl19	ribosomal protein L19	38	37	40
19934	Rpl22	ribosomal protein L22	25	23	23
68028	Rpl22l1	ribosomal protein L22 like 1	139	133	139
65019	Rpl23	ribosomal protein L23	24	22	23
68193	Rpl24	ribosomal protein L24	52	51	52
19941	Rpl26	ribosomal protein L26	21	21	18
26451	Rpl27a	ribosomal protein L27A	12	15	15
19943	Rpl28	ribosomal protein L28	29	31	30
19944	Rpl29	ribosomal protein L29	93	83	87
27367	Rpl3	ribosomal protein L3	14	11	12
19951	Rpl32	ribosomal protein L32	39	41	41
57808	Rpl35a	ribosomal protein L35A	9	9	9
67671	Rpl38	ribosomal protein L38	293	296	295
67891	Rpl4	ribosomal protein L4	2	4	4
100503670	Rpl5	ribosomal protein L5	149	149	148
19988	Rpl6	ribosomal protein L6	259	244	259
19989	Rpl7	ribosomal protein L7	261	271	278
66229	Rpl7l1	ribosomal protein L7-like 1	81	71	78
26961	Rpl8	ribosomal protein L8	35	32	31
20005	Rpl9	ribosomal protein L9	60	54	56
11837	Rplp0	ribosomal protein, large, P0	76	65	69
56040	Rplp1	ribosomal protein, large, P1	757	748	744
67186	Rplp2	ribosomal protein, large P2	5	8	6
103963	Rpn1	ribophorin I	240	235	241
20014	Rpn2	ribophorin II	98	89	100
67053	Rpp14	ribonuclease P 14 subunit (human)	125	125	122
67676	Rpp21	ribonuclease P 21 subunit (human)	108	99	106
102614	Rpp25	ribonuclease P 25 subunit (human)	74	67	63
54364	Rpp30	ribonuclease P/MRP 30 subunit (human)	85	80	85
208366	Rpp40	ribonuclease P 40 subunit (human)	290	304	293
27207	Rps11	ribosomal protein S11	4	3	3
68052	Rps13	ribosomal protein S13	339	336	332
20044	Rps14	ribosomal protein S14	113	116	110
20054	Rps15	ribosomal protein S15	45	42	45
267019	Rps15a	ribosomal protein S15A	968	975	979
20055	Rps16	ribosomal protein S16	15	14	16
20068	Rps17	ribosomal protein S17	317	313	309
20084	Rps18	ribosomal protein S18	5	5	3
20085	Rps19	ribosomal protein S19	33	37	31
67427	Rps20	ribosomal protein S20	199	205	200
66481	Rps21	ribosomal protein S21	41	43	41
20088	Rps24	ribosomal protein S24	1104	1128	1107
27370	Rps26	ribosomal protein S26	80	75	75

67941	Rps27l	ribosomal protein S27-like	73	73	70
54127	Rps28	ribosomal protein S28	13	16	16
20090	Rps29	ribosomal protein S29	1928	1887	1907
27050	Rps3	ribosomal protein S3	69	67	65
20091	Rps3a	ribosomal protein S3A	114	108	105
20102	Rps4x	ribosomal protein S4, X-linked	113	118	112
20103	Rps5	ribosomal protein S5	39	37	40
20104	Rps6	ribosomal protein S6	166	160	165
20111	Rps6ka1	ribosomal protein S6 kinase polypeptide 1	284	283	283
20112	Rps6ka2	ribosomal protein S6 kinase, polypeptide 2	388	382	388
110651	Rps6ka3	ribosomal protein S6 kinase polypeptide 3	1574	1625	1592
56613	Rps6ka4	ribosomal protein S6 kinase, polypeptide 4	82	89	97
73086	Rps6ka5	ribosomal protein S6 kinase, polypeptide 5	322	335	319
67071	Rps6ka6	ribosomal protein S6 kinase polypeptide 6	550	575	536
72508	Rps6kb1	ribosomal protein S6 kinase, polypeptide 1	77	86	73
58988	Rps6kb2	ribosomal protein S6 kinase, polypeptide 2	26	26	28
320119	Rps6kc1	ribosomal protein S6 kinase polypeptide 1	961	963	970
238323	Rps6kl1	ribosomal protein S6 kinase-like 1	83	88	83
20115	Rps7	ribosomal protein S7	37	32	32
20116	Rps8	ribosomal protein S8	35	35	33
76846	Rps9	ribosomal protein S9	34	33	34
16785	Rpsa	ribosomal protein SA	26	24	25
74370	Rptor	regulatory associated protein of MTOR, complex 1	458	469	462
106707	Rpusd1	RNA pseudouridylate synthase domain containing 1	12	10	9
271842	Rpusd2	RNA pseudouridylate synthase domain containing 2	23	24	24
101122	Rpusd3	RNA pseudouridylate synthase domain containing 3	52	55	54
71989	Rpusd4	RNA pseudouridylate synthase domain containing 4	243	238	227
58184	Rqcd1	rcd1 (required for cell differentiation) homolog 1 (S. pombe)	177	183	171
54170	Rragc	Ras-related GTP binding C	985	980	968
20130	Rras	Harvey rat sarcoma oncogene, subgroup R	51	44	41
66922	Rras2	related RAS viral (r-ras) oncogene homolog 2	640	639	631
68750	Rreb1	ras responsive element binding protein 1	935	938	921
20132	Rrh	retinal pigment epithelium derived rhodopsin homolog	36	33	37
20133	Rrm1	ribonucleotide reductase M1	272	270	271
20135	Rrm2	ribonucleotide reductase M2	200	196	202
382985	Rrm2b	ribonucleotide reductase M2 B (TP53 inducible)	360	391	356
106298	Rrn3	RRN3 RNA polymerase I transcription factor homolog (yeast)	114	115	114
18114	Rrp1	ribosomal RNA processing 1 homolog (S. cerevisiae)	92	87	94
72462	Rrp1b	ribosomal RNA processing 1 homolog B (S. cerevisiae)	86	83	85
224823	Rrp36	ribosomal RNA processing 36 homolog (S. cerevisiae)	40	37	42
101867	Rrp8	ribosomal RNA processing 8, methyltransferase, homolog (yeast)	138	128	137
27966	Rrp9	RRP9, small subunit (SSU) processome component, homolog (yeast)	30	28	28
237926	Rsad1	radical S-adenosyl methionine domain containing 1	55	53	53
69994	Rsc1a1	regulatory solute carrier protein, family 1, member 1	82	75	73
233532	Rsf1	remodeling and spacing factor 1	146	152	152
380855	Rsl1	regulator of sex limited protein 1	90	87	87
66880	Rsrc1	arginine/serine-rich coiled-coil 1	481	485	480
66368	Rtcd1	RNA terminal phosphate cyclase domain 1	113	116	110
269400	Rtel1	regulator of telomere elongation helicase 1	66	68	66
76246	Rtf1	Rtf1, Paf1/RNA polymerase II complex component, homolog (S. cerevisiae)	104	101	104
170728	Rtn4ip1	reticulum 4 interacting protein 1	130	135	140
12394	Runx1	runt related transcription factor 1	1287	1312	1313
12395	Runx1t1	runt-related transcription factor 1; translocated to, 1 (cyclin D-related)	2261	2260	2223
12393	Runx2	runt related transcription factor 2	1583	1589	1579
12399	Runx3	runt related transcription factor 3	424	435	433

56505	Ruvbl1	RuvB-like protein 1	95	92	95
20174	Ruvbl2	RuvB-like protein 2	17	17	16
140498	Rxfp2	relaxin/insulin-like family peptide receptor 2	741	747	753
20181	Rxra	retinoid X receptor alpha	459	453	459
20182	Rxb	retinoid X receptor beta	6	8	8
20183	Rxrg	retinoid X receptor gamma	304	308	302
56353	Rybp	RING1 and YY1 binding protein	1241	1251	1211
20187	Ryk	receptor-like tyrosine kinase	345	348	358
20193	S100a1	S100 calcium binding protein A1	6	8	6
20203	S100b	S100 protein, beta polypeptide, neural	133	136	146
13609	S1pr1	sphingosine-1-phosphate receptor 1	1031	1058	1029
13610	S1pr3	sphingosine-1-phosphate receptor 3	496	519	510
20208	Saa1	serum amyloid A 1	23	27	25
83493	Sacm1l	SAC1 (suppressor of actin mutations 1, homolog)-like (<i>S. cerevisia</i>)	195	204	186
56459	Sae1	SUMO1 activating enzyme subunit 1	130	120	122
224903	Safb	scaffold attachment factor B	30	31	31
224902	Safb2	scaffold attachment factor B2	86	85	91
58198	Sall1	sal-like 1 (<i>Drosophila</i>)	2163	2155	2110
50524	Sall2	sal-like 2 (<i>Drosophila</i>)	66	59	62
20689	Sall3	sal-like 3 (<i>Drosophila</i>)	1868	1856	1865
99377	Sall4	sal-like 4 (<i>Drosophila</i>)	275	280	277
74480	Samd4	sterile alpha motif domain containing 4	604	601	603
67630	Samd8	sterile alpha motif domain containing 8	102	111	99
67742	Samsn1	SAM domain, SH3 domain and nuclear localization signals, 1	776	781	755
269003	Sap130	Sin3A associated protein	192	191	184
751865	Sap25	sin3 associated polypeptide	21	22	21
60406	Sap30	sin3 associated polypeptide	64	62	71
57230	Sap30bp	SAP30 binding protein	50	53	62
50724	Sap30l	SAP30-like	233	233	238
192166	Sardh	sarcosine dehydrogenase	337	331	333
66118	Sarnp	SAP domain containing ribonucleoprotein	96	89	94
20226	Sars	seryl-aminoacyl-tRNA synthetase	162	156	151
71984	Sars2	seryl-aminoacyl-tRNA synthetase 2	21	14	20
20227	Sart1	squamous cell carcinoma antigen recognized by T-cells 1	24	21	25
53890	Sart3	squamous cell carcinoma antigen recognized by T-cells 3	43	51	46
20229	Sat1	spermidine/spermine N1-acetyl transferase 1	139	143	135
69215	Sat2	spermidine/spermine N1-acetyl transferase 2	20	22	17
20230	Satb1	special AT-rich sequence binding protein 1	1858	1864	1837
212712	Satb2	special AT-rich sequence binding protein 2	430	425	433
66711	Sbds	Shwachman-Bodian-Diamond syndrome homolog (human)	45	40	44
77980	Sbf1	SET binding factor 1	137	136	137
104175	Sbk1	SH3-binding kinase 1	203	212	219
381836	Sbk2	SH3-binding domain kinase family, member 2	56	62	51
216161	Sbno2	strawberry notch homolog 2 (<i>Drosophila</i>)	83	73	75
66234	Sc4mol	sterol-C4-methyl oxidase-like	228	231	228
235293	Sc5d	sterol-C5-desaturase (fungal ERG3, delta-5-desaturase) homolog (341	354	343
233208	Scaf1	SR-related CTD-associated factor 1	23	24	22
72193	Scaf11	SR-related CTD-associated factor 11	443	455	456
106583	Scaf8	SR-related CTD-associated factor 8	311	307	305
320271	Scai	suppressor of cancer cell invasion	77	85	86
235623	Scap	SREBF chaperone	136	141	127
20778	Scarb1	scavenger receptor class B, member 1	272	278	266
109232	Sccpdh	saccharopine dehydrogenase (putative)	319	331	323
20249	Scd1	stearoyl-Coenzyme A desaturase 1	206	213	214
20250	Scd2	stearoyl-Coenzyme A desaturase 2	174	167	161

30049	Scd3	stearoyl-coenzyme A desaturase 3	132	133	134
329065	Scd4	stearoyl-coenzyme A desaturase 4	153	149	150
20394	Scg5	secretogranin V	118	119	116
22287	Scgb1a1	secretoglobin, family 1A, member 1 (uteroglobin)	198	197	197
30953	Schip1	schwannomin interacting protein 1	1685	1701	1650
50880	Scly	selenocysteine lyase	89	89	92
29871	Scmh1	sex comb on midleg homolog 1	315	321	315
268297	Scml4	sex comb on midleg-like 4 (Drosophila)	538	537	516
100126824	Sco2	SCO cytochrome oxidase deficient homolog 2 (yeast)	25	27	30
20280	Scp2	sterol carrier protein 2, liver	185	170	166
74617	Scpep1	serine carboxypeptidase 1	131	126	129
105782	Scrib	scribbled homolog (Drosophila)	85	76	75
69938	Scrn1	secernin 1	176	190	188
217140	Scrn2	secernin 2	38	30	42
74616	Scrn3	secernin 3	100	93	95
170729	Scrt1	scratch homolog 1, zinc finger protein (Drosophila)	22	24	27
545474	Scrt2	scratch homolog 2, zinc finger protein (Drosophila)	127	129	129
20289	Scx	scleraxis	102	103	105
78891	Scyl1	SCY1-like 1 (S. cerevisiae)	77	80	77
213326	Scyl2	SCY1-like 2 (S. cerevisiae)	143	143	133
240880	Scyl3	SCY1-like 3 (S. cerevisiae)	266	276	269
66945	Sdha	succinate dehydrogenase complex, subunit A, flavoprotein (Fp)	45	40	42
66072	Sdhaf2	succinate dehydrogenase complex assembly factor 2	60	58	55
67680	Sdhb	succinate dehydrogenase complex, subunit B, iron sulfur (Ip)	105	104	98
66052	Sdhc	succinate dehydrogenase complex, subunit C, integral membrane p	40	38	41
66925	Sdhd	succinate dehydrogenase complex, subunit D, integral membrane p	56	49	52
20324	Sdpr	serum deprivation response	708	710	702
242285	Sdr16c5	short chain dehydrogenase/reductase family 16C, member 5	176	172	173
242286	Sdr16c6	short chain dehydrogenase/reductase family 16C, member 6	153	154	151
654795	Sdr39u1	short chain dehydrogenase/reductase family 39U, member 1	83	77	77
74032	Sdr42e1	short chain dehydrogenase/reductase family 42E, member 1	262	254	260
70061	Sdr9c7	4short chain dehydrogenase/reductase family 9C, member 7	152	153	153
231691	Sds	serine dehydratase	37	39	36
257635	Sdsl	serine dehydratase-like	53	54	51
18292	Sebox	SEBOX homeobox	16	17	19
56546	Sec1	secretory blood group 1	25	26	24
56529	Sec11a	SEC11 homolog A (S. cerevisiae)	112	114	110
66286	Sec11c	SEC11 homolog C (S. cerevisiae)	230	231	237
67815	Sec14l2	SEC14-like 2 (S. cerevisiae)	55	47	53
227648	Sec16a	SEC16 homolog A (S. cerevisiae)	117	113	114
66212	Sec61b	Sec61 beta subunit	744	739	731
140740	Sec63	SEC63-like (S. cerevisiae)	239	226	230
20339	Sele	selectin, endothelial cell	84	82	88
223870	Senp1	SUMO1/sentrin specific peptidase 1	20	21	19
75826	Senp2	SUMO/sentrin specific peptidase 2	223	215	206
80886	Senp3	SUMO/sentrin specific peptidase 3	16	12	16
320213	Senp5	SUMO/sentrin specific peptidase 5	174	176	170
215351	Senp6	SUMO/sentrin specific peptidase 6	237	246	233
66315	Senp7	SUMO1/sentrin specific peptidase 7	214	217	205
71599	Senp8	SUMO/sentrin specific peptidase 8	60	58	56
109079	Sephs1	selenophosphate synthetase 1	255	261	264
20768	Sephs2	selenophosphate synthetase 2	44	47	47
20363	Sepp1	selenoprotein P, plasma, 1	617	607	609
211006	Sepsecs	Sep (O-phosphoserine) tRNA:Sec (selenocysteine) tRNA synthase	218	223	218
20364	Sepw1	selenoprotein W, muscle 1	48	44	46

27361	Sepx1	selenoprotein X 1	26	25	26
321007	Serac1	serine active site containing 1	134	134	135
68607	Serhl	serine hydrolase-like	128	134	133
56442	Serinc1	serine incorporator 1	184	191	176
230779	Serinc2	serine incorporator 2	114	110	113
218442	Serinc5	serine incorporator 5	277	296	275
28146	Serp1	stress-associated endoplasmic reticulum protein 1	60	67	64
20700	Serpina1a	serine (or cysteine) peptidase inhibitor, clade A, member 1A	169	171	167
20701	Serpina1b	serine (or cysteine) peptidase inhibitor, clade A, member 1B	103	99	99
268591	Serpina5	serine (or cysteine) peptidase inhibitor, clade A, member 5	43	44	46
12401	Serpina6	serine (or cysteine) peptidase inhibitor, clade A, member 6	87	86	76
20720	Serpine2	serine (or cysteine) peptidase inhibitor, clade E, member 2	576	579	557
12258	Serping1	serine (or cysteine) peptidase inhibitor, clade G, member 1	76	68	78
12406	Serpinh1	serine (or cysteine) peptidase inhibitor, clade H, member 1	148	146	139
55942	Sertad1	SERTA domain containing 1	28	30	30
58172	Sertad2	SERTA domain containing 2	493	501	493
170742	Sertad3	SERTA domain containing 3	49	50	51
56086	Set	SET nuclear oncogene	45	44	41
233904	Setd1a	SET domain containing 1A	36	36	39
235626	Setd2	SET domain containing 2	192	180	189
52690	Setd3	SET domain containing 3	218	221	229
66083	Setd6	SET domain containing 6	141	129	131
73251	Setd7	SET domain containing (lysine methyltransferase) 7	132	127	126
67956	Setd8	SET domain containing (lysine methyltransferase) 8	71	63	61
84505	Setdb1	SET domain, bifurcated 1	118	116	113
239122	Setdb2	SET domain, bifurcated 2	61	64	64
74729	Setmar	SET domain and mariner transposase fusion gene	832	858	816
269254	Setx	senataxin	249	251	244
22668	Sf1	splicing factor 1	50	56	54
67465	Sf3a1	splicing factor 3a, subunit 1	29	32	35
20222	Sf3a2	splicing factor 3a, subunit 2	8	9	8
75062	Sf3a3	splicing factor 3a, subunit 3	41	39	38
81898	Sf3b1	splicing factor 3b, subunit 1	169	163	159
101943	Sf3b3	splicing factor 3b, subunit 3	12	10	12
107701	Sf3b4	splicing factor 3b, subunit 4	25	25	24
66125	Sf3b5	splicing factor 3b, subunit 5	166	167	156
20375	Sfpi1	SFFV proviral integration 1	63	58	61
71514	Sfpq	splicing factor proline/glutamine rich (polypyrimidine tract binding p	122	119	122
20377	Sfrp1	secreted frizzled-related protein 1	527	538	525
20319	Sfrp2	secreted frizzled-related protein 2	332	340	347
20379	Sfrp4	secreted frizzled-related protein 4	97	97	97
231769	Sfswap	splicing factor, suppressor of white-apricot homolog (Drosophila)	646	632	639
20388	Sftpb	surfactant associated protein B	142	144	146
20393	Sgk1	serum/glucocorticoid regulated kinase 1	763	751	760
27219	Sgk2	serum/glucocorticoid regulated kinase 2	100	90	93
170755	Sgk3	serum/glucocorticoid regulated kinase 3	269	270	266
208449	Sgms1	sphingomyelin synthase 1	591	586	588
74442	Sgms2	sphingomyelin synthase 2	164	157	156
20397	Sgpl1	sphingosine phosphate lyase 1	107	100	114
81535	Sgpp1	sphingosine-1-phosphate phosphatase 1	194	193	199
433323	Sgpp2	sphingosine-1-phosphate phosphatase 2	373	367	370
27029	Sgsh	N-sulfoglucosamine sulfohydrolase (sulfamidase)	44	48	48
105835	Sgsm3	small G protein signaling modulator 3	206	199	199
26904	Sh2d1b1	SH2 domain protein 1B1	89	91	95
545378	Sh2d1b2	SH2 domain protein 1B2	93	81	81

73723	Sh3bgrl3	SH3 domain binding glutamic acid-rich protein-like 3	114	108	113
24056	Sh3bp5	SH3-domain binding protein 5 (BTK-associated)	211	204	217
27059	Sh3d19	SH3 domain protein D19	184	180	177
54673	Sh3glb1	SH3-domain GRB2-like B1 (endophilin)	240	236	232
58194	Sh3kbp1	SH3-domain kinase binding protein 1	829	827	796
14218	Sh3pxd2a	SH3 and PX domains 2A	391	390	386
268396	Sh3pxd2b	SH3 and PX domains 2B	195	190	192
106025	Sharpin	SHANK-associated RH domain interacting protein	9	7	8
20416	Shc1	src homology 2 domain-containing transforming protein C1	20	21	17
20422	Shfm1	split hand/foot malformation (ectrodactyly) type 1	838	827	823
20423	Shh	sonic hedgehog	945	942	950
20425	Shmt1	serine hydroxymethyltransferase 1 (soluble)	67	67	70
108037	Shmt2	serine hydroxymethyltransferase 2 (mitochondrial)	24	20	21
20429	Shox2	short stature homeobox 2	882	894	853
74637	Shpk	sedoheptulokinase	51	44	49
268281	Shprh	SNF2 histone linker PHD RING helicase	252	255	254
20437	Siah1a	seven in absentia 1A	188	183	180
20438	Siah1b	seven in absentia 1B	77	74	71
20439	Siah2	seven in absentia 2	297	300	289
24058	Sigirr	single immunoglobulin and toll-interleukin 1 receptor (TIR) domain	43	48	48
18391	Sigmar1	sigma non-opioid intracellular receptor 1	32	30	26
17691	Sik1	salt inducible kinase 1	433	431	453
235344	Sik2	salt inducible kinase 2	272	292	266
70661	Sik3	SIK family kinase 3	320	313	315
20464	Sim1	single-minded homolog 1 (Drosophila)	1118	1122	1101
20465	Sim2	single-minded homolog 2 (Drosophila)	180	184	189
20466	Sin3a	transcriptional regulator, SIN3A (yeast)	181	184	183
20467	Sin3b	transcriptional regulator, SIN3B (yeast)	150	148	158
66603	Sip1	survival of motor neuron protein interacting protein 1	62	70	63
93759	Sirt1	sirtuin 1 (silent mating type information regulation 2, homolog) 1 (S	180	176	185
64383	Sirt2	sirtuin 2 (silent mating type information regulation 2, homolog) 2 (S	27	28	26
64384	Sirt3	sirtuin 3 (silent mating type information regulation 2, homolog) 3 (S	34	33	32
75387	Sirt4	sirtuin 4 (silent mating type information regulation 2 homolog) 4 (S.	54	55	55
68346	Sirt5	sirtuin 5 (silent mating type information regulation 2 homolog) 5 (S.	126	119	124
50721	Sirt6	sirtuin 6 (silent mating type information regulation 2, homolog) 6 (S	28	25	28
209011	Sirt7	sirtuin 7 (silent mating type information regulation 2, homolog) 7 (S	15	18	17
20471	Six1	sine oculis-related homeobox 1 homolog (Drosophila)	211	219	216
20472	Six2	sine oculis-related homeobox 2 homolog (Drosophila)	659	670	657
20473	Six3	sine oculis-related homeobox 3 homolog (Drosophila)	85	85	91
20474	Six4	sine oculis-related homeobox 4 homolog (Drosophila)	100	96	97
20475	Six5	sine oculis-related homeobox 5 homolog (Drosophila)	32	36	36
78473	Skap1	src family associated phosphoprotein 1	400	418	411
20481	Ski	ski sarcoma viral oncogene homolog (avian)	198	193	203
20482	Skil	SKI-like	198	202	203
108077	Skiv2l	superkiller viralicidic activity 2-like (S. cerevisiae)	17	15	17
72198	Skiv2l2	superkiller viralicidic activity 2-like 2 (S. cerevisiae)	170	170	156
207667	Skor1	SKI family transcriptional corepressor 1	523	498	518
664805	Skor2	SKI family transcriptional corepressor 2	935	927	925
21402	Skp1a	S-phase kinase-associated protein 1A	87	93	93
27401	Skp2	S-phase kinase-associated protein 2 (p45)	93	92	88
77799	Sla2	Src-like-adaptor 2	168	160	168
20492	Slbp	stem-loop binding protein	35	36	36
18173	Slc11a1	solute carrier family 11 (proton-coupled divalent metal ion transport	40	36	34
18174	Slc11a2	solute carrier family 11 (proton-coupled divalent metal ion transport	134	136	130
66859	Slc16a9	solute carrier family 16 (monocarboxylic acid transporters), membe	305	311	301

20504	Slc17a1	solute carrier family 17 (sodium phosphate), member 1	99	95	90
105355	Slc17a3	solute carrier family 17 (sodium phosphate), member 3	83	80	73
20512	Slc1a3	solute carrier family 1 (glial high affinity glutamate transporter), member 1	680	674	677
20521	Slc22a12	solute carrier family 22 (organic anion/cation transporter), member 12	527	526	522
30805	Slc22a4	solute carrier family 22 (organic cation transporter), member 4	114	112	116
20520	Slc22a5	solute carrier family 22 (organic cation transporter), member 5	148	154	157
54338	Slc23a2	solute carrier family 23 (nucleobase transporters), member 2	274	275	276
78830	Slc25a12	solute carrier family 25 (mitochondrial carrier, Aralar), member 12	236	225	238
50799	Slc25a13	solute carrier family 25 (mitochondrial carrier, adenine nucleotide transporter), member 13	1108	1125	1107
20524	Slc25a17	solute carrier family 25 (mitochondrial carrier, peroxisomal membrane protein), member 17	214	222	209
68066	Slc25a39	solute carrier family 25, member 39	45	44	49
26457	Slc27a1	solute carrier family 27 (fatty acid transporter), member 1	27	26	29
26458	Slc27a2	solute carrier family 27 (fatty acid transporter), member 2	172	162	157
26568	Slc27a3	solute carrier family 27 (fatty acid transporter), member 3	117	113	120
26569	Slc27a4	solute carrier family 27 (fatty acid transporter), member 4	47	50	44
26459	Slc27a5	solute carrier family 27 (fatty acid transporter), member 5	44	42	44
225579	Slc27a6	solute carrier family 27 (fatty acid transporter), member 6	561	576	579
56017	Slc2a8	solute carrier family 2, (facilitated glucose transporter), member 8	162	158	156
117591	Slc2a9	solute carrier family 2 (facilitated glucose transporter), member 9	330	346	357
109108	Slc30a9	solute carrier family 30 (zinc transporter), member 9	197	218	215
228368	Slc35c1	solute carrier family 35, member C1	219	214	211
56857	Slc37a2	solute carrier family 37 (glycerol-3-phosphate transporter), member 2	182	183	178
14385	Slc37a4	solute carrier family 37 (glucose-6-phosphate transporter), member 4	30	38	31
17254	Slc3a2	solute carrier family 3 (activators of dibasic and neutral amino acid transporters), member 2	86	84	84
22293	Slc45a2	solute carrier family 45, member 2	78	72	68
94229	Slc4a10	solute carrier family 4, sodium bicarbonate cotransporter-like, member 10	769	780	766
19729	Slc50a1	solute carrier family 50 (sugar transporter), member 1	19	13	20
53881	Slc5a3	solute carrier family 5 (inositol transporters), member 3	157	162	170
63993	Slc5a7	solute carrier family 5 (choline transporter), member 7	1824	1823	1844
13162	Slc6a3	solute carrier family 6 (neurotransmitter transporter, dopamine), member 3	185	169	180
15567	Slc6a4	solute carrier family 6 (neurotransmitter transporter, serotonin), member 4	173	168	170
11988	Slc7a2	solute carrier family 7 (cationic amino acid transporter, y+ system), member 2	126	134	129
108115	Slco4a1	solute carrier organic anion transporter family, member 4a1	127	121	124
20563	Slit2	slit homolog 2 (Drosophila)	2960	3003	2932
20564	Slit3	slit homolog 3 (Drosophila)	1010	1019	1006
20874	Slk	STE20-like kinase (yeast)	198	211	201
20568	Slpi	secretory leukocyte peptidase inhibitor	94	91	92
66660	Sltm	SAFB-like, transcription modulator	199	207	197
193116	Slu7	SLU7 splicing factor homolog (S. cerevisiae)	65	63	61
75764	Slx1b	SLX1 structure-specific endonuclease subunit homolog B (S. cerevisiae)	26	23	27
52864	Slx4	SLX4 structure-specific endonuclease subunit homolog (S. cerevisiae)	78	77	82
17125	Smad1	MAD homolog 1 (Drosophila)	439	448	428
17126	Smad2	MAD homolog 2 (Drosophila)	1146	1147	1142
17127	Smad3	MAD homolog 3 (Drosophila)	557	517	534
17128	Smad4	MAD homolog 4 (Drosophila)	225	228	226
17129	Smad5	MAD homolog 5 (Drosophila)	373	382	370
17130	Smad6	MAD homolog 6 (Drosophila)	457	440	463
17131	Smad7	MAD homolog 7 (Drosophila)	863	844	870
55994	Smad9	MAD homolog 9 (Drosophila)	94	95	90
93761	Smarca1	SWI/SNF related, matrix associated, actin dependent regulator of chromatin, subfamily A, member 1	1793	1773	1689
67155	Smarca2	SWI/SNF related, matrix associated, actin dependent regulator of chromatin, subfamily A, member 2	1743	1764	1723
20586	Smarca4	SWI/SNF related, matrix associated, actin dependent regulator of chromatin, subfamily A, member 4	149	155	156
93762	Smarca5	SWI/SNF related, matrix associated, actin dependent regulator of chromatin, subfamily A, member 5	356	342	344
54380	Smarca11	SWI/SNF related matrix associated, actin dependent regulator of chromatin, subfamily A, member 11	213	213	208
20587	Smarcb1	SWI/SNF related, matrix associated, actin dependent regulator of chromatin, subfamily B, member 1	49	47	47

20588	Smarcc1	SWI/SNF related, matrix associated, actin dependent regulator of c	169	178	172
68094	Smarcc2	SWI/SNF related, matrix associated, actin dependent regulator of c	105	104	112
83797	Smarcd1	SWI/SNF related, matrix associated, actin dependent regulator of c	60	52	57
83796	Smarcd2	SWI/SNF related, matrix associated, actin dependent regulator of c	28	26	31
66993	Smarcd3	SWI/SNF related, matrix associated, actin dependent regulator of c	62	60	69
57376	Smarce1	SWI/SNF related, matrix associated, actin dependent regulator of c	115	113	110
24061	Smc1a	structural maintenance of chromosomes 1A	168	150	159
140557	Smc1b	structural maintenance of chromosomes 1B	116	123	120
14211	Smc2	structural maintenance of chromosomes 2	1746	1745	1732
13006	Smc3	structural maintenance of chromosomes 3	197	190	187
70099	Smc4	structural maintenance of chromosomes 4	3	3	4
226026	Smc5	structural maintenance of chromosomes 5	388	380	381
67241	Smc6	structural maintenance of chromosomes 6	212	225	212
233789	Smg1	SMG1 homolog, phosphatidylinositol 3-kinase-related kinase (C. el	147	148	153
229512	Smg5	Smg-5 homolog, nonsense mediated mRNA decay factor (C. eleg	42	33	37
103677	Smg6	Smg-6 homolog, nonsense mediated mRNA decay factor (C. eleg	187	185	175
226517	Smg7	Smg-7 homolog, nonsense mediated mRNA decay factor (C. eleg	222	223	217
20595	Smn1	survival motor neuron 1	123	124	123
76479	Smndc1	survival motor neuron domain containing 1	180	174	168
319757	Smo	smoothened homolog (Drosophila)	93	91	87
236574	Smok2b	sperm motility kinase 2B	68	65	72
272667	Smok4a	sperm motility kinase 4A	319	314	309
228608	Smox	spermine oxidase	260	257	263
20597	Smpd1	sphingomyelin phosphodiesterase 1, acid lysosomal	130	128	129
20598	Smpd2	sphingomyelin phosphodiesterase 2, neutral	17	14	17
58994	Smpd3	sphingomyelin phosphodiesterase 3, neutral	266	263	265
77626	Smpd4	sphingomyelin phosphodiesterase 4	92	96	91
57319	Smpdl3a	sphingomyelin phosphodiesterase, acid-like 3A	175	177	181
100340	Smpdl3b	sphingomyelin phosphodiesterase, acid-like 3B	53	49	49
20603	Sms	spermine synthase	200	201	185
68678	Smtnl1	smoothelin-like 1	39	34	37
71726	Smug1	single-strand selective monofunctional uracil DNA glycosylase	215	220	218
75788	Smurf1	SMAD specific E3 ubiquitin protein ligase 1	319	311	316
66313	Smurf2	SMAD specific E3 ubiquitin protein ligase 2	266	273	279
12180	Smyd1	SET and MYND domain containing 1	97	94	90
226830	Smyd2	SET and MYND domain containing 2	553	556	568
69726	Smyd3	SET and MYND domain containing 3	1328	1305	1329
20613	Snai1	snail homolog 1 (Drosophila)	171	177	182
20583	Snai2	snail homolog 2 (Drosophila)	438	441	444
30927	Snai3	snail homolog 3 (Drosophila)	34	30	32
75627	Snapc1	small nuclear RNA activating complex, polypeptide 1	120	114	115
102209	Snapc2	small nuclear RNA activating complex, polypeptide 2	10	10	13
77634	Snapc3	small nuclear RNA activating complex, polypeptide 3	206	215	216
227644	Snapc4	small nuclear RNA activating complex, polypeptide 4	39	42	37
330959	Snapc5	small nuclear RNA activating complex, polypeptide 5	79	82	83
20617	Snca	synuclein, alpha	676	695	673
67847	Sncaip	synuclein, alpha interacting protein (synphilin)	608	604	597
104069	Sncb	synuclein, beta	45	38	43
56463	Snd1	staphylococcal nuclease and tudor domain containing 1	507	495	493
27681	Snf8	SNF8, ESCRT-II complex subunit, homolog (S. cerevisiae)	54	53	56
76793	Snip1	Smad nuclear interacting protein 1	23	26	23
20623	Snrk	SNF related kinase	388	378	387
320632	Snrnp200	small nuclear ribonucleoprotein 200 (U5)	58	51	55
78372	Snrnp25	small nuclear ribonucleoprotein 25 (U11/U12)	24	31	30
66618	Snrnp27	small nuclear ribonucleoprotein 27 (U4/U6.U5)	88	86	88

76167	Snmp35	small nuclear ribonucleoprotein 35 (U11/U12)	63	65	66
66585	Snmp40	small nuclear ribonucleoprotein 40 (U5)	90	90	85
67797	Snmp48	small nuclear ribonucleoprotein 48 (U11/U12)	257	257	252
20637	Snmp70	small nuclear ribonucleoprotein 70 (U1)	43	49	48
53607	Snrpa	small nuclear ribonucleoprotein polypeptide A	57	57	62
68981	Snrpa1	small nuclear ribonucleoprotein polypeptide A'	298	289	287
20638	Snrpb	small nuclear ribonucleoprotein B	88	88	96
20639	Snrpb2	U2 small nuclear ribonucleoprotein B	218	228	229
20630	Snrpc	U1 small nuclear ribonucleoprotein C	49	43	48
20641	Snrpd1	small nuclear ribonucleoprotein D1	128	126	123
107686	Snrpd2	small nuclear ribonucleoprotein D2	22	20	21
67332	Snrpd3	small nuclear ribonucleoprotein D3	57	55	60
20643	Snrpe	small nuclear ribonucleoprotein E	314	304	312
69878	Snrpf	small nuclear ribonucleoprotein polypeptide F	132	125	130
66354	Snw1	SNW domain containing 1	88	92	90
56440	Snx1	sorting nexin 1	72	76	76
72183	Snx6	sorting nexin 6	228	215	222
20652	Soat1	sterol O-acyltransferase 1	201	204	216
223920	Soat2	sterol O-acyltransferase 2	55	57	60
12703	Socs1	suppressor of cytokine signaling 1	295	300	302
56468	Socs5	suppressor of cytokine signaling 5	292	303	307
192157	Socs7	suppressor of cytokine signaling 7	134	122	131
20655	Sod1	superoxide dismutase 1, soluble	188	183	175
20656	Sod2	superoxide dismutase 2, mitochondrial	78	77	76
20657	Sod3	superoxide dismutase 3, extracellular	489	486	481
227631	Sohlh1	spermatogenesis and oogenesis specific basic helix-loop-helix 1	53	48	54
74434	Sohlh2	spermatogenesis and oogenesis specific basic helix-loop-helix 2	132	135	129
50817	Solh	small optic lobes homolog (Drosophila)	92	88	92
20658	Son	Son DNA binding protein	53	51	54
20411	Sorbs1	sorbin and SH3 domain containing 1	548	554	541
20410	Sorbs3	sorbin and SH3 domain containing 3	136	141	133
20322	Sord	sorbitol dehydrogenase	146	146	142
20660	Sorl1	sortilin-related receptor, LDLR class A repeats-containing	890	889	873
74499	Sost	sclerostin	120	112	112
20665	Sox10	SRY-box containing gene 10	29	30	27
20666	Sox11	SRY-box containing gene 11	2644	2682	2638
20667	Sox12	SRY-box containing gene 12	45	42	45
20668	Sox13	SRY-box containing gene 13	314	318	309
20669	Sox14	SRY-box containing gene 14	970	982	976
20670	Sox15	SRY-box containing gene 15	34	35	36
20671	Sox17	SRY-box containing gene 17	489	492	484
20672	Sox18	SRY-box containing gene 18	101	100	101
20674	Sox2	SRY-box containing gene 2	1430	1460	1441
223227	Sox21	SRY-box containing gene 21	171	154	162
20675	Sox3	SRY-box containing gene 3	803	817	763
214105	Sox30	SRY-box containing gene 30	130	119	121
20677	Sox4	SRY-box containing gene 4	2198	2213	2192
20678	Sox5	SRY-box containing gene 5	2321	2321	2333
20679	Sox6	SRY-box containing gene 6	1774	1766	1753
20680	Sox7	SRY-box containing gene 7	169	154	168
20681	Sox8	SRY-box containing gene 8	103	98	97
20682	Sox9	SRY-box containing gene 9	615	628	624
20683	Sp1	trans-acting transcription factor 1	105	108	104
20684	Sp100	nuclear antigen Sp100	171	170	170
109032	Sp110	Sp110 nuclear body protein	58	56	60

78912	Sp2	Sp2 transcription factor	89	89	91
20687	Sp3	trans-acting transcription factor 3	952	955	961
20688	Sp4	trans-acting transcription factor 4	804	818	816
64406	Sp5	trans-acting transcription factor 5	600	598	604
83395	Sp6	trans-acting transcription factor 6	67	64	64
170574	Sp7	Sp7 transcription factor 7	70	74	69
320145	Sp8	trans-acting transcription factor 8	845	873	855
381373	Sp9	trans-acting transcription factor 9	117	123	116
75622	Spaca3	sperm acrosome associated 3	451	460	450
278203	Spaca5	sperm acrosome associated 5	32	30	34
70834	Spag9	sperm associated antigen 9	360	373	364
20690	Spam1	sperm adhesion molecule 1	142	139	142
73472	Spata18	spermatogenesis associated 18	576	545	528
71242	Spata24	spermatogenesis associated 24	72	71	69
69019	Spcs1	signal peptidase complex subunit 1 homolog (S. cerevisiae)	18	18	18
66624	Spcs2	signal peptidase complex subunit 2 homolog (S. cerevisiae)	35	38	38
30051	Spdef	SAM pointed domain containing ets transcription factor	176	162	164
320277	Spef2	sperm flagellar 2	809	821	815
11790	Speg	SPEG complex locus	100	102	102
56381	Spen	SPEN homolog, transcriptional regulator (Drosophila)	129	126	129
234847	Spg7	spastic paraplegia 7 homolog (human)	75	79	76
20698	Sphk1	sphingosine kinase 1	120	121	110
56632	Sphk2	sphingosine kinase 2	16	17	17
272382	Spib	Spi-B transcription factor (Spi-1/PU.1 related)	27	26	27
20728	Spic	Spi-C transcription factor (Spi-1/PU.1 related)	166	164	161
78242	Spink12	serine peptidase inhibitor, Kazal type 11	104	115	105
20731	Spink4	serine peptidase inhibitor, Kazal type 4	130	129	128
72432	Spink5	serine peptidase inhibitor, Kazal type 5	294	301	288
75526	Spinlw1	serine protease inhibitor-like, with Kunitz and WAP domains 1 (epp)	37	37	39
20737	Spn	sialophorin	100	98	99
20739	Spna1	spectrin alpha 1	114	103	108
20741	Spnb1	spectrin beta 1	308	301	305
20742	Spnb2	spectrin beta 2	585	594	588
26972	Spo11	sporulation protein, meiosis-specific, SPO11 homolog (S. cerevisia)	71	78	76
94214	Spock2	sparc/osteonectin, cwcv and kazal-like domains proteoglycan 2	271	275	267
72902	Spock3	sparc/osteonectin, cwcv and kazal-like domains proteoglycan 3	2261	2336	2245
74585	Sppl3	signal peptide peptidase 3	192	197	193
20751	Spr	sepiapterin reductase	80	79	83
20753	Sprr1a	small proline-rich protein 1A	48	54	51
20754	Sprr1b	small proline-rich protein 1B	32	34	30
20766	Sprr3	small proline-rich protein 3	63	62	59
24064	Spry2	sprouty homolog 2 (Drosophila)	1102	1086	1062
268656	Sptlc1	serine palmitoyltransferase, long chain base subunit 1	146	144	136
20773	Sptlc2	serine palmitoyltransferase, long chain base subunit 2	227	220	219
228677	Sptlc3	serine palmitoyltransferase, long chain base subunit 3	1092	1103	1081
79401	Spz1	spermatogenic leucine zipper 1	112	103	102
20775	Sqle	squalene epoxidase	378	383	349
59010	Sqrdl	sulfide quinone reductase-like (yeast)	2406	2417	2393
18412	Sqstm1	sequestosome 1	65	64	64
24068	Sra1	steroid receptor RNA activator 1	19	19	19
78586	Srbd1	S1 RNA binding domain 1	621	619	598
20779	Src	Rous sarcoma oncogene	241	240	251
78925	Srd5a1	steroid 5 alpha-reductase 1	102	102	96
94224	Srd5a2	steroid 5 alpha-reductase 2	436	447	423
57357	Srd5a3	steroid 5 alpha-reductase 3	174	183	174

20787	Sreb1	sterol regulatory element binding transcription factor 1	265	259	255
20788	Sreb2	sterol regulatory element binding factor 2	91	93	91
218543	Srek1	splicing regulatory glutamine/lysine-rich protein 1	741	757	735
67288	Srek1ip1	splicing regulatory glutamine/lysine-rich protein 1 interacting protein	58	63	57
20807	Srf	serum response factor	107	101	111
67222	Srfbp1	serum response factor binding protein 1	254	254	249
19073	Srgn	serglycin	119	119	127
20810	Srm	spermidine synthase	51	54	57
20811	Srms	src-related kinase lacking C-terminal regulatory tyrosine and N-terr	22	18	18
20813	Srp14	signal recognition particle 14	205	213	219
24067	Srp54a	signal recognition particle 54A	111	113	108
20815	Srpk1	serine/arginine-rich protein specific kinase 1	155	147	151
20817	Srpk2	serine/arginine-rich protein specific kinase 2	357	352	351
56504	Srpk3	serine/arginine-rich protein specific kinase 3	37	38	35
67398	Srpr	signal recognition particle receptor ('docking protein')	72	68	76
27364	Srr	serine racemase	27	27	29
51796	Srrm1	serine/arginine repetitive matrix 1	144	137	140
75956	Srrm2	serine/arginine repetitive matrix 2	56	53	53
68955	Srrm4	serine/arginine repetitive matrix 4	908	877	865
83701	Srrt	serrate RNA effector molecule homolog (Arabidopsis)	21	20	21
110809	Srsf1	serine/arginine-rich splicing factor 1	97	82	96
14105	Srsf10	serine/arginine-rich splicing factor 10	150	141	144
272009	Srsf12	serine/arginine-rich splicing factor 12	71	77	73
20382	Srsf2	serine/arginine-rich splicing factor 2	10	9	12
20383	Srsf3	serine/arginine-rich splicing factor 3	99	93	94
57317	Srsf4	serine/arginine-rich splicing factor 4	97	101	104
67996	Srsf6	serine/arginine-rich splicing factor 6	366	371	377
225027	Srsf7	serine/arginine-rich splicing factor 7	113	116	119
108014	Srsf9	serine/arginine-rich splicing factor 9	51	51	53
76650	Srxn1	sulfiredoxin 1 homolog (S. cerevisiae)	80	75	77
21674	Sry	sex determining region of Chr Y	150	152	149
268996	Ss18	synovial sarcoma translocation, Chromosome 18	955	915	934
269397	Ss18l1	synovial sarcoma translocation gene on chromosome 18-like 1	35	33	34
20823	Ssb	Sjogren syndrome antigen B	86	80	78
381760	Ssbp1	single-stranded DNA binding protein 1	63	64	60
66970	Ssbp2	single-stranded DNA binding protein 2	647	653	657
72475	Ssbp3	single-stranded DNA binding protein 3	338	328	348
231637	Ssh1	slingshot homolog 1 (Drosophila)	120	116	125
237860	Ssh2	slingshot homolog 2 (Drosophila)	343	347	357
245857	Ssh3	slingshot homolog 3 (Drosophila)	72	65	59
20833	Ssrp1	structure specific recognition protein 1	18	16	19
20606	Sstr2	somatostatin receptor 2	109	112	110
20608	Sstr4	somatostatin receptor 4	468	461	448
20609	Sstr5	somatostatin receptor 5	121	128	122
68991	Ssu72	Ssu72 RNA polymerase II CTD phosphatase homolog (yeast)	55	56	52
70356	St13	suppression of tumorigenicity 13	56	50	57
19143	St14	suppression of tumorigenicity 14 (colon carcinoma)	236	229	233
240690	St18	suppression of tumorigenicity 18	915	939	922
20442	St3gal1	ST3 beta-galactoside alpha-2,3-sialyltransferase 1	1652	1649	1646
20444	St3gal2	ST3 beta-galactoside alpha-2,3-sialyltransferase 2	125	123	123
20441	St3gal3	ST3 beta-galactoside alpha-2,3-sialyltransferase 3	318	340	325
20443	St3gal4	ST3 beta-galactoside alpha-2,3-sialyltransferase 4	76	71	77
20454	St3gal5	ST3 beta-galactoside alpha-2,3-sialyltransferase 5	426	418	421
54613	St3gal6	ST3 beta-galactoside alpha-2,3-sialyltransferase 6	264	259	267
20440	St6gal1	beta galactoside alpha 2,6 sialyltransferase 1	362	359	363

240119	St6gal2	beta galactoside alpha 2,6 sialyltransferase 2	1696	1692	1677
20445	St6galnac1	ST6 (alpha-N-acetyl-neuraminyl-2,3-beta-galactosyl-1,3)-N-acetylgl	98	97	97
20446	St6galnac2	ST6 (alpha-N-acetyl-neuraminyl-2,3-beta-galactosyl-1,3)-N-acetylgl	102	104	103
20447	St6galnac3	ST6 (alpha-N-acetyl-neuraminyl-2,3-beta-galactosyl-1,3)-N-acetylgl	1135	1125	1117
20448	St6galnac4	ST6 (alpha-N-acetyl-neuraminyl-2,3-beta-galactosyl-1,3)-N-acetylgl	29	28	28
26938	St6galnac5	ST6 (alpha-N-acetyl-neuraminyl-2,3-beta-galactosyl-1,3)-N-acetylgl	1271	1303	1304
50935	St6galnac6	ST6 (alpha-N-acetyl-neuraminyl-2,3-beta-galactosyl-1,3)-N-acetylgl	54	55	47
20449	St8sia1	ST8 alpha-N-acetyl-neuraminide alpha-2,8-sialyltransferase 1	388	377	382
20450	St8sia2	ST8 alpha-N-acetyl-neuraminide alpha-2,8-sialyltransferase 2	1065	1039	1031
20451	St8sia3	ST8 alpha-N-acetyl-neuraminide alpha-2,8-sialyltransferase 3	815	824	822
20452	St8sia4	ST8 alpha-N-acetyl-neuraminide alpha-2,8-sialyltransferase 4	1926	1980	1901
225742	St8sia5	ST8 alpha-N-acetyl-neuraminide alpha-2,8-sialyltransferase 5	275	277	277
241230	St8sia6	ST8 alpha-N-acetyl-neuraminide alpha-2,8-sialyltransferase 6	629	610	606
20843	Stag2	stromal antigen 2	511	515	480
70527	Stampb	STAM binding protein	148	147	154
76630	Stampb1	STAM binding protein like 1	111	110	113
20845	Star	steroidogenic acute regulatory protein	75	71	80
59045	Stard3	START domain containing 3	43	41	43
170460	Stard5	StAR-related lipid transfer (START) domain containing 5	204	185	195
170461	Stard6	StAR-related lipid transfer (START) domain containing 6	75	75	79
20846	Stat1	signal transducer and activator of transcription 1	277	293	285
20848	Stat3	signal transducer and activator of transcription 3	143	137	140
20849	Stat4	signal transducer and activator of transcription 4	257	260	258
20850	Stat5a	signal transducer and activator of transcription 5A	112	108	105
20851	Stat5b	signal transducer and activator of transcription 5B	157	150	149
20852	Stat6	signal transducer and activator of transcription 6	62	62	55
52331	Stbd1	starch binding domain 1	131	134	135
70358	Steap1	six transmembrane epithelial antigen of the prostate 1	2059	2062	2000
74051	Steap2	six transmembrane epithelial antigen of prostate 2	108	105	115
68428	Steap3	STEAP family member 3	291	300	285
117167	Steap4	STEAP family member 4	895	905	874
20868	Stk10	serine/threonine kinase 10	151	146	144
20869	Stk11	serine/threonine kinase 11	38	40	43
20872	Stk16	serine/threonine kinase 16	10	11	11
98267	Stk17b	serine/threonine kinase 17b (apoptosis-inducing)	644	639	631
54402	Stk19	serine/threonine kinase 19	18	14	18
223255	Stk24	serine/threonine kinase 24 (STE20 homolog, yeast)	599	612	582
59041	Stk25	serine/threonine kinase 25 (yeast)	228	231	242
56274	Stk3	serine/threonine kinase 3 (Ste20, yeast homolog)	565	605	581
26448	Stk30	serine/threonine kinase 30	142	144	139
77485	Stk31	serine threonine kinase 31	596	596	595
269019	Stk32a	serine/threonine kinase 32A	394	406	399
64293	Stk32b	serine/threonine kinase 32B	520	491	493
57740	Stk32c	serine/threonine kinase 32C	208	208	201
117229	Stk33	serine/threonine kinase 33	407	421	422
67333	Stk35	serine/threonine kinase 35	144	148	146
269209	Stk36	serine/threonine kinase 36 (fused homolog, Drosophila)	81	80	77
106504	Stk38	serine/threonine kinase 38	107	103	100
232533	Stk38l	serine/threonine kinase 38 like	205	201	202
53416	Stk39	serine/threonine kinase 39, STE20/SPS1 homolog (yeast)	603	589	603
58231	Stk4	serine/threonine kinase 4	127	131	127
74178	Stk40	serine/threonine kinase 40	67	69	66
20892	Stra13	stimulated by retinoic acid 13	44	44	43
20899	Stra8	stimulated by retinoic acid gene 8	90	81	85
72149	Strada	STE20-related kinase adaptor alpha	77	74	73

227154	Stradb	STE20-related kinase adaptor beta	150	149	160
20901	Strap	serine/threonine kinase receptor associated protein	137	136	129
94186	Strn3	striatin, calmodulin binding protein 3	176	173	179
16430	Stt3a	STT3, subunit of the oligosaccharyltransferase complex, homolog I	91	97	98
68292	Stt3b	STT3, subunit of the oligosaccharyltransferase complex, homolog II	812	827	797
56424	Stub1	STIP1 homology and U-Box containing protein 1	8	8	7
243659	Styk1	serine/threonine/tyrosine kinase 1	119	126	121
20024	Sub1	SUB1 homolog (S. cerevisiae)	275	273	276
20916	Sucla2	succinate-Coenzyme A ligase, ADP-forming, beta subunit	1393	1392	1373
56451	Suclg1	succinate-CoA ligase, GDP-forming, alpha subunit	311	318	312
20917	Suclg2	succinate-Coenzyme A ligase, GDP-forming, beta subunit	1000	1004	984
71954	Suds3	suppressor of defective silencing 3 homolog (S. cerevisiae)	698	690	682
24069	Sufu	suppressor of fused homolog (Drosophila)	132	132	127
70616	Sugp1	SURP and G patch domain containing 1	43	38	38
234373	Sugp2	SURP and G patch domain containing 2	26	28	29
240725	Sulf1	sulfatase 1	2038	2058	1987
72043	Sulf2	sulfatase 2	365	344	370
20887	Sult1a1	sulfotransferase family 1A, phenol-preferring, member 1	61	59	59
56362	Sult1b1	sulfotransferase family 1B, member 1	97	94	97
20888	Sult1c1	sulfotransferase family, cytosolic, 1C, member 1	570	599	592
69083	Sult1c2	sulfotransferase family, cytosolic, 1C, member 2	360	345	343
53315	Sult1d1	sulfotransferase family 1D, member 1	67	68	67
20860	Sult1e1	sulfotransferase family 1E, member 1	123	121	120
20859	Sult2a1	sulfotransferase family 2A, dehydroepiandrosterone (DHEA)-preferring	316	335	310
54200	Sult2b1	sulfotransferase family, cytosolic, 2B, member 1	72	76	71
29859	Sult4a1	sulfotransferase family 4A, member 1	81	70	71
58911	Sumf1	sulfatase modifying factor 1	190	195	189
22218	Sumo1	SMT3 suppressor of mif two 3 homolog 1 (yeast)	217	226	215
170930	Sumo2	SMT3 suppressor of mif two 3 homolog 2 (yeast)	49	57	55
20610	Sumo3	SMT3 suppressor of mif two 3 homolog 3 (yeast)	49	54	46
211389	Suox	sulfite oxidase	64	66	62
114741	Supt16h	suppressor of Ty 16 homolog (S. cerevisiae)	129	129	130
109115	Supt3h	suppressor of Ty 3 homolog (S. cerevisiae)	102	97	95
20922	Supt4h1	suppressor of Ty 4 homolog 1 (S. cerevisiae)	113	119	128
20924	Supt5h	suppressor of Ty 5 homolog (S. cerevisiae)	48	51	49
20926	Supt6h	suppressor of Ty 6 homolog (S. cerevisiae)	72	68	74
72195	Supt7I	suppressor of Ty 7 (S. cerevisiae)-like	42	46	42
338359	Supv3I1	suppressor of var1, 3-like 1 (S. cerevisiae)	53	46	44
20930	Surf1	surfeit gene 1	23	20	24
20937	Suv39h1	suppressor of variegation 3-9 homolog 1 (Drosophila)	89	86	85
64707	Suv39h2	suppressor of variegation 3-9 homolog 2 (Drosophila)	104	116	108
225888	Suv420h1	suppressor of variegation 4-20 homolog 1 (Drosophila)	185	182	178
232811	Suv420h2	suppressor of variegation 4-20 homolog 2 (Drosophila)	31	33	35
52615	Suz12	suppressor of zeste 12 homolog (Drosophila)	158	165	158
20947	Swap70	SWA-70 protein	628	637	633
20962	Sycp3	synaptonemal complex protein 3	160	166	164
68592	Syf2	SYF2 homolog, RNA splicing factor (S. cerevisiae)	256	250	250
20963	Sykb	spleen tyrosine kinase	295	306	317
56403	Syncrip	synaptotagmin binding, cytoplasmic RNA interacting protein	139	148	138
104015	Synj1	synaptojanin 1	141	138	135
20975	Synj2	synaptojanin 2	348	352	344
74126	Syvn1	synovial apoptosis inhibitor 1, synoviolin	52	60	53
20997	T	brachyury	563	543	563
66724	Tab3	TGF-beta activated kinase 1/MAP3K7 binding protein 3	641	635	629
27878	Tada1	transcriptional adaptor 1	196	189	199

217031	Tada2a	transcriptional adaptor 2A	133	136	129
101206	Tada3	transcriptional adaptor 3	44	41	49
270627	Taf1	TAF1 RNA polymerase II, TATA box binding protein (TBP)-associa	256	252	230
24075	Taf10	TAF10 RNA polymerase II, TATA box binding protein (TBP)-associ	19	15	20
68776	Taf11	TAF11 RNA polymerase II, TATA box binding protein (TBP)-associ	65	68	70
66464	Taf12	TAF12 RNA polymerase II, TATA box binding protein (TBP)-associ	45	47	46
99730	Taf13	TAF13 RNA polymerase II, TATA box binding protein (TBP)-associ	39	38	38
21340	Taf1b	TATA box binding protein (Tbp)-associated factor, RNA polymeras	2899	2901	2885
21341	Taf1c	TATA box binding protein (Tbp)-associated factor, RNA polymeras	46	40	43
319944	Taf2	TAF2 RNA polymerase II, TATA box binding protein (TBP)-associa	220	220	215
209361	Taf3	TAF3 RNA polymerase II, TATA box binding protein (TBP)-associa	260	261	256
228980	Taf4a	TAF4A RNA polymerase II, TATA box binding protein (TBP)-assoc	693	672	693
72504	Taf4b	TAF4B RNA polymerase II, TATA box binding protein (TBP)-assoc	438	466	459
226182	Taf5	TAF5 RNA polymerase II, TATA box binding protein (TBP)-associa	47	47	50
102162	Taf5l	TAF5-like RNA polymerase II, p300/CBP-associated factor (PCAF)	49	55	50
21343	Taf6	TAF6 RNA polymerase II, TATA box binding protein (TBP)-associa	22	22	18
225895	Taf6l	TAF6-like RNA polymerase II, p300/CBP-associated factor (PCAF)	27	32	30
24074	Taf7	TAF7 RNA polymerase II, TATA box binding protein (TBP)-associa	28	33	33
74469	Taf7l	TAF7-like RNA polymerase II, TATA box binding protein (TBP)-ass	163	171	159
63856	Taf8	TAF8 RNA polymerase II, TATA box binding protein (TBP)-associa	99	92	90
108143	Taf9	TAF9 RNA polymerase II, TATA box binding protein (TBP)-associa	24	25	23
407786	Taf9b	TAF9B RNA polymerase II, TATA box binding protein (TBP)-assoc	79	80	78
21349	Tal1	T-cell acute lymphocytic leukemia 1	109	111	114
21350	Tal2	T-cell acute lymphocytic leukemia 2	145	137	137
21351	Taldo1	transaldolase 1	56	53	52
216965	Taok1	TAO kinase 1	223	233	221
381921	Taok2	TAO kinase 2	44	45	46
330177	Taok3	TAO kinase 3	249	248	237
21354	Tap1	transporter 1, ATP-binding cassette, sub-family B (MDR/TAP)	13	14	10
21356	Tapbp	TAP binding protein	15	15	18
21357	Tarbp2	TAR (HIV) RNA binding protein 2	8	9	10
230908	Tardbp	TAR DNA binding protein	56	57	53
110960	Tars	threonyl-tRNA synthetase	1061	1069	1068
71807	Tars2	threonyl-tRNA synthetase 2, mitochondrial (putative)	105	109	105
272396	Tarsl2	threonyl-tRNA synthetase-like 2	419	411	406
75812	Tasp1	taspase, threonine aspartase 1	633	656	615
234724	Tat	tyrosine aminotransferase	100	99	101
66826	Taz	tafazzin	18	18	17
67046	Tbc1d7	TBC1 domain family, member 7	233	232	238
72726	Tbcc	tubulin-specific chaperone C	102	98	99
108903	Tbcd	tubulin-specific chaperone d	112	110	110
70430	Tbce	tubulin-specific chaperone E	150	136	138
271981	Tbck	TBC1 domain containing kinase	344	329	330
56480	Tbk1	TANK-binding kinase 1	198	187	204
21372	Tbl1x	transducin (beta)-like 1 X-linked	1333	1308	1292
81004	Tbl1xr1	transducin (beta)-like 1X-linked receptor 1	2419	2431	2376
213773	Tbl3	transducin (beta)-like 3	29	31	29
21374	Tbp	TATA box binding protein	37	34	38
237336	Tbpl1	TATA box binding protein-like 1	201	212	220
227606	Tbpl2	TATA box binding protein like 2	134	140	126
21375	Tbr1	T-box brain gene 1	421	419	420
21376	Tbrg1	transforming growth factor beta regulated gene 1	73	67	72
21379	Tbrg4	transforming growth factor beta regulated gene 4	22	25	28
21380	Tbx1	T-box 1	154	143	148
109575	Tbx10	T-box 10	17	17	17

21384	Tbx15	T-box 15	944	945	941
76365	Tbx18	T-box18	1358	1387	1347
83993	Tbx19	T-box 19	339	329	333
21385	Tbx2	T-box 2	691	693	698
57246	Tbx20	T-box 20	585	596	582
57765	Tbx21	T-box 21	125	118	128
245572	Tbx22	T-box 22	338	323	318
21386	Tbx3	T-box 3	1629	1603	1610
21387	Tbx4	T-box 4	471	487	486
21388	Tbx5	T-box 5	564	568	557
21389	Tbx6	T-box 6	19	20	19
21391	Tbxas1	thromboxane A synthase 1, platelet	317	320	321
21399	Tcea1	transcription elongation factor A (SII) 1	282	267	275
21400	Tcea2	transcription elongation factor A (SII), 2	24	26	26
21401	Tcea3	transcription elongation factor A (SII), 3	101	95	100
237052	Tceal1	transcription elongation factor A (SII)-like 1	86	93	91
594844	Tceal3	transcription elongation factor A (SII)-like 3	225	230	227
331532	Tceal5	transcription elongation factor A (SII)-like 5	48	49	47
66104	Tceal6	transcription elongation factor A (SII)-like 6	156	150	143
100040972	Tceal7	transcription elongation factor A (SII)-like 7	38	35	33
66684	Tceal8	transcription elongation factor A (SII)-like 8	77	80	80
245695	Tceanc	transcription elongation factor A (SII) N-terminal and central domain	129	132	125
67923	Tceb1	transcription elongation factor B (SIII), polypeptide 1	52	49	54
67673	Tceb2	transcription elongation factor B (SIII), polypeptide 2	42	42	40
27224	Tceb3	transcription elongation factor B (SIII), polypeptide 3	94	81	83
56070	Tceryg1	transcription elongation regulator 1 (CA150)	235	235	228
21406	Tcf12	transcription factor 12	648	633	625
21407	Tcf15	transcription factor 15	155	155	152
21411	Tcf20	transcription factor 20	147	156	143
21412	Tcf21	transcription factor 21	770	804	783
66855	Tcf25	transcription factor 25 (basic helix-loop-helix)	96	95	98
21423	Tcf3	transcription factor 3	109	107	109
21413	Tcf4	transcription factor 4	1247	1245	1254
21414	Tcf7	transcription factor 7, T-cell specific	166	166	162
21415	Tcf7I1	transcription factor 7-like 1 (T-cell specific, HMG box)	371	366	373
21416	Tcf7I2	transcription factor 7-like 2, T-cell specific, HMG-box	1443	1436	1442
21418	Tcfap2a	transcription factor AP-2, alpha	739	731	719
21419	Tcfap2b	transcription factor AP-2 beta	1952	1949	1931
21420	Tcfap2c	transcription factor AP-2, gamma	592	601	601
226896	Tcfap2d	transcription factor AP-2, delta	1178	1219	1187
332937	Tcfap2e	transcription factor AP-2, epsilon	104	97	99
83383	Tcfap4	transcription factor AP4	93	90	90
21422	Tcfcp2	transcription factor CP2	113	119	120
81879	Tcfcp2I1	transcription factor CP2-like 1	796	759	790
209446	Tcfe3	transcription factor E3	47	38	37
21425	Tcfef	transcription factor EB	198	182	193
21426	Tcfec	transcription factor EC	1696	1704	1666
21452	Tcn2	transcobalamin 2	62	67	69
21453	Tcof1	Treacher Collins Franceschetti syndrome 1, homolog	140	148	143
21454	Tcp1	t-complex protein 1	8	9	6
21665	Tdg	thymine DNA glycosylase	11	10	10
21667	Tdgf1	teratocarcinoma-derived growth factor 1	46	47	47
58865	Tdh	L-threonine dehydrogenase	144	149	138
56720	Tdo2	tryptophan 2,3-dioxygenase	83	80	75
104884	Tdp1	tyrosyl-DNA phosphodiesterase 1	108	109	103

56196	Tdp2	tyrosyl-DNA phosphodiesterase 2	16	19	18
83561	Tdrd1	tudor domain containing 1	84	79	80
219249	Tdrd3	tudor domain containing 3	1675	1715	1655
214575	Tdrd5	tudor domain containing 5	127	137	131
74691	Tdrd9	tudor domain containing 9	19	21	19
21676	Tead1	TEA domain family member 1	804	784	780
21677	Tead2	TEA domain family member 2	35	34	33
21678	Tead3	TEA domain family member 3	45	40	42
21679	Tead4	TEA domain family member 4	282	276	273
21682	Tec	tec protein tyrosine kinase	209	212	220
106529	Tecr	trans-2,3-enoyl-CoA reductase	54	50	54
243078	Tecrl	trans-2,3-enoyl-CoA reductase-like	1990	1999	1983
21685	Tef	thyrotroph embryonic factor	153	157	155
21687	Tek	endothelial-specific receptor tyrosine kinase	335	325	324
209039	Tenc1	tensin like C1 domain-containing phosphatase	79	70	74
21745	Tep1	telomerase associated protein 1	103	112	115
21748	Terc	telomerase RNA component	195	193	180
21749	Terf1	telomeric repeat binding factor 1	754	748	743
21750	Terf2	telomeric repeat binding factor 2	100	115	111
57321	Terf2ip	telomeric repeat binding factor 2, interacting protein	717	728	700
21752	Tert	telomerase reverse transcriptase	98	92	97
57816	Tesc	tescalcin	235	204	221
21754	Tesk1	testis specific protein kinase 1	27	28	29
230661	Tesk2	testis-specific kinase 2	135	128	126
52463	Tet1	tet oncogene 1	161	183	172
214133	Tet2	tet oncogene family member 2	1191	1220	1188
194388	Tet3	tet oncogene family member 3	112	122	114
56746	Tex101	testis expressed gene 101	61	66	67
83558	Tex11	testis expressed gene 11	372	367	354
83560	Tex14	testis expressed gene 14	262	258	252
21780	Tfam	transcription factor A, mitochondrial	134	138	131
224481	Tfb1m	transcription factor B1, mitochondrial	213	214	209
15278	Tfb2m	transcription factor B2, mitochondrial	42	36	41
21781	Tfdp1	transcription factor Dp 1	144	142	139
211586	Tfdp2	transcription factor Dp 2	402	393	408
54723	Tfip11	tuftelin interacting protein 11	85	83	83
69714	Tfpt	TCF3 (E2A) fusion partner	16	12	16
22042	Tfr	transferrin receptor	195	199	190
21819	Tg	thyroglobulin	299	310	296
76355	Tgds	TDP-glucose 4,6-dehydratase	111	109	107
21802	Tgfa	transforming growth factor alpha	375	365	377
21803	Tgfb1	transforming growth factor, beta 1	46	39	43
21804	Tgfb1i1	transforming growth factor beta 1 induced transcript 1	33	33	30
21808	Tgfb2	transforming growth factor, beta 2	811	793	817
21809	Tgfb3	transforming growth factor, beta 3	333	326	348
21812	Tgfr1	transforming growth factor, beta receptor I	340	339	345
21813	Tgfr2	transforming growth factor, beta receptor II	1721	1747	1723
21814	Tgfr3	transforming growth factor, beta receptor III	473	468	464
21815	Tgif1	TGFB-induced factor homeobox 1	576	563	575
228839	Tgif2	TGFB-induced factor homeobox 2	113	104	110
21816	Tgm1	transglutaminase 1, K polypeptide	52	53	57
21817	Tgm2	transglutaminase 2, C polypeptide	210	212	214
21818	Tgm3	transglutaminase 3, E polypeptide	395	393	372
331046	Tgm4	transglutaminase 4 (prostate)	117	119	126
74176	Tgm5	transglutaminase 5	93	89	95

116940	Tgs1	trimethylguanosine synthase homolog (<i>S. cerevisiae</i>)	137	129	134
21823	Th	tyrosine hydroxylase	374	375	366
57314	Th1l	TH1-like homolog (<i>Drosophila</i>)	137	141	140
73754	Thap1	THAP domain containing, apoptosis associated protein 1	1079	1066	1095
59016	Thap11	THAP domain containing 11	11	8	10
69009	Thap7	THAP domain containing 7	67	70	71
21825	Thbs1	thrombospondin 1	1168	1184	1178
21828	Thbs4	thrombospondin 4	299	304	299
66628	Thg1l	tRNA-histidine guanylyltransferase 1-like (<i>S. cerevisiae</i>)	49	45	47
208967	Thns1l	threonine synthase-like 1 (bacterial)	204	209	202
232078	Thns12	threonine synthase-like 2 (bacterial)	307	320	309
225160	Thoc1	THO complex 1	406	428	408
331401	Thoc2	THO complex 2	799	814	772
73666	Thoc3	THO complex 3	169	171	176
21681	Thoc4	THO complex 4	20	19	20
107829	Thoc5	THO complex 5	93	98	100
386612	Thoc6	THO complex 6 homolog (<i>Drosophila</i>)	4	4	6
66231	Thoc7	THO complex 7 homolog (<i>Drosophila</i>)	453	431	421
50492	Thop1	thimet oligopeptidase 1	49	45	50
21833	Thra	thyroid hormone receptor alpha	56	50	53
230753	Thrap3	thyroid hormone receptor associated protein 3	121	122	122
21834	Thrb	thyroid hormone receptor beta	2537	2560	2504
21835	Thrsp	thyroid hormone responsive SPOT14 homolog (<i>Rattus</i>)	69	70	61
105663	Thtpa	thiamine triphosphatase	20	21	18
72167	Thumpd2	THUMP domain containing 2	1017	1021	1022
14911	Thumpd3	THUMP domain containing 3	177	176	163
21841	Tia1	cytotoxic granule-associated RNA binding protein 1	56	54	51
106759	Ticam1	toll-like receptor adaptor molecule 1	50	47	45
21846	Tie1	tyrosine kinase with immunoglobulin-like and EGF-like domains 1	87	91	92
21853	Timeless	timeless homolog (<i>Drosophila</i>)	48	43	50
66525	Timm50	translocase of inner mitochondrial membrane 50 homolog (yeast)	50	45	50
21857	Timp1	tissue inhibitor of metalloproteinase 1	85	85	89
21858	Timp2	tissue inhibitor of metalloproteinase 2	74	69	70
21859	Timp3	tissue inhibitor of metalloproteinase 3	522	512	510
94242	Tinagl1	tubulointerstitial nephritis antigen-like 1	108	105	101
28113	Tinf2	Terf1 (TRF1)-interacting nuclear factor 2	55	54	47
99929	Tiparp	TCDD-inducible poly(ADP-ribose) polymerase	170	176	174
66131	Tipin	timeless interacting protein	114	120	111
117149	Tirap	toll-interleukin 1 receptor (TIR) domain-containing adaptor protein	46	45	44
21877	Tk1	thymidine kinase 1	31	29	28
57813	Tk2	thymidine kinase 2, mitochondrial	104	102	100
21881	Tkt	transketolase	171	169	178
83553	Tktl1	transketolase-like 1	98	97	92
74419	Tktl2	transketolase-like 2	260	264	263
21885	Tle1	transducin-like enhancer of split 1, homolog of <i>Drosophila</i> E(spl)	2134	2105	2082
21886	Tle2	transducin-like enhancer of split 2, homolog of <i>Drosophila</i> E(spl)	51	49	41
21887	Tle3	transducin-like enhancer of split 3, homolog of <i>Drosophila</i> E(spl)	1446	1441	1468
21888	Tle4	transducin-like enhancer of split 4, homolog of <i>Drosophila</i> E(spl)	2567	2567	2515
228012	Tlk1	tousled-like kinase 1	453	460	456
24086	Tlk2	tousled-like kinase 2 (<i>Arabidopsis</i>)	147	142	148
21892	Tll1	tolloid-like	693	691	692
24087	Tll2	tolloid-like 2	246	233	238
21897	Tlr1	toll-like receptor 1	199	200	214
24088	Tlr2	toll-like receptor 2	354	358	343
142980	Tlr3	toll-like receptor 3	160	163	155

21898	Tlr4	toll-like receptor 4	3210	3232	3193
21899	Tlr6	toll-like receptor 6	45	52	50
170743	Tlr7	toll-like receptor 7	146	149	147
170744	Tlr8	toll-like receptor 8	153	152	145
81897	Tlr9	toll-like receptor 9	51	54	55
21908	Tlx1	T-cell leukemia, homeobox 1	204	202	191
21909	Tlx2	T-cell leukemia, homeobox 2	23	24	20
73166	Tm7sf2	transmembrane 7 superfamily member 2	17	16	22
74140	Tm9sf1	transmembrane 9 superfamily member 1	16	18	16
68581	Tmed10	transmembrane emp24-like trafficking protein 10 (yeast)	179	172	170
56334	Tmed2	transmembrane emp24 domain trafficking protein 2	28	26	24
66154	Tmem14c	transmembrane protein 14C	87	86	91
234371	Tmem161a	transmembrane protein 161A	75	70	70
72512	Tmem173	transmembrane protein 173	64	61	56
57394	Tmem27	transmembrane protein 27	81	81	70
329795	Tmem67	transmembrane protein 67	160	161	157
72098	Tmem68	transmembrane protein 68	503	512	499
239408	Tmem74	transmembrane protein 74	901	936	906
68255	Tmem86b	transmembrane protein 86B	72	73	74
232286	Tmf1	TATA element modulatory factor 1	74	72	69
194597	Tmprss11a	transmembrane protease, serine 11a	178	186	184
319875	Tmprss11bnl	transmembrane protease, serine 11b N terminal like	139	152	145
435845	Tmprss11c	transmembrane protease, serine 11c	236	232	224
231382	Tmprss11d	transmembrane protease, serine 11d	230	237	217
243084	Tmprss11e	transmembrane protease, serine 11e	158	178	154
243083	Tmprss11f	transmembrane protease, serine 11f	203	191	197
75002	Tmprss12	transmembrane (C-terminal) protease, serine 12	106	107	107
214531	Tmprss13	transmembrane protease, serine 13	134	126	127
19146	Tmprss15	transmembrane protease, serine 15	2816	2872	2789
50528	Tmprss2	transmembrane protease, serine 2	293	308	297
140765	Tmprss3	transmembrane protease, serine 3	58	61	58
214523	Tmprss4	transmembrane protease, serine 4	91	103	97
80893	Tmprss5	transmembrane protease, serine 5 (spinesin)	254	242	250
71753	Tmprss6	transmembrane serine protease 6	84	84	82
208171	Tmprss7	transmembrane serine protease 7	86	96	89
432478	Tmprss9	transmembrane protease, serine 9	58	54	57
19241	Tmsb4x	thymosin, beta 4, X chromosome	230	223	235
72736	Tmx1	thioredoxin-related transmembrane protein 1	600	607	619
67988	Tmx3	thioredoxin-related transmembrane protein 3	1156	1184	1152
52837	Tmx4	thioredoxin-related transmembrane protein 4	281	298	278
21923	Tnc	tenascin C	1619	1607	1620
21926	Tnf	tumor necrosis factor	14	13	12
21927	Tnfaip1	tumor necrosis factor, alpha-induced protein 1 (endothelial)	33	29	31
21929	Tnfaip3	tumor necrosis factor, alpha-induced protein 3	405	392	380
72049	Tnfrsf13c	tumor necrosis factor receptor superfamily, member 13c	62	51	56
230979	Tnfrsf14	tumor necrosis factor receptor superfamily, member 14 (herpesviru	81	83	81
21937	Tnfrsf1a	tumor necrosis factor receptor superfamily, member 1a	75	72	72
22163	Tnfrsf4	tumor necrosis factor receptor superfamily, member 4	45	46	48
21941	Tnfrsf8	tumor necrosis factor receptor superfamily, member 8	274	284	269
21943	Tnfsf11	tumor necrosis factor (ligand) superfamily, member 11	147	148	146
69583	Tnfsf13	tumor necrosis factor (ligand) superfamily, member 13	17	17	17
24099	Tnfsf13b	tumor necrosis factor (ligand) superfamily, member 13b	239	239	226
326623	Tnfsf15	tumor necrosis factor (ligand) superfamily, member 15	310	317	310
22164	Tnfsf4	tumor necrosis factor (ligand) superfamily, member 4	314	313	302
665113	Tnik	TRAF2 and NCK interacting kinase	917	921	912

57783	Tnip1	TNFAIP3 interacting protein 1	175	180	183
83813	Tnk1	tyrosine kinase, non-receptor, 1	45	39	43
51789	Tnk2	tyrosine kinase, non-receptor, 2	77	76	78
21951	Tnks	tankyrase, TRF1-interacting ankyrin-related ADP-ribose polymeras	733	734	723
74493	Tnks2	tankyrase, TRF1-interacting ankyrin-related ADP-ribose polymeras	237	247	238
21953	Tnni2	troponin I, skeletal, fast 2	32	35	34
435766	Tnni3k	TNNI3 interacting kinase	494	502	473
21956	Tnnt2	troponin T2, cardiac	138	139	128
21958	Tnp1	transition protein 1	181	180	179
233833	Tnrc6a	trinucleotide repeat containing 6a	316	316	315
213988	Tnrc6b	trinucleotide repeat containing 6b	473	472	474
217351	Tnrc6c	trinucleotide repeat containing 6C	214	222	215
81877	Tnxb	tenascin XB	112	110	124
54473	Tollip	toll interacting protein	138	145	141
791260	Tomt	transmembrane O-methyltransferase	20	21	21
72749	Tonsl	tonsoku-like, DNA repair protein	46	40	41
21969	Top1	topoisomerase (DNA) I	457	478	472
72960	Top1mt	DNA topoisomerase 1, mitochondrial	107	112	109
21973	Top2a	topoisomerase (DNA) II alpha	79	72	86
21974	Top2b	topoisomerase (DNA) II beta	409	419	408
21975	Top3a	topoisomerase (DNA) III alpha	70	66	70
21976	Top3b	topoisomerase (DNA) III beta	33	36	34
235559	Topbp1	topoisomerase (DNA) II binding protein 1	101	98	93
106021	Topors	topoisomerase I binding, arginine/serine-rich	48	44	50
30931	Tor1a	torsin family 1, member A (torsin A)	37	38	38
30934	Tor1b	torsin family 1, member B	86	83	81
30933	Tor2a	torsin family 2, member A	66	63	62
30935	Tor3a	torsin family 3, member A	207	205	203
269389	Tox2	TOX high mobility group box family member 2	399	401	397
244579	Tox3	TOX high mobility group box family member 3	2306	2344	2289
21987	Tpd5211	tumor protein D52-like 1	241	238	249
21990	Tph1	tryptophan hydroxylase 1	102	110	104
216343	Tph2	tryptophan hydroxylase 2	590	585	588
21991	Tpi1	triosephosphate isomerase 1	24	28	24
29807	Tpk1	thiamine pyrophosphokinase	2192	2238	2193
22017	Tpmt	thiopurine methyltransferase	35	31	37
22018	Tpo	thyroid peroxidase	570	553	560
12751	Tpp1	tripeptidyl peptidase I	56	54	52
22019	Tpp2	tripeptidyl peptidase II	248	253	238
17229	Tpsb2	tryptase beta 2	30	26	31
26945	Tpsg1	tryptase gamma 1	80	87	81
101214	Tra2a	transformer 2 alpha homolog (Drosophila)	134	134	130
20462	Tra2b	transformer 2 beta homolog (Drosophila)	356	352	363
22030	Traf2	TNF receptor-associated factor 2	76	76	72
22031	Traf3	TNF receptor-associated factor 3	306	285	309
74019	Traf3ip1	TRAF3 interacting protein 1	101	97	105
22032	Traf4	TNF receptor associated factor 4	108	100	103
22033	Traf5	TNF receptor-associated factor 5	162	156	160
22034	Traf6	TNF receptor-associated factor 6	197	194	197
224619	Traf7	TNF receptor-associated factor 7	56	58	53
70827	Trak2	trafficking protein, kinesin binding 2	223	227	218
170829	Tram2	translocating chain-associating membrane protein 2	336	343	337
68015	Trap1	TNF receptor-associated protein 1	227	228	225
60409	Trappc4	trafficking protein particle complex 4	13	11	9
77647	Trat1	T cell receptor associated transmembrane adaptor 1	490	486	490

13434	Trdmt1	tRNA aspartic acid methyltransferase 1	109	102	101
58866	Treh	trehalase (brush-border membrane glycoprotein)	170	160	163
224829	Trerf1	transcriptional regulating factor 1	578	548	564
22040	Trex1	three prime repair exonuclease 1	30	23	25
24102	Trex2	three prime repair exonuclease 2	56	58	53
50765	Trfr2	transferrin receptor 2	58	61	60
237553	Trhde	TRH-degrading enzyme	2789	2858	2790
211770	Trib1	tribbles homolog 1 (Drosophila)	825	821	827
217410	Trib2	tribbles homolog 2 (Drosophila)	3083	3151	3065
228775	Trib3	tribbles homolog 3 (Drosophila)	12	13	15
66597	Trim13	tripartite motif-containing 13	72	69	70
94092	Trim16	tripartite motif-containing 16	71	76	72
56631	Trim17	tripartite motif-containing 17	32	26	30
80890	Trim2	tripartite motif-containing 2	390	381	396
20821	Trim21	tripartite motif-containing 21	29	29	29
81003	Trim23	tripartite motif-containing 23	65	66	68
21848	Trim24	tripartite motif-containing 24	683	676	669
19720	Trim27	tripartite motif-containing 27	192	191	197
21849	Trim28	tripartite motif-containing 28	29	30	30
20128	Trim30a	tripartite motif-containing 30A	183	186	195
69807	Trim32	tripartite motif-containing 32	1639	1657	1635
94093	Trim33	tripartite motif-containing 33	520	534	523
384309	Trim56	tripartite motif-containing 56	165	164	167
433766	Trim63	tripartite motif-containing 63	72	70	68
330627	Trim66	tripartite motif-containing 66	121	123	131
101700	Trim68	tripartite motif-containing 68	36	43	35
94090	Trim9	tripartite motif-containing 9	288	297	279
223435	Trio	triple functional domain (PTPRF interacting)	665	664	654
14897	Trip12	thyroid hormone receptor interactor 12	180	185	189
69716	Trip13	thyroid hormone receptor interactor 13	115	108	111
56404	Trip4	thyroid hormone receptor interactor 4	108	106	105
22051	Trip6	thyroid hormone receptor interactor 6	35	35	31
66966	Trit1	tRNA isopentenyltransferase 1	139	151	144
212528	Trmt1	TRM1 tRNA methyltransferase 1 homolog (S. cerevisiae)	20	16	18
73681	Trmt11	tRNA methyltransferase 11 homolog (S. cerevisiae)	527	529	533
67674	Trmt112	tRNA methyltransferase 11-2 homolog (S. cerevisiae)	14	15	16
68260	Trmt12	tRNA methyltransferase 12 homolog (S. cerevisiae)	87	85	81
215201	Trmt2b	TRM2 tRNA methyltransferase 2 homolog B (S. cerevisiae)	136	136	128
76357	Trmt5	TRM5 tRNA methyltransferase 5 homolog (S. cerevisiae)	211	216	203
66926	Trmt6	tRNA methyltransferase 6 homolog (S. cerevisiae)	41	38	48
328162	Trmt61a	tRNA methyltransferase 61 homolog A (S. cerevisiae)	52	51	54
72026	Trmu	tRNA 5-methylaminomethyl-2-thiouridylate methyltransferase	229	219	228
71787	Trnau1ap	tRNA selenocysteine 1 associated protein 1	42	52	41
70047	Trmt1	tRNA nucleotidyl transferase, CCA-adding, 1	61	61	62
22059	Trp53	transformation related protein 53	34	35	31
27223	Trp53bp1	transformation related protein 53 binding protein 1	159	153	163
76367	Trp53rk	transformation related protein 53 regulating kinase	117	118	115
22061	Trp63	transformation related protein 63	1207	1191	1173
22062	Trp73	transformation related protein 73	176	183	169
22064	Trpc2	transient receptor potential cation channel, subfamily C, member 2	67	70	66
56407	Trpc4ap	transient receptor potential cation channel, subfamily C, member 4	143	135	134
68667	Trpm4	transient receptor potential cation channel, subfamily M, member 4	68	63	60
225997	Trpm6	transient receptor potential cation channel, subfamily M, member 6	381	379	370
58800	Trpm7	transient receptor potential cation channel, subfamily M, member 7	193	185	183
83925	Trps1	trichorhinophalangeal syndrome I (human)	1205	1247	1219

107328	Trpt1	tRNA phosphotransferase 1	28	29	28
193034	Trpv1	transient receptor potential cation channel, subfamily V, member 1	85	91	87
100683	Trrap	transformation/transcription domain-associated protein	280	262	263
72133	Trub1	TruB pseudouridine (psi) synthase homolog 1 (E. coli)	323	328	329
227682	Trub2	TruB pseudouridine (psi) synthase homolog 2 (E. coli)	36	35	34
436522	Try10	trypsin 10	88	78	70
22074	Try4	trypsin 4	355	359	343
103964	Try5	trypsin 5	69	68	67
64930	Tsc1	tuberous sclerosis 1	99	98	95
21807	Tsc22d1	TSC22 domain family, member 1	670	691	696
14605	Tsc22d3	TSC22 domain family, member 3	340	331	314
78829	Tsc22d4	TSC22 domain family, member 4	46	46	47
66637	Tsen15	tRNA splicing endonuclease 15 homolog (S. cerevisiae)	389	399	398
381802	Tsen2	tRNA splicing endonuclease 2 homolog (S. cerevisiae)	224	222	218
66078	Tsen34	tRNA splicing endonuclease 34 homolog (S. cerevisiae)	15	10	14
76265	Tsen54	tRNA splicing endonuclease 54 homolog (S. cerevisiae)	12	12	14
66399	Tsfm	Ts translation elongation factor, mitochondrial	53	52	55
22088	Tsg101	tumor susceptibility gene 101	125	125	130
110796	Tshz1	teashirt zinc finger family member 1	1494	1510	1492
228911	Tshz2	teashirt zinc finger family member 2	1448	1436	1451
243931	Tshz3	teashirt zinc finger family member 3	2506	2524	2480
22097	Tsix	X (inactive)-specific transcript, antisense	81	85	82
22116	Tsks	testis-specific serine kinase substrate	60	49	60
12257	Tspo	translocator protein	55	48	47
22110	Tspyl1	testis-specific protein, Y-encoded-like 1	109	109	119
52808	Tspyl2	TSPY-like 2	158	159	159
72480	Tspyl4	TSPY-like 4	139	137	140
239364	Tspyl5	testis-specific protein, Y-encoded-like 5	858	849	840
69499	Tsr2	TSR2, 20S rRNA accumulation, homolog (S. cerevisiae)	352	351	357
22114	Tssk1	testis-specific serine kinase 1	8	9	10
22115	Tssk2	testis-specific serine kinase 2	20	19	25
58864	Tssk3	testis-specific serine kinase 3	35	38	42
71099	Tssk4	testis-specific serine kinase 4	24	22	23
73542	Tssk5	testis-specific serine kinase 5	15	11	15
83984	Tssk6	testis-specific serine kinase 6	18	19	21
22122	Tsta3	tissue specific transplantation antigen P35B	23	23	26
106763	Ttbk1	tau tubulin kinase 1	73	74	68
140810	Ttbk2	tau tubulin kinase 2	307	317	301
219022	Ttc5	tetratricopeptide repeat domain 5	67	64	69
22130	Ttf1	transcription termination factor, RNA polymerase I	92	91	94
74044	Ttf2	transcription termination factor, RNA polymerase II	127	128	128
22137	Ttk	Ttk protein kinase	193	188	181
69737	Ttl	tubulin tyrosine ligase	172	175	174
319953	Ttl1	tubulin tyrosine ligase-like 1	80	76	78
330010	Ttl10	tubulin tyrosine ligase-like family, member 10	40	33	36
74410	Ttl11	tubulin tyrosine ligase-like family, member 11	470	461	450
223723	Ttl12	tubulin tyrosine ligase-like family, member 12	202	208	192
269954	Ttl13	tubulin tyrosine ligase-like family, member 13	34	34	32
100216474	Ttl2	tubulin tyrosine ligase-like family, member 2	85	83	77
101100	Ttl3	tubulin tyrosine ligase-like family, member 3	62	55	57
67534	Ttl4	tubulin tyrosine ligase-like family, member 4	141	147	142
320244	Ttl5	tubulin tyrosine ligase-like family, member 5	321	338	335
237930	Ttl6	tubulin tyrosine ligase-like family, member 6	109	108	109
70892	Ttl7	tubulin tyrosine ligase-like family, member 7	2770	2750	2724
239591	Ttl8	tubulin tyrosine ligase-like family, member 8	152	149	151

74711	Ttll9	tubulin tyrosine ligase-like family, member 9	80	82	85
22138	Ttn	titin	621	655	636
50500	Ttpa	tocopherol (alpha) transfer protein	153	152	153
22141	Tub	tubby candidate gene	184	190	197
22142	Tuba1a	tubulin, alpha 1A	122	129	125
22143	Tuba1b	tubulin, alpha 1B	46	50	47
22146	Tuba1c	tubulin, alpha 1C	136	140	137
22145	Tuba4a	tubulin, alpha 4A	31	30	34
53857	Tuba8	tubulin, alpha 8	76	83	79
238463	Tubal3	tubulin, alpha-like 3	38	36	36
545486	Tubb1	tubulin, beta 1	32	33	30
22151	Tubb2a	tubulin, beta 2A	124	115	117
73710	Tubb2b	tubulin, beta 2B	109	108	111
227613	Tubb2c	tubulin, beta 2C	20	17	19
22152	Tubb3	tubulin, beta 3	46	48	47
22153	Tubb4	tubulin, beta 4	35	29	36
22154	Tubb5	tubulin, beta 5	22	21	22
67951	Tubb6	tubulin, beta 6	136	140	135
56427	Tubd1	tubulin, delta 1	50	50	51
71924	Tube1	epsilon-tubulin 1	39	36	35
103733	Tubg1	tubulin, gamma 1	45	43	44
103768	Tubg2	tubulin, gamma 2	70	70	70
233870	Tufm	Tu translation elongation factor, mitochondrial	33	33	34
56734	Tulp2	tubby-like protein 2	21	20	19
70044	Tut1	terminal uridylyl transferase 1, U6 snRNA-specific	30	29	34
19230	Twf1	twinfilin, actin-binding protein, homolog 1 (Drosophila)	106	112	104
22160	Twist1	twist homolog 1 (Drosophila)	753	765	753
13345	Twist2	twist homolog 2 (Drosophila)	780	781	776
28071	Twistnb	TWIST neighbor	677	691	660
22165	Txk	TXK tyrosine kinase	306	308	305
353170	Txlng	taxilin gamma	152	146	143
22166	Txn1	thioredoxin 1	125	124	120
56551	Txn2	thioredoxin 2	148	153	147
66073	Txndc12	thioredoxin domain containing 12 (endoplasmic reticulum)	19	22	19
52700	Txndc17	thioredoxin domain containing 17	11	16	11
213272	Txndc2	thioredoxin domain containing 2 (spermatzoa)	216	214	206
73412	Txndc3	thioredoxin domain containing 3 (spermatzoa)	132	139	135
105245	Txndc5	thioredoxin domain containing 5	364	366	363
67402	Txndc8	thioredoxin domain containing 8	318	321	322
56338	Txnip	thioredoxin interacting protein	96	93	87
53382	Txn1l	thioredoxin-like 1	400	408	404
234723	Txn1l4b	thioredoxin-like 4B	21	18	18
50493	Txnrd1	thioredoxin reductase 1	107	102	107
26462	Txnrd2	thioredoxin reductase 2	16	15	18
232223	Txnrd3	thioredoxin reductase 3	144	157	155
54721	Tyk2	tyrosine kinase 2	73	70	78
72962	Tymp	thymidine phosphorylase	6	4	5
22171	Tyms	thymidylate synthase	124	121	122
22173	Tyr	tyrosinase	406	427	399
22174	Tyro3	TYRO3 protein tyrosine kinase 3	137	136	140
22177	Tyrobp	TYRO protein tyrosine kinase binding protein	73	78	75
22178	Tyrp1	tyrosinase-related protein 1	5346	5447	5275
71767	Tysnd1	trypsin domain containing 1	41	42	44
100929	Tyw1	tRNA-yW synthesizing protein 1 homolog (S. cerevisiae)	149	151	145
209584	Tyw3	tRNA-yW synthesizing protein 3 homolog (S. cerevisiae)	150	153	145

108121	U2af1	U2 small nuclear ribonucleoprotein auxiliary factor (U2AF) 1	53	56	57
233073	U2af1l4	U2 small nuclear RNA auxiliary factor 1-like 4	3	2	2
22185	U2af2	U2 small nuclear ribonucleoprotein auxiliary factor (U2AF) 2	27	25	24
107652	Uap1	UDP-N-acetylglucosamine pyrophosphorylase 1	155	152	163
227620	Uap1l1	UDP-N-acteylglucosamine pyrophosphorylase 1-like 1	19	19	18
22201	Uba1	ubiquitin-like modifier activating enzyme 1	91	89	88
50995	Uba2	ubiquitin-like modifier activating enzyme 2	87	77	83
22200	Uba3	ubiquitin-like modifier activating enzyme 3	37	39	39
66663	Uba5	ubiquitin-like modifier activating enzyme 5	79	75	72
231380	Uba6	ubiquitin-like modifier activating enzyme 6	157	159	150
74153	Uba7	ubiquitin-like modifier activating enzyme 7	43	42	39
72828	Ubash3b	ubiquitin associated and SH3 domain containing, B	683	664	667
24108	Ubd	ubiquitin D	63	60	62
22202	Ube1y1	ubiquitin-activating enzyme E1, Chr Y 1	122	124	118
22209	Ube2a	ubiquitin-conjugating enzyme E2A, RAD6 homolog (S. cerevisiae)	45	52	40
22210	Ube2b	ubiquitin-conjugating enzyme E2B, RAD6 homolog (S. cerevisiae)	49	44	51
68612	Ube2c	ubiquitin-conjugating enzyme E2C	39	40	49
216080	Ube2d1	ubiquitin-conjugating enzyme E2D 1, UBC4/5 homolog (yeast)	135	132	132
56550	Ube2d2	ubiquitin-conjugating enzyme E2D 2	117	121	116
66105	Ube2d3	ubiquitin-conjugating enzyme E2D 3 (UBC4/5 homolog, yeast)	57	64	58
237009	Ube2dnl	ubiquitin-conjugating enzyme E2D N-terminal like	520	523	497
22194	Ube2e1	ubiquitin-conjugating enzyme E2E 1, UBC4/5 homolog (yeast)	827	799	811
218793	Ube2e2	ubiquitin-conjugating enzyme E2E 2 (UBC4/5 homolog, yeast)	1596	1643	1600
22193	Ube2e3	ubiquitin-conjugating enzyme E2E 3, UBC4/5 homolog (yeast)	1282	1285	1268
67921	Ube2f	ubiquitin-conjugating enzyme E2F (putative)	150	151	151
67128	Ube2g1	ubiquitin-conjugating enzyme E2G 1 (UBC7 homolog, C. elegans)	179	182	174
22213	Ube2g2	ubiquitin-conjugating enzyme E2G 2	45	44	46
22214	Ube2h	ubiquitin-conjugating enzyme E2H	280	284	287
22196	Ube2i	ubiquitin-conjugating enzyme E2I	52	50	55
56228	Ube2j1	ubiquitin-conjugating enzyme E2, J1	41	39	39
140499	Ube2j2	ubiquitin-conjugating enzyme E2, J2 homolog (yeast)	72	70	69
53323	Ube2k	ubiquitin-conjugating enzyme E2K (UBC1 homolog, yeast)	267	262	268
22195	Ube2l3	ubiquitin-conjugating enzyme E2L 3	86	82	83
56791	Ube2l6	ubiquitin-conjugating enzyme E2L 6	55	57	61
22192	Ube2m	ubiquitin-conjugating enzyme E2M (UBC12 homolog, yeast)	22	17	22
93765	Ube2n	ubiquitin-conjugating enzyme E2N	69	77	71
109161	Ube2q2	ubiquitin-conjugating enzyme E2Q (putative) 2	203	208	204
67615	Ube2r2	ubiquitin-conjugating enzyme E2R 2	193	191	205
77891	Ube2s	ubiquitin-conjugating enzyme E2S	73	64	69
67196	Ube2t	ubiquitin-conjugating enzyme E2T (putative)	193	195	195
66589	Ube2v1	ubiquitin-conjugating enzyme E2 variant 1	162	151	152
70620	Ube2v2	ubiquitin-conjugating enzyme E2 variant 2	939	938	959
66799	Ube2w	ubiquitin-conjugating enzyme E2W (putative)	167	186	183
22215	Ube3a	ubiquitin protein ligase E3A	803	810	760
117146	Ube3b	ubiquitin protein ligase E3B	80	75	81
100763	Ube3c	ubiquitin protein ligase E3C	332	330	326
140630	Ube4a	ubiquitination factor E4A, UFD2 homolog (S. cerevisiae)	78	79	81
63958	Ube4b	ubiquitination factor E4B, UFD2 homolog (S. cerevisiae)	198	189	187
71707	Ubiad1	UbiA prenyltransferase domain containing 1	214	204	212
140629	Ubox5	U box domain containing 5	65	62	67
22221	Ubp1	upstream binding protein 1	275	293	282
22222	Ubr1	ubiquitin protein ligase E3 component n-recognin 1	163	164	163
224826	Ubr2	ubiquitin protein ligase E3 component n-recognin 2	295	298	286
68795	Ubr3	ubiquitin protein ligase E3 component n-recognin 3	198	197	201
70790	Ubr5	ubiquitin protein ligase E3 component n-recognin 5	336	330	330

21429	Ubtf	upstream binding transcription factor, RNA polymerase I	83	83	83
225896	Ubxn1	UBX domain protein 1	40	36	38
22223	Uchl1	ubiquitin carboxy-terminal hydrolase L1	159	157	152
50933	Uchl3	ubiquitin carboxyl-terminal esterase L3 (ubiquitin thiolesterase)	114	109	111
93841	Uchl4	ubiquitin carboxyl-terminal esterase L4	92	99	92
56207	Uchl5	ubiquitin carboxyl-terminal esterase L5	287	296	280
22245	Uck1	uridine-cytidine kinase 1	46	49	43
80914	Uck2	uridine-cytidine kinase 2	396	398	391
68556	Uck1l	uridine-cytidine kinase 1-like 1	15	18	16
22226	Ucn	urocortin	51	49	48
171530	Ucn2	urocortin 2	29	30	30
22229	Ucp3	uncoupling protein 3 (mitochondrial, proton carrier)	158	156	160
54122	Uevld	UEV and lactate/malate dehydrogenase domains	73	71	71
66155	Ufc1	ubiquitin-fold modifier conjugating enzyme 1	50	60	54
22230	Ufd1l	ubiquitin fusion degradation 1 like	34	35	30
67890	Ufm1	ubiquitin-fold modifier 1	631	642	640
70240	Ufsp1	UFM1-specific peptidase 1	23	20	20
192169	Ufsp2	UFM1-specific peptidase 2	34	34	29
22234	Ugcg	UDP-glucose ceramide glucosyltransferase	525	515	515
22235	Ugdh	UDP-glucose dehydrogenase	127	134	136
320011	Uggt1	UDP-glucose glycoprotein glucosyltransferase 1	276	253	266
216558	Ugp2	UDP-glucose pyrophosphorylase 2	204	200	211
394436	Ugt1a1	UDP glucuronosyltransferase 1 family, polypeptide A1	29	24	24
394430	Ugt1a10	UDP glycosyltransferase 1 family, polypeptide A10	80	83	82
22236	Ugt1a2	UDP glucuronosyltransferase 1 family, polypeptide A2	52	53	50
94284	Ugt1a6a	UDP glucuronosyltransferase 1 family, polypeptide A6A	83	85	77
394435	Ugt1a6b	UDP glucuronosyltransferase 1 family, polypeptide A6B	51	52	53
394432	Ugt1a7c	UDP glucuronosyltransferase 1 family, polypeptide A7C	44	45	47
394434	Ugt1a9	UDP glucuronosyltransferase 1 family, polypeptide A9	49	46	52
94215	Ugt2a1	UDP glucuronosyltransferase 2 family, polypeptide A1	71	62	70
72094	Ugt2a3	UDP glucuronosyltransferase 2 family, polypeptide A3	205	218	206
71773	Ugt2b1	UDP glucuronosyltransferase 2 family, polypeptide B1	114	119	124
243085	Ugt2b35	UDP glucuronosyltransferase 2 family, polypeptide B35	207	211	222
100559	Ugt2b38	UDP glucuronosyltransferase 2 family, polypeptide B38	181	182	192
22238	Ugt2b5	UDP glucuronosyltransferase 2 family, polypeptide B5	209	213	209
105887	Ugt3a1	UDP glycosyltransferases 3 family, polypeptide A1	246	256	249
223337	Ugt3a2	UDP glycosyltransferases 3 family, polypeptide A2	196	209	195
22239	Ugt8a	UDP galactosyltransferase 8A	1214	1217	1192
16589	Uhmk1	U2AF homology motif (UHM) kinase 1	67	75	72
18140	Uhrf1	ubiquitin-like, containing PHD and RING finger domains, 1	33	34	32
109113	Uhrf2	ubiquitin-like, containing PHD and RING finger domains 2	217	224	213
20184	Uimc1	ubiquitin interaction motif containing 1	103	103	102
22241	Ulk1	Unc-51 like kinase 1 (C. elegans)	71	72	67
29869	Ulk2	Unc-51 like kinase 2 (C. elegans)	215	214	213
71742	Ulk3	unc-51-like kinase 3 (C. elegans)	65	59	57
209012	Ulk4	unc-51-like kinase 4 (C. elegans)	554	545	546
22247	Umps	uridine monophosphate synthetase	889	880	879
382018	Unc13a	unc-13 homolog A (C. elegans)	83	76	82
101869	Unc45a	unc-45 homolog A (C. elegans)	24	25	24
217012	Unc45b	unc-45 homolog B (C. elegans)	49	48	47
22255	Uncx	UNC homeobox	314	315	324
22256	Ung	uracil DNA glycosylase	44	46	46
22262	Uox	urate oxidase	122	119	123
103149	Upb1	ureidopropionase, beta	207	214	213
19704	Upf1	UPF1 regulator of nonsense transcripts homolog (yeast)	55	52	53

326622	Upf2	UPF2 regulator of nonsense transcripts homolog (yeast)	247	243	240
67031	Upf3a	UPF3 regulator of nonsense transcripts homolog A (yeast)	99	96	100
68134	Upf3b	UPF3 regulator of nonsense transcripts homolog B (yeast)	49	47	50
100647	Upk3b	uroplakin 3B	84	77	81
22271	Upp1	uridine phosphorylase 1	188	190	191
76654	Upp2	uridine phosphorylase 2	744	748	738
331487	Uprt	uracil phosphoribosyltransferase (FUR1) homolog (S. cerevisiae)	312	317	297
66152	Uqcr10	ubiquinol-cytochrome c reductase, complex III subunit X	91	88	91
66594	Uqcr11	ubiquinol-cytochrome c reductase, complex III subunit XI	39	42	38
22273	Uqcr1	ubiquinol-cytochrome c reductase core protein 1	50	52	49
67003	Uqcr2	ubiquinol cytochrome c reductase core protein 2	89	90	93
66694	Uqcrf1	ubiquinol-cytochrome c reductase, Rieske iron-sulfur polypeptide 1	409	408	399
66576	Uqcrh	ubiquinol-cytochrome c reductase hinge protein	31	31	31
22272	Uqcrq	ubiquinol-cytochrome c reductase, complex III subunit VII	11	12	9
68205	Urm1	ubiquitin related modifier 1 homolog (S. cerevisiae)	52	56	55
243537	Uroc1	urocanase domain containing 1	56	54	63
22275	Urod	uroporphyrinogen decarboxylase	147	160	155
22276	Uros	uroporphyrinogen III synthase	37	32	34
22278	Usf1	upstream transcription factor 1	41	35	40
22282	Usf2	upstream transcription factor 2	30	31	32
230484	Usp1	ubiquitin specific peptidase 1	269	276	276
22224	Usp10	ubiquitin specific peptidase 10	165	164	165
236733	Usp11	ubiquitin specific peptidase 11	199	193	189
22217	Usp12	ubiquitin specific peptidase 12	331	315	325
72607	Usp13	ubiquitin specific peptidase 13 (isopeptidase T-3)	320	321	304
59025	Usp14	ubiquitin specific peptidase 14	276	286	284
14479	Usp15	ubiquitin specific peptidase 15	235	229	236
74112	Usp16	ubiquitin specific peptidase 16	69	77	73
13532	Usp17	ubiquitin specific peptidase 17-like 5	75	75	68
24110	Usp18	ubiquitin specific peptidase 18	117	115	108
71472	Usp19	ubiquitin specific peptidase 19	33	29	31
53376	Usp2	ubiquitin specific peptidase 2	94	94	87
74270	Usp20	ubiquitin specific peptidase 20	144	134	148
30941	Usp21	ubiquitin specific peptidase 21	16	16	14
216825	Usp22	ubiquitin specific peptidase 22	84	87	83
329908	Usp24	ubiquitin specific peptidase 24	1685	1676	1663
30940	Usp25	ubiquitin specific peptidase 25	1193	1209	1197
83563	Usp26	ubiquitin specific peptidase 26	351	338	339
54651	Usp27	ubiquitin specific peptidase 27, X chromosome	155	156	149
235323	Usp28	ubiquitin specific peptidase 28	122	114	117
57775	Usp29	ubiquitin specific peptidase 29	98	92	91
235441	Usp3	ubiquitin specific peptidase 3	250	245	255
100756	Usp30	ubiquitin specific peptidase 30	50	43	44
76179	Usp31	ubiquitin specific peptidase 31	439	442	435
237898	Usp32	ubiquitin specific peptidase 32	275	279	270
170822	Usp33	ubiquitin specific peptidase 33	69	68	71
17847	Usp34	ubiquitin specific peptidase 34	317	314	311
72344	Usp36	ubiquitin specific peptidase 36	115	121	118
319651	Usp37	ubiquitin specific peptidase 37	2	1	1
74841	Usp38	ubiquitin specific peptidase 38	1070	1076	1047
28035	Usp39	ubiquitin specific peptidase 39	57	56	55
22258	Usp4	ubiquitin specific peptidase 4 (proto-oncogene)	70	65	71
227334	Usp40	ubiquitin specific peptidase 40	260	257	266
76800	Usp42	ubiquitin specific peptidase 42	141	135	136
216835	Usp43	ubiquitin specific peptidase 43	210	209	222

327799	Usp44	ubiquitin specific peptidase 44	264	258	265
77593	Usp45	ubiquitin specific peptidase 45	107	108	107
69727	Usp46	ubiquitin specific peptidase 46	540	554	543
74996	Usp47	ubiquitin specific peptidase 47	486	478	487
170707	Usp48	ubiquitin specific peptidase 48	141	137	142
22225	Usp5	ubiquitin specific peptidase 5 (isopeptidase T)	20	20	19
75083	Usp50	ubiquitin specific peptidase 50	221	214	211
635253	Usp51	ubiquitin specific protease 51	314	318	304
99526	Usp53	ubiquitin specific peptidase 53	135	144	132
78787	Usp54	ubiquitin specific peptidase 54	148	146	138
252870	Usp7	ubiquitin specific peptidase 7	206	202	210
84092	Usp8	ubiquitin specific peptidase 8	137	144	145
22284	Usp9x	ubiquitin specific peptidase 9, X chromosome	631	614	612
107868	Usp9y	ubiquitin specific peptidase 9, Y chromosome	984	1010	960
231915	Usp11	ubiquitin specific peptidase like 1	102	101	104
338362	Ust	uronyl-2-sulfotransferase	1158	1189	1201
22286	Utf1	undifferentiated embryonic cell transcription factor 1	87	84	84
67205	Utp111	UTP11-like, U3 small nucleolar ribonucleoprotein, (yeast)	59	57	59
72554	Utp14a	UTP14, U3 small nucleolar ribonucleoprotein, homolog A (yeast)	162	145	161
195434	Utp14b	UTP14, U3 small nucleolar ribonucleoprotein, homolog B (yeast)	206	206	201
105372	Utp15	UTP15, U3 small nucleolar ribonucleoprotein, homolog (yeast)	73	69	74
217109	Utp18	UTP18, small subunit (SSU) processome component, homolog (yeast)	1034	1035	1007
70683	Utp20	UTP20, small subunit (SSU) processome component, homolog (yeast)	200	199	197
78581	Utp23	UTP23, small subunit (SSU) processome component, homolog (yeast)	157	165	158
65961	Utp3	UTP3, small subunit (SSU) processome component, homolog (S. cerevisiae)	63	67	63
216987	Utp6	UTP6, small subunit (SSU) processome component, homolog (yeast)	355	361	347
24111	Uts2	urotensin 2	151	151	148
67883	Uxs1	UDP-glucuronate decarboxylase 1	266	264	276
22319	Vamp3	vesicle-associated membrane protein 3	1015	1052	1037
22321	Vars	valyl-tRNA synthetase	41	44	50
68915	Vars2	valyl-tRNA synthetase 2, mitochondrial (putative)	30	24	29
26949	Vat1	vesicle amine transport protein 1 homolog (T. californica)	23	21	26
270097	Vat11	vesicle amine transport protein 1 homolog-like (T. californica)	362	360	362
22326	Vax1	ventral anterior homeobox containing gene 1	176	179	185
24113	Vax2	ventral anterior homeobox containing gene 2	1	1	1
22327	Vbp1	von Hippel-Lindau binding protein 1	186	191	185
269523	Vcp	valosin containing protein	49	50	52
70675	Vcpip1	valosin containing protein (p97)/p47 complex interacting protein 1	127	121	122
22337	Vdr	vitamin D receptor	143	154	143
22339	Vegfa	vascular endothelial growth factor A	556	540	550
22340	Vegfb	vascular endothelial growth factor B	11	11	11
22341	Vegfc	vascular endothelial growth factor C	1110	1106	1081
381677	Vgf	VGF nerve growth factor inducible	67	65	69
170828	Vgll1	vestigial like 1 homolog (Drosophila)	187	189	197
215031	Vgll2	vestigial like 2 homolog (Drosophila)	632	655	621
232334	Vgll4	vestigial like 4 (Drosophila)	506	498	510
22346	Vhl	von Hippel-Lindau tumor suppressor	43	42	39
104799	Vipar	VPS33B interacting protein, apical-basolateral polarity regulator	37	34	42
27973	Vkorc1	vitamin K epoxide reductase complex, subunit 1	16	20	15
69568	Vkorc111	vitamin K epoxide reductase complex, subunit 1-like 1	122	123	122
22359	Vldlr	very low density lipoprotein receptor	564	572	567
75909	Vmp1	vacuole membrane protein 1	131	130	130
22361	Vnn1	vanin 1	84	94	96
26464	Vnn3	vanin 3	125	126	129
232023	Vopp1	vesicular, overexpressed in cancer, prosurvival protein 1	175	187	176

28084	Vps25	vacuolar protein sorting 25 (yeast)	17	22	17
66914	Vps28	vacuolar protein sorting 28 (yeast)	33	29	30
65114	Vps35	vacuolar protein sorting 35	85	84	88
70160	Vps36	vacuolar protein sorting 36 (yeast)	53	53	53
20479	Vps4b	vacuolar protein sorting 4b (yeast)	129	137	127
21427	Vps72	vacuolar protein sorting 72 (yeast)	24	23	23
22367	Vrk1	vaccinia related kinase 1	856	837	859
69922	Vrk2	vaccinia related kinase 2	495	501	504
101568	Vrk3	vaccinia related kinase 3	82	88	90
114889	Vsx1	visual system homeobox 1 homolog (zebrafish)	102	111	95
12677	Vsx2	visual system homeobox 2	216	218	224
22370	Vtn	vitronectin	7	8	8
225131	Wac	WW domain containing adaptor with coiled-coil	1996	2030	1994
218914	Wapal	wings apart-like homolog (Drosophila)	277	278	282
22375	Wars	tryptophanyl-tRNA synthetase	59	55	61
70560	Wars2	tryptophanyl tRNA synthetase 2 (mitochondrial)	474	463	463
73178	Wasl	Wiskott-Aldrich syndrome-like (human)	164	166	169
60321	Wbp11	WW domain binding protein 11	23	26	21
22380	Wbp4	WW domain binding protein 4	139	138	142
75410	Wbp7	WW domain binding protein 7	29	27	27
66138	Wbscr22	Williams Beuren syndrome chromosome region 22	55	51	52
72145	Wdfy3	WD repeat and FYVE domain containing 3	942	949	932
57750	Wdr12	WD repeat domain 12	182	187	178
57773	Wdr4	WD repeat domain 4	182	169	172
54636	Wdr45	WD repeat domain 45	40	39	42
66840	Wdr45l	Wdr45 like	166	165	161
67561	Wdr48	WD repeat domain 48	145	143	146
140858	Wdr5	WD repeat domain 5	268	267	257
67936	Wdr55	WD repeat domain 55	28	28	26
77305	Wdr82	WD repeat domain containing 82	24	26	24
67836	Wdr83	WD repeat domain containing 83	10	10	11
67228	Wdr85	WD repeat domain 85	34	35	33
103784	Wdr92	WD repeat domain 92	57	60	58
72137	Wdsub1	WD repeat, SAM and U-box domain containing 1	660	661	643
230796	Wdte1	WD and tetratricopeptide repeats 1	124	124	126
76773	Wdyhv1	WDYHV motif containing 1	106	106	110
22390	Wee1	WEE 1 homolog 1 (S. pombe)	210	213	212
381759	Wee2	WEE1 homolog 2 (S. pombe)	45	46	45
215001	Wfikk1	WAP, FS, Ig, KU, and NTR-containing protein 1	38	36	33
22393	Wfs1	Wolfram syndrome 1 homolog (human)	234	244	229
107823	Whsc1	Wolf-Hirschhorn syndrome candidate 1 (human)	203	189	193
234135	Whsc111	Wolf-Hirschhorn syndrome candidate 1-like 1 (human)	210	209	204
24116	Whsc2	Wolf-Hirschhorn syndrome candidate 2 (human)	184	175	187
78428	Wibg	within bgcn homolog (Drosophila)	59	62	66
24117	Wif1	Wnt inhibitory factor 1	447	415	424
52639	Wipi1	WD repeat domain, phosphoinositide interacting 1	137	131	142
74781	Wipi2	WD repeat domain, phosphoinositide interacting 2	119	113	111
232341	Wnk1	WNK lysine deficient protein kinase 1	76	73	72
75607	Wnk2	WNK lysine deficient protein kinase 2	285	279	269
69847	Wnk4	WNK lysine deficient protein kinase 4	29	33	31
22408	Wnt1	wingless-related MMTV integration site 1	35	37	34
22409	Wnt10a	wingless related MMTV integration site 10a	95	90	95
22410	Wnt10b	wingless related MMTV integration site 10b	29	30	30
22411	Wnt11	wingless-related MMTV integration site 11	555	540	574
93735	Wnt16	wingless-related MMTV integration site 16	452	453	472

22413	Wnt2	wingless-related MMTV integration site 2	454	468	446
22414	Wnt2b	wingless related MMTV integration site 2b	250	242	236
22415	Wnt3	wingless-related MMTV integration site 3	257	256	251
22416	Wnt3a	wingless-related MMTV integration site 3A	99	94	95
22417	Wnt4	wingless-related MMTV integration site 4	376	375	383
22418	Wnt5a	wingless-related MMTV integration site 5A	1779	1804	1802
22419	Wnt5b	wingless-related MMTV integration site 5B	491	479	466
22420	Wnt6	wingless-related MMTV integration site 6	49	52	50
22421	Wnt7a	wingless-related MMTV integration site 7A	320	324	339
22422	Wnt7b	wingless-related MMTV integration site 7B	475	459	459
20890	Wnt8a	wingless-related MMTV integration site 8A	91	93	101
22423	Wnt8b	wingless related MMTV integration site 8b	181	180	178
216795	Wnt9a	wingless-type MMTV integration site 9A	105	91	105
22412	Wnt9b	wingless-type MMTV integration site 9B	109	96	99
216853	Wrap53	WD repeat containing, antisense to TP53	25	22	21
22427	Wrn	Werner syndrome homolog (human)	542	553	540
78903	Wrnip1	Werner helicase interacting protein 1	89	84	85
22431	Wt1	Wilms tumor 1 homolog	128	123	120
60532	Wtap	Wilms' tumour 1-associating protein	58	59	60
101543	Wtip	WT1-interacting protein	96	95	96
211652	Wwc1	WW, C2 and coiled-coil domain containing 1	1444	1430	1447
80707	Wwox	WW domain-containing oxidoreductase	1667	1629	1680
107568	Wwp1	WW domain containing E3 ubiquitin protein ligase 1	297	315	315
66894	Wwp2	WW domain containing E3 ubiquitin protein ligase 2	171	169	167
97064	Wwtr1	WW domain containing transcription regulator 1	299	299	297
67439	Xab2	XPA binding protein 2	42	44	45
22433	Xbp1	X-box binding protein 1	128	128	132
16963	Xcl1	chemokine (C motif) ligand 1	462	480	468
22436	Xdh	xanthine dehydrogenase	318	317	309
22590	Xpa	xeroderma pigmentosum, complementation group A	255	275	270
22591	Xpc	xeroderma pigmentosum, complementation group C	53	48	54
170750	Xpnpep1	X-prolyl aminopeptidase (aminopeptidase P) 1, soluble	295	270	277
103573	Xpo1	exportin 1, CRM1 homolog (yeast)	385	385	389
72322	Xpo5	exportin 5	39	35	37
22594	Xrcc1	X-ray repair complementing defective repair in Chinese hamster ce	51	51	53
57434	Xrcc2	X-ray repair complementing defective repair in Chinese hamster ce	297	292	306
74335	Xrcc3	X-ray repair complementing defective repair in Chinese hamster ce	68	68	71
108138	Xrcc4	X-ray repair complementing defective repair in Chinese hamster ce	437	439	431
22596	Xrcc5	X-ray repair complementing defective repair in Chinese hamster ce	325	326	327
14375	Xrcc6	X-ray repair complementing defective repair in Chinese hamster ce	44	39	43
68876	Xrcc6bp1	XRCC6 binding protein 1	1289	1288	1257
24127	Xrn1	5'-3' exoribonuclease 1	335	341	330
24128	Xrn2	5'-3' exoribonuclease 2	299	294	296
102448	Xylb	xylulokinase homolog (H. influenzae)	82	81	88
233781	Xylt1	xylosyltransferase 1	2113	2110	2039
217119	Xylt2	xylosyltransferase II	67	70	63
67057	Yaf2	YY1 associated factor 2	160	147	157
22601	Yap1	yes-associated protein 1	224	218	221
107271	Yars	tyrosyl-tRNA synthetase	78	73	78
70120	Yars2	tyrosyl-tRNA synthetase 2 (mitochondrial)	188	188	189
22608	Ybx1	Y box protein 1	87	84	84
53422	Ybx2	Y box protein 2	30	32	32
69101	YdjC	YdjC homolog (bacterial)	71	78	69
208146	Yeats2	YEATS domain containing 2	93	102	100
64050	Yeats4	YEATS domain containing 4	110	115	118

22612	Yes1	Yamaguchi sarcoma viral (v-yes) oncogene homolog 1	465	487	460
56418	Ykt6	YKT6 homolog (S. Cerevisiae)	144	142	140
56531	Ylpm1	YLP motif containing 1	177	177	178
27377	Yme11	YME1-like 1 (S. cerevisiae)	71	68	65
226418	Yod1	YOD1 OTU deubiquitinating enzyme 1 homologue (S. cerevisiae)	15	14	15
383295	Ypel5	yippee-like 5 (Drosophila)	404	419	388
231386	Ythdc1	YTH domain containing 1	201	213	200
54401	Ywhab	tyrosine 3-monooxygenase/tryptophan 5-monooxygenase activatio	143	139	133
22627	Ywhae	tyrosine 3-monooxygenase/tryptophan 5-monooxygenase activatio	151	158	147
22628	Ywhag	tyrosine 3-monooxygenase/tryptophan 5-monooxygenase activatio	120	112	116
22629	Ywhah	tyrosine 3-monooxygenase/tryptophan 5-monooxygenase activatio	317	310	317
22630	Ywhaq	tyrosine 3-monooxygenase/tryptophan 5-monooxygenase activatio	1971	1941	1940
22632	Yy1	YY1 transcription factor	167	168	174
100073351	Yy2	Yy2 transcription factor	132	136	126
225791	Zadh2	zinc binding alcohol dehydrogenase, domain containing 2	635	628	631
22637	Zap70	zeta-chain (TCR) associated protein kinase	301	302	292
667118	Zbed6	zinc finger, BED domain containing 6	62	66	69
268564	Zbtb1	zinc finger and BTB domain containing 1	40	40	41
229055	Zbtb10	zinc finger and BTB domain containing 10	527	523	511
235320	Zbtb16	zinc finger and BTB domain containing 16	378	377	389
22642	Zbtb17	zinc finger and BTB domain containing 17	126	121	124
56490	Zbtb20	zinc finger and BTB domain containing 20	858	875	877
81630	Zbtb22	zinc finger and BTB domain containing 22	12	9	10
268294	Zbtb24	zinc finger and BTB domain containing 24	233	218	221
75291	Zbtb3	zinc finger and BTB domain containing 3	29	29	32
58206	Zbtb32	zinc finger and BTB domain containing 32	30	31	33
56805	Zbtb33	zinc finger and BTB domain containing 33	101	110	107
245007	Zbtb38	zinc finger and BTB domain containing 38	152	152	151
226470	Zbtb41	zinc finger and BTB domain containing 41 homolog	98	95	97
382639	Zbtb42	zinc finger and BTB domain containing 42	56	50	57
71834	Zbtb43	zinc finger and BTB domain containing 43	273	267	267
235132	Zbtb44	zinc finger and BTB domain containing 44	250	249	238
72147	Zbtb46	zinc finger and BTB domain containing 46	187	189	190
100090	Zbtb48	zinc finger and BTB domain containing 48	38	40	36
75079	Zbtb49	zinc finger and BTB domain containing 49	71	74	73
230119	Zbtb5	zinc finger and BTB domain containing 5	46	46	45
241322	Zbtb6	zinc finger and BTB domain containing 6	26	26	29
16969	Zbtb7a	zinc finger and BTB domain containing 7a	67	58	65
22724	Zbtb7b	zinc finger and BTB domain containing 7B	36	42	37
73680	Zbtb8a	zinc finger and BTB domain containing 8a	139	136	139
215627	Zbtb8b	zinc finger and BTB domain containing 8b	109	111	113
474156	Zbtb9	zinc finger and BTB domain containing 9	101	99	102
223642	Zc3h3	zinc finger CCCH type containing 3	147	147	153
57432	Zc3h8	zinc finger CCCH type containing 8	134	131	139
230594	Zcchc11	zinc finger, CCHC domain containing 11	233	229	229
72693	Zcchc12	zinc finger, CCHC domain containing 12	273	259	243
78796	Zcchc4	zinc finger, CCHC domain containing 4	126	118	121
214290	Zcchc6	zinc finger, CCHC domain containing 6	521	538	542
70650	Zcchc8	zinc finger, CCHC domain containing 8	82	85	83
67197	Zcrb1	zinc finger CCHC-type and RNA binding motif 1	80	82	84
70796	Zdhhc1	zinc finger, DHHC domain containing 1	64	62	65
243983	Zdhhc13	zinc finger, DHHC domain containing 13	256	263	249
108672	Zdhhc15	zinc finger, DHHC domain containing 15	451	454	433
320150	Zdhhc17	zinc finger, DHHC domain containing 17	322	313	310
503610	Zdhhc18	zinc finger, DHHC domain containing 18	90	91	92

70546	Zdhhc2	zinc finger, DHHC domain containing 2	245	253	252
68268	Zdhhc21	zinc finger, DHHC domain containing 21	479	471	478
69035	Zdhhc3	zinc finger, DHHC domain containing 3	102	107	106
102193	Zdhhc7	zinc finger, DHHC domain containing 7	149	160	151
21417	Zeb1	zinc finger E-box binding homeobox 1	339	340	324
24136	Zeb2	zinc finger E-box binding homeobox 2	4658	4696	4567
227693	Zer1	zer-1 homolog (C. elegans)	51	51	54
22639	Zfa	zinc finger protein, autosomal	347	371	352
380993	Zfat	zinc finger and AT hook domain containing	1456	1483	1467
11906	Zfhx3	zinc finger homeobox 3	1725	1729	1734
22640	Zfp1	zinc finger protein 1	81	74	75
65020	Zfp110	zinc finger protein 110	81	85	86
56707	Zfp111	zinc finger protein 111	78	75	85
231866	Zfp12	zinc finger protein 12	58	58	53
104348	Zfp120	zinc finger protein 120	458	443	446
243833	Zfp128	zinc finger protein 128	77	82	81
20841	Zfp143	zinc finger protein 143	98	98	94
22661	Zfp148	zinc finger protein 148	346	355	356
22666	Zfp161	zinc finger protein 161	333	333	333
382118	Zfp167	zinc finger protein 167	78	75	75
385674	Zfp174	zinc finger protein 174	42	38	41
319535	Zfp182	zinc finger protein 182	131	138	123
193452	Zfp184	zinc finger protein 184 (Kruppel-like)	118	110	100
432731	Zfp187	zinc finger protein 187	31	29	28
59057	Zfp191	zinc finger protein 191	175	167	169
93681	Zfp192	zinc finger protein 192	42	43	36
22678	Zfp2	zinc finger protein 2	55	54	54
80902	Zfp202	zinc finger protein 202	101	101	105
449521	Zfp213	zinc finger protein 213	149	147	148
228913	Zfp217	zinc finger protein 217	486	479	480
69890	Zfp219	zinc finger protein 219	23	24	25
30928	Zfp238	zinc finger protein 238	518	521	516
22685	Zfp239	zinc finger protein 239	77	79	78
26466	Zfp260	zinc finger protein 260	42	47	44
74120	Zfp263	zinc finger protein 263	149	165	150
22689	Zfp27	zinc finger protein 27	124	117	126
57247	Zfp276	zinc finger protein (C2H2 type) 276	74	81	83
22690	Zfp28	zinc finger protein 28	66	65	63
208968	Zfp280c	zinc finger protein 280C	131	134	123
235469	Zfp280d	zinc finger protein 280D	428	424	425
226442	Zfp281	zinc finger protein 281	298	306	301
170740	Zfp287	zinc finger protein 287	190	189	175
30046	Zfp292	zinc finger protein 292	146	145	145
114565	Zfp295	zinc finger protein 295	211	204	203
193043	Zfp3	zinc finger protein 3	147	145	140
22693	Zfp30	zinc finger protein 30	59	53	53
54201	Zfp316	zinc finger protein 316	93	89	89
57908	Zfp318	zinc finger protein 318	135	136	132
79233	Zfp319	zinc finger protein 319	26	20	22
218100	Zfp322a	zinc finger protein 322A	236	225	228
54367	Zfp326	zinc finger protein 326	989	991	981
67230	Zfp329	zinc finger protein 329	79	79	79
22694	Zfp35	zinc finger protein 35	53	52	53
21408	Zfp354a	zinc finger protein 354A	300	306	295
27274	Zfp354b	zinc finger protein 354B	55	51	53

30944 Zfp354c	zinc finger protein 354C	306	311	311
22695 Zfp36	zinc finger protein 36	26	25	24
238673 Zfp367	zinc finger protein 367	43	39	37
170936 Zfp369	zinc finger protein 369	1132	1170	1137
12192 Zfp36I1	zinc finger protein 36, C3H type-like 1	1094	1081	1068
12193 Zfp36I2	zinc finger protein 36, C3H type-like 2	812	804	775
333473 Zfp36I3	zinc finger protein 36, C3H type-like 3	46	45	43
22696 Zfp37	zinc finger protein 37	177	180	176
233060 Zfp382	zinc finger protein 382	100	99	99
269800 Zfp384	zinc finger protein 384	56	51	56
56220 Zfp386	zinc finger protein 386 (Kruppel-like)	3183	3236	3164
22698 Zfp39	zinc finger protein 39	66	70	67
69256 Zfp397	zinc finger protein 397	238	224	227
22701 Zfp41	zinc finger protein 41	103	96	102
52708 Zfp410	zinc finger protein 410	90	98	95
328801 Zfp414	zinc finger protein 414	117	105	108
22702 Zfp42	zinc finger protein 42	461	455	427
67255 Zfp422	zinc finger protein 422	81	93	87
94187 Zfp423	zinc finger protein 423	716	699	686
235028 Zfp426	zinc finger protein 426	74	82	78
240186 Zfp438	zinc finger protein 438	691	708	693
72667 Zfp444	zinc finger protein 444	49	52	52
235682 Zfp445	zinc finger protein 445	107	110	110
269870 Zfp446	zinc finger protein 446	43	36	37
78619 Zfp449	zinc finger protein 449	202	194	176
98403 Zfp451	zinc finger protein 451	104	105	99
22704 Zfp46	zinc finger protein 46	86	83	82
242466 Zfp462	zinc finger protein 462	1929	1975	1956
68910 Zfp467	zinc finger protein 467	63	62	68
243963 Zfp473	zinc finger protein 473	44	45	42
382867 Zfp488	zinc finger protein 488	124	108	111
666311 Zfp498	zinc finger protein 498	136	140	152
218820 Zfp503	zinc finger protein 503	212	223	210
668501 Zfp507	zinc finger protein 507	1149	1156	1129
69752 Zfp511	zinc finger protein 511	16	15	15
269639 Zfp512	zinc finger protein 512	255	254	245
101023 Zfp513	zinc finger protein 513	34	34	32
329003 Zfp516	zinc finger protein 516	287	278	299
72672 Zfp518a	zinc finger protein 518A	210	221	211
100515 Zfp518b	zinc finger protein 518B	410	388	410
225207 Zfp521	zinc finger protein 521	2126	2161	2117
224656 Zfp523	zinc finger protein 523	77	75	82
66056 Zfp524	zinc finger protein 524	7	5	5
210172 Zfp526	zinc finger protein 526	18	19	24
328977 Zfp532	zinc finger protein 532	347	349	351
243937 Zfp536	zinc finger protein 536	1684	1695	1719
666528 Zfp541	zinc finger protein 541	128	125	124
233887 Zfp553	zinc finger protein 553	10	13	15
22715 Zfp57	zinc finger protein 57	47	51	53
232976 Zfp574	zinc finger protein 574	67	67	71
101544 Zfp575	zinc finger protein 575	34	31	33
68490 Zfp579	zinc finger protein 579	52	49	50
238693 Zfp58	zinc finger protein 58	56	52	53
68992 Zfp580	zinc finger protein 580	23	24	22
213011 Zfp583	zinc finger protein 583	97	99	94

233410	Zfp592	zinc finger protein 592	144	141	141
68040	Zfp593	zinc finger protein 593	18	17	19
72701	Zfp618	zinc fingerprotein 618	689	703	678
22720	Zfp62	zinc finger protein 62	78	69	72
232816	Zfp628	zinc finger protein 628	56	59	62
320683	Zfp629	zinc finger protein 629	130	131	127
67778	Zfp639	zinc finger protein 639	45	45	50
22722	Zfp64	zinc finger protein 64	1131	1102	1133
239652	Zfp641	zinc finger protein 641	72	72	70
239546	Zfp647	zinc finger protein 647	57	55	51
268469	Zfp652	zinc finger protein 652	132	138	142
319601	Zfp653	zinc finger protein 653	45	40	45
72020	Zfp654	zinc finger protein 654	110	98	98
72180	Zfp661	zinc finger protein 661	61	61	62
269704	Zfp664	zinc finger protein 664	187	182	186
384763	Zfp667	zinc finger protein 667	96	94	99
244219	Zfp668	zinc finger protein 668	44	45	45
319475	Zfp672	zinc finger protein 672	30	26	26
78266	Zfp687	zinc finger protein 687	83	90	87
71131	Zfp689	zinc finger protein 689	62	62	59
195522	Zfp691	zinc finger protein 691	105	102	99
103836	Zfp692	zinc finger protein 692	145	135	143
242109	Zfp697	zinc finger protein 697	217	222	214
353310	Zfp703	zinc finger protein 703	1120	1102	1100
209225	Zfp710	zinc finger protein 710	231	238	230
245595	Zfp711	zinc finger protein 711	233	223	223
72723	Zfp74	zinc finger protein 74	103	103	93
68744	Zfp740	zinc finger protein 740	60	52	52
69228	Zfp746	zinc finger protein 746	443	463	446
233890	Zfp768	zinc finger protein 768	97	101	99
228491	Zfp770	zinc finger protein 770	610	608	596
244216	Zfp771	zinc finger protein 771	30	35	34
243372	Zfp775	zinc finger protein 775	42	43	46
654801	Zfp784	zinc finger protein 784	31	37	34
330301	Zfp786	zinc finger protein 786	27	29	28
67109	Zfp787	zinc finger protein 787	159	158	164
627049	Zfp800	zinc finger protein 800	360	364	358
330502	Zfp82	zinc finger protein 82	52	51	51
75871	Zfp821	zinc finger protein 821	57	58	60
622675	Zfp827	zinc finger protein 827	555	550	537
319748	Zfp865	zinc finger protein 865	27	25	27
214779	Zfp879	zinc finger protein 879	29	27	30
22751	Zfp90	zinc finger protein 90	229	225	214
109910	Zfp91	zinc finger protein 91	34	40	36
22754	Zfp92	zinc finger protein 92	112	102	104
22755	Zfp93	zinc finger protein 93	52	54	53
22761	Zfpm1	zinc finger protein, multitype 1	514	486	510
22762	Zfpm2	zinc finger protein, multitype 2	1897	1908	1880
22764	Zfx	zinc finger protein X-linked	304	295	293
22767	Zfy1	zinc finger protein 1, Y linked	347	341	330
22768	Zfy2	zinc finger protein 2, Y linked	1284	1243	1258
211978	Zfyve26	zinc finger, FYVE domain containing 26	120	122	115
100009600	Zglp1	zinc finger, GATA-like protein 1	52	53	50
229007	Zgpat	zinc finger, CCCH-type with G patch domain	87	77	77
22770	Zhx1	zinc fingers and homeoboxes 1	127	134	120

387609	Zhx2	zinc fingers and homeoboxes 2	513	539	523
320799	Zhx3	zinc fingers and homeoboxes 3	183	187	189
22771	Zic1	zinc finger protein of the cerebellum 1	1365	1377	1392
22773	Zic3	zinc finger protein of the cerebellum 3	1758	1756	1694
65100	Zic5	zinc finger protein of the cerebellum 5	26	24	28
22775	Zik1	zinc finger protein interacting with K protein 1	103	102	106
74570	Zkscan1	zinc finger with KRAB and SCAN domains 1	106	100	112
67235	Zkscan14	zinc finger with KRAB and SCAN domains 14	16	19	16
100041581	Zkscan16	zinc finger with KRAB and SCAN domains 16	96	104	96
268417	Zkscan17	zinc finger with KRAB and SCAN domains 17	47	49	50
72739	Zkscan3	zinc finger with KRAB and SCAN domains 3	100	100	97
544922	Zkscan4	zinc finger with KRAB and SCAN domains 4	52	47	50
22757	Zkscan5	zinc finger with KRAB and SCAN domains 5	41	38	41
52712	Zkscan6	zinc finger with KRAB and SCAN domains 6	481	490	490
67178	Zmat5	zinc finger, matrin type 5	63	62	59
328365	Zmiz1	zinc finger, MIZ-type containing 1	1324	1337	1345
52915	Zmiz2	zinc finger, MIZ-type containing 2	171	171	176
230709	Zmpste24	zinc metalloproteinase, STE24 homolog (<i>S. cerevisiae</i>)	92	97	94
76007	Zmym2	zinc finger, MYM-type 2	308	319	314
574428	Zmynd15	zinc finger, MYND-type containing 15	11	9	9
228880	Zmynd8	zinc finger, MYND-type containing 8	452	432	436
66136	Znrd1	zinc ribbon domain containing, 1	9	7	8
22788	Zp3	zona pellucida glycoprotein 3	27	25	31
360216	Zranb1	zinc finger, RAN-binding domain containing 1	196	203	204
53861	Zranb2	zinc finger, RAN-binding domain containing 2	1261	1299	1260
22184	Zrsr2	zinc finger (CCCH type), RNA binding motif and serine/arginine ricl	146	139	130
332221	Zscan10	zinc finger and SCAN domain containing 10	61	58	62
22758	Zscan12	zinc finger and SCAN domain containing 12	70	69	69
232875	Zscan18	zinc finger and SCAN domain containing 18	101	109	103
22691	Zscan2	zinc finger and SCAN domain containing 2	122	125	127
269585	Zscan20	zinc finger and SCAN domains 20	463	465	460
22697	Zscan21	zinc finger and SCAN domain containing 21	101	92	95
232878	Zscan22	zinc finger and SCAN domain containing 22	52	54	55
99334	Zscan29	zinc finger SCAN domains 29	34	39	34
328918	Zscan30	zinc finger and SCAN domain containing 30	48	44	44
665780	Zscan4b	zinc finger and SCAN domain containing 4B	271	271	277
245109	Zscan4c	zinc finger and SCAN domain containing 4C	337	347	339
545913	Zscan4d	zinc finger and SCAN domain containing 4D	398	407	400
665848	Zscan4e	zinc finger and SCAN domain containing 4E	302	323	305
665902	Zscan4f	zinc finger and SCAN domain containing 4F	464	472	466
170734	Zscan5b	zinc finger and SCAN domain containing 5B	71	72	73
71861	Zswim2	zinc finger, SWIM domain containing 2	175	177	179
69747	Zswim7	zinc finger, SWIM-type containing 7	39	39	40
668166	Zxdb	zinc finger, X-linked, duplicated B	191	198	194
80292	Zxdc	ZXD family zinc finger C	121	120	123
108946	Zzz3	zinc finger, ZZ domain containing 3	413	418	424