

Table 1: **Frequency of ambiguously mapping read counts for various read lengths.** For each read length, 100,000 fusions were randomly generated. Then for each of these fusions, 200 read pairs spanning the fusion site were generated. The number of read pairs out of these 200 that mapped ambiguously was tabulated. Below is a table of the frequency of ambiguous read pair counts for different read lengths.

Ambiguous Read Count (out of 200)	Read Length 30	Read Length 35	Read Length 40	Read Length 45	Read Length 50	Read Length 75	Read Length 100
0	63,997	72,146	77,400	80,247	82,040	86,938	89,202
1	1,733	1,493	435	344	417	140	156
2	1,205	801	738	324	248	114	76
3	1,610	491	364	331	248	88	72
4	958	886	354	224	223	100	51
5	799	619	418	264	161	113	87
6	967	413	246	282	123	121	63
7	745	458	237	194	144	102	64
8	624	378	256	185	166	88	84
9	688	328	201	281	140	89	78
10	503	306	251	142	134	83	78
11	526	291	265	146	161	119	80
12	650	262	232	138	161	99	56
13	475	320	197	130	141	77	67
14	385	267	179	119	109	67	74
15	431	239	184	137	131	90	51
16	362	230	165	131	122	81	52
17	347	185	213	127	131	73	54
18	357	202	143	169	101	74	52
19	309	189	137	93	123	83	46
20	227	172	136	115	121	72	52
21	272	188	130	125	111	88	65
22	281	166	112	126	111	72	52
23	212	147	128	153	98	61	69
24	277	172	101	145	89	54	57
25	229	158	159	99	93	66	56
26	202	124	131	133	85	71	61
27	192	134	104	114	67	64	51
28	215	130	117	85	75	46	47
29	155	167	116	86	62	54	55
30	256	116	141	78	58	53	51
31	173	129	124	113	87	57	55
32	144	118	115	104	90	61	63
33	140	122	119	93	75	51	50
34	174	127	111	78	70	58	59
35	182	109	101	70	73	56	55
36	163	96	106	88	91	61	38
37	150	101	84	93	97	56	42
38	138	118	64	62	65	50	33
39	146	159	76	79	96	70	36
40	156	120	88	68	99	50	31
41	113	91	85	90	64	68	40
42	132	134	75	73	77	43	47
43	89	95	85	87	72	52	46

Table 1 – Continued

Ambiguous Read Count (out of 200)	Read Length 30	Read Length 35	Read Length 40	Read Length 45	Read Length 50	Read Length 75	Read Length 100
44	114	107	103	73	69	45	48
45	117	112	82	70	40	60	54
46	107	87	99	74	50	52	43
47	117	98	110	58	73	31	43
48	106	91	86	67	72	51	32
49	118	73	60	55	64	53	37
50	105	89	78	75	59	61	51
51	100	96	85	75	78	49	55
52	114	75	80	67	77	63	47
53	105	89	69	83	72	65	40
54	83	87	60	54	52	59	40
55	93	86	76	72	56	50	33
56	97	55	81	60	60	70	39
57	124	122	73	61	56	49	37
58	111	89	68	52	48	53	47
59	67	78	61	65	54	40	48
60	83	107	82	65	96	32	39
61	89	68	78	52	86	50	39
62	109	85	75	59	68	62	37
63	112	77	63	61	46	42	31
64	85	54	67	69	86	61	33
65	78	61	65	52	47	32	35
66	82	71	51	59	56	46	35
67	94	54	52	74	63	36	32
68	82	72	55	70	69	39	20
69	84	72	55	87	60	31	29
70	100	72	63	56	41	42	27
71	108	56	73	63	55	34	36
72	68	50	58	71	50	42	38
73	68	56	60	65	44	57	33
74	86	62	84	63	58	44	34
75	65	55	51	52	53	48	35
76	90	74	60	55	51	49	30
77	114	75	66	72	45	59	30
78	94	62	72	67	46	43	27
79	72	78	61	75	46	41	27
80	94	75	59	48	49	35	32
81	78	71	67	54	77	41	28
82	61	82	46	53	40	43	26
83	69	74	68	50	65	40	31
84	73	71	63	78	72	31	38
85	71	57	64	59	59	28	21
86	75	59	51	69	58	29	33
87	74	61	43	46	49	60	37
88	57	79	57	55	34	30	37
89	67	80	70	54	42	35	22
90	80	66	61	56	57	47	29

Table 1 – Continued

Ambiguous Read Count (out of 200)	Read Length 30	Read Length 35	Read Length 40	Read Length 45	Read Length 50	Read Length 75	Read Length 100
91	71	81	77	58	54	40	46
92	68	73	57	45	63	38	31
93	60	59	46	57	56	24	32
94	71	52	68	53	41	25	41
95	77	69	62	63	39	44	33
96	75	82	39	41	44	33	34
97	62	57	53	30	54	35	27
98	58	62	77	40	73	44	36
99	69	58	56	30	54	39	33
100	55	50	54	48	65	38	34
101	70	58	71	55	44	32	28
102	91	57	62	60	55	27	28
103	60	76	50	46	46	23	32
104	56	73	57	35	50	34	46
105	56	64	66	49	47	33	35
106	72	62	45	32	50	31	51
107	55	50	49	47	65	29	51
108	59	60	52	62	61	23	41
109	71	58	51	57	59	16	51
110	69	65	50	67	60	22	36
111	51	59	58	65	61	20	18
112	66	57	57	43	59	33	34
113	64	48	42	64	55	29	25
114	57	49	57	49	43	39	39
115	71	41	49	55	38	41	24
116	56	60	67	59	39	33	31
117	50	34	42	60	38	35	33
118	47	59	51	57	40	47	27
119	64	56	44	41	42	32	17
120	56	57	39	57	39	39	26
121	62	57	54	64	44	36	19
122	55	55	68	58	40	44	28
123	45	58	74	65	38	27	21
124	71	62	42	55	51	46	27
125	54	75	67	54	27	49	23
126	59	57	63	45	49	36	23
127	64	45	66	49	47	42	34
128	58	54	58	55	35	34	21
129	58	50	64	51	29	48	23
130	68	60	60	54	25	71	27
131	55	60	39	50	31	51	28
132	59	64	59	25	40	65	36
133	59	74	64	28	51	54	28
134	66	45	51	34	42	58	37
135	61	61	60	52	34	46	29
136	83	65	82	53	33	32	27
137	61	57	53	48	40	28	26

Table 1 – Continued

Ambiguous Read Count (out of 200)	Read Length 30	Read Length 35	Read Length 40	Read Length 45	Read Length 50	Read Length 75	Read Length 100
138	88	63	52	50	34	28	18
139	66	64	49	46	55	36	20
140	69	71	59	40	64	24	12
141	71	56	51	24	59	29	22
142	49	47	45	49	49	31	19
143	57	53	55	33	48	30	16
144	65	70	51	38	59	32	20
145	59	63	42	52	62	29	27
146	88	80	46	61	47	23	31
147	72	58	47	41	41	17	26
148	36	60	38	37	46	18	16
149	77	71	58	59	46	27	22
150	82	56	57	63	59	21	29
151	69	65	50	62	51	22	23
152	58	50	51	56	62	23	29
153	64	61	55	53	47	25	23
154	73	50	58	67	45	21	21
155	64	74	59	83	93	30	28
156	93	66	56	68	86	29	22
157	65	52	60	63	83	31	26
158	91	77	56	76	72	26	25
159	67	79	57	61	59	28	23
160	70	64	90	97	46	23	19
161	76	55	70	91	39	40	23
162	85	64	96	96	39	29	21
163	49	63	55	75	29	25	24
164	62	75	65	62	38	24	19
165	86	119	100	54	27	22	17
166	85	77	98	48	58	26	20
167	84	85	98	48	38	25	16
168	67	90	94	40	39	24	13
169	78	83	94	45	28	29	15
170	106	124	62	26	39	35	11
171	92	124	49	35	40	30	22
172	104	137	72	47	37	23	15
173	105	104	36	49	46	17	16
174	112	99	62	41	36	20	20
175	104	79	42	44	47	29	22
176	124	83	51	63	52	27	19
177	152	70	35	41	38	26	20
178	144	53	48	36	51	29	18
179	126	66	52	38	26	24	16
180	89	50	46	48	33	36	18
181	102	51	49	37	43	32	21
182	101	33	44	39	44	16	26
183	74	47	57	50	60	29	19
184	76	41	42	50	45	31	25

Table 1 – Continued

<b>Ambiguous Read Count (out of 200)</b>	<b>Read Length 30</b>	<b>Read Length 35</b>	<b>Read Length 40</b>	<b>Read Length 45</b>	<b>Read Length 50</b>	<b>Read Length 75</b>	<b>Read Length 100</b>
<b>185</b>	77	61	46	31	43	38	28
<b>186</b>	79	48	38	24	36	44	31
<b>187</b>	66	47	37	53	43	28	30
<b>188</b>	60	48	59	63	29	17	59
<b>189</b>	62	62	38	40	32	19	41
<b>190</b>	76	57	33	42	26	31	51
<b>191</b>	62	63	39	50	19	29	57
<b>192</b>	39	54	65	41	28	32	62
<b>193</b>	64	59	71	43	28	38	52
<b>194</b>	78	48	36	41	32	42	54
<b>195</b>	60	57	46	30	46	59	55
<b>196</b>	57	72	63	38	44	92	59
<b>197</b>	59	75	59	59	76	113	79
<b>198</b>	84	104	145	118	151	136	186
<b>199</b>	254	269	300	336	346	298	421
<b>200</b>	5,673	5,502	5,060	4,809	4,548	3,655	2,856

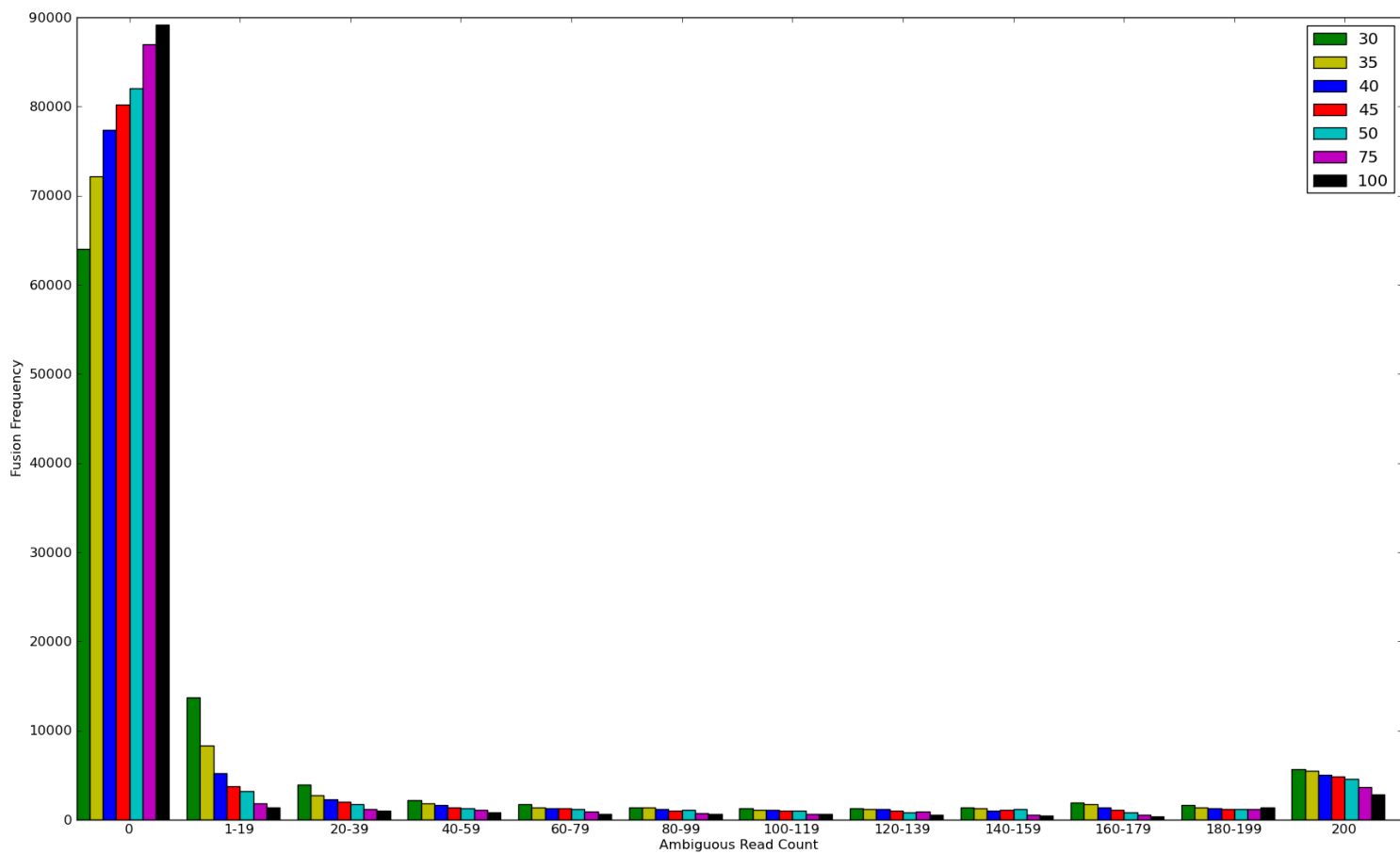


Figure 1: Graph of ambiguously mapping read count frequency data above.

Table 2: All gene fusions nominated by discordant read pairs in the simulated data.

<b>Upstream Partner</b>	<b>Downstream Partner</b>
FOXO3B	EIF3C
FOXO3B	EIF3CL
FOXO3	EIF3C
FOXO3	EIF3CL
FRG1B	LOC162632
FRG1B	LOC220594
FRG1B	USP32
FRG1B	USP6
FRG1	LOC162632
FRG1	LOC220594
FRG1	USP32
FRG1	USP6
LOC283788	LOC162632
LOC283788	LOC220594
LOC283788	USP32
LOC283788	USP6
LOC642236	LOC162632
LOC642236	LOC220594
LOC642236	USP32
LOC642236	USP6
MAGED4B	MBD3L2
MAGED4B	MBD3L3
MAGED4B	MBD3L4
MAGED4B	MBD3L5
MAGED4	MBD3L2
MAGED4	MBD3L3
MAGED4	MBD3L4
MAGED4	MBD3L5
PSG10	PHB
PSG10	ZNF607
PSG11	PHB
PSG11	ZNF607
PSG1	PHB
PSG1	ZNF607
PSG2	PHB
PSG2	ZNF607
PSG3	PHB
PSG3	ZNF607
PSG4	PHB
PSG4	ZNF607
PSG5	PHB
PSG5	ZNF607
PSG6	PHB
PSG6	ZNF607
PSG7	PHB
PSG7	ZNF607
PSG8	PHB
PSG8	ZNF607
PSG9	PHB

Table 2 – Continued

<b>Upstream Partner</b>	<b>Downstream Partner</b>
PSG9	ZNF607
SMN1	CSAG1
SMN1	CSAG2
SMN1	CSAG3
SMN2	CSAG1
SMN2	CSAG2
SMN2	CSAG3



Table 3: **Unambiguous fusion results from melanoma and UHR data.** In addition to the ambiguous fusions reported in the results section, our method returned many unambiguous fusions as well, and they are listed below. For the melanoma data, “Previously Reported” indicates whether the fusion was reported by Berger *et al.* Note that the criteria Berger used for reporting was different than that used here. Specifically, Berger required a read to cover the fusion point and excluded read-throughs present in existing databases. For the UHR data, “Previously Reported” indicates whether Maher *et al.* (2009b) reported the fusion. The UHR data used in this study is not the same as used by Maher, but both use sequencing of UHR. We note that all of the fusions reported by Berger are present in our results and nearly all of the read-throughs. The read-throughs we do not report are CDK2-RAB5B, PFKFB4-SCOTIN, FOXRED-TXN2, and C11orf51-C11orf59. The first three were found but excluded because coverage at the fusion site was less than one-twentieth overall coverage. The last was excluded because it lies within an intron of the RefSeq gene LRTOMT.

5' Gene	Chromosome	3' Gene	Chromosome	Supporting Read Pairs	Previously Reported	Read-through
<b>M000216</b>						
RRM2	2	C2orf48	2	12.0	No	Yes
MFGES8	15	HAPLN3	15	11.0	No	Yes
CLN6	15	CALML4	15	10.0	No	Yes
ARG2	14	RAD51L1	14	10.0	No	No
KCTD2	17	ARHGEF12	11	7.0	Yes	No
RPL7	8	EEF1A1	6	6.0	No	No
TSC22D4	7	C7orf61	7	6.0	No	Yes
VAX2	2	ATP6V1B1	2	5.0	No	Yes
MGAT5	2	LOC151162	2	4.0	No	Yes
HSPE1	2	MOBKL3	2	4.0	No	Yes
MAGIX	X	PLP2	X	3.0	No	Yes
NDST2	10	NEAT1	11	3.0	No	No
MED20	6	USP49	6	3.0	No	Yes
ARHGEF12	11	C16orf35	16	3.0	No	No
GLT8D4	3	PPP4R2	3	3.0	No	Yes
ZHX1	8	C8orf76	8	3.0	No	Yes
SPP1	4	BRI3BP	12	3.0	No	No
<b>M000921</b>						
RECK	9	ALX3	1	34.0	Yes	No
HBXIP	1	OR2S2	9	19.0	No	No
C15orf57	15	CBX3	7	10.0	No	No
HERC2	15	MTMR15	15	8.0	No	No
STYXL1	7	TMEM120A	7	6.0	No	Yes
ST6GALNAC6	9	AK1	9	6.0	No	Yes
SF3A2	19	AMH	19	5.0	No	Yes
STRADA	17	LIMD2	17	5.0	No	Yes
TIMM23	10	BMS1P4	10	5.0	No	No
APBB3	5	SRA1	5	4.0	No	Yes
BTBD8	1	KIAA1107	1	4.0	No	Yes
TMEM8B	9	TLN1	9	4.0	Yes	No
ASXL1	20	RPL35	9	3.0	No	No
ZNF594	17	FLJ36492	17	3.0	No	No
PIR	X	FIGF	X	3.0	No	Yes
ESRP1	8	DPY19L4	8	3.0	Yes	Yes
PFDN5	12	C12orf10	12	3.0	No	Yes
MTRF1L	6	FBXO5	6	3.0	No	Yes

Table 3 – Continued

5' Gene	Chromosome	3' Gene	Chromosome	Supporting Read Pairs	Previously Reported	Read-through
BBS5	2	KBTBD10	2	3.0	No	Yes
HSPE1	2	MOBKL3	2	3.0	No	Yes
NPL	1	DHX9	1	3.0	No	Yes
GPATCH3	1	GPN2	1	2.0	No	Yes
KIAA1267	17	LRRC37A	17	2.0	No	No
WARS2	1	NOTCH2	1	2.0	No	No
VPS45	1	PLEKHO1	1	2.0	No	Yes
MAGIX	X	PLP2	X	2.0	No	Yes
LOC728613	5	SDHA	5	2.0	No	No
TRIM2	4	MND1	4	2.0	No	Yes
<b>M010403</b>						
SMG5	1	PAQR6	1	12.0	No	Yes
PRMT1	19	C19orf76	19	7.0	No	Yes
RPS4Y1	Y	RPS4X	X	5.0	No	No
STYXL1	7	TMEM120A	7	5.0	No	Yes
SCAMP2	15	WDR72	15	5.0	Yes	No
CLN6	15	CALML4	15	5.0	No	Yes
LOC728190	10	SYT15	10	5.0	No	No
HAVCR1	5	TIMD4	5	5.0	No	Yes
RPS27A	2	UBA52	19	4.0	No	No
SUGT1P	9	NOL6	9	4.0	No	Yes
SMOX	20	LOC728228	20	4.0	No	Yes
ARNTL2	12	C12orf70	12	4.0	No	Yes
RRM2	2	C2orf48	2	4.0	No	Yes
ANKRD39	2	ANKRD23	2	3.0	No	Yes
HSPA8	11	RPS11	19	3.0	No	No
LOC541471	2	ANAPC1	2	3.0	No	No
ANXA2	15	RPL6	12	2.0	No	No
ZNF606	19	C19orf18	19	2.0	No	Yes
NONO	X	RPL6	12	2.0	No	No
UNQ2963	12	CLSTN3	12	2.0	No	Yes
ABCB8	7	ACCN3	7	2.0	No	Yes
HOXD11	2	HOXD10	2	2.0	No	Yes
UBXN2A	2	MFSD2B	2	2.0	No	Yes
POLA2	11	CDC42EP2	11	2.0	No	Yes
<b>M970109</b>						
UCN2	3	PFKFB4	3	57.0	No	Yes
HNRNPU	1	NCRNA00201	1	15.0	No	Yes
CLR	12	CLEC2D	12	9.0	No	Yes
BTBD8	1	KIAA1107	1	7.0	No	Yes
SLC39A1	1	CRTC2	1	6.0	No	Yes
RASSF8	12	SSPN	12	5.0	No	No
<b>M980409</b>						
CDK2	12	RAB5B	12	30.0	Yes	Yes
UCN2	3	PFKFB4	3	24.0	No	Yes
TLK2	17	LOC100288069	1	15.0	No	No
CLTC	17	TMEM49	17	14.0	Yes	Yes
SLC39A1	1	CRTC2	1	13.0	No	Yes

Table 3 – Continued

5' Gene	Chromosome	3' Gene	Chromosome	Supporting Read Pairs	Previously Reported	Read-through
ABCB8	7	ACCN3	7	9.0	No	Yes
ARPC4	3	TTL3	3	8.0	No	Yes
ARL6IP1	16	RPS15A	16	7.0	No	Yes
GCN1L1	12	PLA2G1B	12	7.0	Yes	No
SDHAF2	11	C11orf66	11	6.0	No	Yes
STYXL1	7	TMEM120A	7	6.0	No	Yes
MRPS10	6	GUCA1B	6	5.0	No	Yes
OTUD6B	8	LRRC69	8	4.0	No	Yes
LOC728613	5	SDHA	5	4.0	No	No
POLA2	11	CDC42EP2	11	3.0	No	Yes
ADSL	22	SGSM3	22	3.0	No	Yes
CCDC15	11	SLC37A2	11	3.0	Yes	Yes
CLR	12	CLEC2D	12	3.0	No	Yes
ANKRD39	2	ANKRD23	2	3.0	No	Yes
<b>M990802</b>						
ANKHD1	5	C5orf32	5	65.0	Yes	No
RB1	13	ITM2B	13	26.0	Yes	No
SMG5	1	PAQR6	1	12.0	No	Yes
LRRFIP1	2	RBM44	2	6.0	No	Yes
TPD52L2	20	DNAJC5	20	5.0	No	Yes
OR51B4	11	HBE1	11	4.0	No	Yes
WRB	21	SH3BGR	21	3.0	No	No
KIAA1467	12	EMP1	12	3.0	No	No
RPL11	1	TCEB3	1	3.0	No	Yes
YARS2	12	NAP1L1	12	3.0	No	No
TTL12	22	EIF1	17	3.0	No	No
NFX1	9	MTRNR2L8	11	2.0	No	No
<b>M980928</b>						
HOXD4	2	HOXD3	2	9.0	No	Yes
NAIP	5	OCN	5	6.0	No	No
SLAMF9	1	IGSF9	1	2.0	No	Yes
<b>M990514</b>						
UCN2	3	PFKFB4	3	19.0	No	Yes
NADSYN1	11	LOC100188947	10	17.0	No	No
PRMT1	19	C19orf76	19	16.0	No	Yes
COL7A1	3	UCN2	3	15.0	No	Yes
PACSIN2	22	ARFGAP3	22	13.0	No	Yes
CECR7	22	IL17RA	22	10.0	No	Yes
XRCC1	19	ETHE1	19	10.0	No	No
SLC39A1	1	CRTC2	1	9.0	No	Yes
GALNT8	12	KCNA6	12	8.0	No	Yes
WDR35	2	TTC32	2	8.0	Yes	Yes
C14orf133	14	C14orf148	14	7.0	No	Yes
MRPL20	1	CCNL2	1	6.0	No	Yes
C7orf50	7	COX19	7	6.0	No	No
PTPRG	3	C3orf14	3	6.0	Yes	Yes
DMPK	19	SIX5	19	6.0	No	Yes
SLC29A1	6	HSP90AB1	6	6.0	No	Yes

Table 3 – Continued

5' Gene	Chromosome	3' Gene	Chromosome	Supporting Read Pairs	Previously Reported	Read-through
GPR153	1	ICMT	1	6.0	Yes	No
C7orf68	7	EFCAB3	17	5.0	No	No
PIM2	X	SLC35A2	X	5.0	No	Yes
USP36	17	CYTH1	17	5.0	No	Yes
NDUFS2	1	FCER1G	1	5.0	No	Yes
UBE4A	11	ATP5L	11	5.0	No	Yes
STYXL1	7	TMEM120A	7	4.0	No	Yes
PKD1	16	NPIP	16	4.0	No	No
CADM4	19	ZNF428	19	4.0	No	Yes
SHC1	1	PYGO2	1	4.0	No	Yes
CD151	11	TSPAN4	11	4.0	Yes	Yes
KDM6B	17	TMEM88	17	4.0	No	Yes
BCL2L2	14	PABPN1	14	4.0	No	Yes
TPD52L2	20	DNAJC5	20	4.0	No	Yes
ST6GALNAC6	9	AK1	9	4.0	No	Yes
WRB	21	SH3BGR	21	4.0	No	No
SIRT7	17	PCYT2	17	4.0	No	Yes
ODF3B	22	TYMP	22	4.0	No	Yes
SNX8	7	FTSJ2	7	3.0	No	No
POLA2	11	CDC42EP2	11	3.0	No	Yes
PGAP1	2	C2orf66	2	3.0	No	Yes
LMCD1	3	NAG-7	3	3.0	No	Yes
TSEN34	19	RPS9	19	3.0	No	No
CLR	12	CLEC2D	12	3.0	No	No
SIDT2	11	TAGLN	11	3.0	No	Yes
C8orf58	8	KIAA1967	8	3.0	No	Yes
UBE2J2	1	FAM132A	1	2.0	No	Yes
CUEDC1	17	MRPS23	17	2.0	No	Yes
C1RL	12	C1R	12	2.0	No	Yes
GPR155	2	C1R1	2	2.0	No	No
<b>501_Mel</b>						
CCT3	1	C1orf61	1	84.0	Yes	No
SLC12A7	5	C11orf67	11	77.0	Yes	No
GNA12	7	SHANK2	11	36.0	Yes	No
FCHSD2	11	P2RY6	11	21.0	No	No
CLN6	15	CALML4	15	5.0	No	Yes
ANP32B	9	ATP5I	4	5.0	No	No
RAB6A	11	EYS	6	4.0	No	No
MANBA	4	UBE2D3	4	4.0	No	No
RBBP5	1	NUAK2	1	4.0	No	No
DUS3L	19	PRR22	19	3.0	No	Yes
C15orf57	15	CBX3	7	3.0	No	No
FRG1	4	GOSR1	17	3.0	No	No
TBCEL	11	TECTA	11	2.0	No	Yes
CLR	12	CLEC2D	12	2.0	No	Yes
PARP1	1	MIXL1	1	2.0	Yes	No
<b>MeWo</b>						
ARL6IP1	16	RPS15A	16	10.0	No	Yes

Table 3 – Continued

5' Gene	Chromosome	3' Gene	Chromosome	Supporting Read Pairs	Previously Reported	Read-through
METTL10	10	FAM53B	10	7.0	No	Yes
ZNF654	3	C3orf38	3	5.0	No	Yes
TRAK2	2	ALS2CR12	2	4.0	No	Yes
UBA2	19	WTIP	19	4.0	No	Yes
STYXL1	7	TMEM120A	7	3.0	No	Yes
FBXL19	16	ORAI3	16	3.0	No	Yes
CORO1C	12	SELPLG	12	2.0	No	Yes
WRN	8	FIBP	11	2.0	No	No
SEMA4C	2	ANKRD39	2	2.0	No	Yes
HARS	5	DND1	5	2.0	No	Yes
C20orf29	20	MAVS	20	2.0	No	Yes
<b>UHR</b>						
BCAS4	20	BCAS3	17	75.0	Yes	No
GAS6	13	RASA3	13	33.0	Yes	No
AP3D1	19	JSRP1	19	16.0	No	No
ARFGEF2	20	SULF2	20	13.0	Yes	No
CLN6	15	CALML4	15	11.0	No	Yes
RPS6KB1	17	TMEM49	17	8.0	Yes	No
B3GAT3	11	GANAB	11	7.0	No	Yes
BCR	22	ABL1	9	7.0	Yes	No
RRM2	2	C2orf48	2	7.0	No	Yes
ADCK4	19	NUMBL	19	6.0	Yes	Yes
RPLP0	12	EEF1AL7	4	6.0	No	No
SYTL2	11	PICALM	11	6.0	No	No
RPL3	22	EEF1AL7	4	5.0	No	No
SIDT2	11	TAGLN	11	5.0	No	Yes
HNRNPUL2	11	C11orf49	11	5.0	No	No
GCN1L1	12	MSI1	12	5.0	No	No
NUP214	9	XKR3	22	5.0	Yes	No
CCDC123	19	PEPD	19	4.8	Yes	No
TANC2	17	CA4	17	4.0	No	No
EEF1AL7	4	GAPDH	12	4.0	No	No
ZFP41	8	GLI4	8	4.0	Yes	Yes
VAMP8	2	VAMP5	2	4.0	Yes	Yes
HNRNPU	1	NCRNA00201	1	4.0	No	Yes
EEF1AL7	4	EEF2	19	4.0	No	No
LIME1	20	SLC2A4RG	20	4.0	No	Yes
SAPS3	11	DPP3	11	4.0	No	No
SSSCA1	11	FAM89B	11	4.0	No	Yes
VPS72	1	TMOD4	1	3.0	No	Yes
SMG5	1	PAQR6	1	3.0	No	Yes
ANKRD39	2	ANKRD23	2	3.0	Yes	Yes
RPS10	6	NUDT3	6	3.0	No	Yes
POLA2	11	CDC42EP2	11	3.0	Yes	Yes
MRPS10	6	GUCA1B	6	3.0	No	Yes
SUGT1P	9	NOL6	9	3.0	No	Yes
CTNNBIP1	1	CLSTN1	1	3.0	No	Yes
VIM	10	EEF1AL7	4	3.0	No	No

Table 3 – Continued						
5' Gene	Chromosome	3' Gene	Chromosome	Supporting Read Pairs	Previously Reported	Read-through
AHCYL1	1	CFL1	11	2.0	No	No
CBFA2T3	16	LOC390748	16	2.0	No	Yes
TAGLN2	1	CCDC19	1	2.0	No	Yes
FKBP4	12	ITFG2	12	2.0	No	Yes
EEF2	19	EEF1AL7	4	2.0	No	No
EEF1AL7	4	SND1	7	2.0	No	No
BAIAP2L2	22	SLC16A8	22	2.0	No	Yes
LOC442454	X	ENO1	1	2.0	No	No
ALKBH6	19	C19orf46	19	2.0	No	Yes
PHRF1	11	DRD4	11	2.0	No	No
SPN	16	QPRT	16	2.0	No	Yes

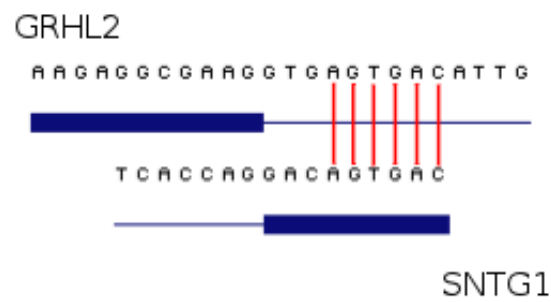


Figure 2: A short homologous sequence near the fusion site of GRHL2 and SNTG1.

### Figure 3 - Ambiguous fusion sequences.

Below is the sequence surrounding each fusion site for the ambiguous fusions reported in the results.

#### HOMEZ-MYH6

CTCGGAGCGGCCGCACCGGGCAGCAACCCCACTCCCACTCGGAGGCCCCCTGCCCTCTCCCC  
ACTTCCCCCGGCCATGGTGGGAGGCTGGGAGCCGCCGCCCGGGCTGGACTGC GGCCTCCC  
TGGAGCACGAGGAGGGCAAGATCCTCCGGGCCAGCTAGAGTTCAACCAGATCAAGGCAGAG  
ATCGAGCGGAAGCTGGCAGAGAAGGACGAGGAGATGGAACAGGCCAAGCGCAACCACCAGCG  
GGTGGTGGACTCGCTGCAGACCTCCCTGGATGCAGAGACACGCAGCCGCAACGAGGTCCTGA  
G

#### KIAA1267-ARL17A

GGGGAGTCTGATATTGAAGAGGAAGAACTGACCAGAGCTGATCCCGAGCAGCGTCATGTACC  
CCTGAGACGCAGGTCAGAATGAAAATGGGCTGCAGACCGGGCAGCTATTGTCAGCCGCTGGA  
ACTGGCTTCAGGCTCATGTTTCTGACTTGGAAATATCGAATTCGTCAGCAAACAGACATTTACA  
AACAGATACGTGCTAATAAG GTTTCTGTGTGGAGACAGTAGAATATAAAAAATAACACCTTCG  
CTGTCTGGGATGTTGGCAGCCACTTCAAATCAGACCTCTGTGGCAGCATTFTTTCCAGAACA  
CAAAAGGTGCCAGAAGCCAGGAAGCACACATCAAGGCTCACTTGCCAGCGGGGTGCTGCCA  
ATAAAATGTAGTCACGTGGAATTTGGAATGTGG

Note that this fusion sequence matches GenBank mRNA accession BC006271.1.

#### CPEB1-RPS17

GCCGACAGTAACTTTGTCCGGAGCCCATCTCAGAGGCTTGACCCAGCAGGACGGTGTGTTGTC  
GGTGTCTGTCATGGAATGCTAAATGCTGAGGCCCTGGCAGCCATCTTGAACGACCTATTTGG  
TGGAGTGGTGTATGCCGGGATTGACACAGATAAGCACAAGTATCCATTGGTTCTGCTCGTG  
TGACTTTCAATAACCAACGGAGTTACCTGAAAGCAGTCAGCGCTGCTTTTGTGGAGATCAAAA  
CCACCAAGTTCACAAAGAAGGTTACAGATTGACCCCTACCTAGAAGATTCTCTGTGTCATATCT  
GCAGTTCTCAGCCTGGTCCTTTCTTCTGTCGAGATCAG GTTTCTCTTTTACCAAGGACCCGC  
CAACATGGGCCGCGTTTCGCACCAAAACCGTGAAGAAGCGGCCCGGGTCATCATAGAAAAGT  
ACTACACGCGCCTGGGCAACGACTTCCACACGAACAAGCGCGTGTGCGAGGAGATCGCCATT  
ATCCCCAGCAAAAAGCTCCGCAACAAGATAGCAGGTTATGTCACGCATCTGATGAAGCGAATT  
CAGAGAGGCCAGTAAGAGGTATCTCCATCAAGCTGCAGGAGGAGGAGAGAGAAAAGGAGAGA  
CAATTATGTTCTGAGGTCTCAGCCTTGGATCAGGAGATTATTGAAGTAGATCCTGACACTAA  
GGAAATGCTGAAGCTTTTGGACTTCGGCAGTCTGTCCAACCTTCAGGTCCTCAGCCTACAGT  
TGGGATGAATTTCAAAAACGCTCGGGGACCTGTTTGAATTTTCTGTAGTGTGCTGATTATTT  
TCAATAAATCTGGG

#### PPIP5K1-CATSPER2

GTCCAGGAAAGGCATCAGATGAACCAGACCGGGCATTGCAGACTTCACCCAGCCTCCTGAG  
GGCCCTGGCCTTCCGAGGAGATCACCCCTCATTGTAACCGAAAAGCTGGTTCCATGGAGGTA  
CTTTCTGAGACTTCATCCTCGAGGCCTGGTGGCTACCGGCTCTTTTCATCTTCACGGCCACCC  
ACAGAAATGAAGCAGAGTGGCCTAG ATCCTTCCCGCCAGAAGAACTTGTATTGGGAGATCA  
ACACCAGCTAGTGCCTTTCTCTATAAAGCCTCAGCGTATAGAACAGATTTACATGCCAGAG  
GCTGTTGAGCAGGCTTCATGTGCGCTGCAGTCAGAGGCCACCT