Supplementary File

Supplementary Table S1. List of species supported (as of Mar. 2020)

Species	Common Name	Genome Assembly
Homo sapiens	Human	hg19
		hg38
Mus musculus	Mouse	mm10
Rattus norvegicus	Rat	rn6
Drosophila melanogaster	Fruit fly	dm3
		dm6
C. elegans	Roundworm	ce11
Danio rerio	Zebrafish	danRer10
		danRer11
Xenopus laevis	African clawed frog	xenLae2
Xenopus tropicalis	Western clawed frog	xenTro9
Oryza sativa	Rice	oSa7
Sus scrofa	Pig	susScr11
Gallus gallus	Chicken	galGal5
		galGal6
Bos taurus	Cow	bosTau9
Arabidopsis thaliana	Thale cress	araTha1

Supplementary Table S2. List of RNA-binding proteins (RBPs)

Ensembl Gene ID	RBP	Binding Motif (Regular Expression)	Species	Protein Domains
ENSG00000115875	9G8/SRSF7	[AT]GGAC[AG]A	Homo_sapiens	RRM
ENSG00000148584	A1CF	[AT]TAATT[AG]	Homo_sapiens	RRM
ENSG00000131503	ANKHD1	AGACG[AT][AT]	Homo_sapiens	KH
ENSG00000101489	BRUNOL4	[GT]GTGT[GT][GT]	Homo_sapiens	RRM
ENSG00000161082	BRUNOL5	TGTGT[GT][GT]	Homo_sapiens	RRM
ENSG00000140488	BRUNOL6	TGTG[AGT][GT]G	Homo_sapiens	RRM
ENSG00000080802	CNOT4	GACAGA	Homo_sapiens	RRM
ENSG00000137449	CPEB2	C[ACT]TTTTT	Homo_sapiens	RRM
ENSG00000113742	CPEB4	TTTTTT	Homo_sapiens	RRM
ENSG00000071626	DAZAP1	TAG[GT][AT][AT][AG]	Homo_sapiens	RRM
ENSG00000120658	ENOX1	[ACT][AG][GT]ACAG	Homo_sapiens	RRM
ENSG00000104413	ESRP1	TGGTGG	Homo_sapiens	RRM
ENSG00000103067	ESRP2	TGGG[AG]A[AGT]	Homo_sapiens	RRM
ENSG00000102081	FMR1	[GT]GACA[AG]G	Homo_sapiens	KH
ENSG00000089280	FUS	CGCGC	Homo_sapiens	RRM
ENSG00000114416	FXR1	A[CT]GAC[AG]	Homo_sapiens	KH
ENSG00000129245	FXR2	[AGT]GAC[AG][AG][AG]	Homo_sapiens	KH
ENSG00000138757	G3BP2	AGGAT[AGT][AG]	Homo_sapiens	RRM
ENSG00000135486	HNRNPA1	[AGT]TAGGG[AT]	Homo_sapiens	RRM
ENSG00000229887	HNRNPA1L2	[AGT]TAGGG[AT]	Homo_sapiens	RRM
ENSG00000122566	HNRNPA2B1	[AGT]TAGGG[AT]	Homo_sapiens	RRM
ENSG00000092199	HNRNPC	[ACT]TTTTT[GT]	Homo_sapiens	RRM
ENSG00000179172	HNRNPCL1	[ACT]TTTTT[GT]	Homo_sapiens	RRM
ENSG00000126945	HNRNPH2	GGGAGGG	Homo_sapiens	RRM
ENSG00000165119	HNRNPK	CCA[AT][AC]CC	Homo_sapiens	KH
ENSG00000104824	HNRNPL	A[AC]A[CT]A[AC]A	Homo_sapiens	RRM
ENSG00000104824	HNRNPL	ACAC[AG]A[ACG]	Homo_sapiens	RRM
ENSG00000143889	HNRPLL	[AG]CA[ACT]ACA	Homo_sapiens	RRM
ENSG00000066044	HuR	TT[AGT]TTTT	Homo_sapiens	RRM
ENSG00000066044	HuR	TT[AT]GTTT	Homo_sapiens	RRM
ENSG00000066044	HuR	TTT[AG][GT]TT	Homo_sapiens	RRM
ENSG00000066044	HuR	TT[GT][AG]TTT	Homo_sapiens	RRM
ENSG00000066044	HuR	TTTTTT[GT]	Homo_sapiens	RRM
ENSG00000073792	IGF2BP2	[ACG][AC]A[ACT][AT]CA	Homo_sapiens	KH,RRM
ENSG00000136231	IGF2BP3	A[AC]A[ACT][AT]CA	Homo_sapiens	KH,RRM
ENSG00000121774	KHDRBS1	ATAAAA[ACG]	Homo_sapiens	KH
ENSG00000112232	KHDRBS2	[AG]ATAAA[AC]	Homo_sapiens	KH
ENSG00000131773	KHDRBS3	ATAAA[ACG]	Homo_sapiens	KH
ENSG00000131914	LIN28A	[ACT]GGAG[AT]A	Homo_sapiens	CSD,Znf
ENSG00000131914	LIN28A	[CT]GGAGG[AG]	Homo_sapiens	CSD
ENSG00000015479	MATR3	[AC]ATCTT[AG]	Homo_sapiens	RRM
ENSG00000152601	MBNL1	GCTTGC	Homo_sapiens	Znf
ENSG00000135097	MSI1	TAGT[AT][AG]G	Homo_sapiens	RRM
ENSG00000135097	MSI1	TAG[GT][AT][AG]G	Homo_sapiens	RRM
ENSG00000139910	NOVA1	[CT]CA[CT]	Homo_sapiens	KH
ENSG00000070756	PABPC1	A[AG]AAAA[AC]	Homo_sapiens	RRM
ENSG00000151846	PABPC3	[AG]AAAAC[AC]	Homo_sapiens	RRM
ENSG00000090621	PABPC4	AAAAAA[AG]	Homo_sapiens	RRM
ENSG00000174740	PABPC5	AGAAA[AGT]T	Homo_sapiens	RRM
ENSG00000100836	PABPN1	A[AG]AAGA	Homo_sapiens	RRM

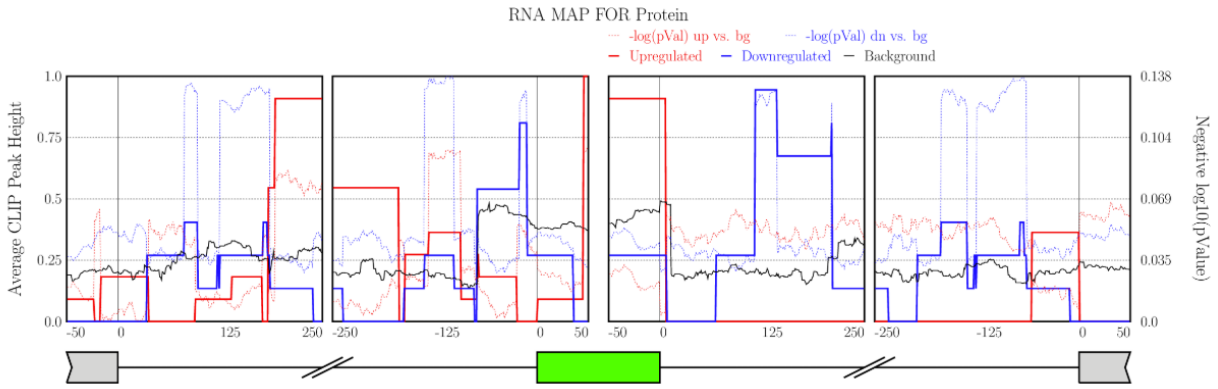
ENSG00000169564	PCBP1	CC[AT][AT][ACT]CC	Homo_sapiens	KH
ENSG00000197111	PCBP2	CC[CT][CT]CC[ACT]	Homo_sapiens	KH
ENSG00000148840	PPRC1	[GC][GC]GCGC[GC]	Homo_sapiens	RRM
ENSG00000011304	PTB/PTBP1	CTCT[CT][CT]	Homo_sapiens	RRM
ENSG00000011304	PTBP1	[ACT][CT]TTT[CT]T	Homo_sapiens	RRM
ENSG00000112531	QKI	ACTAAC[ACG]	Homo_sapiens	KH
ENSG00000125970	RALY	TTTTTT[CGT]	Homo_sapiens	RRM
ENSG00000078328	RBFOX1	[AT]GCATG[AC]	Homo_sapiens	RRM
ENSG00000112183	RBM24	[AT]G[AT]GTG[AGT]	Homo_sapiens	RRM
ENSG00000106344	RBM28	G[AT]GTAG[AGT]	Homo_sapiens	RRM
ENSG00000102317	RBM3	[AG]A[AGT]AC[GT]A	Homo_sapiens	RRM
ENSG00000173933	RBM4	GCGCG[GC][GC]	Homo_sapiens	RRM,Znf
ENSG00000173933	RBM4	GCGCG[GC]G	Homo_sapiens	RRM,Znf
ENSG00000089682	RBM41	[AT]TAC[AT]T[GT]	Homo_sapiens	RRM
ENSG00000126254	RBM42	AACTA[AC]G	Homo_sapiens	RRM
ENSG00000155636	RBM45	GACGA[AC][ACG]	Homo_sapiens	RRM
ENSG00000151962	RBM46	[AG]AT[GC]A[AT][AGT]	Homo_sapiens	RRM
ENSG00000163694	RBM47	GATGA[AT]	Homo_sapiens	RRM
ENSG00000003756	RBM5	GA[AG]GG[AT][AG]	Homo_sapiens	Znf
ENSG00000003756	RBM5	[GC]AAGG[AG]G	Homo_sapiens	RRM
ENSG00000004534	RBM6	[ACT]ATCCA[AG]	Homo_sapiens	RRM
ENSG00000131795	RBM8A	[AG][CT]GCGC[CGT]	Homo_sapiens	RRM
ENSG00000153250	RBMS1	[GT]ATATA[GC]	Homo_sapiens	RRM
ENSG00000144642	RBMS3	[AC]TATA[GT][AC]	Homo_sapiens	RRM
ENSG00000144642	RBMS3	[ACT]ATATA	Homo_sapiens	RRM
ENSG00000020577	SAMD4A	GC[GT]GG[ACT][AC]	Homo_sapiens	SAM
ENSG00000075856	SART3	A[AG]AAAA[AC]	Homo_sapiens	RRM
ENSG00000136450	SF2/ASF	[AG]GAAGAAC	Homo_sapiens	RRM
ENSG00000116560	SFPQ	[GT]T[AG][AG]T[GT][GT]	Homo_sapiens	RRM
ENSG00000104852	SNRNP70	[AG][AT]TCAAG	Homo_sapiens	RRM
ENSG00000077312	SNRPA	[AT]TGCAC[AG]	Homo_sapiens	RRM
ENSG00000112081	SRp20/SRSF3	[AT]C[AT][AT]C	Homo_sapiens	RRM
ENSG00000112081	SRp20/SRSF3	CTC[GT]TC[CT]	Homo_sapiens	RRM
ENSG00000100650	SRp40/SRSF5	[CT][AG]C[AG][GT][AC]	Homo_sapiens	RRM
ENSG00000124193	SRp55/SRSF6	[CT][CT][AT]C[AT][GC]G	Homo_sapiens	RRM
ENSG00000136450	SRSF1	G[AG]AGGA	Homo_sapiens	RRM
ENSG00000136450	SRSF1	GGAGGA	Homo_sapiens	RRM
ENSG00000136450	SRSF1	GGA[GC]G[AG][ACG]	Homo_sapiens	RRM
ENSG00000136450	SRSF1	AGGA[GC][AC]	Homo_sapiens	RRM
ENSG00000136450	SRSF1	GG[AG]GGA[ACG]	Homo_sapiens	RRM
ENSG00000188529	SRSF10	AGAGA[ACG][AC]	Homo_sapiens	RRM
ENSG00000188529	SRSF10	A[AG]AG[AG][AG][AG]	Homo_sapiens	RRM
ENSG00000188529	SRSF10	AGAGA[AG][AG]	Homo_sapiens	RRM
ENSG00000188529	SRSF10	AGAGA[ACG][ACG]	Homo_sapiens	RRM
ENSG00000161547	SRSF2	GGAG[AT][AGT]	Homo_sapiens	RRM
ENSG00000115875	SRSF7	ACGACG	Homo_sapiens	RRM,Znf
ENSG00000111786	SRSF9	[GT]G[AG][AT]G[GC][AC]	Homo_sapiens	RRM
ENSG00000111786	SRSF9	A[GT]GA[ACG][AC][AG]	Homo_sapiens	RRM
ENSG00000120948	TARDBP	GAATG[AGT]	Homo_sapiens	RRM
ENSG00000116001	TIA1	TTTTT[CGT][GT]	Homo_sapiens	RRM
ENSG00000116001	TIA1	[AT]TTTTT[CGT]	Homo_sapiens	RRM
ENSG00000136527	Tra2-beta	GAAAGAA	Homo_sapiens	RRM
ENSG00000149016	TUT1	[AC][AG]ATACT	Homo_sapiens	RRM,Znf

ENSG00000063244	U2AF2	TTTTT[CT]C	Homo_sapiens	RRM
ENSG00000065978	YBX1	AACATC	Homo_sapiens	CSD
ENSG00000065978	YBX1	AACATC[AGT]	Homo_sapiens	CSD
ENSG00000006047	YBX2	AACA[AT]C[AGT]	Homo_sapiens	CSD
ENSG00000135482	ZC3H10	[GC][GC]AGCG[AC]	Homo_sapiens	Znf
ENSG00000100722	ZC3H14	TTT[AGT]TTT	Homo_sapiens	Znf
ENSG00000139168	ZCRB1	G[AG][ACT]TTAA	Homo_sapiens	RRM
ENSG00000075292	ZNF638	[CGT]GTT[GC][GT]T	Homo_sapiens	RRM
ENSMUSG00000028790	KHDRBS1	TAAAA[ACG][ACG]	Mus_musculus	KH
ENSMUSG00000051695	PCBP1	C[CT]TTCC	Mus_musculus	KH
ENSMUSG00000001120	PCBP3	TTT[CT]CC	Mus_musculus	KH
ENSMUSG00000027510	RBM38	[GT][GT]GTGT[GT]	Mus_musculus	RRM

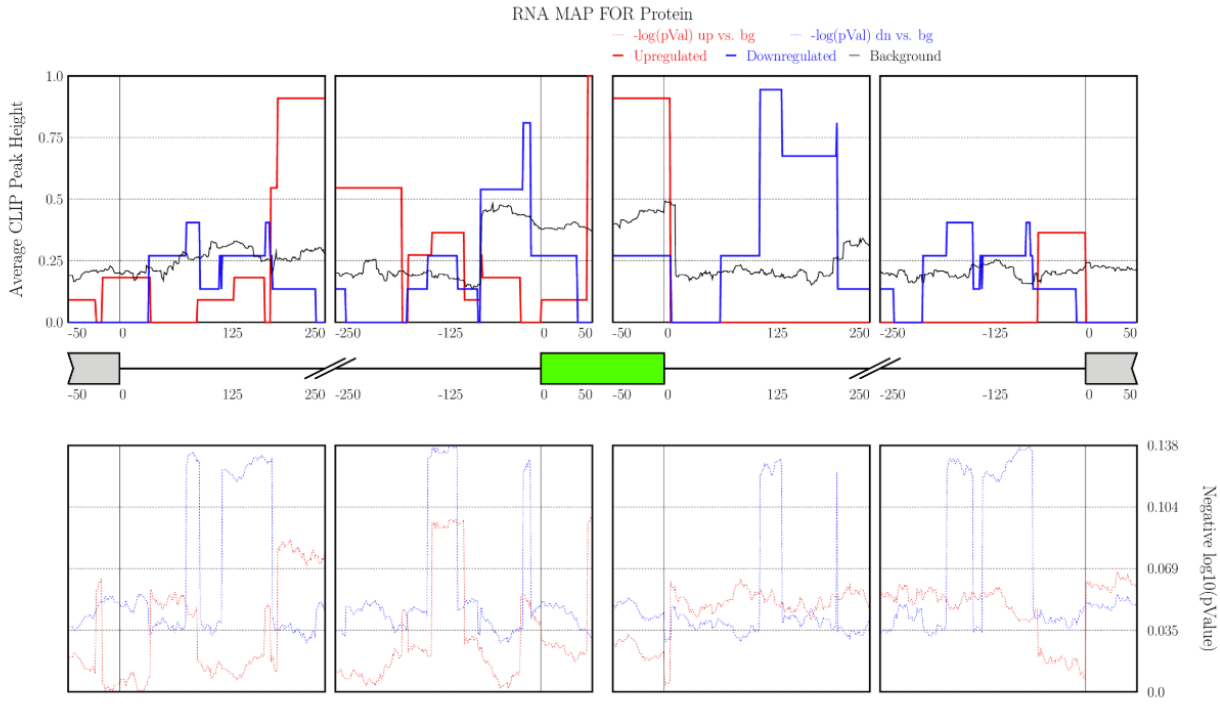
Supplementary Figure S1. Plotting motifScore/peakHeight and negative log P values together or separately using "Plot Type" option

rMAPS2 can plot all motifScore/peakHeight together with (**A)** or separately from (**B)** the statistical values.

A. Plotting solid and dashed lines together



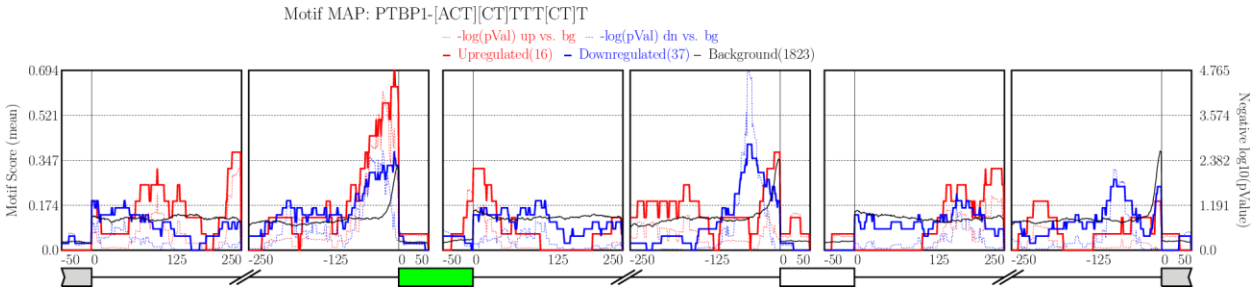
B. Plotting solid and dashed lines separately



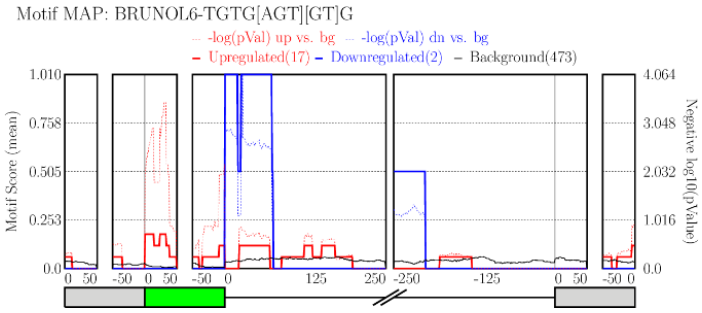
Supplementary Figure S2. Motif Map analysis result

rMAPS2 RBP motif enrichment analysis results for MXE and A5/3SS events using RNA-seq data. **A**. MXE plot shows enrichment of the PTBP1 motif in the upstream intron of the upregulated first exons (solid red line) and in the downstream intron of the downregulated first exons (solid blue line). **B**. A5SS plot shows enrichment of the BRUNOL6 motif in the downstream intron of downregulated AS regions (solid blue line). **C**. A3SS plot shows enrichment of the ZNF638 motif in the upstream intron of upregulated AS regions (solid red line).

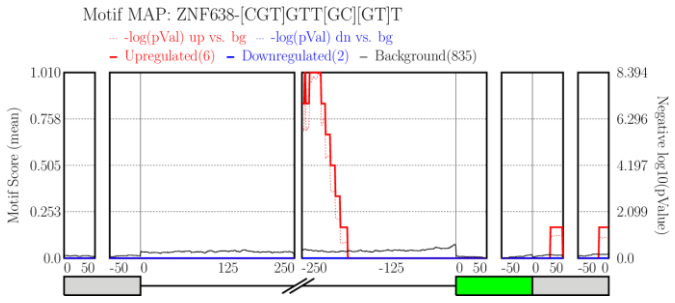
A. MXE



B. A5SS



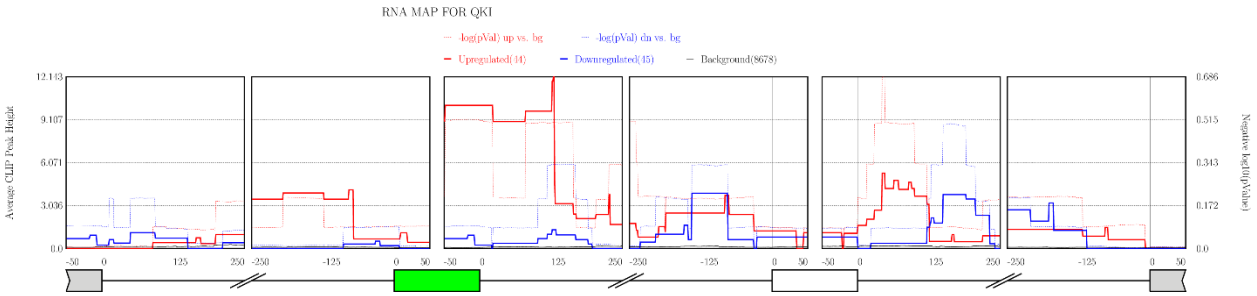
C. A3SS



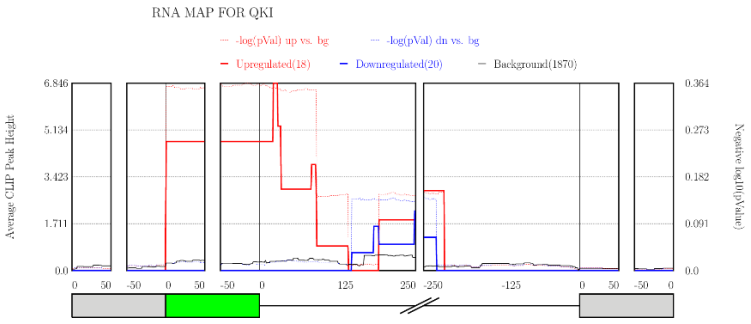
Supplementary Figure S3. CLIP Map analysis result

rMAPS2 CLIP-seq peak enrichment analysis results for MXE and A5/3SS events using RNA-seq and CLIP-seq datasets. **A-C** plots show CLIP-seq peak distribution over the up/down regulated AS regions. The scale of the second Y-axis (negative $\log_{10}$ P value) indicates that QKI has no or minimal regulatory role in these three types of AS event.

A. MXE



B. A5SS



C. A3SS