Supplementary Table 1: Genetic alterations identified in RMS cases analyzed by Targeted exom

Case #	Targeted Exome Sequencing (MSK-IMPACT) alterations
3	1. NRAS (NM_002524) exon3 p.Q61L (c.182A>T)
	2. HIST2H3D (NM_001123375 - 1q21.2) Amplification (Fold Change: 2.1)
	3. HIST2H3C (NM_021059 - 1q21.2) Amplification (Fold Change: 2.1)
	4. PTEN (NM_000314 - 10q23.31) Deletion (Fold Change: -8.7)
	5. NTRK2 (NM_006180 - 9q21.33) Loss (Fold Change: -1.7)
	6. MYOD1 (NM_002478) exon1 p.L122R (c.365T>G)
4	1. BMPR1A (NM_004329 - 10q23.2) Intragenic deletion
	2. MYOD1 (NM_002478) exon1 p.L122R (c.365T>G)
	3. PTEN (NM_000314) exon1 p.V9fs (c.24_27delCGTT)
9	1. MYOD1 exon 1 p.L122R
	2. PIK3CA exon 21 p. G1049R
	2. FGFR4 p V548M
15	1. MYOD1 (NM_002478) exon1 p.L122R (c.365T>G)
	2. PIK3R3 (NM_003629) exon1 p.T4fs (c.11_25delinsAATA)
	3. IGF2 (NM_001127598 - 11p15.5) Amplification (Fold Change: 2.2)
	4. MAX (NM_002382 - 14q23.3) Loss (Fold Change: -1.6)
	5. FBXW7 (NM_033632) exon11 p.616_618del (c.1842_1850delACAAACATT)
16	1. NPM1 (NM_002520 - 5q35.1) Amplification (Fold Change: 2.2)
	2. FANCC (NM_000136 - 9q22.32) Amplification (Fold Change: 2.1)
	3. IGF2 (NM_001127598 - 11p15.5) Amplification (Fold Change: 6.3)
	4. MYOD1 (NM_002478 - 11p15.1) Amplification (Fold Change: 2.0)
	5. IGF1 (NM_001111285 - 12q23.2) Amplification (Fold Change: 2.3)
	6. ICOSLG (NM_015259 - 21q22.3) Amplification (Fold Change: 2.2)
	7. CBFB (NM_022845 - 16q22.1) Deletion (Fold Change: -1.9)
	8. NF1 (NM_001042492 - 17q11.2) Deletion (Fold Change: -1.9)
	9. MYOD1 (NM_002478) exon1 p.L122R (c.365T>G)
	10. NOTCH1 (NM_017617) exon20 p.Y1093H (c.3277T>C)
	11. POLE (NM_006231) exon43 p.C1992S (c.5975G>C)
17	1. PIK3CA (NM_006218) exon21 p.M1043V (c.3127A>G)
	2. FGFR4 (NM_213647 - 5q35.2) Amplification (Fold Change: 6.0)
	3. NSD1 (NM_022455 - 5q35.3) Amplification (Fold Change: 2.8)
	4. NPM1 (NM_002520 - 5q35.1) Gain (Fold Change: 1.9)
	5. RAD51 (NM_002875 - 15q15.1) Deletion (Fold Change: -2.4)
	6. MGA (NM_001164273 - 15q15.1) Deletion (Fold Change: -2.4)
	7. B2M (NM_004048 - 15q21.1) Deletion (Fold Change: -2.4)
	8. FGFR4 (NM_213647) exon13 p.V550L (c.1648G>T)
	9. IL7R (NM_002185) exon8 splicing variant (c.877-1G>C)
	10. MYOD1 (NM_002478) exon1 p.L122R (c.365T>G)
19	1. PIK3CA (NM_006218) exon21 p.H1047R (c.3140A>G)
	2. GATA3 (NM_002051 - 10p14) Loss (Fold Change: -1.6)
	3. MYOD1 (NM_002478) exon1 p.L122R (c.365T>G)
20	1. PIK3CA (NM_006218) exon2 p.K111E (c.331A>G)
	2. IGF2 (NM_001127598 - 11p15.5) Amplification (Fold Change: 2.0)
	3. CDKN2B (NM_004936 - 9p21.3) Deletion (Fold Change: -7.2)

	4. CDKN2Ap16INK4A (NM_000077 - 9p21.3) Deletion (Fold Change: -7.2) 5. CDKN2Ap14ARF (NM_058195 - 9p21.3) Deletion (Fold Change: -7.2) 6. IFNGR1 (NM_000416 - 6q23.3) Loss (Fold Change: -1.9) () 7. TNFAIP3 (NM_006290 - 6q23.3) Loss (Fold Change: -1.9) () 8. RAD51B (NM_133509 - 14q24.1) Loss (Fold Change: -1.8) () 9. RAD51 (NM_002875 - 15q15.1) Loss (Fold Change: -1.8) () 10. MGA (NM_001164273 - 15q15.1) Loss (Fold Change: -1.8) () 11. B2M (NM_004048 - 15q21.1) Loss (Fold Change: -1.8) () 12. SPEN (NM_015001 - 1p36.13) Loss (Fold Change: -1.7) () 13. ARID1B (NM_020732) exon1 p.A363V (c.1088C>T) 14. ARID5B (NM_032199) exon10 p.S705Y (c.2114G>A) 15. CHEK2 (NM_007194) exon4 p.I157T (c.470T>C) 16. H3F3A (NM_002107) exon3 p.L61F (c.181C>T) 17. IKBKE (NM_014002) exon12 p.Q424R (c.1271A>G) 18. MAP3K1 (NM_005921) exon16 p.E1286V (c.3857A>T) 19. MLL2 (NM_003482) exon48 p.E5251Rfs*24 (c.15751delG) 20. MYOD1 (NM_002478) exon1 p.L122R (c.365T>G) 21. NOTCH4 (NM_004557) exon5 splicing variant (c.800-3C>T) 22. ROS1 (NM_002944) exon24 p.E1265Q (c.3793G>C) 23. SMARCB1 (NM_003073) exon9 p.R377H (c.1130G>A) 24. STAT5A (NM_003152) exon20 p.D747N (c.2239G>A) 25. TMEM127 (NM_001193304) exon3 p.R94Q (c.281G>A)
23	1. PIK3CA (NM_006218) exon2 p.K111del (c.332_334delAGA) 2. MDM2 (NM_002392 - 12q15) Amplification (Fold Change: 4.4) 3. BCOR (NM_001123385) exon8 p.S1271fs (c.3812delinsTT) 4. MYOD1 (NM_002478) exon1 p.L122R (c.365T>G)
26	1. IGF2 (NM_001127598 - 11p15.5) Amplification (Fold Change: 4.0) 2. BRCA2 (NM_000059 - 13q13.1) Gain (Fold Change: 1.9) () 3. MYOD1 (NM_002478) exon1 p.L122R (c.365T>G)
27	1. MDM2 (NM_002392 - 12q15) Amplification (Fold Change: 21.3) 2. GATA3 (NM_002051 - 10p14) Deletion (Fold Change: -2.8) 3. ARID1B (NM_020732) exon5 p.E665D (c.1995A>T) 4. CHEK2 (NM_007194) exon11 p.T367Mfs*15 (c.1100delC) 5. MYOD1 (NM_002478) exon1 p.L122R (c.365T>G) 6. PLCG2 (NM_002661) exon9 p.P236L (c.707C>T) 7. SPEN (NM_015001) exon11 p.L3093V (c.9277C>G)