Table S1. List of the pre-S genotyping results by TA cloning- and NGS-based analyses in 75 HBV-related HCC patients

Patient No.	TA Cloning Result[a]	NGS Result (Pre-S Del Type (%))[b]	NGS Result (Pre-S Del Region (%))[c]
1	pre-S1 del (nt 2855-2872)	1. **pre-S1 del (92.118)[d]**	1. pre-S1 del (nt 2855-2872) (90.102)
		2. **wild-type (7.278)**	2. wild-type (7.278)
		3. pre-S2 del (0.372)	3. pre-S2 del (nt 1-28) (0.180)
		4. pre-S1+pre-S2 del (0.231)	4. pre-S1+pre-S2 del (nt 2855-2872, 1-111) (0.027)
		I. pre-S1 plus pre-S2 del (92.490)[e]	
		II. pre-S1 plus pre-S1+pre-S2 del (92.349)	
		III. pre-S2 plus pre-S1+pre-S2 del (0.603)	
		IV. all three types of pre-S del (92.722)	
2	1. wild-type	1. **pre-S1 del (75.241)**	1. pre-S1 del (nt 2910-3089) (48.977)
	2. pre-S1 del (nt 2910-3089)	2. **wild-type (22.338)**	2. wild-type (22.338)
		3. pre-S2 del (1.891)	3. pre-S2 del (nt 1-54) (1.579)
		4. pre-S1+pre-S2 del (0.530)	4. pre-S1+pre-S2 del (nt 2910-3089, 1-57) (0.277)
		I. pre-S1 plus pre-S2 del (77.132)	
		II. pre-S1 plus pre-S1+pre-S2 del (75.771)	
		III. pre-S2 plus pre-S1+pre-S2 del (2.421)	
		IV. all three types of pre-S del (77.662)	
3	wild-type	1. **pre-S1 del (76.228)**	1. pre-S1 del (nt 3110-3127) (24.869)
		2. **wild-type (12.583)**	2. wild-type (12.583)
		3. **pre-S2 del (10.622)**	3. pre-S2 del (nt 1-57) (10.000)
		4. pre-S1+pre-S2 del (0.567)	4. pre-S1+pre-S2 del (nt 2855-2872, 1-57) (0.490)
		I. pre-S1 plus pre-S2 del (86.850)	
		II. pre-S1 plus pre-S1+pre-S2 del (76.795)	
		III. pre-S2 plus pre-S1+pre-S2 del (11.189)	
		IV. all three types of pre-S del (87.417)	

4	wild-type	1. **wild-type (71.590)**	1. wild-type (71.590)
		2. **pre-S1 del (28.270)**	2. pre-S1 del (nt 2854-3147) (23.961)
		3. pre-S2 del (0.129)	3. pre-S2 del (nt 3211-3216) (0.048)
		4. pre-S1+pre-S2 del (0.011)	4. pre-S1+pre-S2 del (nt 2954-3097, 1-54) (0.002)
		I. pre-S1 plus pre-S2 del (28.399)	
		II. pre-S1 plus pre-S1+pre-S2 del (28.281)	
		III. pre-S2 plus pre-S1+pre-S2 del (0.140)	
		IV. all three types of pre-S del (28.410)	
5	pre-S2 del (nt 24-50)	1. **wild-type (58.461)**	1. wild-type (58.461)
		2. **pre-S2 del (37.194)**	2. pre-S2 del (nt 24-50) (33.801)
		3. pre-S1 del (2.939)	3. pre-S1 del (nt 2880-3146) (0.646)
		4. pre-S1+pre-S2 del (1.407)	4. pre-S1+pre-S2 del (nt 2880-3146, 24-50) (0.355)
		I. pre-S1 plus pre-S2 del (40.133)	
		II. pre-S1 plus pre-S1+pre-S2 del (4.346)	
		III. pre-S2 plus pre-S1+pre-S2 del (38.601)	
		IV. all three types of pre-S del (41.539)	
6	wild-type	1. **wild-type (96.592)**	1. wild-type (96.592)
		2. pre-S1 del (2.906)	2. pre-S1 del (nt 3026-3205) (0.604)
		3. pre-S2 del (0.469)	3. pre-S2 del (nt 1-12) (0.233)
		4. pre-S1+pre-S2 del (0.033)	4. pre-S1+pre-S2 del (nt 2854-2979, 6-134) (0.008)
		I. pre-S1 plus pre-S2 del (3.375)	
		II. pre-S1 plus pre-S1+pre-S2 del (2.939)	
		III. pre-S2 plus pre-S1+pre-S2 del (0.502)	
		IV. all three types of pre-S del (3.408)	
7	wild-type	1. **wild-type (99.000)**	1. wild-type (99.000)
		2. pre-S1 del (0.927)	2. pre-S1 del (nt 3106-3129) (0.294)

		3. pre-S2 del (0.062)	3. pre-S2 del (nt 1-54) (0.031)
		4. pre-S1+pre-S2 del (0.012)	4. pre-S1+pre-S2 del (nt 2855-2972, 1-54) (0.008)
		I. pre-S1 plus pre-S2 del (0.989)	
		II. pre-S1 plus pre-S1+pre-S2 del (0.939)	
		III. pre-S2 plus pre-S1+pre-S2 del (0.074)	
		IV. all three types of pre-S del (1.000)	
8	wild-type	1. **wild-type (93.746)**	1. wild-type (93.746)
		2. **pre-S1 del (5.846)**	2. pre-S1 del (nt 3026-3205) (2.417)
		3. pre-S2 del (0.389)	3. pre-S2 del (nt 3211-3213) (0.135)
		4. pre-S1+pre-S2 del (0.018)	4. pre-S1+pre-S2 del (nt 2856-2873, 1-21) (0.004)
		I. pre-S1 plus pre-S2 del (6.235)	
		II. pre-S1 plus pre-S1+pre-S2 del (5.864)	
		III. pre-S2 plus pre-S1+pre-S2 del (0.407)	
		IV. all three types of pre-S del (6.254)	
9	wild-type	1. **pre-S1+pre-S2 del (46.237)**	1. pre-S1+pre-S2 del (nt 2956-3126, 1-9) (24.002)
		2. **pre-S2 del (26.927)**	2. pre-S2 del (nt 1-54) (23.226)
		3. **pre-S1 del (14.368)**	3. pre-S1 del (nt 2944-3075) (5.140)
		4. **wild-type (12.467)**	4. wild-type (12.467)
		I. pre-S1 plus pre-S2 del (41.295)	
		II. pre-S1 plus pre-S1+pre-S2 del (60.605)	
		III. pre-S2 plus pre-S1+pre-S2 del (73.164)	
		IV. all three types of pre-S del (87.533)	
10	wild-type	1. **wild-type (97.851)**	1. wild-type (97.851)
		2. pre-S1 del (2.037)	2. pre-S1 del (nt 3026-3205) (1.109)
		3. pre-S2 del (0.108)	3. pre-S2 del (nt 3211-3213) (0.049)
		4. pre-S1+pre-S2 del (0.005)	4. pre-S1+pre-S2 del (nt 2855-2872, 1-54) (0.003)

		I. pre-S1 plus pre-S2 del (2.145)	
		II. pre-S1 plus pre-S1+pre-S2 del (2.042)	
		III. pre-S2 plus pre-S1+pre-S2 del (0.113)	
		IV. all three types of pre-S del (2.149)	
11	wild-type	1. **wild-type (98.964)**	1. wild-type (98.964)
		2. pre-S1 del (0.943)	2. pre-S1 del (nt 2854-2970) (0.125)
		3. pre-S2 del (0.084)	3. pre-S2 del (nt 1-9) (0.028)
		4. pre-S1+pre-S2 del (0.009)	4. pre-S1+pre-S2 del (nt 2954-3097, 1-13) (0.009)
		I. pre-S1 plus pre-S2 del (1.027)	
		II. pre-S1 plus pre-S1+pre-S2 del (0.952)	
		III. pre-S2 plus pre-S1+pre-S2 del (0.093)	
		IV. all three types of pre-S del (1.036)	
12	wild-type	1. **wild-type (97.781)**	1. wild-type (97.781)
		2. pre-S1 del (2.099)	2. pre-S1 del (nt 3026-3205) (1.099)
		3. pre-S2 del (0.112)	3. pre-S2 del (nt 3211-3216) (0.055)
		4. pre-S1+pre-S2 del (0.008)	4. pre-S1+pre-S2 del (nt 3026-3205, 43-138) (0.002)
		I. pre-S1 plus pre-S2 del (2.211)	
		II. pre-S1 plus pre-S1+pre-S2 del (2.107)	
		III. pre-S2 plus pre-S1+pre-S2 del (0.120)	
		IV. all three types of pre-S del (2.219)	
13	wild-type	1. **wild-type (92.291)**	1. wild-type (92.291)
		2. pre-S1 del (4.092)	2. pre-S1 del (nt 2854-2970) (0.650)
		3. pre-S2 del (3.038)	3. pre-S2 del (nt 1-54) (2.641)
		4. pre-S1+pre-S2 del (0.578)	4. pre-S1+pre-S2 del (nt 2855-2872, 1-54) (0.435)
		I. pre-S1 plus pre-S2 del (7.130)	
		II. pre-S1 plus pre-S1+pre-S2 del (4.670)	

		III. pre-S2 plus pre-S1+pre-S2 del (3.616)	
		IV. all three types of pre-S del (7.709)	
14	wild-type	1. **wild-type (69.001)**	1. wild-type (69.001)
		2. **pre-S1 del (20.530)**	2. pre-S1 del (nt 3110-3127) (4.779)
		3. **pre-S2 del (9.463)**	3. pre-S2 del (nt 1-54) (8.226)
		4. pre-S1+pre-S2 del (1.006)	4. pre-S1+pre-S2 del (nt 2855-2872, 1-18, 26-59) (0.259)
		I. pre-S1 plus pre-S2 del (29.993)	
		II. pre-S1 plus pre-S1+pre-S2 del (21.536)	
		III. pre-S2 plus pre-S1+pre-S2 del (10.469)	
		IV. all three types of pre-S del (31.999)	
15	wild-type	1. **wild-type (50.938)**	1. wild-type (50.938)
		2. **pre-S1 del (19.760)**	2. pre-S1 del (nt 2854-2970) (5.470)
		3. **pre-S1+pre-S2 del (15.021)**	3. pre-S1+pre-S2 del (nt 2855-2872, 1-54) (12.421)
		4. **pre-S2 del (14.280)**	4. pre-S2 del (nt 1-54) (13.606)
		I. pre-S1 plus pre-S2 del (34.040)	
		II. pre-S1 plus pre-S1+pre-S2 del (34.781)	
		III. pre-S2 plus pre-S1+pre-S2 del (29.301)	
		IV. all three types of pre-S del (49.062)	
16	wild-type	1. **wild-type (75.230)**	1. wild-type (75.230)
		2. **pre-S1+pre-S2 del (13.878)**	2. pre-S1+pre-S2 del (nt 2860-2880, 2954-3097, 1-15) (11.572)
		3. **pre-S1 del (10.730)**	3. pre-S1 del (nt 2860-2880, 2954-3097) (9.550)
		4. pre-S2 del (0.162)	4. pre-S2 del (nt 1-15) (0.138)
		I. pre-S1 plus pre-S2 del (10.892)	
		II. pre-S1 plus pre-S1+pre-S2 del (24.608)	
		III. pre-S2 plus pre-S1+pre-S2 del (14.040)	
		IV. all three types of pre-S del (24.770)	

17	wild-type	1. **wild-type (98.571)**	1. wild-type (98.571)
		2. pre-S1 del (1.173)	2. pre-S1 del (nt 3106-3129) (0.242)
		3. pre-S2 del (0.178)	3. pre-S2 del (nt 2-149) (0.043)
		4. pre-S1+pre-S2 del (0.078)	4. pre-S1+pre-S2 del (nt 2854-2985, 27-149) (0.014)
		I. pre-S1 plus pre-S2 del (1.351)	
		II. pre-S1 plus pre-S1+pre-S2 del (1.251)	
		III. pre-S2 plus pre-S1+pre-S2 del (0.256)	
		IV. all three types of pre-S del (1.429)	
18	wild-type	1. **wild-type (96.915)**	1. wild-type (96.915)
		2. pre-S1 del (2.701)	2. pre-S1 del (nt 3026-3205) (1.755)
		3. pre-S2 del (0.364)	3. pre-S2 del (nt 25-54) (0.148)
		4. pre-S1+pre-S2 del (0.020)	4. pre-S1+pre-S2 del (nt 2854-2988, 45-149) (0.004)
		I. pre-S1 plus pre-S2 del (3.065)	
		II. pre-S1 plus pre-S1+pre-S2 del (2.721)	
		III. pre-S2 plus pre-S1+pre-S2 del (0.384)	
		IV. all three types of pre-S del (3.085)	
19	wild-type	1. **wild-type (98.069)**	1. wild-type (98.069)
		2. pre-S1 del (1.263)	2. pre-S1 del (nt 3103-3126) (0.253)
		3. pre-S2 del (0.609)	3. pre-S2 del (nt 1-15) (0.535)
		4. pre-S1+pre-S2 del (0.059)	4. pre-S1+pre-S2 del (nt 2854-2996, 44-144) (0.015)
		I. pre-S1 plus pre-S2 del (1.872)	
		II. pre-S1 plus pre-S1+pre-S2 del (1.322)	
		III. pre-S2 plus pre-S1+pre-S2 del (0.668)	
		IV. all three types of pre-S del (1.931)	

20	wild-type	1. **wild-type (69.571)**	1. wild-type (69.571)
		2. **pre-S2 del (18.590)**	2. pre-S2 del (nt 1-54) (18.482)
		3. **pre-S1+pre-S2 del (8.224)**	3. pre-S1+pre-S2 del (nt 2855-2872, 1-54) (7.712)
		4. pre-S1 del (3.615)	4. pre-S1 del (nt 2855-2872) (2.674)
		I. pre-S1 plus pre-S2 del (22.205)	
		II. pre-S1 plus pre-S1+pre-S2 del (11.839)	
		III. pre-S2 plus pre-S1+pre-S2 del (26.814)	
		IV. all three types of pre-S del (30.429)	
21	wild-type	1. **pre-S2 del (41.477)**	1. pre-S2 del (nt 1-54) (24.620)
		2. **pre-S1+pre-S2 del (39.126)**	2. pre-S1+pre-S2 del (nt 2855-2872, 1-54) (26.451)
		3. **wild-type (12.348)**	3. wild-type (12.348)
		4. **pre-S1 del (7.048)**	4. pre-S1 del (nt 2855-2872) (4.978)
		I. pre-S1 plus pre-S2 del (48.525)	
		II. pre-S1 plus pre-S1+pre-S2 del (46.174)	
		III. pre-S2 plus pre-S1+pre-S2 del (80.603)	
		IV. all three types of pre-S del (87.652)	
22	1. wild-type	1. **pre-S2 del (42.909)**	1. pre-S2 del (nt 1-54) (38.091)
	2. pre-S1 del (nt 2855-2872)	2. **pre-S1+pre-S2 del (27.915)**	2. pre-S1+pre-S2 del (2855-2872, 1-54) (25.090)
		3. **wild-type (17.564)**	3. wild-type (17.564)
		4. **pre-S1 del (11.612)**	4. pre-S1 del (nt 2855-2872) (8.072)
		I. pre-S1 plus pre-S2 del (54.521)	
		II. pre-S1 plus pre-S1+pre-S2 del (39.527)	
		III. pre-S2 plus pre-S1+pre-S2 del (70.824)	
		IV. all three types of pre-S del (82.436)	

23	1. wild-type	1. **wild-type (52.661)**	1. wild-type (52.661)
	2. pre-S1+pre-S2 del	2. **pre-S2 del (25.093)**	2. pre-S2 del (nt 1-54) (18.682)
	(nt 2855-2872, 1-54)	3. **pre-S1+pre-S2 del (11.424)**	3. pre-S1+pre-S2 del (nt 2855-2872, 1-54) (8.344)
		4. **pre-S1 del (10.821)**	4. pre-S1 del (nt 2855-2872) (2.817)
		I. pre-S1 plus pre-S2 del (36.724)	
		II. pre-S1 plus pre-S1+pre-S2 del (22.245)	
		III. pre-S2 plus pre-S1+pre-S2 del (36.517)	
		IV. all three types of pre-S del (47.339)	
24	wild-type	1. **wild-type (96.073)**	1. wild-type (96.073)
		2. pre-S1 del (1.895)	2. pre-S1 del (nt 2954-3097) (0.632)
		3. pre-S1+pre-S2 del (1.202)	3. pre-S1+pre-S2 del (nt 2855-2872, 1-54) (0.452)
		4. pre-S2 del (0.830)	4. pre-S2 del (nt 1-54) (0.382)
		I. pre-S1 plus pre-S2 del (2.725)	
		II. pre-S1 plus pre-S1+pre-S2 del (3.097)	
		III. pre-S2 plus pre-S1+pre-S2 del (2.032)	
		IV. all three types of pre-S del (3.927)	
25	wild-type	1. **wild-type (93.547)**	1. wild-type (93.547)
		2. pre-S1 del (4.345)	2. pre-S1 del (nt 3026-3205) (0.869)
		3. pre-S2 del (1.844)	3. pre-S2 del (nt 1-54) (1.107)
		4. pre-S1+pre-S2 del (0.265)	4. pre-S1+pre-S2 del (nt 2855-2872, 2897-2923, 1-54) (0.180)
		I. pre-S1 plus pre-S2 del (6.189)	
		II. pre-S1 plus pre-S1+pre-S2 del (4.610)	
		III. pre-S2 plus pre-S1+pre-S2 del (2.109)	
		IV. all three types of pre-S del (6.453)	

26	wild-type	1. **wild-type (97.921)**	1. wild-type (97.921)
		2. pre-S1 del (1.388)	2. pre-S1 del (nt 3067-3162) (0.040)
		3. pre-S2 del (0.691)	3. pre-S2 del (nt 3211-3216) (0.046)
		4. pre-S1+pre-S2 del (0.000)	4. pre-S1+pre-S2 del (0.000)
		I. pre-S1 plus pre-S2 del (2.079)	
		II. pre-S1 plus pre-S1+pre-S2 del (1.388)	
		III. pre-S2 plus pre-S1+pre-S2 del (0.691)	
		IV. all three types of pre-S del (2.079)	
27	pre-S1+pre-S2 del (nt 2855-2872, 1-54)	1. **wild-type (60.195)**	1. wild-type (60.195)
		2. **pre-S2 del (22.882)**	2. pre-S2 del (nt 1-57) (22.473)
		3. **pre-S1+pre-S2 del (9.280)**	3. pre-S1+pre-S2 del (nt 2855-2872, 1-54) (4.815)
		4. **pre-S1 del (7.643)**	4. pre-S1 del (nt 3025-3126) (4.396)
		I. pre-S1 plus pre-S2 del (30.525)	
		II. pre-S1 plus pre-S1+pre-S2 del (16.923)	
		III. pre-S2 plus pre-S1+pre-S2 del (32.162)	
		IV. all three types of pre-S del (39.805)	
28	wild-type	1. **pre-S1 del (75.113)**	1. pre-S1 del (nt 2855-2872) (5.979)
		2. **wild-type (11.506)**	2. wild-type (11.506)
		3. **pre-S1+pre-S2 del (10.472)**	3. pre-S1+pre-S2 del (nt 2855-2872, 1-54) (8.016)
		4. pre-S2 del (2.909)	4. pre-S2 del (nt 1-54) (2.747)
		I. pre-S1 plus pre-S2 del (78.022)	
		II. pre-S1 plus pre-S1+pre-S2 del (85.585)	
		III. pre-S2 plus pre-S1+pre-S2 del (13.381)	
		IV. all three types of pre-S del (88.494)	

29	wild-type	1. **wild-type (97.730)**	1. wild-type (97.730)
		2. pre-S1 del (1.691)	2. pre-S1 del (nt 2855-2970) (0.217)
		3. pre-S2 del (0.575)	3. pre-S2 del (nt 1-12) (0.323)
		4. pre-S1+pre-S2 del (0.004)	4. pre-S1+pre-S2 del (nt 2855-2970, 1-54) (0.004)
		I. pre-S1 plus pre-S2 del (2.266)	
		II. pre-S1 plus pre-S1+pre-S2 del (1.695)	
		III. pre-S2 plus pre-S1+pre-S2 del (0.579)	
		IV. all three types of pre-S del (2.270)	
30	pre-S1 del (nt 3010-3075)	1. **wild-type (87.018)**	1. wild-type (87.018)
		2. **pre-S1 del (11.703)**	2. pre-S1 del (nt 3010-3075) (5.189)
		3. pre-S2 del (1.113)	3. pre-S2 del (nt 1-9) (0.392)
		4. pre-S1+pre-S2 del (0.166)	4. pre-S1+pre-S2 del (nt 3010-3075, 1-9) (0.046)
		I. pre-S1 plus pre-S2 del (12.816)	
		II. pre-S1 plus pre-S1+pre-S2 del (11.869)	
		III. pre-S2 plus pre-S1+pre-S2 del (1.279)	
		IV. all three types of pre-S del (12.982)	
31	pre-S1 del (nt 2910-3089)	1. **wild-type (78.709)**	1. wild-type (78.709)
		2. **pre-S1 del (20.616)**	2. pre-S1 del (nt 2910-3089) (9.181)
		3. pre-S2 del (0.646)	3. pre-S2 del (nt 1-15) (0.345)
		4. pre-S1+pre-S2 del (0.029)	4. pre-S1+pre-S2 del (nt 2910-3055, 3067-3089, 4-12) (0.007)
		I. pre-S1 plus pre-S2 del (21.262)	
		II. pre-S1 plus pre-S1+pre-S2 del (20.645)	
		III. pre-S2 plus pre-S1+pre-S2 del (0.675)	
		IV. all three types of pre-S del (21.291)	

32	wild-type	1. **wild-type (98.105)**	1. wild-type (98.105)
		2. pre-S1 del (1.152)	2. pre-S1 del (nt 2855-2970) (0.060)
		3. pre-S2 del (0.733)	3. pre-S2 del (nt 1-9) (0.408)
		4. pre-S1+pre-S2 del (0.010)	4. pre-S1+pre-S2 del (nt 2855-2872, 1-54) (0.003)
		I. pre-S1 plus pre-S2 del (1.885)	
		II. pre-S1 plus pre-S1+pre-S2 del (1.162)	
		III. pre-S2 plus pre-S1+pre-S2 del (0.743)	
		IV. all three types of pre-S del (1.895)	
33	wild-type	1. **wild-type (80.067)**	1. wild-type (80.067)
		2. **pre-S2 del (9.477)**	2. pre-S2 del (nt 1-12) (8.957)
		3. **pre-S1 del (8.993)**	3. pre-S1 del (nt 2866-3075) (7.322)
		4. pre-S1+pre-S2 del (1.463)	4. pre-S1+pre-S2 del (nt 2866-3075, 1-9) (0.871)
		I. pre-S1 plus pre-S2 del (18.470)	
		II. pre-S1 plus pre-S1+pre-S2 del (10.456)	
		III. pre-S2 plus pre-S1+pre-S2 del (10.940)	
		IV. all three types of pre-S del (19.933)	
34	wild-type	1. **wild-type (80.175)**	1. wild-type (80.175)
		2. **pre-S2 del (13.639)**	2. pre-S2 del (nt 1-30) (4.394)
		3. **pre-S1 del (5.169)**	3. pre-S1 del (nt 2865-2975) (2.356)
		4. pre-S1+pre-S2 del (1.017)	4. pre-S1+pre-S2 del (nt 2866-2975, 1-29) (0.212)
		I. pre-S1 plus pre-S2 del (18.808)	
		II. pre-S1 plus pre-S1+pre-S2 del (6.186)	
		III. pre-S2 plus pre-S1+pre-S2 del (14.656)	
		IV. all three types of pre-S del (19.825)	

35	wild-type	1. **wild-type (92.156)**	1. wild-type (92.156)
		2. **pre-S1 del (7.022)**	2. pre-S1 del (nt 2854-3018) (1.346)
		3. pre-S2 del (0.793)	3. pre-S2 del (nt 1-9) (0.323)
		4. pre-S1+pre-S2 del (0.029)	4. pre-S1+pre-S2 del (nt 2855-2872, 1-9) (0.004)
		I. pre-S1 plus pre-S2 del (7.815)	
		II. pre-S1 plus pre-S1+pre-S2 del (7.051)	
		III. pre-S2 plus pre-S1+pre-S2 del (0.822)	
		IV. all three types of pre-S del (7.844)	
36	1. pre-S1 del (nt 2854-2970)	1. **pre-S1+pre-S2 del (40.433)**	1. pre-S1+pre-S2 del (nt 2855-2872, 1-54) (22.713)
	2. pre-S1+pre-S2 del	2. **pre-S1 del (34.174)**	2. pre-S1 del (nt 2854-2970) (22.956)
	(nt 2855-2872, 1-54)	3. **wild-type (20.822)**	3. wild-type (20.822)
		4. pre-S2 del (4.571)	4. pre-S2 del (nt 1-54) (4.380)
		I. pre-S1 plus pre-S2 del (38.745)	
		II. pre-S1 plus pre-S1+pre-S2 del (74.607)	
		III. pre-S2 plus pre-S1+pre-S2 del (45.004)	
		IV. all three types of pre-S del (79.178)	
37	wild-type	1. **wild-type (80.758)**	1. wild-type (80.758)
		2. **pre-S2 del (12.910)**	2. pre-S2 del (nt 1-54) (6.944)
		3. **pre-S1 del (5.629)**	3. pre-S1 del (nt 2855-2875) (4.209)
		4. pre-S1+pre-S2 del (0.704)	4. pre-S1+pre-S2 del (nt 2855-2875, 1-54) (0.253)
		I. pre-S1 plus pre-S2 del (18.539)	
		II. pre-S1 plus pre-S1+pre-S2 del (6.333)	
		III. pre-S2 plus pre-S1+pre-S2 del (13.614)	
		IV. all three types of pre-S del (19.242)	

38	pre-S1 del (nt 3021-3203)	1. **wild-type (61.320)**	1. wild-type (61.320)
		2. **pre-S1 del (34.045)**	2. pre-S1 del (nt 3021-3203) (23.818)
		3. pre-S2 del (3.491)	3. pre-S2 del (nt 6-41) (1.385)
		4. pre-S1+pre-S2 del (1.144)	4. pre-S1+pre-S2 del (nt 2855-2872, 2919-3126, 6-41) (0.163)
		I. pre-S1 plus pre-S2 del (37.536)	
		II. pre-S1 plus pre-S1+pre-S2 del (35.189)	
		III. pre-S2 plus pre-S1+pre-S2 del (4.635)	
		IV. all three types of pre-S del (38.680)	
39	wild-type	1. **wild-type (97.172)**	1. wild-type (97.172)
		2. pre-S1 del (1.957)	2. pre-S1 del (nt 3021-3203) (0.353)
		3. pre-S2 del (0.850)	3. pre-S2 del (nt 1-12) (0.488)
		4. pre-S1+pre-S2 del (0.021)	4. pre-S1+pre-S2 del (nt 3078-3094, 6-41) (0.003)
		I. pre-S1 plus pre-S2 del (2.807)	
		II. pre-S1 plus pre-S1+pre-S2 del (1.978)	
		III. pre-S2 plus pre-S1+pre-S2 del (0.871)	
		IV. all three types of pre-S del (2.828)	
40	wild-type	1. **wild-type (97.501)**	1. wild-type (97.501)
		2. pre-S1 del (1.586)	2. pre-S1 del (nt 3107-3202) (0.081)
		3. pre-S2 del (0.908)	3. pre-S2 del (nt 1-12) (0.529)
		4. pre-S1+pre-S2 del (0.005)	4. pre-S1+pre-S2 del (nt 3133-3136, 1-10) (0.005)
		I. pre-S1 plus pre-S2 del (2.494)	
		II. pre-S1 plus pre-S1+pre-S2 del (1.591)	
		III. pre-S2 plus pre-S1+pre-S2 del (0.913)	
		IV. all three types of pre-S del (2.499)	

41	pre-S1 del (nt 2858-2986)	1. **pre-S1 del (84.262)**	1. pre-S1 del (nt 2858-2986) (82.700)
		2. **wild-type (14.798)**	2. wild-type (14.798)
		3. pre-S1+pre-S2 del (0.779)	3. pre-S1+pre-S2 del (nt 2858-2981, 1-10) (0.268)
		4. pre-S2 del (0.161)	4. pre-S2 del (nt 1-33) (0.053)
		I. pre-S1 plus pre-S2 del (84.423)	
		II. pre-S1 plus pre-S1+pre-S2 del (85.041)	
		III. pre-S2 plus pre-S1+pre-S2 del (0.940)	
		IV. all three types of pre-S del (85.202)	
42	wild-type	1. **wild-type (97.757)**	1. wild-type (97.757)
		2. pre-S1 del (1.305)	2. pre-S1 del (nt 3106-3207) (0.060)
		3. pre-S2 del (0.923)	3. pre-S2 del (nt 3211-3213) (0.124)
		4. pre-S1+pre-S2 del (0.015)	4. pre-S1+pre-S2 del (nt 3069-3118, 3211-3212) (0.004)
		I. pre-S1 plus pre-S2 del (2.228)	
		II. pre-S1 plus pre-S1+pre-S2 del (1.320)	
		III. pre-S2 plus pre-S1+pre-S2 del (0.938)	
		IV. all three types of pre-S del (2.243)	
43	wild-type	1. **pre-S2 del (49.695)**	1. pre-S2 del (nt 37-54) (43.929)
		2. **wild-type (49.248)**	2. wild-type (49.248)
		3. pre-S1+pre-S2 del (0.814)	3. pre-S1+pre-S2 del (nt 3139-3142, 37-54) (0.049)
		4. pre-S1 del (0.242)	4. pre-S1 del (nt 3103-3200) (0.019)
		I. pre-S1 plus pre-S2 del (49.937)	
		II. pre-S1 plus pre-S1+pre-S2 del (1.056)	
		III. pre-S2 plus pre-S1+pre-S2 del (50.509)	
		IV. all three types of pre-S del (50.752)	

44	wild-type	1. **wild-type (98.244)**	1. wild-type (98.244)
		2. pre-S1 del (1.113)	2. pre-S1 del (nt 3089-3202) (0.049)
		3. pre-S2 del (0.643)	3. pre-S2 del (nt 1-15) (0.319)
		4. pre-S1+pre-S2 del (0.000)	4. pre-S1+pre-S2 del (0.000)
		I. pre-S1 plus pre-S2 del (1.756)	
		II. pre-S1 plus pre-S1+pre-S2 del (1.113)	
		III. pre-S2 plus pre-S1+pre-S2 del (0.643)	
		IV. all three types of pre-S del (1.756)	
45	wild-type	1. **wild-type (97.534)**	1. wild-type (97.534)
		2. pre-S1 del (1.376)	2. pre-S1 del (nt 3106-3207) (0.063)
		3. pre-S2 del (1.076)	3. pre-S2 del (nt 1-9) (0.769)
		4. pre-S1+pre-S2 del (0.014)	4. pre-S1+pre-S2 del (nt 3095-3150, 1-12) (0.007)
		I. pre-S1 plus pre-S2 del (2.452)	
		II. pre-S1 plus pre-S1+pre-S2 del (1.390)	
		III. pre-S2 plus pre-S1+pre-S2 del (1.090)	
		IV. all three types of pre-S del (2.466)	
46	wild-type	1. **wild-type (97.735)**	1. wild-type (97.735)
		2. pre-S1 del (1.534)	2. pre-S1 del (nt 3138-3197) (0.111)
		3. pre-S2 del (0.731)	3. pre-S2 del (nt 1-9) (0.371)
		4. pre-S1+pre-S2 del (0.000)	4. pre-S1+pre-S2 del (0.000)
		I. pre-S1 plus pre-S2 del (2.265)	
		II. pre-S1 plus pre-S1+pre-S2 del (1.534)	
		III. pre-S2 plus pre-S1+pre-S2 del (0.731)	
		IV. all three types of pre-S del (2.265)	

47	wild-type	1. **wild-type (78.334)**	1. wild-type (78.334)
		2. **pre-S1 del (20.695)**	2. pre-S1 del (nt 2895-3140) (15.887)
		3. pre-S2 del (0.866)	3. pre-S2 del (nt 1-9) (0.279)
		4. pre-S1+pre-S2 del (0.105)	4. pre-S1+pre-S2 del (nt 2895-3141, 1-19, 23-27) (0.023)
		I. pre-S1 plus pre-S2 del (21.561)	
		II. pre-S1 plus pre-S1+pre-S2 del (20.800)	
		III. pre-S2 plus pre-S1+pre-S2 del (0.971)	
		IV. all three types of pre-S del (21.666)	
48	1. pre-S1 del (nt 2968-3093)	1. **pre-S1 del (57.159)**	1. pre-S1 del (nt 2968-3093) (47.067)
	2. pre-S2 del (nt 1-54)	2. **wild-type (20.456)**	2. wild-type (20.456)
		3. **pre-S2 del (13.666)**	3. pre-S2 del (nt 1-54) (8.120)
		4. **pre-S1+pre-S2 del (8.719)**	4. pre-S1+pre-S2 del (nt 2968-3093, 1-54) (3.469)
		I. pre-S1 plus pre-S2 del (70.825)	
		II. pre-S1 plus pre-S1+pre-S2 del (65.878)	
		III. pre-S2 plus pre-S1+pre-S2 del (22.385)	
		IV. all three types of pre-S del (79.544)	
49	wild-type	1. **wild-type (75.021)**	1. wild-type (75.021)
		2. **pre-S2 del (21.983)**	2. pre-S2 del (nt 1-1) (19.454)
		3. pre-S1 del (2.327)	3. pre-S1 del (nt 2855-2872) (0.704)
		4. pre-S1+pre-S2 del (0.669)	4. pre-S1+pre-S2 del (nt 2855-2872, 1-54) (0.606)
		I. pre-S1 plus pre-S2 del (24.310)	
		II. pre-S1 plus pre-S1+pre-S2 del (2.996)	
		III. pre-S2 plus pre-S1+pre-S2 del (22.652)	
		IV. all three types of pre-S del (24.979)	

50	wild-type	1. **wild-type (98.169)**	1. wild-type (98.169)
		2. pre-S1 del (1.138)	2. pre-S1 del (nt 3138-3197) (0.067)
		3. pre-S2 del (0.693)	3. pre-S2 del (nt 1-9) (0.377)
		4. pre-S1+pre-S2 del (0.000)	4. pre-S1+pre-S2 del (0.000)
		I. pre-S1 plus pre-S2 del (1.831)	
		II. pre-S1 plus pre-S1+pre-S2 del (1.138)	
		III. pre-S2 plus pre-S1+pre-S2 del (0.693)	
		IV. all three types of pre-S del (1.831)	
51	wild-type	1. **wild-type (97.734)**	1. wild-type (97.734)
		2. pre-S1 del (1.546)	2. pre-S1 del (nt 3104-3202) (0.165)
		3. pre-S2 del (0.719)	3. pre-S2 del (nt 1-9) (0.377)
		4. pre-S1+pre-S2 del (0.000)	4. pre-S1+pre-S2 del (0.000)
		I. pre-S1 plus pre-S2 del (2.265)	
		II. pre-S1 plus pre-S1+pre-S2 del (1.546)	
		III. pre-S2 plus pre-S1+pre-S2 del (0.719)	
		IV. all three types of pre-S del (2.266)	
52	wild-type	1. **wild-type (98.167)**	1. wild-type (98.167)
		2. pre-S1 del (1.192)	2. pre-S1 del (nt 2854-3128) (0.132)
		3. pre-S2 del (0.617)	3. pre-S2 del (nt 1-9) (0.246)
		4. pre-S1+pre-S2 del (0.024)	4. pre-S1+pre-S2 del (nt 3022-3125, 1-55) (0.018)
		I. pre-S1 plus pre-S2 del (1.809)	
		II. pre-S1 plus pre-S1+pre-S2 del (1.216)	
		III. pre-S2 plus pre-S1+pre-S2 del (0.641)	
		IV. all three types of pre-S del (1.833)	

53	wild-type	1. **wild-type (97.002)**	1. wild-type (97.002)
		2. pre-S1 del (2.144)	2. pre-S1 del (nt 3026-3205) (0.927)
		3. pre-S2 del (0.849)	3. pre-S2 del (nt 1-9) (0.528)
		4. pre-S1+pre-S2 del (0.005)	4. pre-S1+pre-S2 del (nt 3020-3119, 1-55) (0.005)
		I. pre-S1 plus pre-S2 del (2.993)	
		II. pre-S1 plus pre-S1+pre-S2 del (2.149)	
		III. pre-S2 plus pre-S1+pre-S2 del (0.854)	
		IV. all three types of pre-S del (2.998)	
54	wild-type	1. **wild-type (96.687)**	1. wild-type (96.687)
		2. pre-S1 del (2.625)	2. pre-S1 del (nt 2855-2872) (1.117)
		3. pre-S2 del (0.676)	3. pre-S2 del (nt 1-12) (0.411)
		4. pre-S1+pre-S2 del (0.013)	4. pre-S1+pre-S2 del (nt 2855-2872, 1-17) (0.004)
		I. pre-S1 plus pre-S2 del (3.301)	
		II. pre-S1 plus pre-S1+pre-S2 del (2.638)	
		III. pre-S2 plus pre-S1+pre-S2 del (0.689)	
		IV. all three types of pre-S del (3.313)	
55	wild-type	1. **wild-type (64.666)**	1. wild-type (64.666)
		2. **pre-S1 del (34.582)**	2. pre-S1 del (nt 2858-2986) (33.466)
		3. pre-S2 del (0.493)	3. pre-S2 del (nt 1-9) (0.303)
		4. pre-S1+pre-S2 del (0.259)	4. pre-S1+pre-S2 del (nt 2858-2981, 1-10) (0.069)
		I. pre-S1 plus pre-S2 del (35.075)	
		II. pre-S1 plus pre-S1+pre-S2 del (34.841)	
		III. pre-S2 plus pre-S1+pre-S2 del (0.752)	
		IV. all three types of pre-S del (35.334)	

56	wild-type	1. **pre-S1 del (69.372)**	1. pre-S1 del (nt 2856-3101) (66.854)
		2. **wild-type (30.404)**	2. wild-type (30.404)
		3. pre-S2 del (0.218)	3. pre-S2 del (nt 1-12) (0.130)
		4. pre-S1+pre-S2 del (0.005)	4. pre-S1+pre-S2 del (nt 2984-3098, 1-10) (0.002)
		I. pre-S1 plus pre-S2 del (69.590)	
		II. pre-S1 plus pre-S1+pre-S2 del (69.377)	
		III. pre-S2 plus pre-S1+pre-S2 del (0.223)	
		IV. all three types of pre-S del (69.596)	
57	wild-type	1. **wild-type (94.005)**	1. wild-type (94.005)
		2. pre-S1 del (3.729)	2. pre-S1 del (nt 2895-3188) (0.677)
		3. pre-S2 del (1.824)	3. pre-S2 del (nt 1-54) (1.029)
		4. pre-S1+pre-S2 del (0.442)	4. pre-S1+pre-S2 del (nt 2855-2872, 1-54) (0.253)
		I. pre-S1 plus pre-S2 del (5.553)	
		II. pre-S1 plus pre-S1+pre-S2 del (4.171)	
		III. pre-S2 plus pre-S1+pre-S2 del (2.266)	
		IV. all three types of pre-S del (5.995)	
58	wild-type	1. **wild-type (95.575)**	1. wild-type (95.575)
		2. pre-S1 del (2.481)	2. pre-S1 del (nt 3039-3092) (0.590)
		3. pre-S2 del (1.931)	3. pre-S2 del (nt 1-12) (0.510)
		4. pre-S1+pre-S2 del (0.013)	4. pre-S1+pre-S2 del (nt 2854-2940, 1-144) (0.007)
		I. pre-S1 plus pre-S2 del (4.412)	
		II. pre-S1 plus pre-S1+pre-S2 del (2.494)	
		III. pre-S2 plus pre-S1+pre-S2 del (1.944)	
		IV. all three types of pre-S del (4.424)	

59	pre-S2 del (nt 15-56)	1. **pre-S2 del (64.182)**	1. pre-S2 del (nt 15-56) (33.613)
		2. **wild-type (32.367)**	2. wild-type (32.367)
		3. pre-S1+pre-S2 del (2.975)	3. pre-S1+pre-S2 del (nt 3088-3126, 15-56) (0.176)
		4. pre-S1 del (0.476)	4. pre-S1 del (nt 2923-3090) (0.073)
		I. pre-S1 plus pre-S2 del (64.658)	
		II. pre-S1 plus pre-S1+pre-S2 del (3.451)	
		III. pre-S2 plus pre-S1+pre-S2 del (67.157)	
		IV. all three types of pre-S del (67.633)	
60	wild-type	1. **pre-S1 del (38.192)**	1. pre-S1 del (nt 2854-2970) (27.998)
		2. **wild-type (34.644)**	2. wild-type (30.404)
		3. **pre-S2 del (19.195)**	3. pre-S2 del (nt 1-54) (18.373)
		4. **pre-S1+pre-S2 del (7.968)**	4. pre-S1+pre-S2 del (nt 3025-3126, 1-57) (2.383)
		I. pre-S1 plus pre-S2 del (57.387)	
		II. pre-S1 plus pre-S1+pre-S2 del (46.160)	
		III. pre-S2 plus pre-S1+pre-S2 del (27.163)	
		IV. all three types of pre-S del (65.356)	
61	pre-S1 del (nt 2855-2965)	1. **pre-S1 del (40.086)**	1. pre-S1 del (nt 2855-2965) (24.125)
		2. **wild-type (34.919)**	2. wild-type (34.919)
		3. **pre-S2 del (16.065)**	3. pre-S2 del (nt 1-54) (15.565)
		4. **pre-S1+pre-S2 del (8.930)**	4. pre-S1+pre-S2 del (nt 3022-3126, 1-60) (2.911)
		I. pre-S1 plus pre-S2 del (56.151)	
		II. pre-S1 plus pre-S1+pre-S2 del (49.016)	
		III. pre-S2 plus pre-S1+pre-S2 del (24.995)	
		IV. all three types of pre-S del (65.081)	

62	pre-S1+pre-S2 del (nt 2855-2872, 1-54)	1. **pre-S1 del (29.181)**	1. pre-S1 del (nt 2856-2969) (17.015)
		2. **wild-type (23.836)**	2. wild-type (23.836)
		3. **pre-S2 del (23.645)**	3. pre-S2 del (nt 1-54) (23.402)
		4. **pre-S1+pre-S2 del (23.338)**	4. pre-S1+pre-S2 del (nt 2855-2872, 1-54) (15.956)
		I. pre-S1 plus pre-S2 del (52.826)	
		II. pre-S1 plus pre-S1+pre-S2 del (52.519)	
		III. pre-S2 plus pre-S1+pre-S2 del (46.983)	
		IV. all three types of pre-S del (76.164)	
63	pre-S1 del (nt 2854-2970)	1. **pre-S1 del (52.401)**	1. pre-S1 del (nt 2854-2970) (43.037)
		2. **wild-type (42.979)**	2. wild-type (42.979)
		3. pre-S2 del (2.312)	3. pre-S2 del (nt 1-54) (1.977)
		4. pre-S1+pre-S2 del (2.308)	4. pre-S1+pre-S2 del (nt 2860-2880, 2954-3097, 1-15) (1.445)
		I. pre-S1 plus pre-S2 del (54.713)	
		II. pre-S1 plus pre-S1+pre-S2 del (54.709)	
		III. pre-S2 plus pre-S1+pre-S2 del (4.620)	
		IV. all three types of pre-S del (57.021)	
64	wild-type	1. **pre-S1 del (41.155)**	1. pre-S1 del (nt 2854-2970) (35.773)
		2. **wild-type (37.573)**	2. wild-type (37.573)
		3. **pre-S2 del (18.905)**	3. pre-S2 del (nt 1-54) (18.494)
		4. pre-S1+pre-S2 del (2.367)	4. pre-S1+pre-S2 del (nt 2855-2970, 1-54) (1.676)
		I. pre-S1 plus pre-S2 del (60.060)	
		II. pre-S1 plus pre-S1+pre-S2 del (43.522)	
		III. pre-S2 plus pre-S1+pre-S2 del (21.272)	
		IV. all three types of pre-S del (62.427)	

65	wild-type	1. **pre-S1 del (63.334)**	1. pre-S1 del (nt 2854-2970) (33.450)
		2. **wild-type (32.806)**	2. wild-type (32.806)
		3. pre-S2 del (1.965)	3. pre-S2 del (nt 1-54) (1.708)
		4. pre-S1+pre-S2 del (1.895)	4. pre-S1+pre-S2 del (nt 2855-2970, 1-54) (0.994)
		I. pre-S1 plus pre-S2 del (65.229)	
		II. pre-S1 plus pre-S1+pre-S2 del (65.229)	
		III. pre-S2 plus pre-S1+pre-S2 del (3.860)	
		IV. all three types of pre-S del (67.194)	
66	pre-S1+pre-S2 del (nt 2855-2872, 1-54)	1. **wild-type (30.973)**	1. wild-type (30.973)
		2. **pre-S1+pre-S2 del (27.774)**	2. pre-S1+pre-S2 del (nt 2855-2872, 1-54) (24.398)
		3. **pre-S1 del (27.161)**	3. pre-S1 del (nt 2854-2970) (14.813)
		4. **pre-S2 del (14.091)**	4. pre-S2 del (nt 1-54) (13.846)
		I. pre-S1 plus pre-S2 del (41.252)	
		II. pre-S1 plus pre-S1+pre-S2 del (54.935)	
		III. pre-S2 plus pre-S1+pre-S2 del (41.865)	
		IV. all three types of pre-S del (69.027)	
67	wild-type	1. **wild-type (46.914)**	1. wild-type (46.914)
		2. **pre-S1 del (45.517)**	2. pre-S1 del (nt 2854-2970) (37.666)
		3. **pre-S2 del (6.834)**	3. pre-S2 del (nt 1-54) (5.216)
		4. pre-S1+pre-S2 del (0.735)	4. pre-S1+pre-S2 del (nt 2854-2970, 1-54) (0.307)
		I. pre-S1 plus pre-S2 del (52.351)	
		II. pre-S1 plus pre-S1+pre-S2 del (46.252)	
		III. pre-S2 plus pre-S1+pre-S2 del (7.569)	
		IV. all three types of pre-S del (53.086)	

68	pre-S1+pre-S2 del (nt 2855-2872, 1-54)	1. **pre-S1 del (43.130)**	1. pre-S1 del (nt 2854-2970) (35.888)
		2. **wild-type (41.965)**	2. wild-type (41.965)
		3. **pre-S2 del (9.508)**	3. pre-S2 del (nt 1-54) (9.239)
		4. **pre-S1+pre-S2 del (5.397)**	4. pre-S1+pre-S2 del (nt 2855-2872, 1-54) (4.160)
		I. pre-S1 plus pre-S2 del (52.638)	
		II. pre-S1 plus pre-S1+pre-S2 del (48.527)	
		III. pre-S2 plus pre-S1+pre-S2 del (14.905)	
		IV. all three types of pre-S del (58.035)	
69	pre-S1+pre-S2 del (nt 2855-2872, 1-54)	1. **wild-type (36.868)**	1. wild-type (36.868)
		2. **pre-S1 del (35.238)**	2. pre-S1 del (nt 2854-2970) (29.499)
		3. **pre-S2 del (21.130)**	3. pre-S2 del (nt 1-54) (20.218)
		4. **pre-S1+pre-S2 del (6.763)**	4. pre-S1+pre-S2 del (nt 2855-2872, 1-54) (3.332)
		I. pre-S1 plus pre-S2 del (56.368)	
		II. pre-S1 plus pre-S1+pre-S2 del (42.001)	
		III. pre-S2 plus pre-S1+pre-S2 del (27.893)	
		IV. all three types of pre-S del (63.132)	
70	pre-S1 del (nt 2854-3021)	1. **wild-type (94.788)**	1. wild-type (94.788)
		2. **pre-S1 del (4.643)**	2. pre-S1 del (nt 2854-3021) (3.404)
		3. pre-S2 del (0.455)	3. pre-S2 del (nt 1-15) (0.192)
		4. pre-S1+pre-S2 del (0.114)	4. pre-S1+pre-S2 del (nt 2855-2872, 1-54) (0.086)
		I. pre-S1 plus pre-S2 del (5.098)	
		II. pre-S1 plus pre-S1+pre-S2 del (4.757)	
		III. pre-S2 plus pre-S1+pre-S2 del (0.569)	
		IV. all three types of pre-S del (5.212)	

71	wild-type	1. **pre-S2 del (54.981)**	1. pre-S2 del (nt 48-56) (52.982)
		2. **wild-type (42.238)**	2. wild-type (42.238)
		3. pre-S1+pre-S2 del (2.274)	3. pre-S1+pre-S2 del (nt 3026-3205, 48-56) (0.916)
		4. pre-S1 del (0.507)	4. pre-S1 del (nt 2854-3021) (0.334)
		I. pre-S1 plus pre-S2 del (55.488)	
		II. pre-S1 plus pre-S1+pre-S2 del (2.781)	
		III. pre-S2 plus pre-S1+pre-S2 del (57.255)	
		IV. all three types of pre-S del (57.762)	
72	pre-S1 del (nt 2854-3021)	1. **wild-type (91.511)**	1. wild-type (91.511)
		2. **pre-S1 del (7.310)**	2. pre-S1 del (nt 2854-3021) (5.744)
		3. pre-S2 del (0.807)	3. pre-S2 del (nt 48-56) (0.294)
		4. pre-S1+pre-S2 del (0.373)	4. pre-S1+pre-S2 del (nt 2855-2872, 1-54) (0.322)
		I. pre-S1 plus pre-S2 del (8.117)	
		II. pre-S1 plus pre-S1+pre-S2 del (7.683)	
		III. pre-S2 plus pre-S1+pre-S2 del (1.180)	
		IV. all three types of pre-S del (8.489)	
73	pre-S1+pre-S2 del (nt 2855-2872, 3012-3086, 1-51)	1. **wild-type (52.297)**	1. wild-type (52.297)
		2. **pre-S1+pre-S2 del (31.339)**	2. pre-S1+pre-S2 del (nt 2855-2872, 3012-3086, 1-51) (8.935)
		3. **pre-S1 del (12.863)**	3. pre-S1 del (nt 2855-2872, 3012-3092) (6.480)
		4. pre-S2 del (3.502)	4. pre-S2 del (nt 1-51) (2.094)
		I. pre-S1 plus pre-S2 del (16.365)	
		II. pre-S1 plus pre-S1+pre-S2 del (44.202)	
		III. pre-S2 plus pre-S1+pre-S2 del (34.841)	
		IV. all three types of pre-S del (47.703)	

74	pre-S2 del (nt 1-57)	1. **wild-type (58.984)**	1. wild-type (58.984)
		2. **pre-S2 del (34.533)**	2. pre-S2 del (nt 1-57) (20.926)
		3. pre-S1+pre-S2 del (4.497)	3. pre-S1+pre-S2 del (nt 3026-3205, 2-55) (0.590)
		4. pre-S1 del (1.986)	4. pre-S1 del (nt 2944-3120) (1.128)
		I. pre-S1 plus pre-S2 del (36.519)	
		II. pre-S1 plus pre-S1+pre-S2 del (6.483)	
		III. pre-S2 plus pre-S1+pre-S2 del (39.030)	
		IV. all three types of pre-S del (41.016)	
75	wild-type	1. **wild-type (97.112)**	1. wild-type (97.112)
		2. pre-S1 del (2.178)	2. pre-S1 del (nt 2854-3021) (0.641)
		3. pre-S2 del (0.679)	3. pre-S2 del (nt 25-54) (0.355)
		4. pre-S1+pre-S2 del (0.031)	4. pre-S1+pre-S2 del (nt 2855-2970, 25-54) (0.007)
		I. pre-S1 plus pre-S2 del (2.857)	
		II. pre-S1 plus pre-S1+pre-S2 del (2.209)	
		III. pre-S2 plus pre-S1+pre-S2 del (0.710)	
		IV. all three types of pre-S del (2.888)	

[a]All the PCR bands visualized in agarose gel were analyzed and listed in descending size order.

[b]The total frequency of pre-S gene DNA in each type of pre-S deletion was shown in descending order (1-4).

[c]The pre-S gene DNA with the highest frequency in each type of pre-S deletion was shown.

[d]The pre-S deletion type above the cut-off percentage (4.643) was shown in bold.

[e]Combination of different types of pre-S deletions was shown (I-IV).

Abbreviations: nt, nucleotide; del, deletion.

Table S2. Univariate and multivariate analyses of pre-S deletion type for overall survival in 75 HBV-related HCC patients

Characteristics	Univariate Analysis			Multivariate Analysis		
	HR	95% CI	P value	HR	95% CI	P value
Age (years) (>50 vs. ≤50)	0.764	0.270-2.159	0.6109			
Gender (men vs. women)	1.462	0.191-11.179	0.7143			
Smoking (yes vs. no)	1.004	0.357-2.821	0.9947			
Alcohol (yes vs. no)	2.048	0.760-5.524	0.1566			
HBsAg (positive vs. negative)[a]						
HBeAg (positive vs. negative)[b]	0.635	0.083-4.861	0.6616			
HBV genotype (B vs. C)	1.296	0.292-5.752	0.7332			
HBV DNA (IU/mL) (>1×10^4 vs. ≤1×10^4)[c]	1.682	0.561-5.043	0.3537			
Albumin (g/dL) (>3.8 vs. ≤3.8)	0.425	0.135-1.341	0.1444			
AST (U/L) (>34 vs. ≤34)	1.323	0.298-5.864	0.7126			
ALT (U/L) (>40 vs. ≤40)	0.849	0.307-2.349	0.7530			
AFP (ng/mL) (>400 vs. ≤400)	2.542	0.937-6.895	0.0669			
Tumor size (cm) (>5 vs. ≤5)	1.605	0.581-4.437	0.3615			
Tumor encapsulation (yes vs. no)[d]	0.386	0.124-1.199	0.0997			
Lymph node involvement (yes vs. no)	0.513	0.067-3.899	0.5186			
Portal vein thrombosis (yes vs. no)	1.981	0.444-8.834	0.3701			
Vascular invasion (yes vs. no)	1.930	0.680-5.480	0.2169			
Distant metastasis (yes vs. no)	3.336	0.924-12.040	0.0658			
Steatosis grade (2/3 vs. 0/1)[e]	21.354	1.329-343.018	0.0307*			
Metavir inflammation score (2/3 vs. 0/1)[f]	1.474	0.284-7.645	0.6438			
Ishak fibrosis score (4/5/6 vs. 0/1/2/3)[g]	1.153	0.324-4.100	0.8263			
Child-Pugh cirrhosis score (B/C vs. A)	2.953	1.044-8.356	0.0413*	2.974	1.035-8.549	0.0430*
CLIP score (4/5/6 vs. 0/1/2/3)	5.233	0.675-40.579	0.1133			

	HR	95% CI	P value	HR	95% CI	P value
Tumor differentiation grade (3/4 vs. 1/2)	0.818	0.291-2.301	0.7040			
BCLC stage (C/D vs. A/B)	1.314	0.296-5.834	0.7199			
AJCC TNM stage (IIIA/IIIB/IIIC/IVA/IVB vs. I/II)	3.113	1.053-9.201	0.0400*	3.146	1.041-9.510	0.0423*
Antiviral therapy after surgery (yes vs. no)	0.746	0.279-1.993	0.5590			
Del spanning pre-S gene segments (yes vs. no)	1.051	0.373-2.962	0.9250			
Only pre-S1 del (yes vs. no)	1.324	0.454-3.868	0.6073			
Only pre-S2 del (yes vs. no)	0.814	0.107-6.206	0.8423			
Only pre-S1+pre-S2 del (yes vs. no)[h]						
Both pre-S1 and pre-S2 del (yes vs. no)	3.216	0.708-14.615	0.1304			
Both pre-S1 and pre-S1+pre-S2 del (yes vs. no)	1.606	0.209-12.326	0.6487			
Both pre-S2 and pre-S1+pre-S2 del (yes vs. no)	0.000	0.000	0.9937			
All three types of pre-S del (yes vs. no)	0.302	0.039-2.366	0.2542			
Del spanning the pre-S1 gene segment (yes vs. no)	1.110	0.402-3.065	0.8407			
Del spanning the pre-S2 gene segment (yes vs. no)	0.818	0.283-2.366	0.7104			

[a]There were no patients negative for HBsAg for analysis.

[b]Only 71 patients with available data were analyzed.

[c]Only 74 patients with available data were analyzed.

[d]Only 62 patients with available data were analyzed.

[e]Only 25 patients with available data were analyzed and thus excluded from multivariate analysis.

[f]Only 44 patients with available data were analyzed.

[g]Only 56 patients with available data were analyzed.

[h]There were no patients with only pre-S1+pre-S2 del for analysis.

*, P value<0.05.

Abbreviations: HR, hazard ratio; CI, confidence interval; del, deletion.

Table S3. Univariate and multivariate analyses of pre-S deletion percentage for overall survival in 75 HBV-related HCC patients

Characteristics	Univariate Analysis			Multivariate Analysis		
	HR	95% CI	P value	HR	95% CI	P value
Child-Pugh cirrhosis score (B/C vs. A)	2.953	1.044-8.356	0.0413*	2.974	1.035-8.549	0.0430*
AJCC TNM stage (IIIA/IIIB/IIIC/IVA/IVB vs. I/II)	3.113	1.053-9.201	0.0400*	3.146	1.041-9.510	0.0423*
Pre-S1 del percentage[a]						
II (>1.895) vs. I (≤1.895)[b]	1.630	0.402-6.603	0.4938			
III (>5.629) vs. I (≤1.895)	1.061	0.214-5.263	0.9426			
IV (>28.270) vs. I (≤1.895)	1.396	0.306-6.367	0.6664			
Pre-S2 del percentage						
II (>0.643) vs. I (≤0.643)	1.482	0.387-5.669	0.5658			
III (>1.824) vs. I (≤0.643)	1.276	0.317-5.129	0.7315			
IV (>13.666) vs. I (≤0.643)	1.100	0.241-5.011	0.9024			
Pre-S1+pre-S2 del percentage						
II (>0.015) vs. I (≤0.015)	1.126	0.311-4.070	0.8567			
III (>0.442) vs. I (≤0.015)	0.766	0.171-3.439	0.7282			
IV (>2.975) vs. I (≤0.015)	0.717	0.157-3.287	0.6687			
Pre-S1 plus pre-S2 del percentage						
II (>2.725) vs. I (≤2.725)	1.846	0.473-7.209	0.3776			
III (>18.539) vs. I (≤2.725)	0.295	0.031-2.846	0.2913			
IV (>49.938) vs. I (≤2.725)	1.696	0.399-7.206	0.4745			
Pre-S1 plus pre-S1+pre-S2 del percentage						
II (>2.043) vs. I (≤2.043)	0.728	0.178-2.986	0.6595			
III (>6.332) vs. I (≤2.043)	1.108	0.297-4.136	0.8782			
IV (>44.201) vs. I (≤2.043)	0.767	0.164-3.589	0.7360			
Pre-S2 plus pre-S1+pre-S2 del percentage						

	HR	95% CI	P value
II (>0.689) vs. I (≤0.689)	1.819	0.500-6.615	0.3639
III (>2.109) vs. I (≤0.689)	1.137	0.283-4.563	0.8564
IV (>24.995) vs. I (≤0.689)	0.771	0.139-4.292	0.7668
All three types of pre-S del percentage			
II (>2.828) vs. I (≤2.828)	1.035	0.288-3.718	0.9580
III (>21.666) vs. I (≤2.828)	0.208	0.023-1.866	0.1606
IV (>58.035) vs. I (≤2.828)	1.499	0.391-5.747	0.5548

[a]Patients were divided into quarters of the distribution of indicated type of pre-S del percentage from the lowest to the highest (designated I to IV, respectively).

[b]Threshold percentage of indicated pre-S del type for each quarter was shown in parenthesis.

*, P value<0.05.

Abbreviations: HR, hazard ratio; CI, confidence interval; del, deletion.

Table S4. Univariate and multivariate analyses of combined pre-S deletion for overall survival in 75 HBV-related HCC patients

Characteristics	Univariate Analysis			Multivariate Analysis		
	HR	95% CI	P value	HR	95% CI	P value
Child-Pugh cirrhosis score (B/C vs. A)	2.953	1.044-8.356	0.0413*	2.974	1.035-8.549	0.0430*
AJCC TNM stage (IIIA/IIIB/IIIC/IVA/IVB vs. I/II)	3.113	1.053-9.201	0.0400*	3.146	1.041-9.510	0.0423*
Combined pre-S del[a]						
com-II[b] vs. com-I						
com-III vs. com-I	1.101	0.297-4.074	0.8859			
com-IV vs. com-I	0.597	0.132-2.702	0.5029			

[a]Patients were divided into four groups based on pre-S del types and percentages: com-I, del spanning the pre-S2 gene segment (no) & pre-S2 plus pre-S1+pre-S2 del percentage (I/II/III); com-II, del spanning the pre-S2 gene segment (no) & pre-S2 plus pre-S1+pre-S2 del percentage (IV); com-III, del spanning the pre-S2 gene segment (yes) & pre-S2 plus pre-S1+pre-S2 del percentage (I/II/III); and com-IV, del spanning the pre-S2 gene segment (yes) & pre-S2 plus pre-S1+pre-S2 del percentage (IV).

[b]There were no patients falling into the com-II group for analysis.

*, P value<0.05.

Abbreviations: HR, hazard ratio; CI, confidence interval; del, deletion; com, combined.