## HIVDB algV9\_0 => algV9\_1 Changes

At least 200 patterns were affected. Due to 24 changed rules listed below:

- Added new rule L100I + K103N + P225H, with scores -10 (DOR), 0 (EFV), 0 (ETR), 0 (NVP), 0 (RPV).
- Added new rule **K103N + P225H**, with scores 10 (DOR), 0 (EFV), 0 (ETR), 0 (NVP), 0 (RPV).
- Changed scores of rule V106M: 50 to 30 (DOR).
- Changed scores of rule V108I: 15 to 10 (DOR).
- Changed scores of rule **E138K**: 10 to 5 (DOR).
- Changed scores of rule Y188C: 10 to 5 (DOR).
- Changed scores of rule Y188H: 10 to 5 (DOR).
- Changed scores of rule **G190S**: 30 to 20 (DOR).
- Changed scores of rule **H221Y**: 15 to 10 (DOR).
- Changed scores of rule **P225H**: 30 to 20 (DOR).
- Changed scores of rule **F227I**: 50 to 60 (DOR).
- Changed scores of rule **F227L**: 50 to 60 (DOR).
- Changed scores of rule F227V: 50 to 60 (DOR).
- Changed scores of rule **L234I**: 30 to 45 (DOR).
- Changed scores of rule P236L: 15 to 10 (DOR).
- Changed scores of rule Y318F: 30 to 60 (DOR).
- Changed scores of rule **K103N + Y181C**: 10 to 5 (DOR).
- Changed rule V106A + F227L to V106A + F227CL and its scores 15 to 0 (DOR).
- Changed scores of rule **V106I + Y181C**: 10 to 5 (DOR).
- Changed scores of rule V106I + G190S: 10 to 5 (DOR).
- Changed scores of rule V108I + Y181C: 10 to 5 (DOR).
- Changed scores of rule V108I + L234I: 15 to 10 (DOR).
- Changed rule Y181C + G190ACSTV to Y181CIV + G190ACSTV and its scores 20 to 10 (DOR).
- Changed rule A98G + F227C to A98G + F227CL.

pattern	count	DOR	EFV	ETR	NVP	RPV
K103N + Y181C	890	20 => 15	90	30	120	45
K103N + P225H	712	30	105	0	105	0
K103N + V108I	523	15 => 10	70	0	75	0
V108I	414	15 => 10	10	0	15	0
Y181C + G190A	353	30 => 20	75	50	120	70
Y181C + H221Y	287	35 => 30	40	40	75	70
K103N + Y181C + G190A	243	40 => 25	135	50	180	70
K103N + Y181C + H221Y	234	45 => 35	100	40	135	70
K103N + V106M	204	50 => 30	120	0	120	0
K101E + Y181C + G190A	193	50 => 40	95	75	155	115
G190S	178	30 => 20	60	10	60	15
V108I + Y181C + H221Y	171	60 => 45	50	40	90	70
V108I + Y181C	160	35 => 25	40	30	75	45
H221Y	128	15 => 10	10	10	15	15
V106A + F227L	124	125 => 120	75	0	90	0
K101E + G190S	118	50 => 40	75	30	90	60
K103N + H221Y	98	15 => 10	70	10	75	15
K103N + V108I + P225H	94	45 => 40	115	0	120	0
K103N + V108I + H221Y	92	30 => 20	80	10	90	15
E138K	91	10 => 5	10	10	10	45
K101E + Y181C + G190S	83	80 => 60	110	75	155	115
L100I + K103N + H221Y	81	45 => 40	130	40	135	75
K103N + V108I + Y181C	80	45 => 30	100	30	135	45

K103N + P225H + K238T	7.4	30	135	0	135	0
V106M	73	50 => 30	60	0	60	0
Y181C + G190S	72	60 => 40	90	50	120	70
A98G + K103N + Y181C	70	40 => 35	110	4.5	155	65
K103N + V108I + Y181C + H221Y	67	70 => 50	110	40	150	70
A98G + K103N + P225H	66	45	120	10	135	15
Y181C + G190A + H221Y	66	55 => 40	85	60	135	95
V106M + G190A	65	50 => 30	105	10	120	15
K103R + V106M + V179D	61	50 => 30	90	1.0	90	25
K103N + V108I + K238T	60	15 => 10	100	0	105	0
V106M + Y188C	58	60 => 35	120	0	120	0
A98G + K103N + V108I	56	30 => 25	85	10	105	15
K103N + G190S	56	30 => 20	120	10	120	15
L100I + K103N + P225H	55	60 => 50	165	30	165	60
V106M + V179D	55	50 => 30	70	10	70	10
K101E + V108I + Y181C + G190A	53	75 => 55	105	75	170	115
K103N + Y188C	50	10 => 5	120	0	120	0
K103N + Y188H	48	10 => 5	90	0	120	0
K101E + V106M + G190A	45	70 => 50	120	30	150	60
K103S + V106M	45	50 => 30	105	0	120	0
V108I + Y181C + G190A	45	55 => 35	85	50	135	70
Y188C	45	10 => 5	60	0	60	0
A98G + Y181C + G190A	44	50 => 40	95	65	155	90
F227L	44	50 => 60	15	0	30	0
K103N + Y181C + G190A + H221Y	4 4	65 => 45	145	60	195	95
K101H + Y181C + G190A	43	30 => 20	85	60	135	80
V106M + V179D + F227L	42	100 => 90	85	10	100	10
V108I + Y181C + G190A + H221Y	42	80 => 55	95	60	150	95
A98G + K103N + Y181C + G190A	41	60 => 45	155	65	215	90
V106M + Y188L	41	110 => 90	120	10	120	60
K103N + Y318F	40	30 => 60	70	0	90	0
K103N + V108I + Y181C + G190A + H221Y	35	90 => 60	155	60	210	95
V106M + F227L	35	100 => 90	75	0	90	0
K103N + Y181C + N348I	34	20 => 15	90	30	135	45
L100I + K103N + V108I	34	45 => 40	130	30	135	60
P225H	34	30 => 20	45	0	45	0
A98G + K101E + Y181C + G190A	33	70 => 60	115	90	190	135
K101E + V108I + Y181C + G190A + H221Y	33	100 => 75	115	85	185	140
V106A + G190A + F227L	33	125 =>	120	10	150	15
	0.0	120	445	0.0	405	
K103N + V108I + M230L	30	75 => 70	115	30	135	60
P236L	30	15 => 10	0	0	0	0
Y188H	30	10 => 5	30	0	60	0
Y318F	30	30 => 60	10	0	30	0
A98G + Y181C + H221Y	29	55 => 50 20 => 15	60 120	55 30	110	90
K103N + Y181C + K238T					150	
K103N + V108I + N348I	28	15 => 10 55 => 45	70 60	0 45	90	0 65
A98G + V108I + Y181C V106I + Y181C	26	30 => 25	30	4.5	70	65
V1061 + Y181C V106M + G190A + F227L	26	100 => 90	120	10	150	15
K101E + V106I + G190S	24	70 => 55	75	40	100	70
V106I + V181C + G190A	24	50 => 35	75	60	130	90
K101E + Y181C + G190A K101E + Y181C + G190A + H221Y	23	75 => 60	105	85	170	140
A98G + K101E + V108I + Y181C + G190A	22	95 => 75	125	90	205	135
K103N + V106M + F227L	21	100 => 90	135	0	150	0
A98G + V108H + Y181C + H221Y	1 4 4	80 => 65	70	55	125	90
11200 , VIOUI , IIOIO , 116611	20				127	
	20			4.0	90	7.5
K101E + E138A + G190S	20	50 => 40	75	40	90	75 15
K101E + E138A + G190S K103N + G190A + P225H	20 20	50 => 40 30	75 150	10	165	15
K101E + E138A + G190S K103N + G190A + P225H K103N + V179E + P225H	20 20 20	50 => 40 30 30	75 150 115	10	165 115	15 10
K101E + E138A + G190S K103N + G190A + P225H K103N + V179E + P225H K101H + Y181C + G190S	20 20 20 19	50 => 40 30 30 60 => 40	75 150 115 100	10 10 60	165 115 135	15 10 80
K101E + E138A + G190S K103N + G190A + P225H K103N + V179E + P225H K101H + Y181C + G190S K103N + E138A + P225H	20 20 20 19	50 => 40 30 30 60 => 40 30	75 150 115 100 105	10 10 60 10	165 115 135 105	15 10 80 15
K101E + E138A + G190S K103N + G190A + P225H K103N + V179E + P225H K101H + Y181C + G190S K103N + E138A + P225H K103N + V106M + E138A	20 20 20 19 19	50 => 40 30 30 60 => 40 30 50 => 30	75 150 115 100 105 120	10 10 60 10	165 115 135 105 120	15 10 80 15 15
K101E + E138A + G190S K103N + G190A + P225H K103N + V179E + P225H K101H + Y181C + G190S K103N + E138A + P225H K103N + V106M + E138A K103N + V108I + G190A	20 20 20 19 19 19	50 => 40 30 30 60 => 40 30 50 => 30 15 => 10	75 150 115 100 105 120 115	10 10 60 10 10	165 115 135 105 120 135	15 10 80 15 15
K101E + E138A + G190S K103N + G190A + P225H K103N + V179E + P225H K101H + Y181C + G190S K103N + E138A + P225H K103N + V106M + E138A	20 20 20 19 19	50 => 40 30 30 60 => 40 30 50 => 30	75 150 115 100 105 120	10 10 60 10	165 115 135 105 120	15 10 80 15 15
K101E + E138A + G190S K103N + G190A + P225H K103N + V179E + P225H K101H + Y181C + G190S K103N + E138A + P225H K103N + V106M + E138A K103N + V108I + G190A	20 20 20 19 19 19	50 => 40 30 30 60 => 40 30 50 => 30 15 => 10 115 =>	75 150 115 100 105 120 115	10 10 60 10 10	165 115 135 105 120 135	15 10 80 15 15

K103N + V106A + F227L						
	18	125 =>	135	0	150	0
		120				
K103N + Y181C + P225H	18	50 => 45	135	30	165	45
K103S + Y181C + G190A	18	30 => 20	120	50	180	70
			-			
V106I + V108I	18	25 => 20	10	10	25	10
K101E + E138K	17	25 => 20	25	25	40	90
K101E + V106M	17	65 => 45	75	15	90	45
K103N + V108I + Y181C + G190A	17	65 => 40	145	50	195	70
Y188L + H221Y	17	75 => 70	70	20	75	75
K101E + V106I + Y181C + G190S	16	110 => 80	110	85	165	135
K101H + G190S	16	30 => 20	70	20	75	25
K101H + V108I + Y181C + G190A	16	55 => 35	95	60	150	80
K103N + V108I + P225H + K238T	16	45 => 40	145	0	150	0
V106I + Y181C + H221Y	16	55 => 45	40	50	85	90
A98G + K103N + V108I + Y181C	15	65 => 50	120	45	170	65
G190A + H221Y	15	15 => 10	55	20	75	30
K101E + K103N + Y181C + G190A	15	60 => 45	155	75	215	115
				1	1	
K101E + V108I + G190A	15	35 => 30	70	30	105	60
K103N + E138Q + Y181C	15	20 => 15	100	40	130	60
K103N + V108I + H221Y + P225H	15	60 => 50	125	10	135	15
K103N + Y181C + Y188C	15	30 => 20	150	30	180	45
V106M + Y181C	15	60 => 40	90	30	120	45
K101E + K103N + V108I	14	30 => 25	85	15	105	45
K101E + Y181C + G190S + H221Y	14	105 => 80	120	85	170	140
K103N + L234I	14	30 => 45	60	0	60	0
				1	1	
K103N + P225H + M230L	14	90	150	30	165	60
K103N + V106M + Y181C	14	70 => 45	150	30	180	45
V108I + G190A	14	15 => 10	55	10	75	15
K101E + K103N + Y181C	13	35 => 30	110	50	155	90
K103N + G190A + H221Y	13	15 => 10	115	20	135	30
K103N + H221Y + L234I	13	45 => 55	70	10	75	15
Y181I + H221Y	13	45 => 40	40	70	75	85
Y181V + H221Y	13	45 => 40	40	70	75	85
			_			
A98G + G190S	12	45 => 35	75	20	90	30
A98G + K101E + V108I + Y181C + G190A + H221Y	12	120 => 95	135	100	220	160
A98G + V108I	12	30 => 25	25	10	45	15
K101E + E138G + G190S	12	50 => 40	85	40	100	75
				+		
K101E + V106M + E138A + G190A	12	70 => 50	120	40	150	75
K101E + V106M + G190A + F227L	12	120 =>	135	30	180	60
		110				
K101E + V106M + Y181C + G190A	12		155	7.5	215	115
K101E + V106M + Y181C + G190A	12	100 => 70	155	75	215	115
K101E + Y181C + H221Y	12	100 => 70 50 => 45	60	60	110	115
K101E + Y181C + H221Y K103N + P225H + N348I	12 12	100 => 70 50 => 45 30	60 105	60 0	110 120	115
K101E + Y181C + H221Y	12	100 => 70 50 => 45	60	60	110	115
K101E + Y181C + H221Y K103N + P225H + N348I K103N + V108I + E138Q	12 12	100 => 70 50 => 45 30	60 105	60 0	110 120	115
K101E + Y181C + H221Y K103N + P225H + N348I K103N + V108I + E138Q K103N + V108I + K238N	12 12 12 12	100 => 70 50 => 45 30 15 => 10 15 => 10	60 105 80 80	60 0 10 0	110 120 85 85	115 0 15 0
K101E + Y181C + H221Y K103N + P225H + N348I K103N + V108I + E138Q K103N + V108I + K238N K103N + V108I + Y181C + H221Y + K238T	12 12 12 12 12	100 => 70 50 => 45 30 15 => 10 15 => 10 70 => 50	60 105 80 80 140	60 0 10 0 40	110 120 85 85 180	115 0 15 0 70
K101E + Y181C + H221Y K103N + P225H + N348I K103N + V108I + E138Q K103N + V108I + K238N K103N + V108I + Y181C + H221Y + K238T L100I + K103N + E138K	12 12 12 12 12 12	100 => 70 50 => 45 30 15 => 10 15 => 10 70 => 50 40 => 35	60 105 80 80 140 130	60 0 10 0 40 40	110 120 85 85 180 130	115 0 15 0 70 105
K101E + Y181C + H221Y K103N + P225H + N348I K103N + V108I + E138Q K103N + V108I + K238N K103N + V108I + Y181C + H221Y + K238T	12 12 12 12 12	100 => 70 50 => 45 30 15 => 10 15 => 10 70 => 50	60 105 80 80 140	60 0 10 0 40	110 120 85 85 180	115 0 15 0 70
K101E + Y181C + H221Y K103N + P225H + N348I K103N + V108I + E138Q K103N + V108I + K238N K103N + V108I + Y181C + H221Y + K238T L100I + K103N + E138K	12 12 12 12 12 12	100 => 70 50 => 45 30 15 => 10 15 => 10 70 => 50 40 => 35	60 105 80 80 140 130	60 0 10 0 40 40	110 120 85 85 180 130	115 0 15 0 70 105
K101E + Y181C + H221Y K103N + P225H + N348I K103N + V108I + E138Q K103N + V108I + K238N K103N + V108I + Y181C + H221Y + K238T L100I + K103N + E138K L100I + K103N + Y181C L234I	12 12 12 12 12 12 12 12 12	100 => 70 50 => 45 30 15 => 10 15 => 10 70 => 50 40 => 35 50 => 45 30 => 45	60 105 80 80 140 130 150	60 0 10 0 40 40 60	110 120 85 85 180 130 180	115 0 15 0 70 105 105 0
K101E + Y181C + H221Y  K103N + P225H + N348I  K103N + V108I + E138Q  K103N + V108I + K238N  K103N + V108I + Y181C + H221Y + K238T  L100I + K103N + E138K  L100I + K103N + Y181C  L234I  V106I + Y188C	12 12 12 12 12 12 12 12 12 12	100 => 70 50 => 45 30 15 => 10 15 => 10 70 => 50 40 => 35 50 => 45 30 => 45 20 => 15	60 105 80 80 140 130 150 0	60 0 10 0 40 40 60 0	110 120 85 85 180 130 180 0	115 0 15 0 70 105 105 0 10
K101E + Y181C + H221Y  K103N + P225H + N348I  K103N + V108I + E138Q  K103N + V108I + K238N  K103N + V108I + Y181C + H221Y + K238T  L100I + K103N + E138K  L100I + K103N + Y181C  L234I  V106I + Y188C  V106M + Y181C + G190A	12 12 12 12 12 12 12 12 12 12 12 12	100 => 70 50 => 45 30 15 => 10 15 => 10 70 => 50 40 => 35 50 => 45 30 => 45 20 => 15 80 => 50	60 105 80 80 140 130 150 0 60	60 0 10 0 40 40 60 0	110 120 85 85 180 130 180 0 70	115 0 15 0 70 105 105 0 10 70
K101E + Y181C + H221Y  K103N + P225H + N348I  K103N + V108I + E138Q  K103N + V108I + K238N  K103N + V108I + Y181C + H221Y + K238T  L100I + K103N + E138K  L100I + K103N + Y181C  L234I  V106I + Y188C	12 12 12 12 12 12 12 12 12 12	100 => 70 50 => 45 30 15 => 10 15 => 10 70 => 50 40 => 35 50 => 45 30 => 45 20 => 15	60 105 80 80 140 130 150 0	60 0 10 0 40 40 60 0	110 120 85 85 180 130 180 0	115 0 15 0 70 105 105 0 10
K101E + Y181C + H221Y  K103N + P225H + N348I  K103N + V108I + E138Q  K103N + V108I + K238N  K103N + V108I + Y181C + H221Y + K238T  L100I + K103N + E138K  L100I + K103N + Y181C  L234I  V106I + Y188C  V106M + Y181C + G190A  V106M + Y188H	12 12 12 12 12 12 12 12 12 12 12 12	100 => 70 50 => 45 30 15 => 10 15 => 10 70 => 50 40 => 35 50 => 45 30 => 45 20 => 15 80 => 50	60 105 80 80 140 130 150 0 60	60 0 10 0 40 40 60 0	110 120 85 85 180 130 180 0 70	115 0 15 0 70 105 105 0 10 70
K101E + Y181C + H221Y  K103N + P225H + N348I  K103N + V108I + E138Q  K103N + V108I + K238N  K103N + V108I + Y181C + H221Y + K238T  L100I + K103N + E138K  L100I + K103N + Y181C  L234I  V106I + Y188C  V106M + Y181C + G190A  V106M + Y188H  V108I + H221Y	12 12 12 12 12 12 12 12 12 12 12 12 12 1	100 => 70 50 => 45 30 15 => 10 15 => 10 70 => 50 40 => 35 50 => 45 30 => 45 20 => 15 80 => 50 60 => 35 30 => 20	60 105 80 80 140 130 150 0 60 135 90 20	60 0 10 0 40 40 60 0 10 50	110 120 85 85 180 130 180 0 70 180 120	115 0 15 0 70 105 105 0 10 70 0 15
K101E + Y181C + H221Y  K103N + P225H + N348I  K103N + V108I + E138Q  K103N + V108I + K238N  K103N + V108I + Y181C + H221Y + K238T  L100I + K103N + E138K  L100I + K103N + Y181C  L234I  V106I + Y188C  V106M + Y181C + G190A  V106M + Y188H  V108I + H221Y  V108I + Y181C + H221Y + N348I	12 12 12 12 12 12 12 12 12 12 12 12 12 1	100 => 70 50 => 45 30 15 => 10 15 => 10 70 => 50 40 => 35 50 => 45 30 => 45 20 => 15 80 => 50 60 => 35 30 => 20 60 => 45	60 105 80 80 140 130 150 0 60 135 90 20	60 0 10 0 40 40 60 0 10 50 0 10 40	110 120 85 85 180 130 180 0 70 180 120 30	115 0 15 0 70 105 105 0 10 70 0 15 70
K101E + Y181C + H221Y  K103N + P225H + N3481  K103N + V108I + E138Q  K103N + V108I + K238N  K103N + V108I + Y181C + H221Y + K238T  L100I + K103N + E138K  L100I + K103N + Y181C  L234I  V106I + Y188C  V106M + Y181C + G190A  V106M + Y188H  V108I + H221Y  V108I + Y181C + H221Y + N348I  Y181C + G190S + H221Y	12 12 12 12 12 12 12 12 12 12 12 12 12 1	100 => 70 50 => 45 30 15 => 10 15 => 10 70 => 50 40 => 35 50 => 45 30 => 45 20 => 15 80 => 50 60 => 35 30 => 20 60 => 45 85 => 60	60 105 80 80 140 130 150 0 60 135 90 20 50	60 0 10 0 40 40 60 0 10 50 0 10 40	110 120 85 85 180 130 180 0 70 180 120 30 105	115 0 15 0 70 105 105 0 10 70 0 15 70 95
K101E + Y181C + H221Y  K103N + P225H + N348I  K103N + V108I + E138Q  K103N + V108I + K238N  K103N + V108I + Y181C + H221Y + K238T  L100I + K103N + E138K  L100I + K103N + Y181C  L234I  V106I + Y188C  V106M + Y181C + G190A  V106M + Y188H  V108I + H221Y  V108I + Y181C + H221Y + N348I	12 12 12 12 12 12 12 12 12 12 12 12 12 1	100 => 70 50 => 45 30 15 => 10 15 => 10 70 => 50 40 => 35 50 => 45 30 => 45 20 => 15 80 => 50 60 => 35 30 => 20 60 => 45	60 105 80 80 140 130 150 0 60 135 90 20	60 0 10 0 40 40 60 0 10 50 0 10 40	110 120 85 85 180 130 180 0 70 180 120 30	115 0 15 0 70 105 105 0 10 70 0 15 70
K101E + Y181C + H221Y  K103N + P225H + N3481  K103N + V108I + E138Q  K103N + V108I + K238N  K103N + V108I + Y181C + H221Y + K238T  L100I + K103N + E138K  L100I + K103N + Y181C  L234I  V106I + Y188C  V106M + Y181C + G190A  V106M + Y188H  V108I + H221Y  V108I + Y181C + H221Y + N348I  Y181C + G190S + H221Y	12 12 12 12 12 12 12 12 12 12 12 12 12 1	100 => 70 50 => 45 30 15 => 10 15 => 10 70 => 50 40 => 35 50 => 45 30 => 45 20 => 15 80 => 50 60 => 35 30 => 20 60 => 45 85 => 60	60 105 80 80 140 130 150 0 60 135 90 20 50	60 0 10 0 40 40 60 0 10 50 0 10 40	110 120 85 85 180 130 180 0 70 180 120 30 105	115 0 15 0 70 105 105 0 10 70 0 15 70 95
K101E + Y181C + H221Y  K103N + P225H + N3481  K103N + V108I + E138Q  K103N + V108I + K238N  K103N + V108I + Y181C + H221Y + K238T  L100I + K103N + E138K  L100I + K103N + Y181C  L234I  V106I + Y188C  V106M + Y181C + G190A  V106M + Y188H  V108I + H221Y  V108I + H221Y  V108I + G190S + H221Y  A98G + V108I + Y181C + G190A  K101E + V108I + Y181C	12 12 12 12 12 12 12 12 12 12 12 12 12 1	100 => 70 50 => 45 30 15 => 10 15 => 10 70 => 50 40 => 35 50 => 45 30 => 45 20 => 15 80 => 50 60 => 35 30 => 20 60 => 45 85 => 60 75 => 55 50 => 40	60 105 80 80 140 130 150 0 60 135 90 20 50 100 105 60	60 0 10 0 40 40 60 0 10 50 0 10 40 60 65 50	110 120 85 85 180 130 180 0 70 180 120 30 105 135 170	115 0 15 0 70 105 105 0 10 70 0 15 70 95 90
K101E + Y181C + H221Y  K103N + P225H + N3481  K103N + V108I + E138Q  K103N + V108I + K238N  K103N + V108I + Y181C + H221Y + K238T  L100I + K103N + E138K  L100I + K103N + Y181C  L234I  V106I + Y188C  V106M + Y181C + G190A  V106M + Y181C + G190A  V108I + H221Y  V108I + H221Y  A98G + V108I + Y181C + G190A	12 12 12 12 12 12 12 12 12 12 12 12 12 1	100 => 70 50 => 45 30 15 => 10 15 => 10 70 => 50 40 => 35 50 => 45 30 => 45 20 => 15 80 => 50 60 => 35 30 => 20 60 => 45 85 => 60 75 => 55 50 => 40 105 =>	60 105 80 80 140 130 150 0 60 135 90 20 50 100 105	60 0 10 0 40 40 60 0 10 50 0 10 40 60 65	110 120 85 85 180 130 180 0 70 180 120 30 105 135	115 0 15 0 70 105 105 0 10 70 0 15 70 95 90
K101E + Y181C + H221Y  K103N + P225H + N3481  K103N + V108I + E138Q  K103N + V108I + K238N  K103N + V108I + Y181C + H221Y + K238T  L100I + K103N + E138K  L100I + K103N + Y181C  L234I  V106I + Y188C  V106M + Y181C + G190A  V106M + Y188H  V108I + H221Y  V108I + H221Y  V108I + Y181C + H221Y + N348I  Y181C + G190S + H221Y  A98G + V108I + Y181C + G190A  K101E + V108I + Y181C  K103N + H221Y + M230L + L234I	12 12 12 12 12 12 12 12 12 12 12 12 12 1	100 => 70 50 => 45 30 15 => 10 15 => 10 70 => 50 40 => 35 50 => 45 30 => 45 20 => 15 80 => 50 60 => 35 30 => 20 60 => 45 85 => 60 75 => 55 50 => 40 105 => 115	60 105 80 80 140 130 150 0 60 135 90 20 50 100 105 60 115	60 0 10 0 40 40 60 0 10 50 0 10 40 60 65 50 40	110 120 85 85 180 130 180 0 70 180 120 30 105 135 170 110	115 0 15 0 70 105 105 0 10 70 0 15 70 95 90 90 75
K101E + Y181C + H221Y  K103N + P225H + N3481  K103N + V108I + E138Q  K103N + V108I + K238N  K103N + V108I + Y181C + H221Y + K238T  L100I + K103N + E138K  L100I + K103N + Y181C  L234I  V106I + Y188C  V106M + Y181C + G190A  V106M + Y188H  V108I + H221Y  V108I + H221Y  V108I + G190S + H221Y  A98G + V108I + Y181C + G190A  K101E + V108I + Y181C	12 12 12 12 12 12 12 12 12 12 12 12 12 1	100 => 70 50 => 45 30 15 => 10 15 => 10 70 => 50 40 => 35 50 => 45 30 => 45 20 => 15 80 => 50 60 => 35 30 => 20 60 => 45 85 => 60 75 => 55 50 => 40 105 =>	60 105 80 80 140 130 150 0 60 135 90 20 50 100 105 60	60 0 10 0 40 40 60 0 10 50 0 10 40 60 65 50	110 120 85 85 180 130 180 0 70 180 120 30 105 135 170	115 0 15 0 70 105 105 0 10 70 0 15 70 95 90
K101E + Y181C + H221Y  K103N + P225H + N3481  K103N + V108I + E138Q  K103N + V108I + K238N  K103N + V108I + Y181C + H221Y + K238T  L100I + K103N + E138K  L100I + K103N + Y181C  L234I  V106I + Y188C  V106M + Y181C + G190A  V106M + Y188H  V108I + H221Y  V108I + H221Y  V108I + Y181C + H221Y + N348I  Y181C + G190S + H221Y  A98G + V108I + Y181C + G190A  K101E + V108I + Y181C  K103N + H221Y + M230L + L234I	12 12 12 12 12 12 12 12 12 12 12 12 12 1	100 => 70 50 => 45 30 15 => 10 15 => 10 70 => 50 40 => 35 50 => 45 30 => 45 20 => 15 80 => 50 60 => 35 30 => 20 60 => 45 85 => 60 75 => 55 50 => 40 105 => 115	60 105 80 80 140 130 150 0 60 135 90 20 50 100 105 60 115	60 0 10 0 40 40 60 0 10 50 0 10 40 60 65 50 40	110 120 85 85 180 130 180 0 70 180 120 30 105 135 170 110	115 0 15 0 70 105 105 0 10 70 0 15 70 95 90 90 75
K101E + Y181C + H221Y  K103N + P225H + N3481  K103N + V108I + E138Q  K103N + V108I + K238N  K103N + V108I + Y181C + H221Y + K238T  L100I + K103N + E138K  L100I + K103N + Y181C  L234I  V106I + Y188C  V106M + Y181C + G190A  V106M + Y181C + H221Y + N348I  V108I + H221Y  V108I + H221Y  V108I + Y181C + H221Y + N348I  Y181C + G190S + H221Y  A98G + V108I + Y181C  K103N + H221Y + M230L + L234I  K103N + V106A + Y181C  K103N + V106A + Y181C  K103N + V106A + Y181C	12 12 12 12 12 12 12 12 12 12 12 12 12 1	100 => 70 50 => 45 30 15 => 10 15 => 10 70 => 50 40 => 35 50 => 45 30 => 45 20 => 15 80 => 50 60 => 35 30 => 20 60 => 35 30 => 20 60 => 45 85 => 60 75 => 55 50 => 40 105 => 115 80 => 75 30 => 20	60 105 80 80 140 130 150 0 60 135 90 20 50 100 105 60 115	60 0 10 0 40 40 60 0 10 50 0 10 40 40 60 60 40 40 40 40 50 0 10 50 10 10 10 10 10 10 10 10 10 1	110 120 85 85 180 130 180 0 70 180 120 30 105 135 170 110 135	115 0 15 0 70 105 105 0 10 70 0 15 70 95 90 90 75
K101E + Y181C + H221Y  K103N + P225H + N3481  K103N + V108I + E138Q  K103N + V108I + K238N  K103N + V108I + Y181C + H221Y + K238T  L100I + K103N + E138K  L100I + K103N + Y181C  L234I  V106I + Y188C  V106M + Y181C + G190A  V106M + Y188H  V108I + H221Y  V108I + H221Y  V108I + Y181C + H221Y + N348I  Y181C + G190S + H221Y  A98G + V108I + Y181C  K103N + H221Y + M230L + L234I  K103N + V106A + Y181C  K103N + V108I + H221Y + K238T  K103N + V108I + H221Y + K238T  K103N + V108I + H221Y + K238T	12 12 12 12 12 12 12 12 12 12 12 12 12 1	100 => 70 50 => 45 30 15 => 10 15 => 10 70 => 50 40 => 35 50 => 45 30 => 45 20 => 15 80 => 50 60 => 35 30 => 20 60 => 45 85 => 60 75 => 55 50 => 40 105 => 115 80 => 75 30 => 20 15 => 10	60 105 80 80 140 130 150 0 60 135 90 20 50 100 105 60 115 135 110 80	60 0 10 0 40 40 60 0 10 50 0 10 40 40 60 0 10 50 0 10 40 40 40 40 50 10 10 10 10 10 10 10 10 10 1	110 120 85 85 180 130 180 0 70 180 120 30 105 135 170 110 135 180 120 85	115 0 15 0 70 105 105 0 10 70 0 15 70 95 90 90 75 45 15
K101E + Y181C + H221Y K103N + P225H + N348I K103N + V108I + E138Q K103N + V108I + K238N K103N + V108I + Y181C + H221Y + K238T L100I + K103N + E138K L100I + K103N + Y181C L234I V106I + Y188C V106M + Y181C + G190A V106M + Y181C + G190A V108I + H221Y V108I + H221Y V108I + Y181C + H221Y + N348I Y181C + G190S + H221Y A98G + V108I + Y181C + G190A K101E + V108I + Y181C K103N + H221Y + M230L + L234I  K103N + V106A + Y181C K103N + V108I + H221Y + K238T K103N + V108I + V179E V106M + V179D + G190A	12 12 12 12 12 12 12 12 12 12 12 12 12 1	100 => 70 50 => 45 30 15 => 10 15 => 10 70 => 50 40 => 35 50 => 45 30 => 45 20 => 15 80 => 50 60 => 35 30 => 20 60 => 45 85 => 60 75 => 55 50 => 40 105 => 115 80 => 75 30 => 20 15 => 10 50 => 30	60 105 80 80 140 130 150 0 60 135 90 20 50 105 60 115 135 110 80 115	60 0 10 0 40 40 60 0 10 50 0 10 40 60 60 60 60 60 10 40 40 40 40 40 50 10 10 10 10 10 10 10 10 10 1	110 120 85 85 180 130 180 0 70 180 120 30 105 135 170 110 135 180 120 85 130	115 0 15 0 70 105 105 0 10 70 0 15 70 95 90 75 45 15 10 25
K101E + Y181C + H221Y  K103N + P225H + N3481  K103N + V108I + E138Q  K103N + V108I + K238N  K103N + V108I + Y181C + H221Y + K238T  L100I + K103N + E138K  L100I + K103N + Y181C  L234I  V106I + Y188C  V106M + Y181C + G190A  V106M + Y188H  V108I + H221Y  V108I + H221Y  V108I + Y181C + H221Y + N348I  Y181C + G190S + H221Y  A98G + V108I + Y181C  K103N + H221Y + M230L + L234I  K103N + V106A + Y181C  K103N + V108I + H221Y + K238T  K103N + V108I + H221Y + K238T  K103N + V108I + H221Y + K238T	12 12 12 12 12 12 12 12 12 12 12 12 12 1	100 => 70 50 => 45 30 15 => 10 15 => 10 70 => 50 40 => 35 50 => 45 30 => 45 20 => 15 80 => 50 60 => 35 30 => 20 60 => 45 85 => 60 75 => 55 50 => 40 105 => 115 80 => 75 30 => 20 15 => 10	60 105 80 80 140 130 150 0 60 135 90 20 50 100 105 60 115 135 110 80	60 0 10 0 40 40 60 0 10 50 0 10 40 40 60 0 10 50 0 10 40 40 40 40 50 10 10 10 10 10 10 10 10 10 1	110 120 85 85 180 130 180 0 70 180 120 30 105 135 170 110 135 180 120 85	115 0 15 0 70 105 105 0 10 70 0 15 70 95 90 90 75 45 15
K101E + Y181C + H221Y  K103N + P225H + N3481  K103N + V108I + E138Q  K103N + V108I + K238N  K103N + V108I + Y181C + H221Y + K238T  L100I + K103N + E138K  L100I + K103N + Y181C  L234I  V106I + Y188C  V106M + Y181C + G190A  V106M + Y188H  V108I + H221Y  V108I + Y181C + H221Y + N348I  Y181C + G190S + H221Y  A98G + V108I + Y181C + G190A  K101E + V108I + Y181C  K103N + H221Y + M230L + L234I  K103N + V106A + Y181C  K103N + V108I + H221Y + K238T  K103N + V108I + H221Y + K238T  K103N + V108I + V179E  V106M + V179D + G190A	12 12 12 12 12 12 12 12 12 12 12 12 12 1	100 => 70 50 => 45 30 15 => 10 15 => 10 70 => 50 40 => 35 50 => 45 30 => 45 20 => 15 80 => 50 60 => 35 30 => 20 60 => 45 85 => 60 75 => 55 50 => 40 105 => 115 80 => 75 30 => 20 15 => 10 50 => 30	60 105 80 80 140 130 150 0 60 135 90 20 50 105 60 115 135 110 80 115	60 0 10 0 40 40 60 0 10 50 0 10 40 60 60 60 60 60 10 40 40 40 40 40 50 10 10 10 10 10 10 10 10 10 1	110 120 85 85 180 130 180 0 70 180 120 30 105 135 170 110 135 180 120 85 130	115 0 15 0 70 105 105 0 10 70 0 15 70 95 90 75 45 15 10 25
K101E + Y181C + H221Y  K103N + P225H + N348I  K103N + V108I + E138Q  K103N + V108I + K238N  K103N + V108I + Y181C + H221Y + K238T  L100I + K103N + E138K  L100I + K103N + Y181C  L234I  V106I + Y188C  V106M + Y181C + G190A  V106M + Y181C + H221Y + N348I  V108I + H221Y  V108I + Y181C + H221Y + N348I  Y181C + G190S + H221Y  A98G + V108I + Y181C  K103N + H221Y + M230L + L234I  K103N + V106A + Y181C  K103N + V108I + H221Y + K238T  K103N + V108I + H221Y + K238T  K103N + V108I + V179E  V106M + V179D + G190A  V108I + V179E + Y181C  Y181C + G190A + N348I	12 12 12 12 12 12 12 12 12 12 12 12 12 1	100 => 70 50 => 45 30 15 => 10 15 => 10 70 => 50 40 => 35 50 => 45 30 => 45 20 => 15 80 => 50 60 => 35 30 => 20 60 => 45 85 => 60 75 => 55 50 => 40 105 => 115 80 => 75 30 => 20 105 => 10 50 => 30 30 => 20 20 => 45 30 => 20 30 => 20 30 => 45 45 45 45 45 45 46 47 48 50 => 55 50 => 40 105 => 10 50 => 30 30 => 20 30 => 20 30 => 20 30 => 20 30 => 20 30 => 35 30 => 20 30 => 30 30 => 20	60 105 80 80 140 130 150 0 60 135 90 20 50 100 105 60 115 135 110 80 115 50 75	60 0 10 0 40 40 60 0 10 50 0 10 40 60 60 60 60 60 60 10 40 40 40 40 40 40 40 40 40 4	110 120 85 85 180 130 180 0 70 180 120 30 105 135 170 110 135 180 120 85 130	115 0 15 0 70 105 105 0 10 70 0 15 70 95 90 90 75 45 15 10 25 55 70
K101E + Y181C + H221Y K103N + P225H + N348I K103N + V108I + E138Q K103N + V108I + K238N K103N + V108I + Y181C + H221Y + K238T L100I + K103N + E138K L100I + K103N + Y181C L234I V106I + Y188C V106M + Y181C + G190A V106M + Y181C + H221Y + N348I V108I + H221Y V108I + Y181C + H221Y + N348I Y181C + G190S + H221Y A98G + V108I + Y181C K103N + H221Y + M230L + L234I  K103N + V106A + Y181C K103N + V106A + Y181C K103N + V108I + H221Y + K238T K103N + V108I + V179E V106M + V179D + G190A V108I + V179E + Y181C	12 12 12 12 12 12 12 12 12 12 12 12 12 1	100 => 70 50 => 45 30 15 => 10 15 => 10 70 => 50 40 => 35 50 => 45 30 => 45 20 => 15 80 => 50 60 => 35 30 => 20 60 => 45 85 => 60 75 => 55 50 => 40 105 => 115 80 => 75 30 => 20 105 => 115 80 => 75 30 => 20 105 => 115	60 105 80 80 140 130 150 0 60 135 90 20 50 100 105 60 115 135 110 80 115 50	60 0 10 0 40 40 60 0 10 50 0 10 40 60 60 60 60 60 60 10 40 40 40 40 40 50 10 40 40 40 40 40 40 40 40 40 4	110 120 85 85 180 130 180 0 70 180 120 30 105 135 170 110 135 180 120 85 130 85	115 0 15 0 70 105 105 0 10 70 0 15 70 95 90 75 45 15 10 25 55

A98G + K101E + G190S	10	65 => 55	90	40	120	75
A98G + K103N + V108I + H221Y	10	45 => 35	95	20	120	30
A98G + L100I + K103N + V108I	10	60 => 55	145	40	165	75
G190A + F227L	10	50 => 60	60	10	90	15
G190S + N348I	10	30 => 20	60	10	75	15
K103N + E138Q + P225H	10	30	115	10	115	15
K103N + Y181C + H221Y + K238T	10	45 => 35	130	40	165	70
K103R + V106M + V179D + F227L	10	100 => 90	105	10	120	25
K103S + G190A + P225H	10	30 => 20	135	10	165	15
V106I + G190S	10	50 => 35	60	20	70	25
V179E + Y181C + G190A	10	30 => 20	85	60	130	80
A98G + K101E + Y181C + G190S	9	100 => 80	130	90	190	135
A98G + K103N + V108I + K238T	9	30 => 25	115	10	135	15
K101E + V106I + Y181C + G190A	9	70 => 55	95	85	165	135
K103N + F227L	9	50 => 60	75	0	90	0
K103N + V106I + Y181C	9	40 => 30	90	40	130	65
K103N + V106M + G190A	9	50 => 30	165	10	180	15
K103N + V108I + Y181C + K238T	9	45 => 30	130	30	165	45
K103N + Y181C + G190A + N348I	9	40 => 25	135	50	195	70
K103N + Y181C + G190S	9	70 => 45	150	50	180	70
L100I + K103N + V108I + H221Y	9	60 => 50	140	4.0	150	75
L100I + K103N + Y181C + G190A	9	70 => 55	195	80	240	130
V108I + E138A	9	15 => 10	10	10	15	15
V179D + Y181C + G190A	9	30 => 20	85	60	130	80
V179D + Y181C + H221Y	9	35 => 30	50	50	85	80
Y181C + G190A + K238T	9	30 => 20	105	50	150	70
A98G + K101E + Y181C + G190A + H221Y	8	95 => 80	125	100	205	160
A98G + K103N + V108I + Y181C + G190A	8	85 => 60	165	65	230	90
A98G + V106I + Y181C + G190A	8	70 => 55	95	75	165	110
G190E + H221Y	8	75 => 70	70	55	75	75
G1900 + H221Y	8	45 => 40	70	55	75	60
K103N + H221Y + P225H	8	45 => 40	115	10	120	15
K103N + V108I + Y181C + N348I	8	45 => 30	100	30	150	45
K103N + V1001 + 1101C + N3401 K103N + Y181C + G190A + K238T	8	40 => 25	165	50	210	70
L100I + K103N + V106M	8	80 => 60	180	30	180	60
V106I + V108I + Y181C + H221Y	8	80 => 60	50	50	100	90
V1061 + V188L + H221Y	8	85 => 80	70	30	85	85
V1061 + 1186L + H2211 V106M + Y181C + F227L	8	110 =>	105	30	150	45
V100M + 1101C + F22/L	O	100	103	30	130	40
Y181C + Y188C	8	20 => 15	90	30	120	45
A98G + K103N + V108I + F227L	7	80 => 100	100 =>	10	135	15 =>
AJOG I KIOJN T VIOOI T EZZ/E	, '	00 -> 100	115	=>	=>	30
			110	25	150	
A98G + K103N + Y181C + G190A + H221Y	7	85 => 65	165	75	230	115
A98G + K103N + Y181C + H221Y	7	65 => 55	120	55	170	90
A98G + K103N + 1161C + H2211 A98G + K103N + Y318F	7	45 => 75	85	10	120	15
	7	100 => 75	115	75	185	115
A98G + V108I + Y181C + G190A + H221Y	7		135	30		60
K101E + K103N + G190S		50 => 40			150	
K101E + V106M + Y181C	7	75 => 55	110	50	155	90
K103N + H221Y + K238T	7	15 => 10	100	10	105	15
K103N + V106A + P225H	7	90	150	0	165	0
K103N + V106I + V108I	7	25 => 20	70	10	85	10