

Supplementary Table: Background sequences of the 69 sets. This overview contains all mutations that were not changed within the given set, hence might include PI-RAMs.

Set Nr	Background Mutations
1	V3I, L10V, I13V, G16A, K20R, V32A, L33F, E35D, M36I, S37E, M46I, K55R, Q58E, D60E, Q61E, I62V, L63P, V82A, L89M, L90M, I93L
2	V3I, L10I, I13V, K20R, V32I, E35D, M36I, S37E, K43Q, M46L, K55R, L63P, I64L, I66F, A71V, I72V, V82A, I84V, L89V
3	V3I, L10I, I13V, I15V, E21Q, L33F, E35D, M36I, S37D, R41K, I54M, I62V, L63P, A71V, T74E, P79A, I84V, I85V, L89V, L90M, I93L
4	V3I, L10V, G16A, S37K, R41K, M46I, I47V, G48M, Q61D, L63P, I72V, T74S, L76V, V77I, V82C, I93L
5	V3I, G16A, S37K, R41K, M46I, I47V, G48M, I54M, Q61D, L63P, I72V, T74S, V77I, V82C, I93L
6	V3I, L10I, I13V, G16E, E34Q, S37N, M46I, I54M, Q61N, I62V, L63T, I64V, T74S, I84V
7	V3I, I13V, G16E, V32I, L33F, S37N, M46I, I47V, I54L, L63T, I72V
8	V3I, L10I, V11I, I13V, G16A, L33F, E34Q, M46I, K55R, L63P, G73T, V77I, I84V, L89S, L90M, I93L
9	V3I, L10F, G16A, L33F, E34Q, S37N, R41K, G51A, L63P, G73T, P79D, I84V, L89V, L90M, I93L
10	V3I, L10I, T12K, I13V, K14R, L19I, L33F, S37N, R41K, I54L, I62V, L63Q, A71V, G73S, I84V, L89T, L90M, Q92K
11	V3I, L10F, T12E, L19I, S37N, M46I, K55R, Q61N, I62V, L63P, I66V, T74S, I84V, I85V, L90M, T91S
12	V3I, L10F, V11I, I13V, L33F, E35N, M36I, S37D, K55R, I62V, L63P, A71V, T74P, I84V, L90M, T91S
13	V3I, L10V, I13V, V32I, S37N, M46I, I47V, K55R, I62V, L63P, I64L, A71I, I72L, P79A, L89S
14	V3I, T4S, L10V, V11I, I15V, L19P, K20I, A22V, E35G, M36I, S37N, K45R, I54V, I62V, L63P, C67F, G68E, A71V, I72L, N83S, I84V, I85V
15	V3I, L10V, V11I, I13V, L33F, E34Q, S37D, M46L, G48V, Q58E, D60N, I62V, L63P, A71V, V82A, I84V, I93L
16	V3I, L10I, K20R, E34N, E35D, M36I, S37N, R41K, K43T, G48V, I50V, I54T, Q61E, I62V, L63A, I64L, A71V, I72T, T74S, V82A, L89M, I93L
17	V3I, L10F, I15V, V32I, S37N, M46I, I47V, K55R, L63P, V82A, L89V, I93L
18	V3I, L10I, I13V, S37N, M46I, I54M, Q61N, I62V, L63T, I64V, T74S, I84V
19	V3I, L10F, T12A, I15V, L19P, K20I, E34Q, S37Y, R41K, M46I, K55R, I62V, L63P, I72T, G73T, V77I, I84V, I85V, I93L
20	V3I, L10F, V11I, L19I, V32I, L33F, M36L, S37N, K43T, M46I, I47V, I62V, L63P, I72L, V82A
21	V3I, L10I, I13V, I15V, L24I, L33F, M36I, S37N, R41K, M46I, I54M, K55R, L63P, K70R, I72V, T74S, I84V, L89M
22	V3I, L10I, I13V, G16E, V32I, E34Q, S37N, M46I, I47V, I54M, Q61N, L63T, I64V, T74S
23	V3I, L10F, V11I, I13V, G16A, L33F, E35N, M36I, S37D, K55R, I62V, L63P, A71V, T74P, I84V, L90M, T91S
24	V3I, L10F, V11I, I13V, I15V, L24I, L33F, E35D, M36I, S37N, R41K, M46I, K55R, L63P, K70R, I72V, T74S, I84V, L89M
25	V3I, L10I, V11L, I13V, I15V, L19W, K20V, L33F, E35N, S37N, R41K, K43Q, K45R, I54L, R57K, I62V, L63P, K70E, A71V, G73S, I84V, L89V, L90M
26	V3I, L10F, T12E, L19I, M36I, S37N, M46I, K55R, Q61N, I62V, L63P, I66V, G73C, T74S, I84V, I85V, L90M, T91S
27	V3I, L10I, T12P, I13V, I15V, K20I, M36I, S37N, M46I, F53Y, I62V, L63P, C67F, I72L, G73C, P79A, I84V, L90M
28	V3I, L10F, V11I, I13V, K20V, L33F, S37N, D60E, L63P, A71I, I72L, P79A, I84V, L89V,

	T91S, Q92K
29	V3I, L10F, I13V, I15V, K20V, V32I, M36I, S37N, I47V, Q58E, L63P, A71I, I72V, V82A, L89V
30	V3I, L10I, I15V, G16E, L19I, K20R, E35D, M36I, S37N, M46I, I50V, F53L, Q61H, L63T, E65D, A71V, I72T, L89M
31	V3I, L10F, V11I, T12P, I15V, V32I, L33F, E34Q, S37N, R41K, I47V, I54M, K55R, I62V, L63P, C67E, A71I, I72V, G73D, V77I, N83D, Q92K, I93L
32	V3I, L10I, V32I, S37N, L38W, K43T, M46I, I47V, I54M, I62V, L63P, A71L, I85V, L89V, L90M, I93L
33	V3I, L10Y, V11I, T12K, I13V, I15V, S37N, K43T, I54M, D60E, L63P, A71V, G73S, I84V, L90M, Q92R
34	V3I, L10I, L33F, E34Q, M46I, I54M, I62V, L63P, A71V, V77I, P79S, V82A, I93L
35	V3I, L10F, T12E, I13V, K14R, G16A, V32I, L33F, E34Q, S37N, I47V, I54M, L63P, A71M, I72L, V77I, P79S, I93L
36	V3I, L10F, I13V, I15V, K20I, M36I, S37D, M46I, I54V, L63P, T74P, I84V, L89V, T91S, I93L
37	V3I, L10I, I13V, L33F, E35D, M36I, S37N, R41K, K43T, I50V, I62V, L63P, A71V, T74P, V82A, L90M, I93L
38	V3I, L10F, T12Q, I13V, V32I, L33F, S37N, M46I, I47V, Q58E, I62V, L63P, C67F, K70E, G73C, V77I, L90M
39	V3I, L10I, I13V, G16A, V32I, L33F, M46I, I47V, I54L, L63P, V77I, I84V, L89V, L90M
40	V3I, L10I, V11I, I13V, L19I, L33F, S37N, I54L, K55R, Q58E, D60E, Q61E, I62V, L63P, A71V, I72T, G73S, I84V, L90M
41	V3I, L10F, I13A, A22V, E35D, M36I, S37N, R41K, M46I, I47V, R57K, Q61N, I62V, L63P, I64V, A71V, L76V, N83D, T91S
42	V3I, T12S, I15V, L19T, V32I, M36I, S37N, R41K, L63P, H69K, A71V, V82A, I85V, L89V, I93L
43	V3I, T4S, L10F, V11L, I15V, M36I, S37D, M46I, I62V, L63P, A71I, I72K, G73T, I84V, I85V, L89V, L90M
44	V3I, L10I, T12P, L19P, L24I, E35D, M36I, S37N, M46I, I54M, I62V, L63P, I64V, A71V, I72T, T74S, L76V, I93L
45	V3I, L10F, I13V, I15V, K20V, V32I, E35D, M36I, S37N, K43T, I47V, D60E, I62V, L63P, A71I, T74P, L89V, L90M
46	V3I, L10V, V32I, L33F, E34N, E35D, M36I, S37D, I47V, I54M, K55R, R57K, Q58E, I62V, L63P, A71V, T74A, I93L
47	V3I, L10I, T12P, I13V, K14R, L33F, S37N, R41K, M46I, R57K, L63P, V77I, V82I, I84V, L90M, I93L
48	V3I, L10F, V11I, I13V, I15V, Q18H, V32I, L33F, E34Q, S37E, K43R, I47V, I54M, R57K, I62V, L63P, V77I, L89V
49	V3I, T12I, I13V, L33F, S37N, P39Q, R41K, M46I, I54M, K55R, I62V, L63P, A71V, T74S, L76V, V77I, I93L
50	V3I, L10F, I13V, K20I, M36I, S37N, M46I, K55R, D60E, I62V, L63P, I64V, I84V, T91S
51	V3I, L10V, I13V, I15V, V32I, L33F, M36I, S37N, I47V, I54M, Q58E, D60E, Q61E, L63P, I64V, H69Y, A71V, I93L
52	V3I, L10I, I13V, K14R, I15V, E35N, M36I, S37D, M46I, I54V, R57K, Q58E, D60Q, L63P, H69K, T74A, L76V, V82I, I84V, L89M
53	V3I, L10F, I15V, G16A, L19I, K20I, E34Q, M36I, S37N, R41K, G51A, L63P, A71I, I72V, G73T, P79D, I84V, I85V, L90M, Q92R, I93L
54	V3I, L10I, I13V, K20T, L33F, S37N, I54M, L63P, I64V, I66F, A71V, I72M, V77I, I84V, L90M
55	V3I, L10F, T12E, L19I, V32I, L33F, M36I, S37N, I54L, K55R, Q61N, I62V, L63P, I66V, T74S, I84V, I85V, L89V, L90M, T91S
56	V3I, L10I, I15V, K20R, V32I, L33F, E34Q, E35D, M36I, S37N, K43T, M46I, I47V, R57K, I62V, L63P, A71V, V82A, L90M

57	V3I, L10I, T12K, I13V, K14R, L19I, V32I, L33F, E34Q, S37N, R41K, M46I, I54L, I62V, L63Q, I64L, I66F, V77I, I84V, L89T, L90M, Q92K
58	V3I, I13V, L19I, V32I, L33F, M36A, S37N, P39S, M46I, I47V, K55R, Q58E, I62V, L63P, A71V, G73S, V77I, V82A, L90M, I93L, C95F
59	V3I, L10I, G16E, L33F, S37N, M46I, G48Q, Q58E, L63H, K70E, A71V, V77I, V82F, I84V, L90M, I93M
60	V3I, L10V, I13V, I15V, V32I, L33F, S37N, R41K, K43E, K45R, I47V, I54M, D60N, L63P, C67F, A71V, I72K, L89V
61	V3I, T12S, I13V, K14R, Q18H, L33F, E34K, S37N, K45V, K55N, L63P, I64V, V77I, I84V
62	V3I, I13V, K20R, L23I, E35D, M36I, S37N, R41K, M46I, I50V, F53L, I54V, K55R, R57K, D60E, Q61N, L63P, A71V, I85V, L89I
63	V3I, L10F, V11I, I13V, I15V, V32I, L33F, S37N, I54L, Q58E, I62V, L63P, I84V, L89I, L90M, I93L
64	V3I, L10I, I13V, G16A, L33F, S37N, K43T, M46L, I54L, D60H, L63P, I66F, I72T, V77I, I84V, L89V, L90M
65	V3I, L10I, I13V, L33F, E35D, S37D, K43T, M46I, I54A, L63P, I66F, A71V, G73S, V82A, L89V, L90M
66	V3I, L10F, I13V, K20R, A22V, L24M, V32I, L33F, E35N, M36I, S37N, I54L, Q58E, D60E, I62V, L63P, H69K, A71I, N83D, I84V, T91S
67	V3I, L10F, V11I, K14R, I15V, E35D, S37N, R41T, K45V, I50V, I62V, I64V, K70E, A71V, V77I, V82A, I85V, L89I, T91S
68	V3I, T12I, I13V, G16A, L33F, S37N, P39Q, R41K, K43T, M46I, I54M, K55R, I62V, L63P, A71V, T74S, L76V, V77I, I93L
69	V3I, L10I, V11I, I13V, L19I, L33F, E34Q, M46L, I54L, Q58E, I62V, L63P, I64M, A71V, G73S, V77I, V82A, L89V, L90M, Q92K, I93L, C95F