

**Table S2. Primers used in this study**

Name	Sequence (nucleotides to be mutated are lowercased)	Function
Mly1-5'	TGCATGCCTGCAGGTCGA <sub>t</sub> TCTAGAGGATCC	FWD and REV primers for removing <i>Mly</i> I site (234)
Mly1-3'	TCGACCTGCAGGCATGCAAGCTTGGCGTAA	
Mly2-5'	TTATCTACACGACGGGGAG <sub>c</sub> CAGGCAACTAT	FWD and REV primers for removing <i>Mly</i> I site (2334)
Mly2-3'	TCCCCGTCGTGTAGATAACTACGATACGGG	
Mly3-5'	GTGTCTTACCGGGTTGGA <sub>t</sub> TCAAGACGATAG	FWD and REV primers for removing <i>Mly</i> I site (2836)
Mly3-3'	TCCAACCCGGTAAGACACGACTTATCGCCA	
Mly4-5'	AACGACCGAGCGCAGCGA <sub>t</sub> TCAGTGAGCGAG	FWD and REV primers for removing <i>Mly</i> I site (3322)
Mly4-3'	TCGCTGCGCTCGGTCGTTCCGGCTGCGGCCA	
F64L-5'	GGCCAACACTTGTCACTACT <sub>ctt</sub> TCTTATGGTGTT	FWD and REV primers for introducing F64L mutation
F64L-3'	AGTAGTGACAAGTGTTGGCCATGGAACAGGTA	
F64L-5'-2	ATGGACACTTGTCACTACT <sub>ctt</sub> TCTTATGGTGTT	FWD and REV primers for introducing F64L into P58Δ
F64L-3'-2	AGTAGTGACAAGTGTTCCATGGAACAGGTAGT	
S30R-5'	ATGGGCACAAATTTTCTGT <sub>Cgc</sub> GGAGAGGGTGAA	FWD and REV primers for introducing S30R mutation
S30R-3'	GACAGAAAATTTGTGCCCATTAACATCACCAT	
C48Δ-5'	AAACTTACCCTTAAATTTATCACTACTGGAAA	FWD and REV primers for introducing C48Δ mutation
C48Δ-3'	ATAAATTTAAGGGTAAGTTTTCCGTATGTTGC	
P75/D76 →H-5'	TCAATGCTTTTTCCCGTTATCATCATATGAAAC	FWD and REV primers for P75/D76→H mutation
P75/D76 →H-3'	GATAACGGGAAAAGCATTGAACACCATAAGAG	
P75Δ-5'	TTCAATGCTTTTTCCCGTTATGATCATATGAAA	FWD and REV primers for introducing P75Δ mutation
P75Δ-3'	ATAACGGGAAAAGCATTGAACACCATAAGAGA	
E172Δ-5'	TTCAAAATTCGCCACAACATAGATGGATCCGT	FWD and REV primers for introducing E172Δ mutation
E172Δ-3'	ATGTTGTGGCGAATTTTGAAGTTAGCTTTGAT	
S175/V176 →F-5'	CCACAACATTGAAGATGGATTTCAACTAGCAG	FWD and REV primers for S175/V176→F mutation
S175/V176 →F-3'	ATCCATCTTCAATGTTGTGGCGAATTTTGAAG	
S175/V176 →F-5'-2	TCGCCACAACATAGATGGATTTCAACTAGCAG	FWD and REV primers for introducing S175/V176→F mutation into E172Δ mutant
S175/V176 →F-3'-2	ATCCATCTATGTTGTGGCGAATTTTGAAGTTA	