

## SUPPLEMENTAL MATERIALS

**Supplementary Table 1**  
**Mutagenic primers used for the site-directed saturation mutagenesis**

Primers	Sequences (5' to 3')
W474X_f	GCCAGTGTAGTGGACNNK <b>K</b> GAGGAGATGTACGAG
W474X_r	CTCGTACATCTCCTCMNNGTCCACTACACTGGC
M477X_f	CTGGGAGGAGNNK <b>T</b> ACGAGCTCAGCG
M477X_r	GCTGAGCTCGTAMNNCTCCTCCCAGTCC
F485X_f	GACGCCGCCNNK <b>K</b> CGGAACTTCATAGAGC
F485X_r	TGAAGTTCCGMNNGGCGGGCTCGCTGAG
F488X_f	GCCTTCCGGAACNNK <b>K</b> ATAGAGCAGCTGACG
F488X_r	CGTCAGCTGCTCTATMNNGTTCGGAAGGC
I489X_f	CGCCTTCCGGAACTTCNNK <b>K</b> GAGCAGCTGACGGGAG
I489X_r	CTCCCGTCAGCTGCTCMNNGAAGTTCCGGAAGGCG
T527X_f	ACGACAGCGTTNNK <b>K</b> CCGCTGAAACCCCTACTG
T527X_r	AGGGGTTTCAGCGGMNNAACGCTGTCGTTCTG
P370X_f	GTACACGGCGGGNNK <b>K</b> TTCGCGGAGGACAG
P370X_r	GTCCTCCGCGAAMNNCCCCGCCGTGTACC
E419X_f	ACCCCTGCGGCGGTNNK <b>K</b> CTCGAGGATGTATC
E419X_r	ATACATCCTCGAGMNNACCGCCGCACCCCTCGC
Y444X_f	ACATCATGGGCNNK <b>K</b> AGCTACGGCGGCTACATG
Y444X_r	TAGCCGCCGTAGCTMNNGCCCATGATGTAAAG
Y446X_f	CATGGGCTACAGCNNK <b>K</b> GGCGGCTACATGACCC
Y446X_r	TCATGTAGCCGCCMNNGCTGTAGCGCATGATG
Y449X_f	CAGCTACGGCGGCNNK <b>K</b> ATGACCCTATGCGCCCTAACAATG
Y449X_r	CATAGGGTCATMNNGCCCGCGTAGCTGTAGCCCATGATG

N represents any nucleotides of A, T, G, or C, while K represents G or T and M represents G or T.