Supplementary Material

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g a g c t c A G C T G C T C C G C A A T G C C T A T T C A T G G G G A A T G G A C T T T G A G G A G A T G G A G C G C C
        g a g c t c A G C T G C T C C G C A A T G C C T A T T C A T G G G G A A T G G A C T T T G A G G A G A T G G A G C G C C
        g a g c t c A G C T G C T C C G C A A T G C C T A T T C A T G G G G A A T G G A C T T T G A G G A G A T G G A G C G C C
cv
        g a g c t c A G C T G C T C C G C A A T G C C T A T T C A T G G G G A A T G G A C T T T G A G G A G A T G G A G C G C C
F419W-CE gageteAGCTGCTCCGCAATGCCTATTCATGGGGAATGGACTTTGAGGAGATGGACCC
F419W-EE gagctcAGCTGCTCCGCAATGCCTATTCATGGGGAATGGACTTTGAGGAGATGGACCC
       g a g c t c A G C T G C T C C G C A A T G C C T A T T C A T G G G G A A T G G A C T T T G A G G A G A T G G A G C C C
F419W-CV gagctcAGCTGCTCCGCAATGCCTATTCATGGGGAATGGACTTTGAGGAGATGGAGCGCC
FF
        A A A A C C T C C T C A A A A T T G T T T G C G C C T A T C C T G A A T C T G C A G G T C T T G A A G A C C A T T T G C
EV
        A A A A C C T C C T C A A A A T T G T T T G C G C C T A T C C T G A A T C T G C A G G T C T T G A A G A C C A T T T G C
       AAAACCTCCTCAAAATTGTTTGCGCCTATCCTGAATCTGCAGGTCTTGAAGACCATTTGC
F419W
F419W-CE AAAACCTCCTCAAAATTGTTTGCGCCTATCCTGAATCTGCAGGTCTTGAAGACCATTTGC
F419W-EE AAAACCTCCTCAAAATTGTTTGCGCCTATCCTGAATCTGCAGGTCTTGAAGACCATTTGC
F419W-EV AAAACCTCCTCAAAATTGTTTGCGCCTATCCTGAATCTGCAGGTCTTGAAGACCATTTGC
F419W-CV AAAACCTCCTCAAAATTGTTTGCGCCCTATCCTGAATCTGCAGGTCTTGAAGACCATTTGC
CE
        A G A T T A T T A A G T C G G A G A T C A A T G A C T T T A A G C C A G C T C G T A T T G C A A T C G A C T C C C T C T
        A G A T T A T T A A G T C G G A G A T C A A T G A C T T T A A G C C A G C T C G T A T T G C A A T C G A C T C C C T C T
ΕV
        A G A T T A T T A A G T C G G A G A T C A A T G A C T T T A A G C C A G C T C G T A T T G C A A T C G A C T C C C T C T
        A G A T T A T T A A G T C G G A G A T C A A T G A C T T T A A G C C A G C T C G T A T T G C A A T C G A C T C C C T C T
F419W
       A GATTATTA A GT C G G A GAT C A A T G A C T T T A A G C C A G C T C G T A T T G C A A T C G A C T C C C T C T
       A GATTATTA A GT C G G A GAT C A A T G A C T T T A A G C C A G C T C G T A T T G C A A T C G A C T C C C T C T
F419W-EE A G A T T A T T A A G T C G G A G A T C A A T G A C T T T A A G C C A G C T C G T A T T G C A A T C G A C T C C C T C T
       A GATTATTA A GT C G G A GAT C A A T G A C T T T A A G C C A G C T C G T A T T G C A A T C G A C T C C C T C T
F419W-CV A GATTATTAAGTC G G A GAT C A A T G A C T T T A A G C C A G C T C G T A T T G C A A T C G A C T C C T C T
CE
        CTGCTTTGGCGCGGGGCGTTAGCAACAATGCCTTCCGCCAATTTGTAATTGGTGTCACTG
        C T G C T T T G G C G C G G G G C G T T A G C A A C A A T G C C T T C C G C C A A T T T G T A A T T G G T G T C A C T G
ΕV
       CTGCTTTGGCGCGGGGCGTTAGCAACAATGCCTTCCGCCAATTTGTAATTGGTGTCACTG
       C T G C T T T G G C G C G G G C G T T A G C A A C A A T G C C T T C C G C C A A T T T G T A A T T G G T G T C A C T G
F419W
        CTGCTTTGGCGCGGGGCGTTAGCAACAATGCCTTCCGCCAATTTGTAATTGGTGTCACTG
F419W-CE CTGCTTTGGCGCGGGGCGTTAGCAACAATGCCTTCCGCCAATTTGTAATTGGTGTCACTG
F419W-EE CTGCTTTGGCGCGGGGCGTTAGCAACAATGCCTTCCGCCAATTTGTAATTGGTGTCACTG
F419W-EV CTGCTTTGGCGCGGGGCGTTAGCAACAATGCCTTCCGCCAATTTGTAATTGGTGTCACTG
F419W-CV CTGCTTTGGCGGGGGGGTTAGCAACAATGCCTTCCGCCAATTTGTAATTGGTGTCACTG
CE
        GCT A C G C G A A A C A A G A A G A A A T C A C G G G A C T A T T C A C A A T A C C A G T G A T C A A T T T A T G G
       G C T A C G C G A A A C A A G A A A T C A C G G G A C T A T T C A C A A T A C C A G T G A T C A A T T T A T G G
        GCT A C GC GA A A C A A GA A GA A A T C A C G G G A C T A T T C A C A A T A C C A G T G A T C A A T T T A T G G
CV
        GCTACGCGAAACAAGAAGAATCACGGGACTATTCACAAATACCAGTGATCAATTTATGG
F419W
                                                                                       GGATGG
GGATGG
GGATGG
        G C T A C G C G A A A C A A G A A G A A A T C A C G G G A C T A T T C A C A A T A C C A G T G A T C A A
F419W-CE GCTACGCGAAACAAGAAGAATCACGGGACTATTCACAAATACCAGTGATCAA
F419W-EE GCTACGCGAAACAAGAAGAATCACGGGACTATTCACAAATACCAGTGATCAA
F419W-EV GCTACGCGAAACAAGAAGAATCACGGGACTATTCACAAATACCAGTGATCAA
EE
        GAGC GCATT CGATT A CT GACT C C CATAT C GAAGAGAT A C GGATAC GATTAT C T T GC T C C
       GAGCGCATT CGATTACT GACT CCCATAT C GAGGT GATTAC GGATAC GATTAT CTT GCT CC
cv
        GAGCGCATTCGATTACTGACTCCCATATC<mark>TGTGTG</mark>ATTACGGATACGATTATCTTGCTCC
       GAGCGCATTCGATTACTGACTCCCATATCTCAACAATTACGGATACGATTATCTTGCTCC
F419W-CE GAGCGCATTCGATTACTGACTCCCATATCTGTGAGATTACGGATACGATTATCTTGCTCC
F419W-EE GAGCGCATTCGATTACTGACTCCCATATCGAAGAGATTACGGATACGATTATCTTGCTCC
F419W-EV GAGCGCATTCGATTACTGACTCCCATATC<mark>GAGGTG</mark>ATTACGGATACGATTATCTTGCTCC
F419W-CV GAGCGCATTCGATTACTGACTCCCATATCTGTTGATTACGGATACGATTATCTTGCTCC
CE
        A A T A C G T C G A G A T T C G T G G C G A A T G T C C C G C G C C A T T A A C G T C T T C A A G A T G C G C G A T
        A A T A C G T C G A G A T T C G T G G C G A A T G T C C C G C G C C A T T A A C G T C T T C A A G A T G C G C G A T
       A A T A C G T C G A G A T T C G T G G C G A A A T G T C C C G C G C C A T T A A C G T C T T C A A G A T G C G C G G A T
        A A T A C G T C G A G A T T C G T G G C G A A T G T C C C G C G C C A T T A A C G T C T T C A A G A T G C G C G G A T
F419W
        A A T A C G T C G A G A T T C G T G G C G A A A T G T C C C G C G C C A T T A A C G T C T T C A A G A T G C G C G G A T
       A A T A C G T C G A G A T T C G T G G C G A A A T G T C C C G C G C C A T T A A C G T C T T C A A G A T G C G C G G A T
F419W-EE AATACGTCGAGATTCGTGGCGAAATGTCCCGCGCCATTAACGTCTTCAAGATGCGCGGAT
       A A T A C G T C G A G A T T C G T G G C G A A A T G T C C C G C G C C A T T A A C G T C T T C A A G A T G C G C G G A
F419W-CV AATACGTCGAGATTCGTGGCGAAATGTCCCGCGCCATTAACGTCTTCAAGATGCGCGGAT
CE
       CTTGGCATGACAAAGCAATCCGCgaattc
       CTTGGCATGACAAAGCAATCCGCgaatt
ΕV
       CTTGGCATGACAAAGCAATCCGCgaatt
        CTTGGCATGACAAAGCAATCCGCgaattc
F419W
       CTT GGCAT GACAAAGCAAT CCGC aatt c
       CTTGGCATGACAAAGCAATCCGCgaattc
F419W-EE CTTGGCATGACAAAGCAATCCGCaatta
F419W-CV CTTGGCATGACAAAGCAATCCGCgaatte
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Supplementary Figure S1. **The synthesized gene sequences.** Codons that correspond to W419 substitution and phospho-mimicking mutations are highlighted in red and yellow, respectively. Bases marked with lower case letters represent recognition sites.