

**TABLE S1. Oligonucleotide primers used in this study.**

Primer	Oligonucleotide sequence *
plsΔC740b-F	5'-CGCGGATCCGGGAACACCACCGGTTAGTTCAGAAAATTCAACAAC-3'
plsΔC740b-R	5'-GGCCGCTCGAGTCAGATTTCCAGGACTTGGTAACGTTAACAAGAC-3'
plsC740b-F	5'-GGGAATTCCATATGCTTAAGGCTATAAACGGCACCCTC-3'
plsC740b-R	5'-GGCCGCTCGAGTCATTACTCTTACCCTCTAATTCTTCTATGGC-3'
plsD55A-F	5'-GAATGGAAGGCTTTTACAGACGAGGGATTCGTGGATAC-3'
plsD55A-R	5'-GTCTGTAAAAACCTTCCATTCTATAATTTTCTGCGTCC-3'
plsD58A-F	5'-GATTTTACAGCCGAGGGATTCGTGGATACATCATTACAGC-3'
plsD58A-R	5'-GAATCCCTCGGCTGTGAAAATCCTTCCATTCTATAATTTTC-3'
plsE59A-F	5'-ACAGACCGGGGATTCGTGGATACATCATTACAGCTTTAG-3'
plsE59A-R	5'-ATCCACGAATCCCCTGTCTGTAAAATCCTTCCATTTC-3'
plsD55A/D58A-F	5'-GAAAATTATAGAATGGAAGGCAATTTACAGCAGAGGGATTCGTGG-3'
plsD55A/D58A-R	5'-CCACGAATCCCTCTGCTGTAAAATGCTTCCATTCTATAATTTTC-3'
plsD55A/E59A-F	5'-AAGGCTTTTACAGACCGGGGATTCGTGGATACATCATTTC-3'
plsD55A/E59A-R	5'-TCCCCTGTCTGTAAAATGCTTCCATTCTATAATTTTCC-3'
plsD58A/E59A-F	5'-GATTTTACAGCCCGGGGATTCGTGGATACATCATTACAGC-3'
plsD58A/E59A-R	5'-GAATCCCGCGCTGTGAAAATCCTTCCATTCTATAATTTTC-3'
plsD55A/D58A/E59A-F	5'-ACAGCCGGGGATTCGTGGATACATCATTACAGCTTTAG-3'
plsD55A/D58A/E59A-R	5'-ATCCACGAATCCCCTGCTGTAAAATGCTTCCATTTC-3'
plsD55N/D58N-F	5'-GAAAATTATAGAATGGAAGAAATTTTACAACGAGGGATTCGTGG-3'
plsD55N/D58N-R	5'-CCACGAATCCCTCGTTGTGAAAATCTTCCATTCTATAATTTTC-3'
plsD55N/D58N/E59Q-F	5'-ACAACAGGGATTCGTGGATACATCATTACAGCTTTAG-3'
plsD55N/D58N/E59Q-R	5'-ATCCACGAATCCCTGTTGTGAAAATCTTCCATTTC-3'
plsR276A-F	5'-ATGGCAATAAGAGTTCCTTAGGAGTGATGGACGGGGTAGC-3'
plsR276A-R	5'-CCTAAGAAGTCTATTGCCATTATTTGGGCACCTGGAGC-3'
plsD818A-F	5'-AATTCAGCTCTAGACTTGTACCTTTATGACAGTAAAG-3'
plsD818A-R	5'-GTACAAGTCTAGAGCTGAATTCGGAACACTTGGGTTG-3'
plsD820A-F	5'-AATTCAGATCTAGCTTGTACCTTTATGACAGTAAAG-3'
plsD820A-R	5'-GTACAAGCTAGATCTGAATTCGGAACACTTGGGTTG-3'
plsE842A-F	5'-GCAGAAGAAGCAGTTGTAGTTGAGTATCCTAAGCCTG-3'
plsE842A-R	5'-TACAACCTCTTCTTCTGCTGTTGGGTTCCATCTAAG-3'
plsD818A/D820A-F	5'-AATTCAGCACTAGCAATTGTACCTTTATGACAGTAAAG-3'
plsD818A/D820A-R	5'-GTACAATGCTAGTCTGAATTCGGAACACTTGGGTTGCC-3'
plsD818N-F	5'-AATTCACAATCTAGACTTGTACCTTTATGACAGTAAAG-3'
plsD818N-R	5'-GTACAAGTCTAGATTTGAATTCGGAACACTTGGGTTGCC-3'
plsD820N-F	5'-AATTCAGATCTAACTTGTACCTTTATGACAGTAAAG-3'
plsD820N-R	5'-GTACAAGTTTAGATCTGAATTCGGAACACTTGGGTTGCC-3'
plsE842Q-F	5'-GCAGAAGAAAGAGTTGTAGTTGAGTATCCTAAGCCTG-3'
plsE842Q-R	5'-TACAACCTGTTCTTCTGCTGTTGGGTTCCATCTAAG-3'
plsD818N/D820N-F	5'-AATTCACAATCTAACTTGTACCTTTATGACAGTAAAG-3'
plsD818N/D820N-R	5'-GTACAAGTTTAGATTTGAATTCGGAACACTTGGGTTGCC-3'

\* Underlined sequences indicate the restriction enzyme sites used in this study. Boxes indicate the

mutated nucleotides.

**TABLE S2. Primer pairs, template and restriction enzyme sites used in the construction of expression plasmids.**

Expression plasmid	Primer pair	Template	Restriction enzyme site
pET26b- <i>pls</i> ΔC740b	plsΔC740b-F+plsΔC740b-R	pET26b- <i>pls</i>	<i>Bam</i> HI- <i>Xho</i> I
pET26b- <i>pls</i> C740b	plsC740b-F+plsC740b-R	pET26b- <i>pls</i>	<i>Nde</i> I- <i>Xho</i> I
pET26b- <i>pls</i> D55A	plsD55A-F+plsD55A-R	pET26b- <i>pls</i>	-
pET26b- <i>pls</i> D58A	plsD58A-F+ plsD58A-R	pET26b- <i>pls</i>	-
pET26b- <i>pls</i> E59A	plsE59A-F+plsE59A-R	pET26b- <i>pls</i>	-
pET26b- <i>pls</i> D55A/D58A	plsD55A/D58A-F+ plsD55A/D58A-R	pET26b- <i>pls</i>	-
pET26b- <i>pls</i> D55A/E59A	plsD55A/E59A-F+ plsD55A/E59A-R	pET26b- <i>pls</i>	-
pET26b- <i>pls</i> D58A/E59A	plsD58A/E59A-F+ plsD58A/E59A-R	pET26b- <i>pls</i>	-
pET26b- <i>pls</i> D55A/D58A/E59A	plsD55A/D58A/E59A-F+ plsD55A/D58A/E59A-R	pET26b- <i>pls</i> D55A	-
pET26b- <i>pls</i> D55N/D58N	plsD55N/D58N-F+ plsD55N/D58N-R	pET26b- <i>pls</i>	-
pET26b- <i>pls</i> D55N/D58N/E59Q	plsD55N/D58N/E59Q-F+ plsD55N/D58N/E59Q-R	pET26b- <i>pls</i> D55N/D58N	-
pET26b- <i>pls</i> R276A	plsR276A-F+plsR276A-R	pET26b- <i>pls</i>	-
pET26b- <i>pls</i> D818A	plsD818A-F+plsD818A-R	pET26b- <i>pls</i>	-
pET26b- <i>pls</i> D820A	plsD820A-F+plsD820A-R	pET26b- <i>pls</i>	-
pET26b- <i>pls</i> E842A	plsE842A-F+plsE842A-R	pET26b- <i>pls</i>	-
pET26b- <i>pls</i> D818A/D820A	plsD818A/D820A-F+ plsD818A/D820A-R	pET26b- <i>pls</i>	-
pET26b- <i>pls</i> D818A/D820A/E842A	PlsD818A/D820A-F+ plsD818A/D820A-R	pET26b- <i>pls</i> E842A	-
pET26b- <i>pls</i> D818N	plsD818N-F+plsD818N-R	pET26b- <i>pls</i>	-
pET26b- <i>pls</i> D820N	plsD820N-F+plsD820N-R	pET26b- <i>pls</i>	-
pET26b- <i>pls</i> E842Q	plsE842Q-F+plsE842Q-R	pET26b- <i>pls</i>	-
pET26b- <i>pls</i> D818N/D820N	plsD818N/D820N-F+ plsD818N/D820N-R	pET26b- <i>pls</i>	-
pET26b- <i>pls</i> D818N/D820N/E842Q	plsD818N/D820N-F+ plsD818N/D820N-R	pET26b- <i>pls</i> E842Q	-