

Table 1: Histidyl-tRNA Anticodon (3'-GUQ-5') (Mis)Matching with Various Codons at Position $\alpha 45$ of Luciferase along with Their Specific Activities (\pm Standard Deviation) and Error Frequencies^d

codon/ anticodon mismatching	SA \pm SD (light units/ μ g of luciferase)	error frequency $SA_{\text{mutant}}/SA_{\text{wild-type}}$
histidine 5'-CAC-3'	7790 \pm 1420	
5'-CAU-3'		
glutamine 5'-CAG-3'	37 \pm 12	4.1×10^{-3} ^a
proline 5'-CcU-3'	1.06 \pm 0.19	1.4×10^{-4} ^c
leucine 5'-CuC-3'	0.015 \pm 0.004	2.9×10^{-6} ^b
leucine 5'-CuU-3'	0.010 \pm 0.005	1.3×10^{-6}
aspartic acid 5'-gAC-3'	1.48 \pm 0.27	2.0×10^{-4} ^a
tyrosine 5'-uAC-3'	0.050 \pm 0.009	6.6×10^{-6} ^c
leucine 5'-Cug-3'	0.00070 \pm 0.00030	9.0×10^{-8}
lysine 5'-aAa-3'	0.167 \pm 0.030	2.2×10^{-5} ^a
arginine 5'-aga-3'	1.22 \pm 0.22	1.6×10^{-4} ^c
leucine 5'-uug-3'	0.00012 \pm 0.0006	1.5×10^{-8}
alanine 5'-gcc-3'	0.0040 \pm 0.0007	5.3×10^{-7} ^a

^a Average results from Xin et al. (40) and Li et al. (41) for purified luciferase mutants, which differ on average by 61%. ^b Average results from the present work and Li et al. (41), which differ on average by 61%. ^c Results from Li et al. (41) for purified luciferase mutant protein. ^d Lowercase nucleic acid bases indicate a mismatch with the histidyl-tRNA anticodon. All measurements were made at least in triplicate.