

M G S S H H H H H H S S G L V P ↓ R G S H M
 ATGGGCAGCAGCCATCATCATCATCACAGCAGCGGCTGGTGCCGCGCGGCAGCCATATG

Protein A T C D A L S F Q S K W I T I N H S A C A I H C I A K G Y K
 Original 1 GCCACTTGCAGCAGCACTCAGCTTCCAATCCAAGTGGATCACCATAAACCACTCAGCATGCGCCATCCACTGCATCGCCAAAGGATACAAG
 Optimized GCCACCTGCGATGCCCTGAGTTTTCAGAGCAAATGGATTACCATTAAATCATAGTGCATGCGCAATTCATTGCATTGCCAAAGGTTATAAA

Protein G G Q C K N T V C H C R K G G G G S G G G G S G G G G S A T
 Original 91 GGTGGTCAATGTAAGAACACTGTCTGTCACTGCAGGAAGGGCGGCGGTGGTAGCGGCGGCGGTGGTAGCGGCGGCGGTGGTAGCGCCACT
 Optimized GGCGGTCAGTGCAAAATACCGTGTGTCAATTGCCGCAAGGCCGCGGTGGTAGCGGCGGCGGTGGTAGCGGCGGCGGTGGTAGCCACC

Protein C D A L S F Q S K W I T I N H S A C A I H C I A K G Y K G G
 Original 181 TGCAGCAGCACTCAGCTTCCAATCCAAGTGGATCACCATAAACCACTCAGCATGCGCCATCCACTGCATCGCCAAAGGATACAAGGGTGGT
 Optimized TCGATGCCCTGAGTTTTCAGAGCAAATGGATTACCATTAAATCATAGTGCATGCGCAATTCATTGCATTGCCAAAGGTTATAAGCGGT

Protein Q C K N T V C H C R K G G G G S G G G G S G G G G S A T C D
 Original 271 CAATGTAAGAACACTGTCTGTCACTGCAGGAAGGGCGGCGGTGGTAGCGGCGGCGGTGGTAGCGGCGGCGGTGGTAGCGCCACTTGCAGAC
 Optimized CAGTGCAAAATACCGTGTGTCAATTGCCGCAAGGCCGCGGTGGTAGCGGCGGCGGTGGTAGCGGCGGCGGTGGTAGCCACCTGCCGAT

Protein A L S F Q S K W I T I N H S A C A I H C I A K G Y K G G Q C
 Original 361 GCACTCAGCTTCCAATCCAAGTGGATCACCATAAACCACTCAGCATGCGCCATCCACTGCATCGCCAAAGGATACAAGGGTGGTCAATGT
 Optimized GCCCTGAGTTTTCAGAGCAAATGGATTACCATTAAATCATAGTGCATGCGCAATTCATTGCATTGCCAAAGGTTATAAGGCCGCTCAGTGC

Protein K N T V C H C R K *
 Original 451 AAGAACACTGTCTGTCACTGCAGGAAGTAG
 Optimized AAAAAACCGTGTGTCAATTGCCGCAATAACTCGAG

Figure S1. The optimized sequence of *CcDef2*. The box indicates the 6×His tag. The thrombin site is shaded and the red arrow represents the cleavage site. Mutated nucleotides are shown in red and linkers in blue. Restriction endonuclease sites (*Nde* I and *Xho* I) are indicated using underlines and the asterisk denotes the stop codon.