

Table S1. **List of the oligonucleotide primers used for site-directed mutagenesis.** Red color indicates the introduced mutant nucleotide. F – forward primer, r – reverse primer.

Substitution	Oligo sequence
D113A	D113A-f: 5'-aacttcgttttggtgctgCttggaatgcttcgggag-3'
	D113A-r: 5'-ctcccgaagcattccaaGcagcaccaaaacgaagtt-3'
N115A	N115A-f: 5'-cgtttggtgctgattggGCTgcttcgggagactatcac-3'
	N115A-r: 5'-gtgatatgtctccgaagcaGCCaatcagcaccaaaacg-3'
N115D	N115D-f: 5'-cgtttggtgctgattggGatgcttcgggagactatcac-3'
	N115D-r: 5'-gtgatatgtctccgaagcatCccaatcagcaccaaaacg-3'
S117A	S117A-f: 5'-gggtgctgattggaatgctGcgggagactatcacgatga-3'
	S117A-r: 5'-tcatagtgatagtctccgCagcattccaatcagcacc-3'
D122A	D122A-f: 5'-gcttcgggagactatcacgCtgaaataaaacgtggtacctatg-3'
	D122A-r: 5'-cataggtaccacgttttattcaGcgtgatagtctccgaagc-3'
E123A	E123A-f: 5'-cttcgggagactatcacgatgCaataaaacgtggtacctatgatgg-3'
	E123A-r: 5'-ccatcataggtaccacgttttattGcatcgtgatagtctccgaag-3'
D130A	D130A-f: 5'-gaaataaaacgtggtacctatgCtggcggatcatgtcgaac-3'
	D130A-r: 5'-gttcgacatgaccgccaGcataggtaccacgttttattc-3'
S117A/D122A	S117A/D122A-f: 5'-gctGcgggagactatcacgCtgaaataaaacgtggtacctatg-3'
	S117A/D122A-r: 5'-cataggtaccacgttttattcaGcgtgatagtctccgCagc-3'
S117A/E123A	S117A/E123A-f: 5'-ctGcgggagactatcacgatgCaataaaacgtggtacctatgatgg-3'
	S117A/E123A-r: 5'-ccatcataggtaccacgttttattGcatcgtgatagtctccgCag-3'

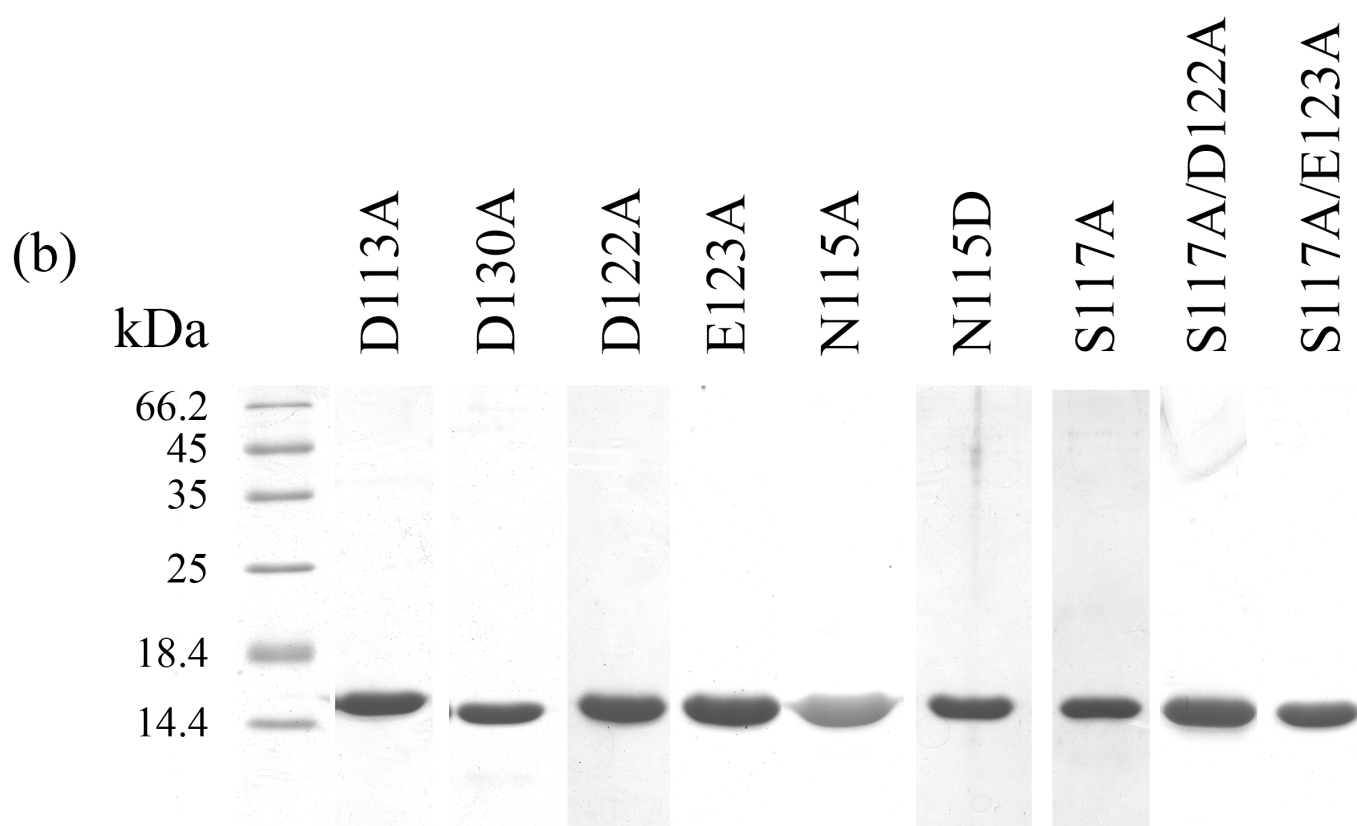
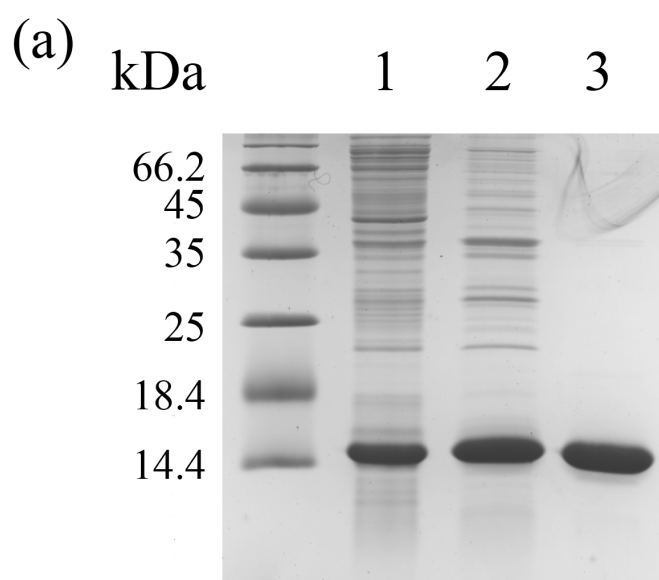


Fig. 1S

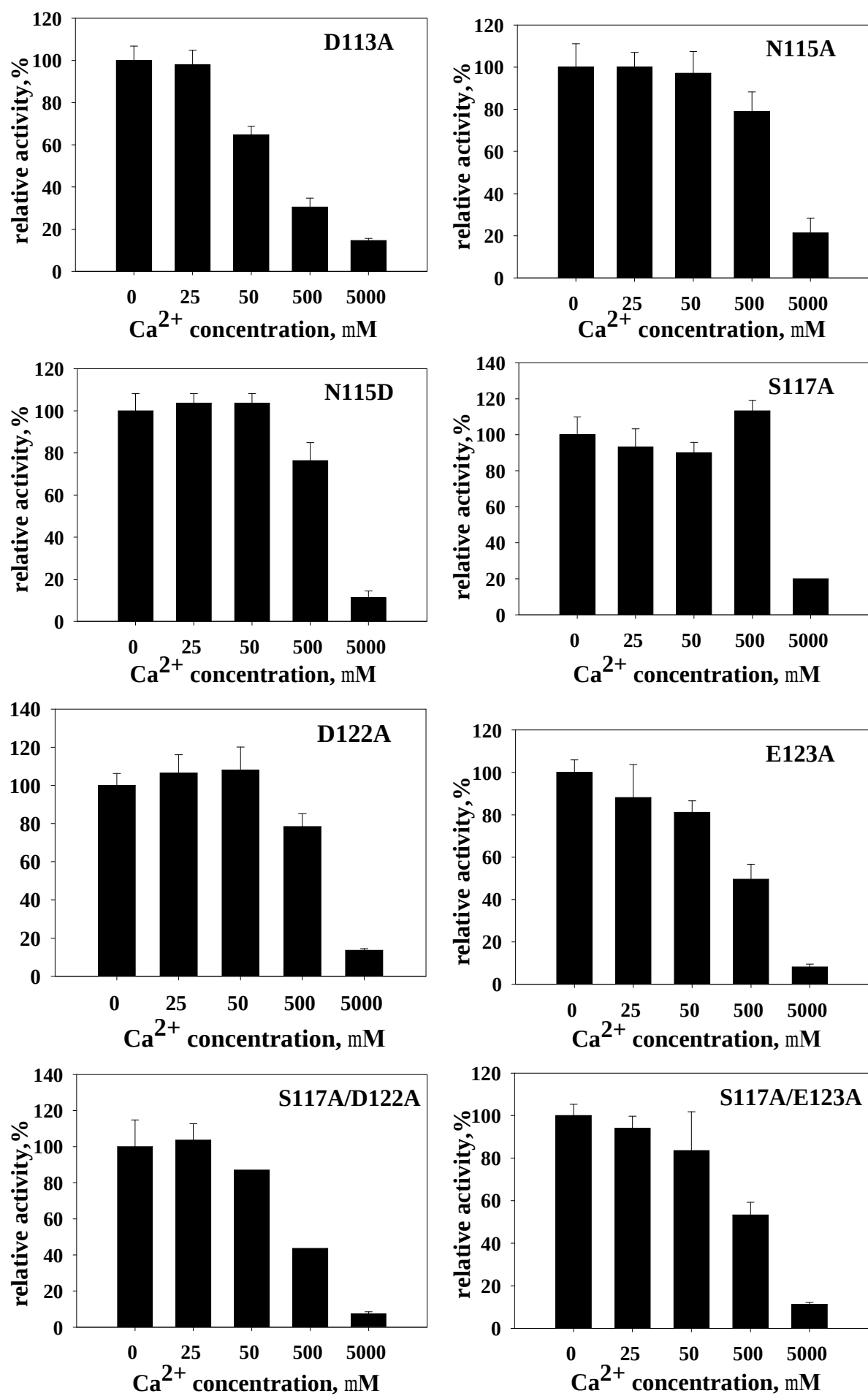


Fig. S2.

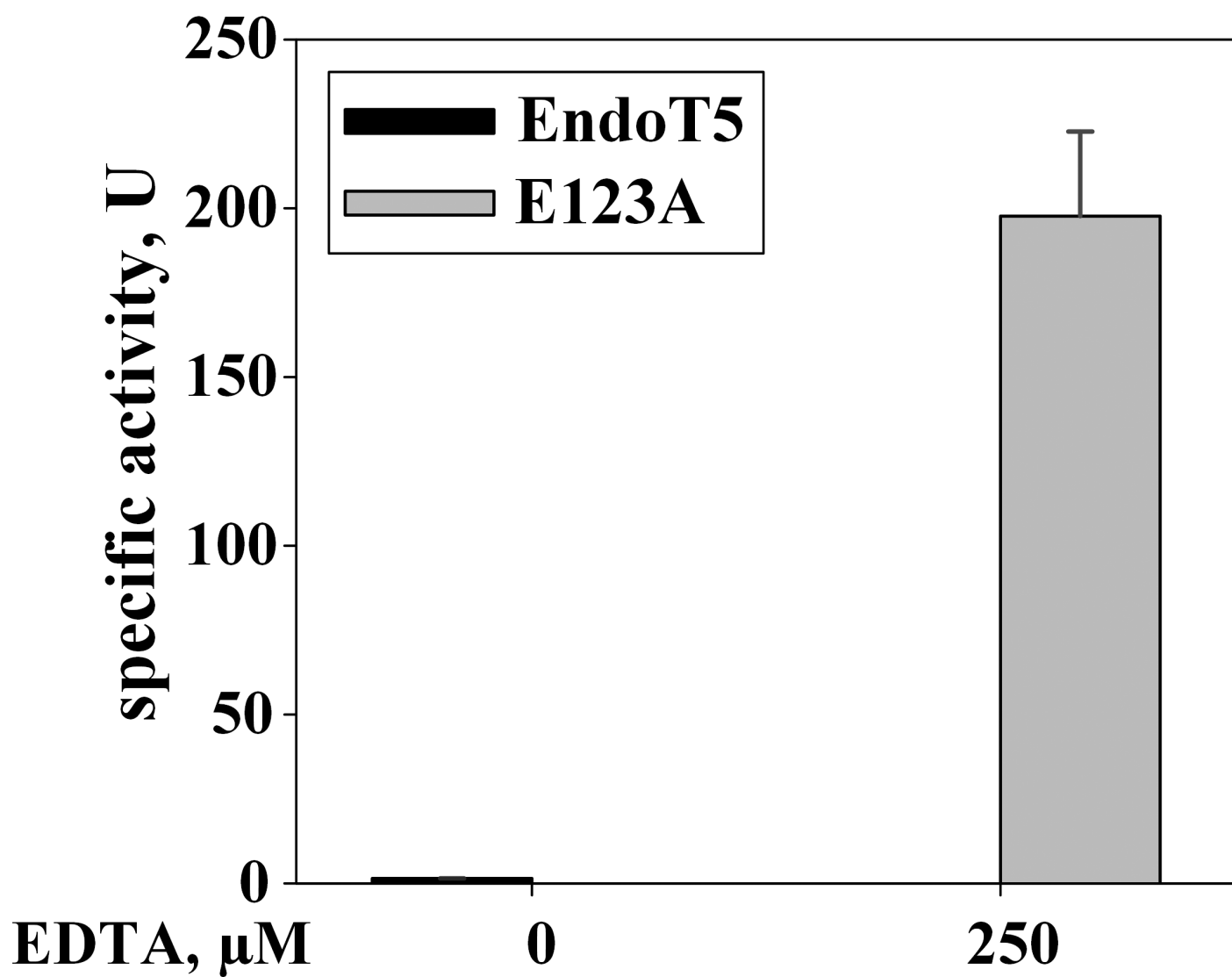


Fig. S3