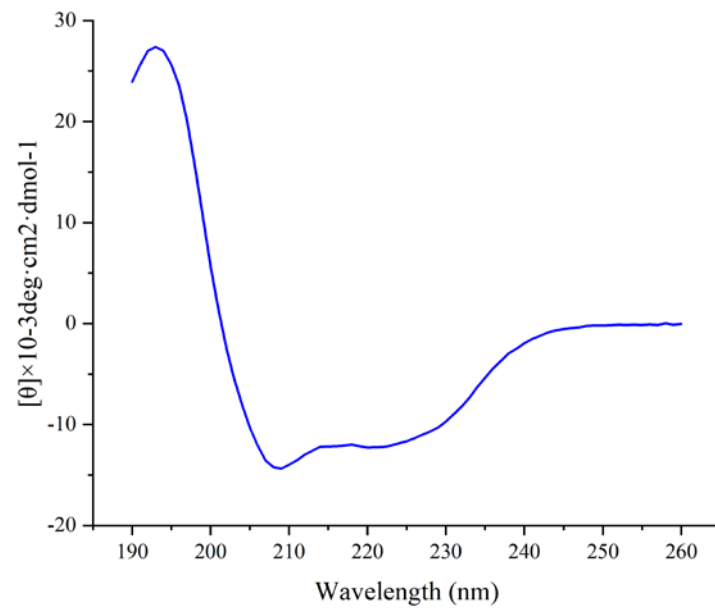
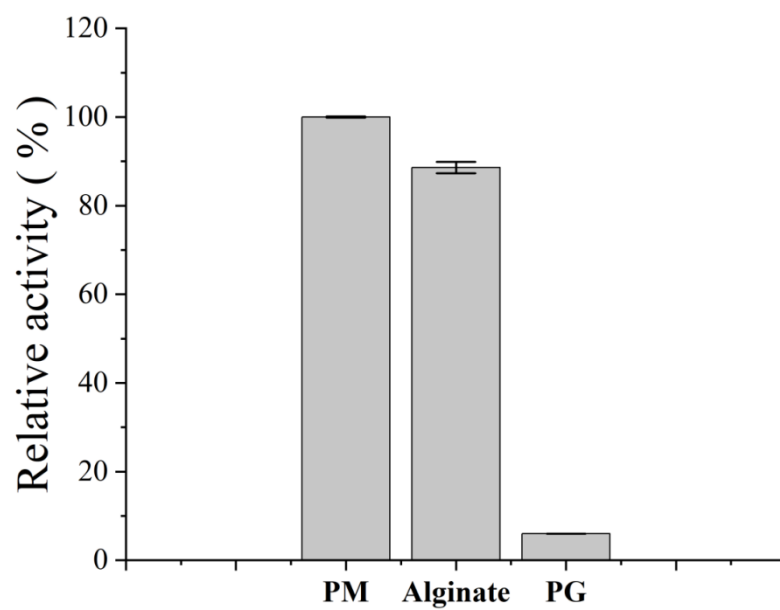


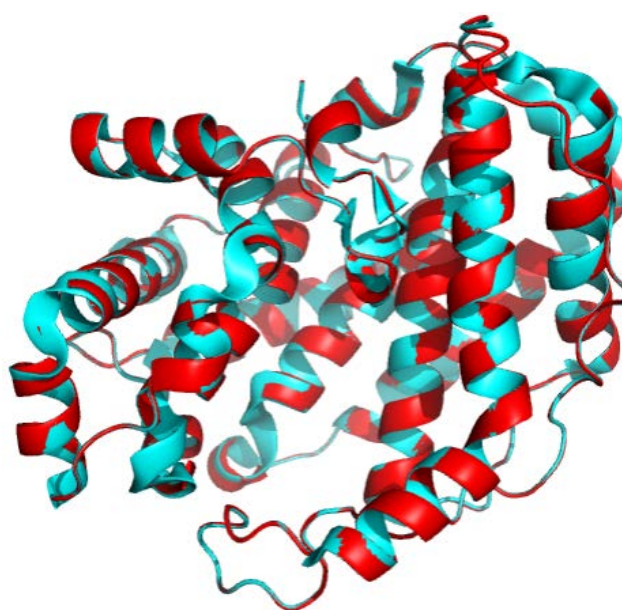
**Figure S1.** SDS-PAGE (12.5%, w/v) gel showing purified PMD and its mutants. Lane M, molecular weight marker; lane 1, purified PMD; lane 2, purified K58A; lane 3, R66A; lane 4, R78A; lane 5, K89A; lane 6, Y248A; lane 7, K313A; lane 8, R344A.



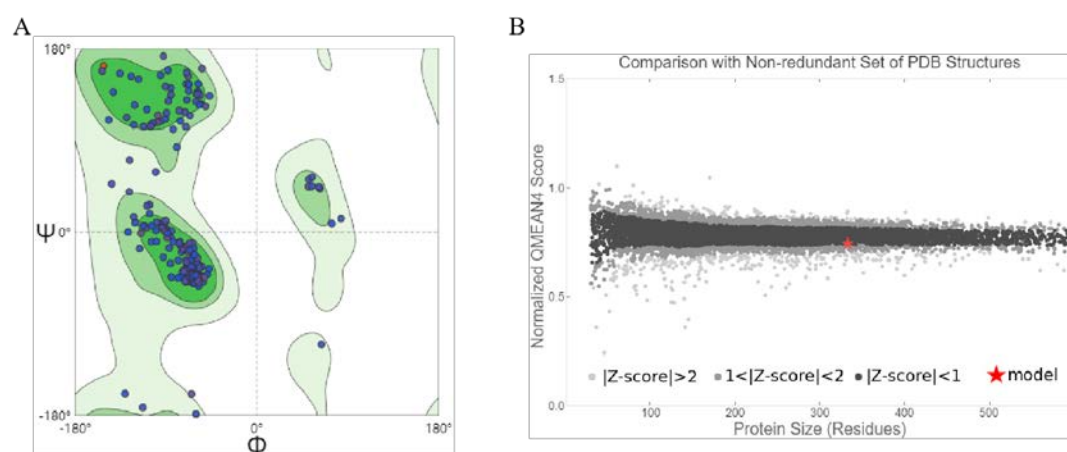
**Figure S2.** Circular Dichroism (CD) Spectra of PMD.



**Figure S3.** Relative activities of PMD towards PM, sodium alginate and PG (maximum activity was identified as 100%).



**Figure S4.** The superposition of the model built and the template. (the model built colored in red and the template colored in cyan)



**Figure S5.** Quality assessment of PMD homology model. (A) Ramachandran Plots of homology model. (B) Quality comparison of homology model

Composition	Helix	Antiparallel	Parallel	Beta-Turn	Random	Total
Proportion (%)	85.3	0.2	1.7	8.7	4.4	100.3

**Table S1.** The percentage of secondary structures calculated from the circular dichroism