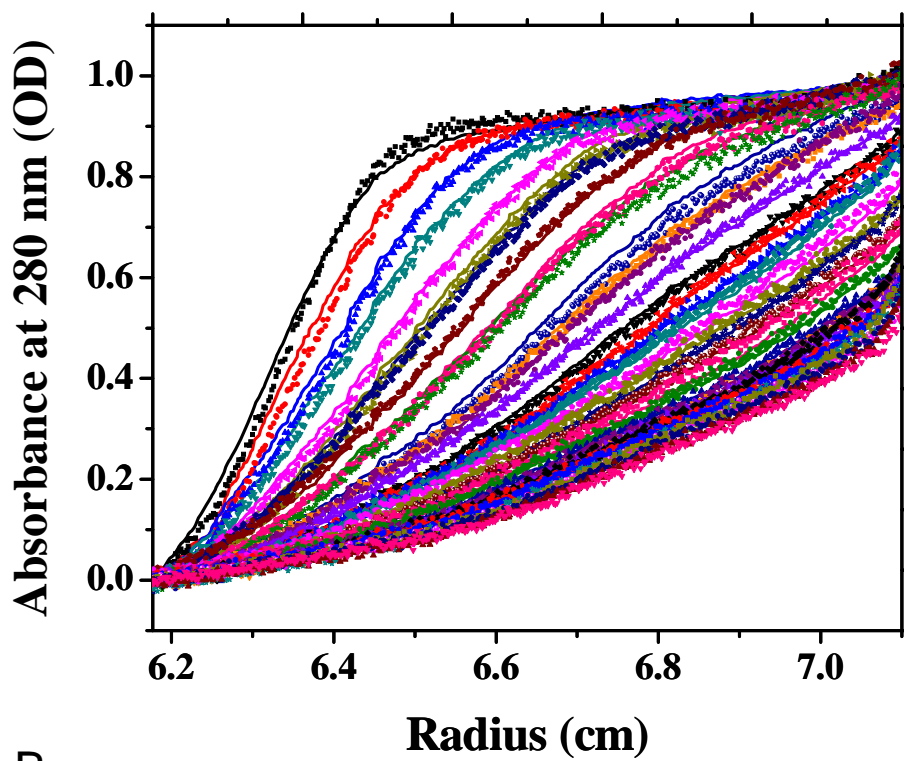
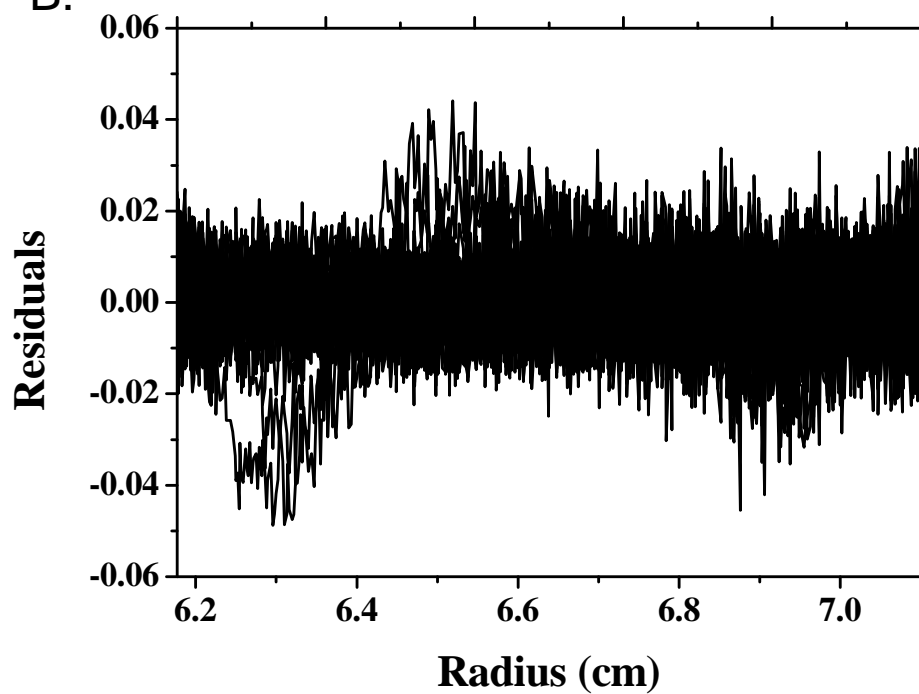


Figure S1

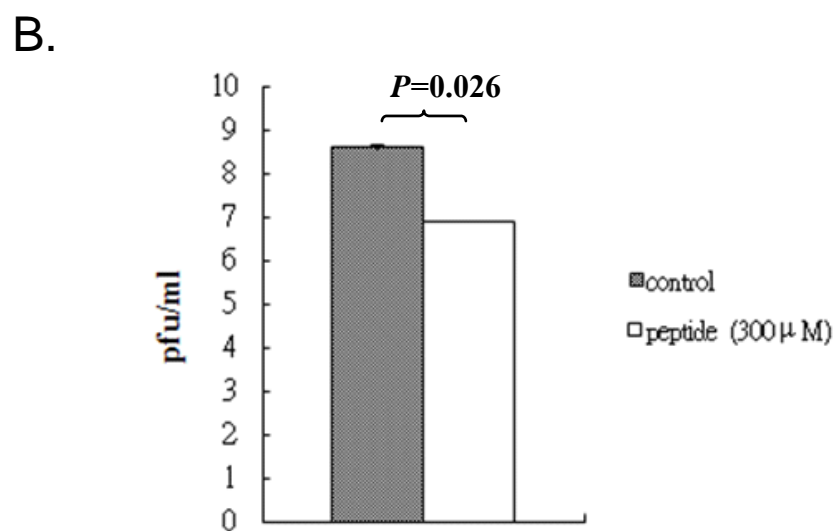
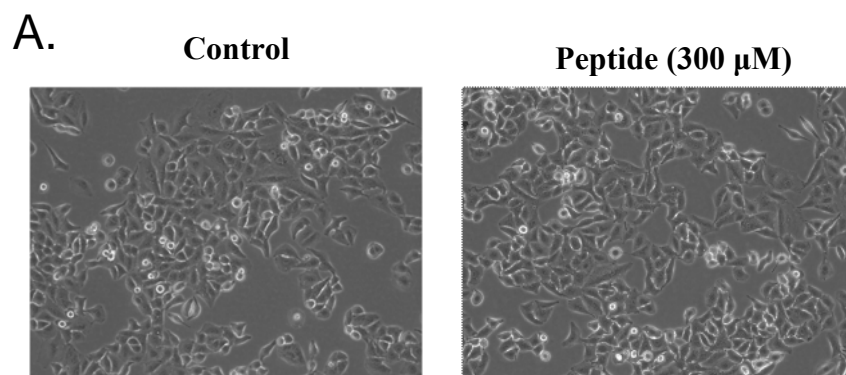
A.



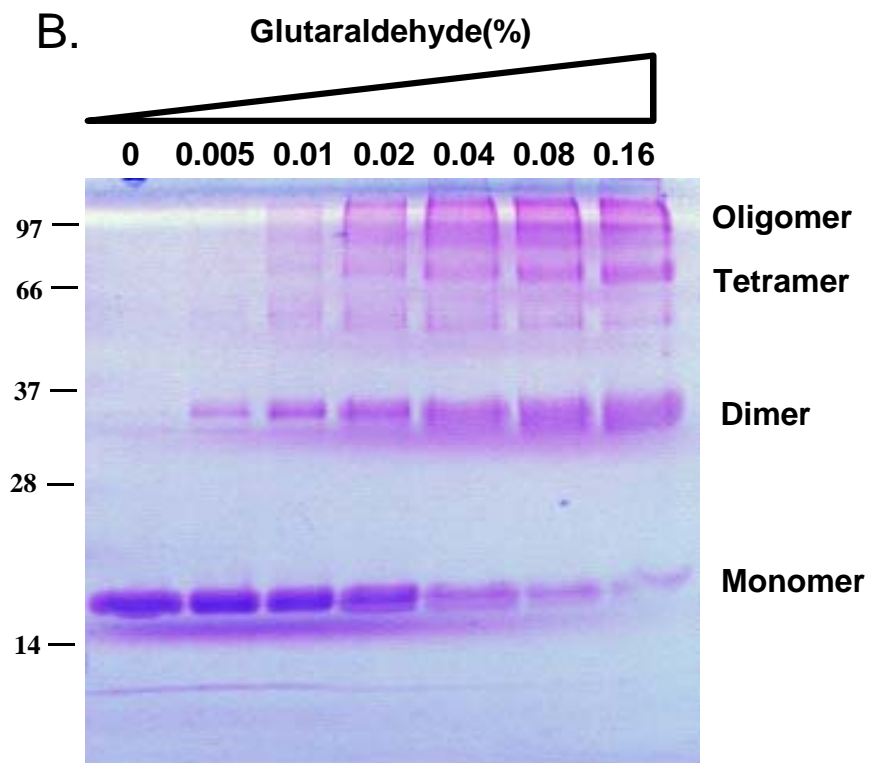
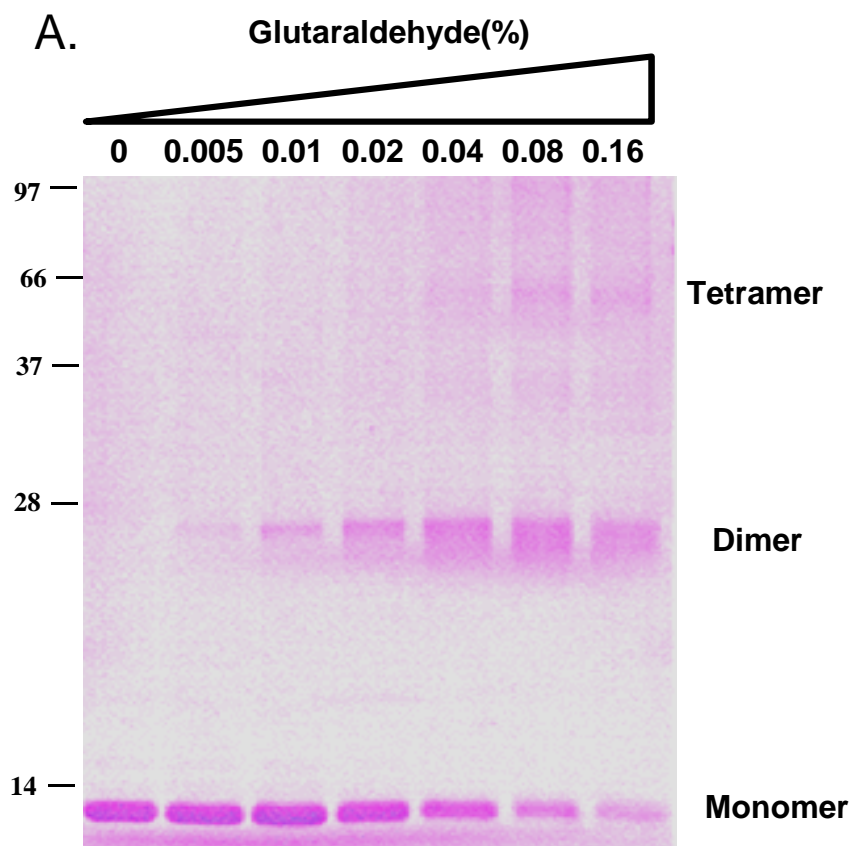
B.



## Figure S2



**Figure S3**



## Figure S4

OrigSeq	245	EKPRWKRPNDVTSNVTQCFGPRDLDFHFGSAGVVANGVKAKGYPQFAELVPS	298
Jnet	245	-----E-----EEEE-----HHHHHHH-----HHHH-----	298
jhmm	245	-----EEEE-----HHHHHHH-----HHHH-----	298
jpssm	245	-----E-----EEEE-----HHHHHHH-----HEHH-----	298
FI-Pred	245	-----HHHH-----HHHH-----	298
Porter	245	---H-----HHHH-----HHHH-----HHHH-----	298
APSSP2	245	-----HHHH-----HHHH-----E-----	298
PROF	245	-----EEEE-----HHHH-----HHHE-----	298
OrigSeq	299	TAAMLFDSHIVSKESGNTVVLTFTRVTVPKDHPHLGKFLLEELNAFTREMQQHP	354
Jnet	299	HHHH-----EEEEEEEEEEEE-----HHHHHHHHHH-----	354
jhmm	299	HHHH-----EEEEEEEEEEEE-----HHHHHHHHHH-----	354
jpssm	299	HHHH-----EEEEEEEEEEEE-----HHHHHHHHHH-H-----	354
FI-Pred	299	--EEEE--EEE-----EEEEEEEEEEEE-----HHHHHHHHHHHH-----	354
Porter	299	HHHH--EEEE-----EEEEEEEEEEEE-----HHHHHHHH-----	354
APSSP2	299	HHHH--E-EEEE-----EEEEEEEEEEEE-----HHHHHHHHHHHH-----	354
PROF	299	-EEEE--EEE-----EEEEEEEEEEEE-----HHHHHHHHHH-----	354
OrigSeq	355	LLNPSALEFNPSQTSPATAEVRDEVS IETDI IDEVN	389
Jnet	355	-----EEEE-----	389
jhmm	355	-----EEEE-----	389
jpssm	355	-----EEEE-----	389
FI-Pred	355	-----EEEE-----	389
Porter	355	-----HHH-----EEEE-----	389
APSSP2	355	-----E-EEEE-----	389
PROF	355	-----EEEE-----	389

Figure S5

```
229E 245 QKPRWKRQPNDDYTSNYTQCFGPRDLH---NFGSAGVYVANGYKAKGYPPQ 291
OC43 NKPRQKRSPNKQC--TVQQCFGKRGPNQ---NFGGGEMLKLGTSDPQFPI
SARS KKPRQKRTATKQY--NYTQAFGRRGPEQTQGNFGDQDLIRQGTDYKQWPQ
IBV HRRYCKRTIPPNY--RYDQYFGPRTKGK-EGNFGDDKHNEEGIKDGRVTA

229E 292 FAELVPSTAAMLFDSHIYS-----KESGNTVYVLTFTTRYTVPKD 330
OC43 LAELAPTAGAFFFGSRLELAKYQNLSGNPDEPQKDYYELRYNGAIRFDST
SARS IAQFAPSASAFFGMSRIGM-----EYTPSGTALTYHGAIKLDDK
IBV MLNLVPSSHAFLFGSRVTP-----KLQLDGLHLRFEFTTVYPCD

229E 331 HPHLGKFLEELNAFTREMQQHPLLNP SALEFNPSQTSPATAEPYRDEVSI 380
OC43 LSGFETIMKYLVNENLNAYQQQDGMNMSPKPQR-QR--GHKNGQGENDNI
SARS DPQFKDNVILLNKHIDAYKTFPPTEPKKDKKKKTD--AQPLPQRQKKQP
IBV DPQFDNYVKICDQCVDGVGTRPKDDEPKPKSRSSSRPATRGNSPAPRQR

229E 381 ETDIIDEVN 389
OC43 SVAYPKSRVQQNKSRELTAEDISLLKKMDEPYTEDTSEI
SARS TYTLLPADMDDFSRLQNSMSGASADSTQA
IBV PKKEKLLKKQDDEADKALTSDEERNNAQLEFYDEPKVINWGDAAALGENEL
```

# Figure S6

