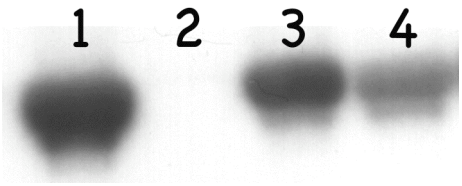
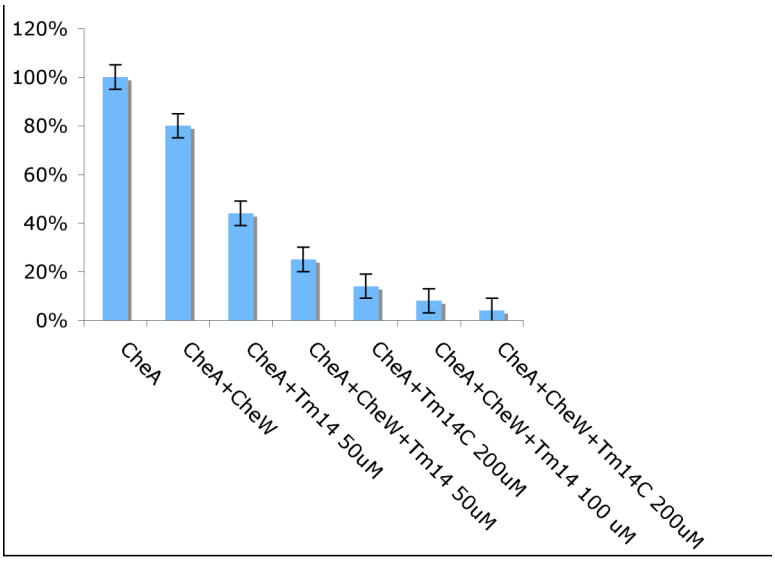
Supplemental Fig. 1 The affect of Tm14 on CheA activity.

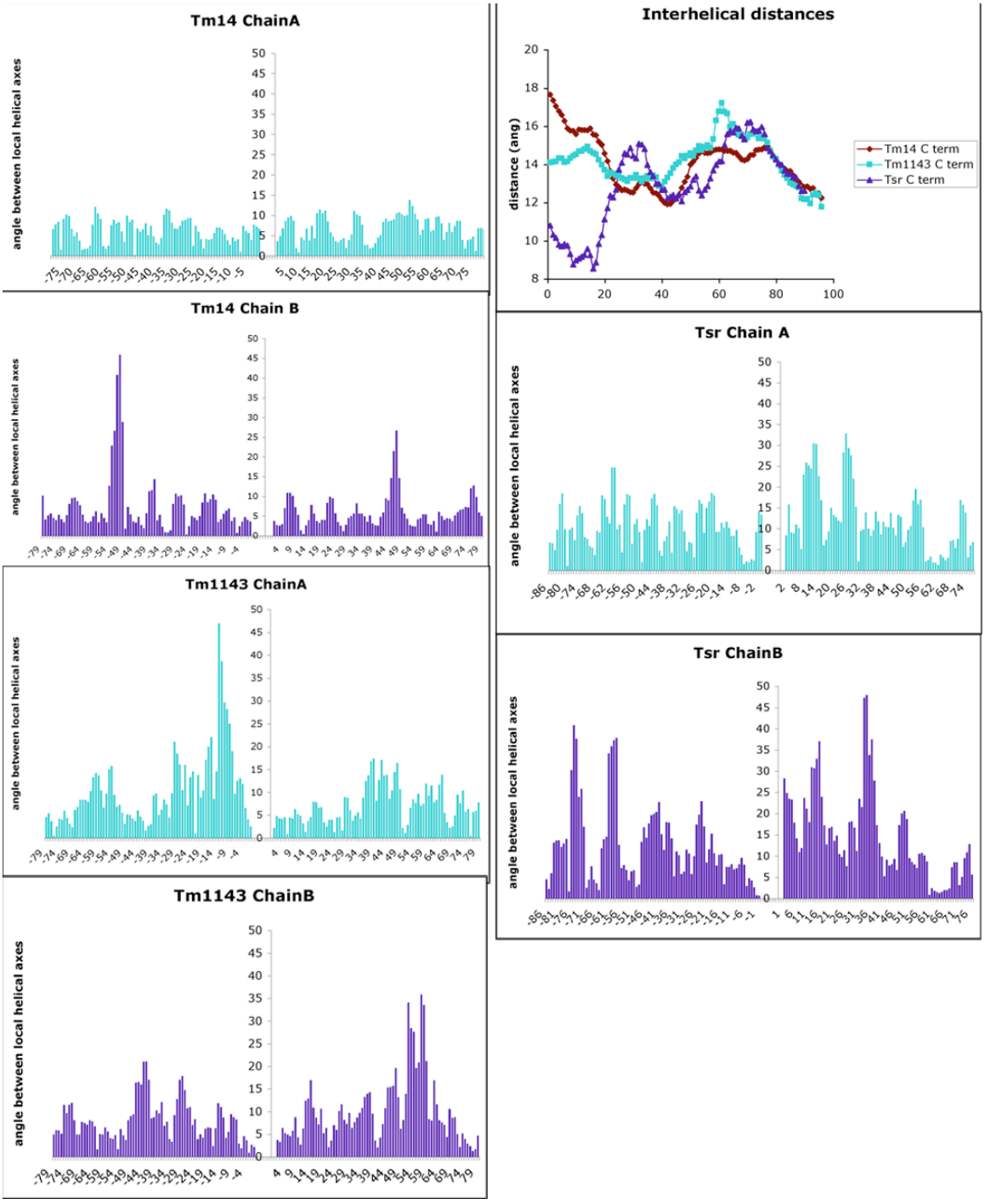


A) Full-length Tm14 inhibits *T. maritima* CheA autophosphorylation activity. Autoradiogram of SDS-Page Gel containing CheA after 2 minutes of autophosphorylation with ATP/AT^{32}P (100 μM) at 25° C. Lane 1: CheA 12 μM and CheW 19 μM. Lane 2: CheW 19 μM and Tm14 50 μM. Lane 3: CheA 12 μM and Tm14 50 μM. Lane 4: CheA 12 μM, CheW 19 μM, and Tm14 50 μM.

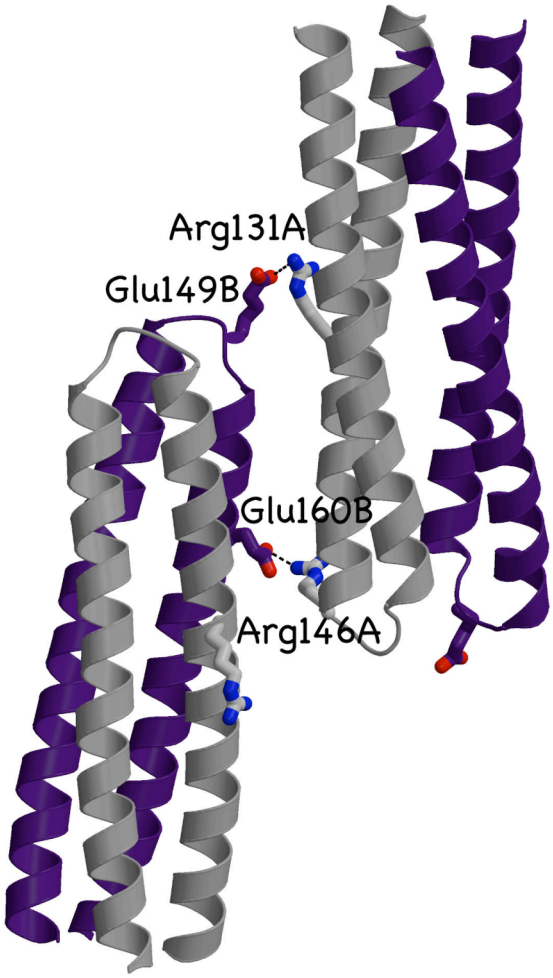


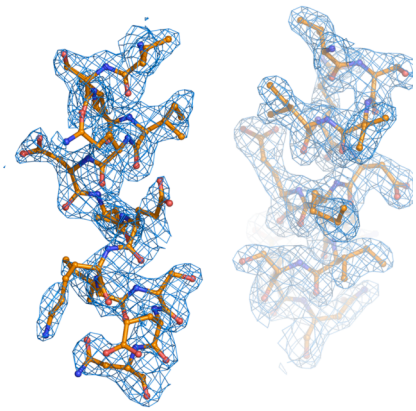
B) CheA auto phosphorylation activity with full length Tm14 and $Tm14_C$. Both the full length Tm14 and the truncated Tm14 inhibit CheA. The degree of inhibition increases in the presence of CheW.

Supplemental Fig. 2 Structural parameters for receptor signaling domains.
Structural parameters of the three receptor structures as analyzed by HELANAL. These parameters further illustrate the asymmetry between the two subunits in Tm14 as compared to Tm1143 and Tsr.



Supplemental Fig. 3 Head-to-tail crystal packing interactions of Tm14 within the crystal lattice. Strictly conserved residues Arg146 , Glu149, and Glu160 are involved in salt bridges to an adjacent dimer in the crystal lattice. These salt bridges bring the signaling tips of the receptors close together.





Supplemental Fig. 4 2.2 Å resolution 2Fo-Fc electron density map of the bulge region of Tm14. Contours are shown at 1.5 σ.