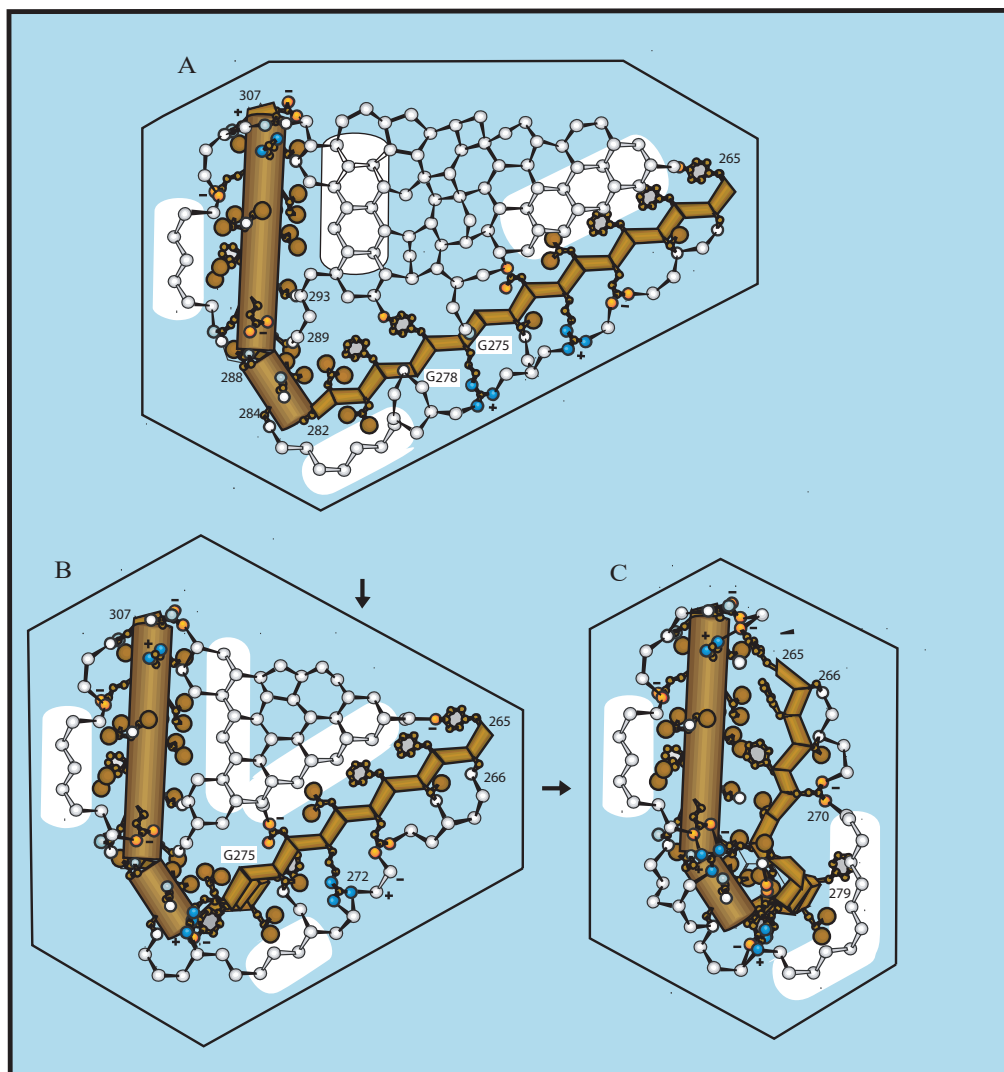


VIII - Hydration-Directed Assembly

Just as the polypeptide chain has two strategically-positioned prolines to produce bends in proper spatial locations, the continuing chain has two glycines at positions 278 and 275 which initiate beta-turns and permit the hydrophobic surface of the leucine at 272 and two phenylalanines to displace linearly-ordered water on the right side of the coil and form a more stable assembly.



By initiating a beta-turn, glycine 278 permits the chain to move upward and bring the cationic side-chain of arginine 276 close enough to the anionic phenolic-oxygen of tyrosine 277 to be coupled by a single water molecule as shown in B. Then, by forming a second beta-turn at glycine 275, the chain moves back down to permit the complimentary hydrophobic surfaces on the coil and the linear segment to form a tight, dehydrated, thermodynamically-stable union.

As polypeptide folding and assembly continues, the same strategic placement of hydration ordering and disordering peptides in the chain guide it into its final structural form and direct its enzymatic function. For a continuation of the role of surface water in assembly and function of this enzyme and three other proteins, check out www.linearwater.com.