



Figure S1. X-ray structures demonstrate roles of tryptophans in stabilizing protein folding and protein-ligand interactions. **A**, Extracellular view at the x-ray structure of KvAP (PDB code 1orq). P-helix tryptophans Wp51 and Wp52, which are conserved in potassium channels, are involved in inter-subunit and intra-subunit H-bonds, respectively. **B**, Periplasmic ligand-binding protein ProX from *E. coli* complexes with betaine (PDB code 1r9l). Three tryptophans form an "aromatic box" that accommodates the ligand's trimethylammonium group. **C**, Complex of morphine antibody with morphine (PDB code 1qoy). The ligand ammonium bond binds in the ring formed by three tryptophans. The fourth tryptophan (on the bottom of the panel) has a closest to the ligand atom, which is 5.16 Å from the ligand ammonium nitrogen..