

Supplementary Materials

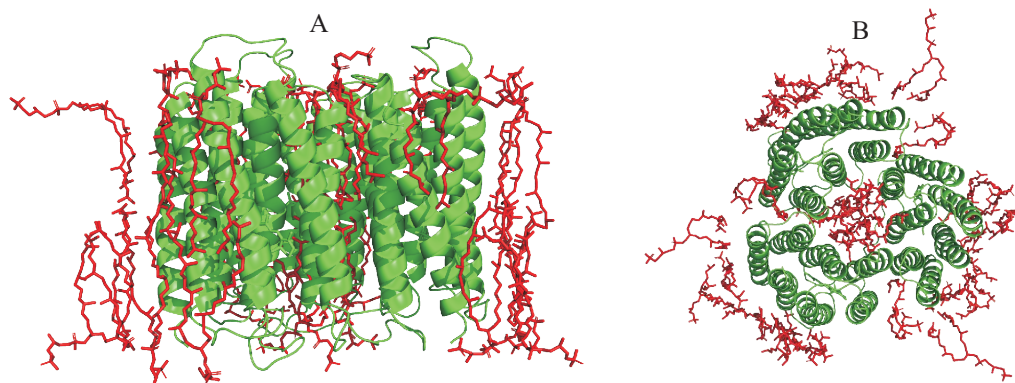


Figure S1. An example membrane protein structure (PDB ID: 2BRD) showing that most ligands (lipids here, in red sticks) are far away from the protein structure (in green cartoons). (A) and (B) are the front and top views, respectively.

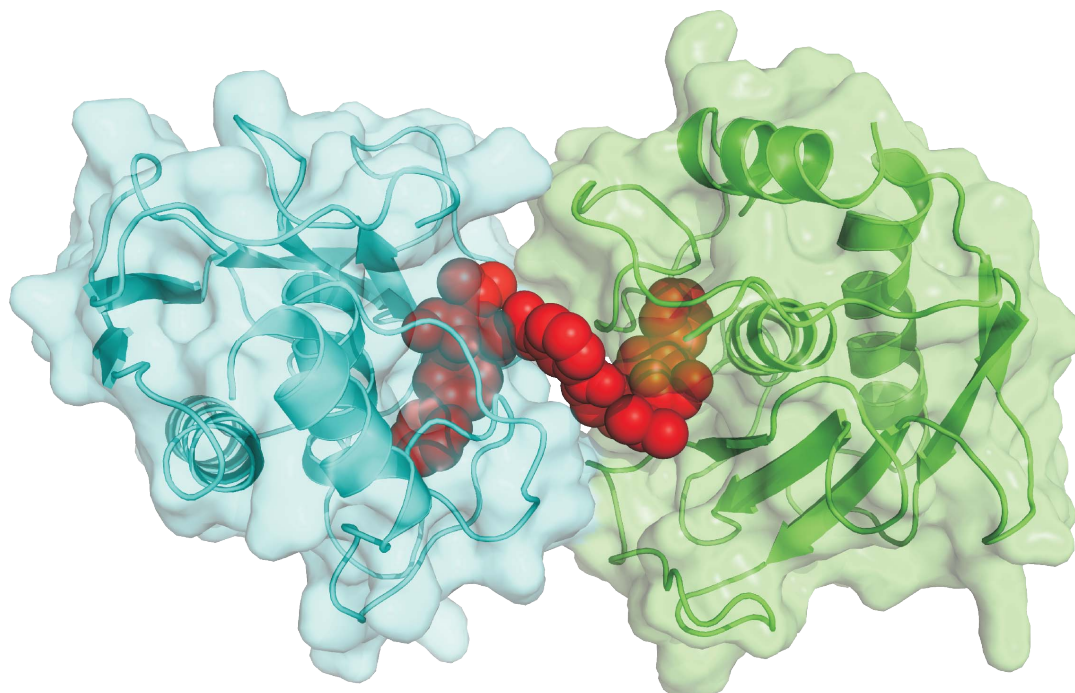


Figure S2. An example showing the ligand is located at the interface of two chains (PDB ID: 4H82). The two protein chains are shown in green and cyan cartoons and the ligand is shown in red balls.

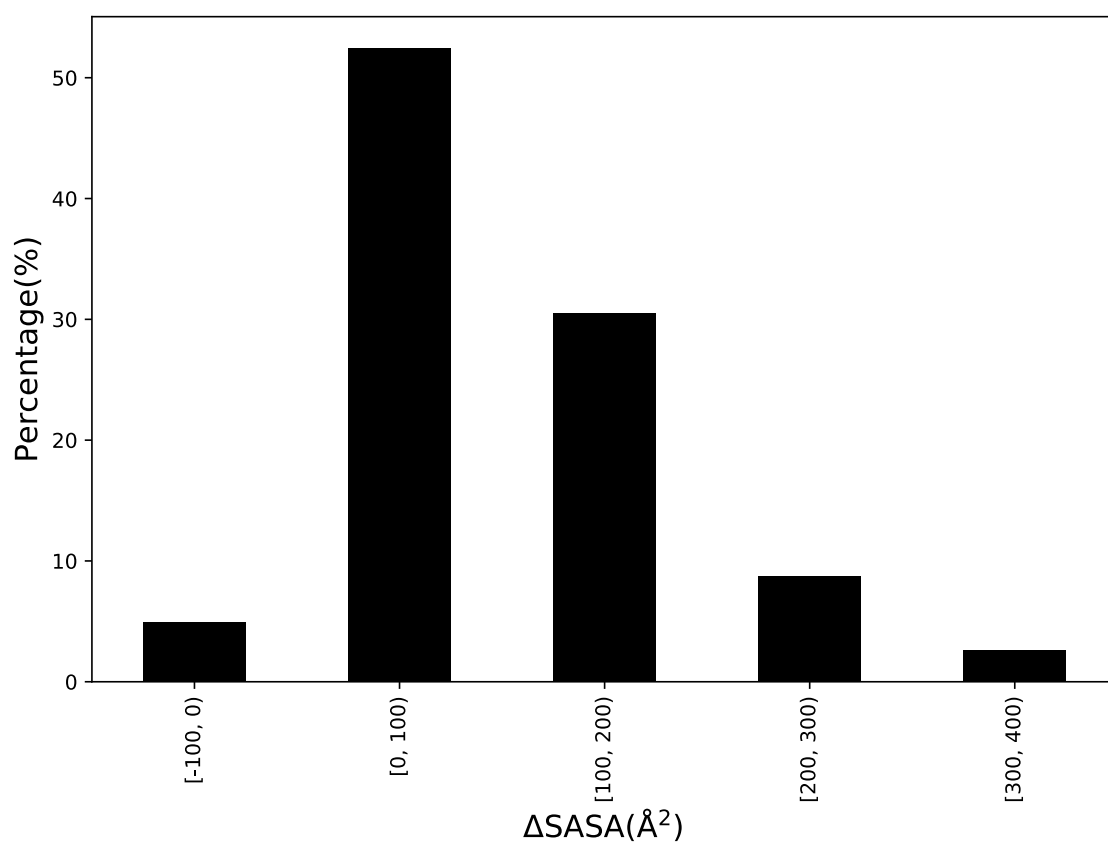


Figure S3. The difference between the solvent accessible surface areas (SASA) of ligands docked to MS and QS.

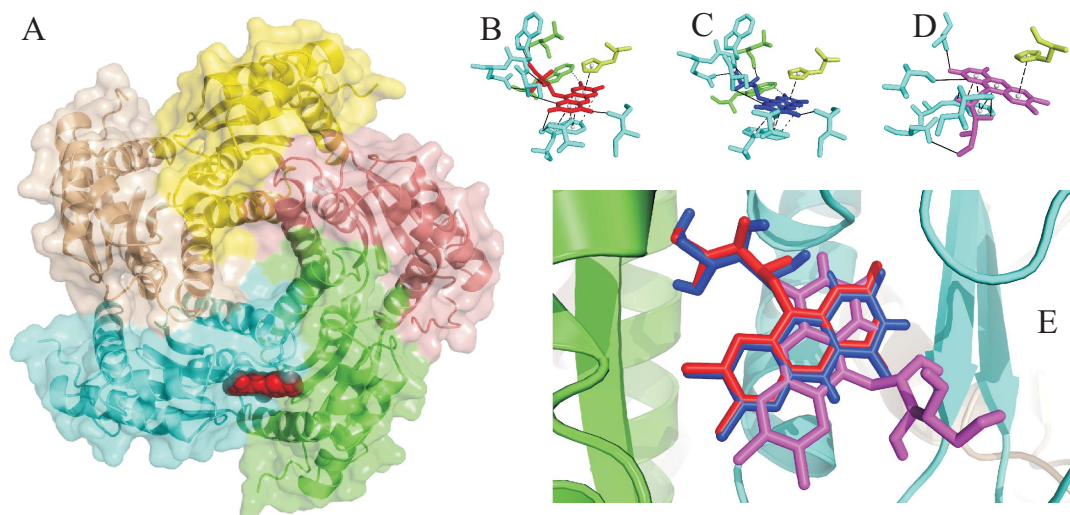


Figure S4. An example pentamer showing that docking with QS yields more accurate conformation than with MS (PDB ID: 1KYV). (A) Overview of the QS, in which the chain structure is shown in colored cartoon and surface while the ligand is shown in red sphere. The chains are shown in different colors. (B), (C), (D) are the atomic interactions between the protein and the ligand in N, Q and M conformations, respectively. (E) is the comparison between the conformations. For (B-E), the N, Q and M conformations are shown in red, blue and magenta sticks, respectively.

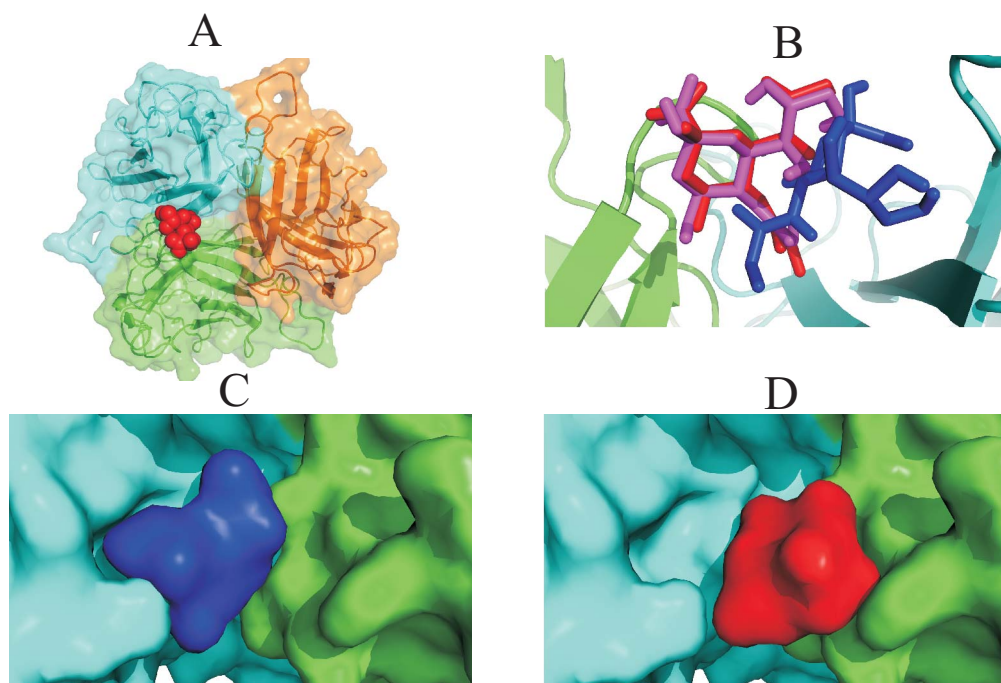


Figure S5. An example complex of a homo trimer showing the M conformation has a lower RMSD than the Q conformation (PDB ID: 2WGU). (A) is the overview of the QS. (B) is the comparison of ligand conformations (N, Q and M are in red, blue and magenta sticks, respectively). (C) and (D) show the geometry complementarity between the QS and the Q (blue surface), N (red surface) conformations, respectively.