

Supporting Information S2 Table. Selected membrane properties of systems I-III. For each system, the receptor-to-lipid hydrogen bonding occupancy ($\rho_{\text{HB}}^{\text{prt-lip}}$), the lipid-to-lipid hydrogen bonding occupancy ($\rho_{\text{HB}}^{\text{lip-lip}}$), the lipid-to-water hydrogen bonding occupancy ($\rho_{\text{HB}}^{\text{lip-sol}}$), and the average area per lipid (APL) are averaged over the last 400 ns of MD simulated time.

Index	I	II	III
$\rho_{\text{HB}}^{\text{prt-lip}}$	35/4381	35/4389	37/4037
$\rho_{\text{HB}}^{\text{lip-lip}}$	0	317/3968	238/3616
$\rho_{\text{HB}}^{\text{lip-SOL}}$	3045/30799	3084/31212	2866/29319
APL (nm ²)	0.61	0.56	0.50