**Supplementary information, Table S1. Cryo-EM data collection, refinement and validation statistics**

| | IFT-A | IFT-A (-IFT139) | IFT-A–TULP3 | IFT-A–TULP3 (-IFT139) |
|---|---|---|---|---|
| | (EMDB: EMD-29073) (PDB: 8FGW) | | (EMDB: EMD-29078) (PDB: 8FH3) | |
| **Data collection and processing** | | | | |
| Magnification | 81,000 | 105,000 | 81,000 | 63,000 |
| Voltage (kV) | 300 | 300 | 300 | 200 |
| Electron exposure (e–/Å$^2$) | 66.2 | 76.2 | 53.06 | 82.5 |
| Defocus range (μm) | -0.6 – -1.8 | -0.6 – -1.8 | -0.6 – -2.0 | -0.6 – -1.8 |
| Pixel size (Å) | 0.5285 | 0.413 | 0.5285 | 0.6572 |
| Symmetry imposed | C1 | C1 | C1 | C1 |
| Initial particle images (no.) | 1,649,804 | 1,962,671 | 2,136,547 | 485,077 |
| Final particle images (no.) | 67,560 | 180,200 | 113,784 | 61,090 |
| Map resolution (Å) | Overall: 3.7<br>Sub-vol.1: 3.9<br>Sub-vol.2: 3.0 | Overall: 3.6<br>Sub-vol.3: 3.0<br>Sub-vol.4: 3.2 | Overall: 4.3<br>Sub-vol.1: 3.6<br>Sub-vol.2: 3.5 | 6.0 |
| FSC threshold | 0.143 | 0.143 | 0.143 | 0.143 |
| Map resolution range (Å) | | | | |
| **Refinement** | | | | |
| Initial model used (PDB code) | *De novo*/AF2 | | *De novo*/AF2 | |
| Model resolution (Å) | 3.2 | | 3.9 | |
| FSC threshold | 0.5 | | 0.5 | |
| Model resolution range (Å) | 3.2 – 57.5 | | 3.9 – 50 | |
| Map sharpening *B* factor (Å$^2$) | Sub-vol.1: -97.0<br>Sub-vol.2: -72.6<br>Sub-vol.3: -88.2<br>Sub-vol.4: -77.5 | | Sub-vol.1: -68.7<br>Sub-vol.2: -89.2 | |
| Model composition | | | | |
| Non-hydrogen atoms | 43596 | | 26774 | |
| Protein residues | 5564 | | 3642 | |
| Ligands | 5 | | 5 | |
| *B* factors (Å$^2$) | | | | |
| Protein | 69.318 | | 62.157 | |
| Ligand | 75.272 | | 189.004 | |
| R.m.s. deviations | | | | |
| Bond lengths (Å) | 0.015 | | 0.010 | |
| Bond angles (°) | 0.852 | | 0.983 | |
| Validation | | | | |
| MolProbity score | 2.02 | | 2.17 | |
| Clashscore | 13.25 | | 15.79 | |
| Poor rotamers (%) | 0 | | 0 | |
| Ramachandran plot | | | | |
| Favored (%) | 94.26 | | 92.57 | |
| Allowed (%) | 5.74 | | 7.43 | |
| Disallowed (%) | 0 | | 0 | |