Appendix 0 Table 1. Data collection and refinement statistics for collected datasets

| Specimen       | ApoFtn | TMV | T20S proteasome |
|----------------|--------|-----|-----------------|
| 3 cryoChips    | 3.4 mg/mL ApoFtn | 1.1 mg/mL TMV | 1.4 mg/mL T20S |

| Microscope | TFS Titan Krios | JEOL 3200-FSC |
|------------|-----------------|---------------|
| Voltage (kV) | 300             | 300           |
| Detector   | K2-XP           | K2-XP         |
| Energy filter | Gatan BioQuantum | In-column omega filter |
| Number of movies | 945 (815 / 130) | 82 (43 / 39) |
| Pixel size (Å) | 0.8127         | 1.288         |
| Electron exposure (e⁻/Å²) | 63            | 59.7          |
| # of frames | 90              | 93            |
| Exposure time (s) | 9              | 10.95         |
| Defocus range (µm) | -1 to -2       | -2 to -4      |
| Symmetry imposed | O             | D7            |
| Map sharpening B-factor (Å²) | -73.6          | -175.2        |
| Final number of particles / asymmetric units | 21,683 / 520,392 | 279,332 / 3,910,648 |
| Final map resolution (Å) | 2.4           | 3.2           |

Appendix 0 Table 2. Data collection and refinement statistics for reference datasets on holey carbon grids

| Specimen       | ApoFtn-QF | T20S-QF |
|----------------|-----------|---------|
| Quantifoil R2/1 300mesh | 3.4 mg/mL ApoFtn | 1.4 mg/mL T20S |
| Microscope | TFS Titan Krios | JEOL 3200-FSC |
| Voltage (kV) | 300             | 300           |
| Detector   | K2-XP           | K2-XP         |
| Energy filter | Gatan BioQuantum | In-column omega filter |
| Number of movies | 276           | 879          |
| Pixel size (Å) | 0.8127         | 1.288         |
| Electron exposure (e⁻/Å²) | 63            | 59.7          |
| # of frames | 90              | 93            |
| Exposure time (s) | 9              | 10.95         |
| Defocus range (µm) | -1 to -2       | -2 to -4      |
| Symmetry imposed | O             | D7            |
| Map sharpening B-factor (Å²) | -73.6          | -175.2        |
| Final number of particles / asymmetric units | 21,683 / 520,392 | 279,332 / 3,910,648 |
| Final map resolution (Å) | 2.4           | 3.2           |