# WORLDWIDE wwPDB PROTEIN DATA BANK

# Full wwPDB EM Validation Report (i)

Nov 14, 2022 – 06:30 PM JST

|  |  |  |
|---|---|---|
| PDB ID | : | 6JQ0 |
| EMDB ID | : | EMD-9872 |
| Title | : | CryoEM structure of Abo1 Walker B (E372Q) mutant hexamer - ATP complex |
| Authors | : | Cho, C.; Jang, J.; Song, J.J. |
| Deposited on | : | 2019-03-28 |
| Resolution | : | 3.54 Å(reported) |

This is a Full wwPDB EM Validation Report for a publicly released PDB entry.

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/EMValidationReportHelp
with specific help available everywhere you see the (i) symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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# 1 Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:
*ELECTRON MICROSCOPY*

The reported resolution of this entry is 3.54 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.

| Metric | Percentile Ranks | Value |
|---|---|---|
| Clashscore | | 5 |
| Ramachandran outliers | | 0.5% |
| Sidechain outliers | | 0.5% |

*Worse* ——— *Better*

▮ Percentile relative to all structures
❘ Percentile relative to all EM structures
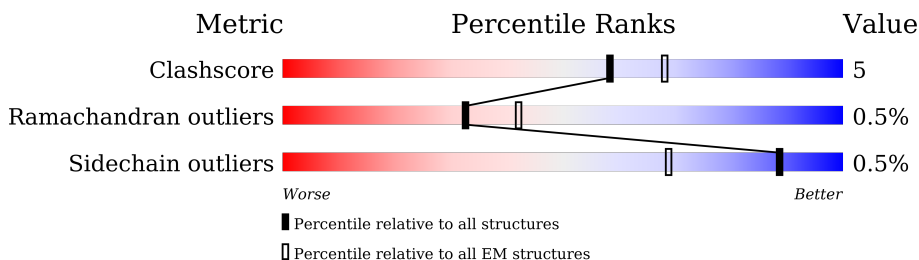
| Metric | Whole archive (#Entries) | EM structures (#Entries) |
|---|---|---|
| Clashscore | 158937 | 4297 |
| Ramachandran outliers | 154571 | 4023 |
| Sidechain outliers | 154315 | 3826 |

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion < 40%). The numeric value is given above the bar.

| Mol | Chain | Length | Quality of chain |
|---|---|---|---|
| 1 | A | 1198 | 10% / 37% · 6% · 57% |
| 1 | B | 1198 | · / 40% · 7% · 52% |
| 1 | C | 1198 | · / 43% · 5% · 53% |
| 1 | D | 1198 | · / 40% · 7% · 53% |
| 1 | E | 1198 | · / 41% · 7% · 52% |
| 1 | F | 1198 | 7% / 38% · 5% · 56% |
| 2 | G | 14 | 7% / 100% |

# 2 Entry composition ⓘ

There are 4 unique types of molecules in this entry. The entry contains 26917 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called Uncharacterized AAA domain-containing protein C31G5.19.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | A | 516 | Total<br>4144 | C<br>2659 | N<br>699 | O<br>764 | S<br>22 | 0 | 0 |
| 1 | B | 571 | Total<br>4587 | C<br>2936 | N<br>784 | O<br>845 | S<br>22 | 0 | 0 |
| 1 | C | 569 | Total<br>4574 | C<br>2929 | N<br>783 | O<br>840 | S<br>22 | 0 | 0 |
| 1 | D | 566 | Total<br>4547 | C<br>2915 | N<br>776 | O<br>834 | S<br>22 | 0 | 0 |
| 1 | E | 577 | Total<br>4628 | C<br>2963 | N<br>790 | O<br>853 | S<br>22 | 0 | 0 |
| 1 | F | 524 | Total<br>4185 | C<br>2680 | N<br>724 | O<br>760 | S<br>21 | 0 | 0 |

There are 54 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
| --- | --- | --- | --- | --- | --- |
| A | -7 | GLY | - | expression tag | UNP O14114 |
| A | -6 | ALA | - | expression tag | UNP O14114 |
| A | -5 | MET | - | expression tag | UNP O14114 |
| A | -4 | GLY | - | expression tag | UNP O14114 |
| A | -3 | SER | - | expression tag | UNP O14114 |
| A | -2 | GLY | - | expression tag | UNP O14114 |
| A | -1 | ILE | - | expression tag | UNP O14114 |
| A | 0 | GLN | - | expression tag | UNP O14114 |
| A | 372 | GLN | GLU | engineered mutation | UNP O14114 |
| B | -7 | GLY | - | expression tag | UNP O14114 |
| B | -6 | ALA | - | expression tag | UNP O14114 |
| B | -5 | MET | - | expression tag | UNP O14114 |
| B | -4 | GLY | - | expression tag | UNP O14114 |
| B | -3 | SER | - | expression tag | UNP O14114 |
| B | -2 | GLY | - | expression tag | UNP O14114 |
| B | -1 | ILE | - | expression tag | UNP O14114 |
| B | 0 | GLN | - | expression tag | UNP O14114 |
| B | 372 | GLN | GLU | engineered mutation | UNP O14114 |

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| Chain | Residue | Modelled | Actual | Comment | Reference |
|:---:|:---:|:---:|:---:|:---:|:---:|
| C | -7 | GLY | - | expression tag | UNP O14114 |
| C | -6 | ALA | - | expression tag | UNP O14114 |
| C | -5 | MET | - | expression tag | UNP O14114 |
| C | -4 | GLY | - | expression tag | UNP O14114 |
| C | -3 | SER | - | expression tag | UNP O14114 |
| C | -2 | GLY | - | expression tag | UNP O14114 |
| C | -1 | ILE | - | expression tag | UNP O14114 |
| C | 0 | GLN | - | expression tag | UNP O14114 |
| C | 372 | GLN | GLU | engineered mutation | UNP O14114 |
| D | -7 | GLY | - | expression tag | UNP O14114 |
| D | -6 | ALA | - | expression tag | UNP O14114 |
| D | -5 | MET | - | expression tag | UNP O14114 |
| D | -4 | GLY | - | expression tag | UNP O14114 |
| D | -3 | SER | - | expression tag | UNP O14114 |
| D | -2 | GLY | - | expression tag | UNP O14114 |
| D | -1 | ILE | - | expression tag | UNP O14114 |
| D | 0 | GLN | - | expression tag | UNP O14114 |
| D | 372 | GLN | GLU | engineered mutation | UNP O14114 |
| E | -7 | GLY | - | expression tag | UNP O14114 |
| E | -6 | ALA | - | expression tag | UNP O14114 |
| E | -5 | MET | - | expression tag | UNP O14114 |
| E | -4 | GLY | - | expression tag | UNP O14114 |
| E | -3 | SER | - | expression tag | UNP O14114 |
| E | -2 | GLY | - | expression tag | UNP O14114 |
| E | -1 | ILE | - | expression tag | UNP O14114 |
| E | 0 | GLN | - | expression tag | UNP O14114 |
| E | 372 | GLN | GLU | engineered mutation | UNP O14114 |
| F | -7 | GLY | - | expression tag | UNP O14114 |
| F | -6 | ALA | - | expression tag | UNP O14114 |
| F | -5 | MET | - | expression tag | UNP O14114 |
| F | -4 | GLY | - | expression tag | UNP O14114 |
| F | -3 | SER | - | expression tag | UNP O14114 |
| F | -2 | GLY | - | expression tag | UNP O14114 |
| F | -1 | ILE | - | expression tag | UNP O14114 |
| F | 0 | GLN | - | expression tag | UNP O14114 |
| F | 372 | GLN | GLU | engineered mutation | UNP O14114 |

- Molecule 2 is a protein called *unknown substrate*.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|:---:|:---:|:---:|:---:|:---:|:---:|:---:|:---:|:---:|
| | | | Total | C | N | O | | |
| 2 | G | 14 | 70 | 42 | 14 | 14 | 0 | 0 |

- Molecule 3 is ADENOSINE-5'-DIPHOSPHATE (three-letter code: ADP) (formula: $C_{10}H_{15}N_5O_{10}P_2$).



ADP
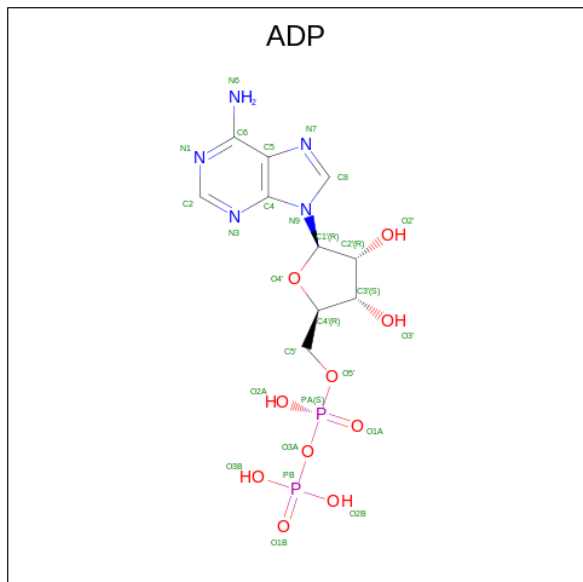
| Mol | Chain | Residues | Atoms | | | | | AltConf |
|-----|-------|----------|-------|---|---|---|---|---------|
| 3 | A | 1 | Total | C | N | O | P | 0 |
| | | | 27 | 10 | 5 | 10 | 2 | |

- Molecule 4 is ADENOSINE-5'-TRIPHOSPHATE (three-letter code: ATP) (formula: $C_{10}H_{16}N_5O_{13}P_3$).



ATP

| Mol | Chain | Residues | Atoms | | | | | AltConf |
|-----|-------|----------|-------|---|---|---|---|---------|
| 4 | B | 1 | Total | C | N | O | P | 0 |
| | | | 31 | 10 | 5 | 13 | 3 | |

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| Mol | Chain | Residues | Atoms | | | | | AltConf |
|---|---|---|---|---|---|---|---|---|
| 4 | C | 1 | Total | C | N | O | P | 0 |
| | | | 31 | 10 | 5 | 13 | 3 | |
| 4 | D | 1 | Total | C | N | O | P | 0 |
| | | | 31 | 10 | 5 | 13 | 3 | |
| 4 | E | 1 | Total | C | N | O | P | 0 |
| | | | 31 | 10 | 5 | 13 | 3 | |
| 4 | F | 1 | Total | C | N | O | P | 0 |
| | | | 31 | 10 | 5 | 13 | 3 | |

# 3 Residue-property plots ⓘ

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion in map density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red diamond above a residue indicates a poor fit to the EM map for this residue (all-atom inclusion < 40%). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

• Molecule 1: Uncharacterized AAA domain-containing protein C31G5.19

• Molecule 1: Uncharacterized AAA domain-containing protein C31G5.19



Chain B: 40% 7% 52%

GLU ALA GLU ARG ARG LYS LEU ARG HIS GLY LYS LEU GLN LYS HIS LEU ASP GLU THR LYS ALA ASP MET GLN PHE THR SER GLU GLU LYS PRO SER VAL ASP GLU SER ILE THR GLU VAL ASP ALA ILE LYS ASP GLY PRO PRO VAL LEU ALA GLU THR LEU THR ASN SER LEU MET GLU

ASP VAL GLY GLU ASN VAL ASP MET ASP ILE GLU ASP ASN GLU ILE PHE THR ASN SER GLN SER THR MET SER VAL PRO SER MET LEU VAL GLU ASN GLU GLU SER PRO LYS PRO ASP GLU ILE ASP GLN LYS VAL SER GLU PRO LEU GLU ASN GLY LYS SER PRO VAL GLY

VAL PRO SER ALA ALA ARG VAL LEU ARG VAL SER THR ASP THR ASP VAL SER THR ASN ILE SER ASN GLY ARG ALA ASP ILE PRO VAL ASP THR LEU ILE THR SER ALA ASP SER VAL PRO ASN ALA ALA PRO THR ASP HIS ASN ILE SER ASP GLY ILE GLU ILE GLU GLN

GLU VAL VAL PHE PRO ASP LEU VAL PHE ASP <span>E1128 D1129 R1130</span> <span>D1140 S1141</span> <span>T1146 V1147 D1148 Q1149</span> <span>H1152</span> <span>W1168</span> <span>E1176</span> <span>R1179</span> <span>E1183 F1184 M1185 I1186</span> ASN ALA LEU GLN

• Molecule 1: Uncharacterized AAA domain-containing protein C31G5.19

Chain C:      43%      5%      53%

GLY ALA MET SER GLY ILE GLN MET LYS GLU GLU ALA SER GLU HIS GLY GLY SER ALA ASP GLU THR GLN GLU LEU PRO VAL SER ASP SER ASP GLU MET PRO ASN ASN ALA LYS ARG ARG ARG SER GLN SER MET ILE ALA ASN LYS ARG ILE HIS GLN ALA PHE GLN
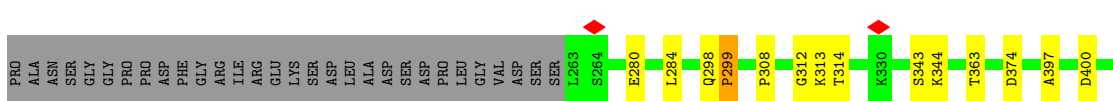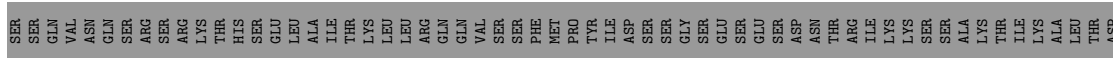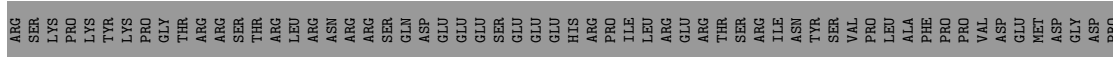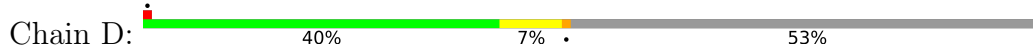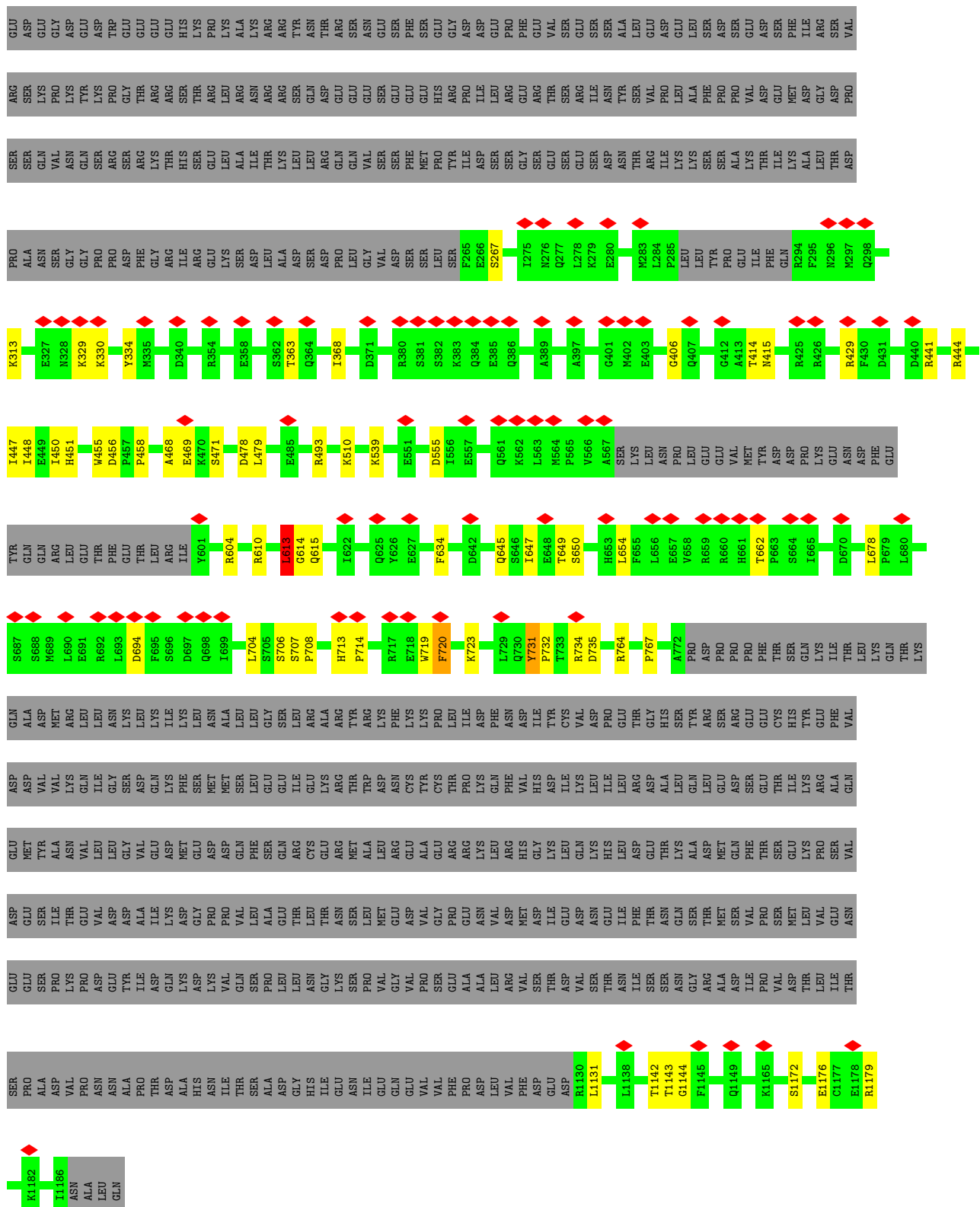
GLU ASP GLU GLY ASP GLU ASP TRP GLU GLU GLU GLU HIS LYS PRO LYS ALA LYS ARG TYR ASN THR ARG ASN GLU SER ASN GLU SER PHE SER GLU GLY ASP GLU PRO PHE GLU VAL SER GLU GLU SER ALA LEU GLU ASP LEU SER SER GLU ASP SER PHE ILE ARG SER VAL

ARG SER LYS PRO LYS PRO GLY PRO ASP PHE GLY ARG ILE ARG GLU ARG SER THR ARG LEU ARG ASN ARG ARG GLY SER GLN ASP GLU GLU GLU VAL SER GLU GLU GLU HIS ARG PRO ILE LEU ARG ARG THR SER ARG ILE ASN TYR VAL PRO LEU ALA PHE PRO PRO VAL ASP MET GLY ASP PRO

SER SER GLN VAL ASN GLN SER ARG SER ARG LYS THR HIS SER GLU LEU ALA ILE ILE THR LYS LEU LEU ARG GLN GLN VAL GLN SER SER PHE MET PRO TYR ILE ASP SER SER GLY SER GLU ILE SER GLU ASP SER ASN THR ARG ILE LYS SER SER ALA LYS THR ILE LYS ALA LEU THR ASP

PRO ALA ASN SER GLY GLY PRO ASP PHE GLY ARG ILE ARG GLU SER ASP LYS SER ASP LEU ALA ASP SER ASP PRO LEU GLY VAL ASP SER SER PHE MET PRO TYR ILE <span>L263 S264</span> <span>R294</span> <span>S326 E327 N328 K329 K330</span> <span>F333</span> <span>R336</span> <span>C341</span> <span>R380</span> <span>T414 N415</span> <span>R425</span> <span>F430</span> <span>D440</span> <span>R444</span>

<span>I447</span> <span>D456</span> <span>V459 P460</span> <span>S471</span> <span>D478</span> <span>R493 T494</span> <span>T502 K503 R504</span> <span>D508 P509 K510 T511 I512</span> <span>K517 D518</span> <span>S529</span> <span>R532</span> <span>N550</span> <span>F553</span> <span>D580</span> <span>D585 F586 E587</span> <span>E596 T597</span> <span>L598</span> <span>P603</span> <span>L613 Q614 Q615</span> <span>D635</span> <span>S643</span> <span>S664</span> <span>P669</span> <span>I699</span>

<span>L700</span> <span>S705 S706</span> <span>H713 P714 Q715</span> <span>L769</span> <span>A772</span> PRO ASP PRO PRO PHE THR SER GLN LYS ILE THR LEU LYS GLN THR LYS ARG ALA GLU GLU MET TYR ALA ASN VAL LEU LEU GLY VAL SER ASP GLN LYS LEU GLU PHE SER GLU MET MET SER LEU GLU GLU ILE GLU GLY LYS ARG THR TRP ASP ASN CYS TYR CYS

LEU ILE ASP PHE ASN ASP ILE TYR CYS VAL ASP PRO GLU THR GLY HIS SER TYR ARG SER ARG GLU GLU SER ARG GLU MET GLN PHE THR SER GLU GLU VAL ASP PHE VAL ASP VAL VAL LYS GLN ILE GLU GLY VAL SER GLU ASP GLN GLN LYS PHE SER MET MET SER LEU GLU GLU ILE GLU GLY LYS ARG

THR PRO LYS GLN PHE VAL HIS ASP ILE LYS LEU ILE LEU ASP ASP GLY THR LYS ALA ASP GLN LEU SER THR MET GLN THR SER VAL PRO SER MET LEU VAL GLU GLU SER GLN VAL LEU LEU GLY VAL ASP SER GLU MET MET SER LEU GLU GLU MET SER ASP GLN PHE SER GLN ARG CYS GLU GLU MET ALA LEU ARG ARG GLU ASP VAL GLY

ARG ARG LYS LEU ARG HIS GLY LYS LEU GLN LYS HIS LEU ASP GLU GLU THR LYS ALA ASP LEU GLN GLU MET GLN PHE THR SER MET SER VAL PRO SER MET LEU VAL GLU GLY SER GLU SER PRO LYS PRO ASP ALA ILE LYS ASP GLY PRO PRO VAL LEU ALA GLU THR LEU THR ASN SER LEU MET GLU GLU ASP VAL GLY

PRO GLU ASN VAL ASP MET ASP ILE GLU ASP ASN GLU ILE PHE THR ASN SER GLN SER THR MET SER VAL PRO SER MET LEU VAL GLU GLU SER GLN VAL LEU PRO LYS PRO ASP GLU TYR ILE ASP GLN LYS VAL SER GLN LYS ASP GLY PRO PRO VAL LEU ALA GLU THR LEU ASN SER GLY LYS SER PRO VAL GLY VAL PRO SER

GLU ALA ALA LEU ARG VAL SER THR ASP SER VAL SER THR ASN ILE SER ASN GLY ARG ALA ASP ALA ASP ILE PRO VAL ASP THR LEU ILE THR SER ALA ASP SER VAL PRO ASN ALA ALA PRO THR ASP HIS ASN ILE SER THR SER ALA ASP GLY HIS ILE GLU ASN ILE GLU GLN GLU VAL VAL

PHE PRO ASP LEU VAL PHE ASP GLU **D1129** T1146 **V1147** D1148 Q1149 K1165 R1170 V1173 **K1182** N1187 ALA LEU GLN

• Molecule 1: Uncharacterized AAA domain-containing protein C31G5.19

Chain D:



40%     7%  ·     53%



• Molecule 1: Uncharacterized AAA domain-containing protein C31G5.19

Chain E:

41%　　　7%　　　52%

GLY ALA MET GLY SER GLY ILE GLN MET LYS GLU GLU ALA SER GLU HIS GLY GLY SER ALA ASP GLU THR GLN GLU LEU SER PRO VAL SER ASP SER SER ASP GLU MET PRO ASN ASN ALA LYS ARG ARG ARG SER GLN SER MET ILE ALA ASN LYS ARG ILE HIS GLN ALA PHE GLN

GLU ASP GLU GLY ASP GLU TRP GLU GLU GLU GLU HIS LYS PRO LYS ALA LYS ARG ARG TYR ASN THR ARG SER ASN GLU SER GLU PHE SER GLU GLY ASP GLU GLU HIS ARG PRO ILE LEU ARG GLU THR SER ARG ILE ASN TYR SER VAL PRO LEU ALA PHE PRO PRO VAL ASP GLU MET ASP SER GLY ASP PRO

ARG SER LYS PRO LYS TYR LYS PRO GLY THR ARG ARG SER ARG THR ARG LEU ARG ASN ARG ARG SER GLN SER ASP GLU GLU GLU SER GLU GLU GLU HIS ARG PRO ILE LEU ARG GLU THR SER ARG ILE ASN TYR SER VAL PRO LEU ALA PHE PRO PRO VAL ASP GLU MET ASP SER GLY ASP PRO

SER SER GLN VAL ASN GLN SER ARG SER ARG LYS THR HIS SER GLU ALA ILE THR LYS LEU LEU ARG GLN GLN VAL SER SER PHE MET PRO TYR ILE ASP SER SER GLY GLU GLU SER GLU GLU SER ASP ASN THR ARG ILE LYS LYS SER SER ALA LYS THR ILE LYS ALA LEU THR ASP

PRO ALA ASN SER GLY GLY PRO ASP PRO ASP PHE GLY ARG ILE ARG GLU GLU LYS SER ASP LEU ALA ASP SER ASP <span style="background:green">P256 L257 G258 V259 D260 S261 S262 L263 S264</span> Q277 <span style="background:orange">L284</span> E290 Q293 R294 M297 Q298 P299 T314 L315 E327 N328 K329 K330 I367 Q372 R380

I409 P417 R425 R426 R429 R432 D440 R444 I447 R453 N454 V459 C464 S465 K472 D478 L479 L498 Y499 R500 S501 T502 K517 L541 S542 P543 E557 N571 V576 D579 K582 E583 E587 Y588 Q589 Q590 R591 L592 E593

L613 G614 Q615 I622 Q625 Q632 S633 F634 L639 R660 H661 L675 S688 R692 L693 D694 L702 A703 L704 S705 S706 S707 H713 Y731 P752 T753 E754 P773 ASP PRO PRO PHE THR SER GLN LYS ILE THR LEU LYS GLN THR LYS GLN ALA

ASP MET ARG LEU LEU ASN LYS LEU LYS ILE LYS LEU ASN ALA LEU LEU GLY SER LEU ARG ALA ARG THR TRP ASP ASN CYS TYR CYS THR PRO LYS GLN ARG ARG LYS LEU ARG HIS GLY LYS LEU GLN GLN LYS LEU ILE LEU ILE ARG ASP GLU THR GLY HIS SER TYR ARG SER ARG GLU CYS HIS TYR GLU PHE VAL ASP ASP

VAL VAL LYS GLN ILE GLY SER ASP GLN LYS PHE SER MET MET SER LEU GLU ILE GLU LYS ARG THR TRP ASP ASN CYS TYR CYS THR PRO LYS GLN PHE VAL HIS ASP LYS LEU GLN LEU LYS LEU ILE LEU ILE ARG ASP ALA ALA LEU GLU LEU GLU ASP SER GLU THR ILE LYS ARG ALA GLN GLU MET

TYR ALA ASN VAL LEU LEU GLY VAL GLU ASP MET GLU ASP GLN PHE SER GLN ARG CYS GLU ARG MET ALA LEU ARG GLU GLU ALA GLU ARG LYS LEU ARG HIS GLY LYS LEU LEU GLU GLN ILE GLU GLN ASN GLU ILE PHE THR ASN GLN ASN SER THR MET GLN PHE THR GLU GLU LYS PRO SER VAL ASP GLU

SER ILE THR GLU VAL ASP ALA ILE LYS ASP GLY PRO VAL LEU ALA GLU THR LEU ASN SER LEU MET GLU ASP VAL GLY PRO GLY ASP ALA ALA LEU ARG VAL SER THR VAL SER THR ILE GLU GLU ASN GLU ILE PHE THR ASN GLN ASN SER GLN MET GLN PHE THR GLU GLU LYS PRO SER VAL MET LEU VAL GLU ASN GLU GLU

SER PRO LYS ASP GLU TYR ILE ASP GLN LYS ASP LYS VAL GLN SER PRO LEU LEU ASN GLY LYS SER PRO VAL GLY VAL VAL PRO SER GLU ALA ALA LEU ARG VAL SER ASP MET SER ILE GLU GLN ILE PHE THR ASN GLY ARG ALA ASP ILE PRO VAL THR THR LEU THR SER PRO

ALA ASP VAL PRO ASN ASN ALA PRO THR ASP ALA HIS ASN ILE THR SER ALA ASP GLY HIS ILE GLU ASN ILE GLU GLN GLN VAL VAL PHE PRO ASP ASP LEU VAL PHE ASP <span style="background:green">E1128</span> Q1136 <span style="background:green">D1140</span> T1146 V1147 D1148 Q1149 W1168 N1169 R1170 N1171 S1172 V1173 V1174 D1175 R1179 K1182

<span style="background:green">M1185 I1186</span> ASN ALA LEU GLN

• **Molecule 1: Uncharacterized AAA domain-containing protein C31G5.19**

Chain F:

7%

38%　　　5%　　　56%

GLY ALA MET GLY SER GLY ILE GLN MET LYS GLU GLU ALA SER GLU HIS GLY GLY SER ALA ASP GLU THR GLN GLU LEU SER PRO VAL SER ASP SER SER ASP GLU MET PRO ASN ASN ALA LYS ARG ARG ARG SER GLN SER MET ILE ALA ASN LYS ARG ILE HIS GLN ALA PHE GLN

GLU ASP GLU GLY ASP GLU TRP GLU GLU GLU GLU HIS LYS PRO LYS ALA LYS ARG ARG TYR ASN THR ARG SER ASN GLU SER PHE GLU GLU GLY ASP ASP GLU PRO PHE GLU VAL SER GLU SER SER ALA LEU GLU GLU ASP GLU LEU SER ASP SER GLU ASP SER PHE ILE ARG SER VAL

ARG SER LYS PRO LYS TYR LYS PRO GLY THR ARG ARG SER ARG LYS THR HIS SER THR ARG LEU ARG ASN ARG SER GLN ASP GLU GLU GLU SER GLU GLU HIS ARG PRO ILE LEU ARG GLU GLU THR SER ARG ILE ASN TYR SER VAL PRO LEU ALA PHE PRO PRO VAL ASP GLU MET ASP GLY ASP PRO

SER SER GLN ASN GLN ARG SER ARG LYS THR HIS SER GLU ALA ILE LEU THR LYS LEU LEU ARG GLN GLN VAL SER SER PHE MET PRO TYR ILE ASP ASP SER ASP ASN THR ARG ILE LYS LYS SER ALA LYS THR ILE LYS SER LEU LEU THR ASP

PRO ALA ASN SER GLY GLY PRO ASP PHE GLY ARG ILE ARG GLU GLU LYS SER ASP LEU ALA ASP SER ASP PRO LEU GLY VAL ASP SER SER LEU SER LEU **F265 E266** S267 **I275 N276 Q277 L278 K279 E280** **M283 L284 P285** LEU LEU TYR PRO GLU ILE PHE GLN **R294 F295 N296 M297 Q298**

**K313** **E327 N328 K329** K330 **Y334 M335** **D340** **R354** **E358** **S362 T363 Q364** I368 **D371** **R380 S381 S382 K383 Q384 E385 Q386** **A389** **A397** **G401 M402 E403** **G406** **Q407** **G412 A413 T414 N415** **R425 R426** **R429** **F430 D431** **D440 R441** R444

**I447 I448 E449 I450 H451** W455 D456 **P457 P458** **A468 E469 K470** S471 **D478 L479** **E485** R493 K510 K539 **E551** **D555 I556 E557** **Q561 K562 L563 M564 P565 V566 A567** SER LYS LEU ASN PRO LEU GLU GLU VAL MET TYR ASP ASP PRO LYS GLU ASN ASP PHE GLU

TYR GLN GLN ARG LEU GLU GLY THR PHE GLU THR LEU ARG ILE **Y601** **R604** **R610** **L613** **G614 Q615** **I622** **Q625 Y626 E627** **F634** **D642** **Q645 S646 I647 E648 T649 S650** **H653 L654 F655 L656 E657 V658 R659 R660 H661 T662 P663 S664 I665** **D670** **L678 P679 L680**

**S687 S688 M689 L690 E691 R692 L693 D694 F695 S696 D697 Q698 I699** **L704 S705 S706 S707 P708** **H713 P714** **R717 E718 W719 F720** K723 **L729 Q730 Y731 P732 T733 R734 D735** **R764** **P767** **A772** PRO ASP PRO PRO PHE THR SER GLN LYS ILE THR LEU LYS GLN THR LYS

GLN ALA ASP MET ARG LEU LEU ASN LYS SER LEU LYS LEU LEU ASN ALA LEU LEU GLY SER LEU ARG ALA ARG TYR ARG LYS PHE LYS LYS PRO LEU ASP PHE ASN ASP ILE ILE ASP PHE ASN ASP ILE LYS TYR CYS VAL ASP PRO GLU GLY THR GLY HIS SER TYR ARG SER ARG GLU GLU CYS HIS TYR GLU PHE VAL

ASP ASP VAL VAL LYS GLN ILE GLY SER ASP GLN GLN LYS ASP PHE SER MET MET SER LEU GLU GLU LYS ARG THR TRP ASP ASN CYS TYR CYS THR PRO LYS GLN PHE VAL HIS ILE LYS LEU LEU LEU ARG ASP ALA LEU GLN LEU ASP ASP SER THR ILE ARG ALA GLN

GLU MET TYR ALA ASN VAL VAL LEU LEU GLY VAL GLU ASP VAL GLU MET GLU ASP ASP GLN PHE GLN LEU ARG CYS GLU ARG MET ALA LEU ARG ARG GLU ALA GLU LEU ARG ARG GLY LYS LEU ARG LEU HIS GLY LYS LEU LEU GLN HIS LEU GLU THR ALA ASP MET GLN PHE THR SER GLU THR LYS PRO SER VAL

ASP GLU SER ILE THR GLU VAL ASP ASP ALA ILE LYS ASP GLY GLY PRO VAL LEU ALA GLU GLY THR LEU THR ASN SER SER LEU MET GLU ASP ALA GLY PRO GLU GLU LYS GLN VAL ASN MET GLU ASP GLU ILE ILE PHE THR ASN ASN GLY SER THR MET SER VAL PRO SER MET LEU VAL GLU ASN

GLU GLU SER PRO LYS PRO ASP ASP TYR ILE GLN ASP LYS ASP LYS VAL PRO LEU ASN GLY LYS SER PRO VAL GLY VAL PRO SER GLU ALA ALA LEU ARG VAL SER THR ASP VAL SER THR ASN ILE ILE SER SER ASN GLY ARG ALA ASP ILE PRO VAL ASP THR LEU ILE THR

SER PRO ALA ASP VAL PRO ASN ASN ALA PRO THR ASP ALA HIS ASN SER ILE THR THR SER ALA ASP ASP GLY HIS ILE GLU GLU GLU VAL VAL PHE PRO ASP ASP LEU VAL PHE ASP GLU ASP **R1130 L1131** **L1138** **T1142 T1143 G1144 F1145** **Q1149** **K1165** **S1172** **E1176 C1177 E1178 R1179**

**K1182** **I1186** ASN ALA LEU GLN

• Molecule 2: unknown substrate

Chain G: 7% 100%

X333 H X346

# 4 Experimental information (i)

| Property | Value | Source |
|---|---|---|
| EM reconstruction method | SINGLE PARTICLE | Depositor |
| Imposed symmetry | POINT, C1 | Depositor |
| Number of particles used | 99421 | Depositor |
| Resolution determination method | FSC 0.143 CUT-OFF | Depositor |
| CTF correction method | PHASE FLIPPING AND AMPLITUDE CORRECTION | Depositor |
| Microscope | FEI TITAN KRIOS | Depositor |
| Voltage (kV) | 300 | Depositor |
| Electron dose $(e^-/\text{Å}^2)$ | 1.0 | Depositor |
| Minimum defocus (nm) | Not provided | |
| Maximum defocus (nm) | Not provided | |
| Magnification | Not provided | |
| Image detector | FEI FALCON III (4k x 4k) | Depositor |
| Maximum map value | 33.699 | Depositor |
| Minimum map value | -21.482 | Depositor |
| Average map value | -0.030 | Depositor |
| Map value standard deviation | 1.233 | Depositor |
| Recommended contour level | 5.5 | Depositor |
| Map size (Å) | 380.8, 380.8, 380.8 | wwPDB |
| Map dimensions | 340, 340, 340 | wwPDB |
| Map angles (°) | 90.0, 90.0, 90.0 | wwPDB |
| Pixel spacing (Å) | 1.12, 1.12, 1.12 | Depositor |

# 5　Model quality ⓘ

## 5.1　Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: ADP, ATP

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

| Mol | Chain | Bond lengths | | Bond angles | |
|-----|-------|------|----------|------|----------|
| | | RMSZ | #$|Z|$ >5 | RMSZ | #$|Z|$ >5 |
| 1 | A | 0.32 | 0/4236 | 0.57 | 1/5731 (0.0%) |
| 1 | B | 0.36 | 0/4691 | 0.63 | 1/6351 (0.0%) |
| 1 | C | 0.38 | 0/4678 | 0.58 | 0/6334 |
| 1 | D | 0.38 | 0/4651 | 0.62 | 2/6298 (0.0%) |
| 1 | E | 0.36 | 0/4734 | 0.62 | 4/6411 (0.1%) |
| 1 | F | 0.32 | 0/4278 | 0.62 | 1/5788 (0.0%) |
| All | All | 0.36 | 0/27268 | 0.61 | 9/36913 (0.0%) |

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand.A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

| Mol | Chain | #Chirality outliers | #Planarity outliers |
|-----|-------|---------------------|---------------------|
| 1 | A | 0 | 3 |
| 1 | B | 0 | 8 |
| 1 | C | 0 | 2 |
| 1 | D | 0 | 10 |
| 1 | E | 0 | 4 |
| 1 | F | 0 | 8 |
| All | All | 0 | 35 |

There are no bond length outliers.

All (9) bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed($^o$) | Ideal($^o$) |
|-----|-------|-----|------|-------|---|----------------|-------------|
| 1 | E | 284 | LEU | CA-CB-CG | 9.22 | 136.50 | 115.30 |
| 1 | D | 431 | ASP | CB-CG-OD2 | 7.98 | 125.48 | 118.30 |
| 1 | F | 613 | LEU | CA-CB-CG | 6.38 | 129.96 | 115.30 |
| 1 | E | 315 | LEU | CA-CB-CG | 6.28 | 129.74 | 115.30 |

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| Mol | Chain | Res | Type | Atoms | Z | Observed($^o$) | Ideal($^o$) |
|-----|-------|-----|------|-------|---|----------------|-------------|
| 1 | D | 613 | LEU | CA-CB-CG | 5.74 | 128.51 | 115.30 |
| 1 | B | 615 | GLN | C-N-CA | 5.69 | 135.93 | 121.70 |
| 1 | A | 431 | ASP | CB-CG-OD1 | 5.65 | 123.38 | 118.30 |
| 1 | E | 615 | GLN | C-N-CA | 5.46 | 135.36 | 121.70 |
| 1 | E | 297 | MET | C-N-CA | 5.41 | 135.22 | 121.70 |

There are no chirality outliers.

All (35) planarity outliers are listed below:

| Mol | Chain | Res | Type | Group |
|-----|-------|-----|------|-------|
| 1 | A | 1132 | THR | Peptide |
| 1 | A | 438 | LEU | Peptide |
| 1 | A | 662 | THR | Peptide |
| 1 | B | 312 | GLY | Peptide |
| 1 | B | 499 | TYR | Peptide |
| 1 | B | 507 | ILE | Peptide |
| 1 | B | 509 | PRO | Peptide |
| 1 | B | 615 | GLN | Peptide |
| 1 | B | 662 | THR | Peptide |
| 1 | B | 751 | SER | Peptide |
| 1 | B | 761 | ARG | Peptide |
| 1 | C | 430 | PHE | Peptide |
| 1 | C | 456 | ASP | Peptide |
| 1 | D | 284 | LEU | Peptide |
| 1 | D | 298 | GLN | Peptide |
| 1 | D | 299 | PRO | Peptide |
| 1 | D | 363 | THR | Peptide |
| 1 | D | 455 | TRP | Peptide |
| 1 | D | 626 | TYR | Peptide |
| 1 | D | 627 | GLU | Peptide |
| 1 | D | 720 | PHE | Peptide |
| 1 | D | 731 | TYR | Peptide |
| 1 | D | 732 | PRO | Peptide |
| 1 | E | 284 | LEU | Peptide |
| 1 | E | 298 | GLN | Peptide |
| 1 | E | 453 | ARG | Peptide |
| 1 | E | 660 | ARG | Peptide |
| 1 | F | 363 | THR | Peptide |
| 1 | F | 406 | GLY | Peptide |
| 1 | F | 456 | ASP | Peptide |
| 1 | F | 614 | GLY | Peptide |
| 1 | F | 662 | THR | Peptide |

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| Mol | Chain | Res | Type | Group |
|-----|-------|-----|------|-------|
| 1 | F | 719 | TRP | Peptide |
| 1 | F | 731 | TYR | Peptide |
| 1 | F | 732 | PRO | Peptide |

## 5.2 Too-close contacts ⓘ

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

| Mol | Chain | Non-H | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|-------|----------|----------|---------|--------------|
| 1 | A | 4144 | 0 | 4187 | 45 | 0 |
| 1 | B | 4587 | 0 | 4658 | 61 | 0 |
| 1 | C | 4574 | 0 | 4648 | 40 | 0 |
| 1 | D | 4547 | 0 | 4625 | 53 | 0 |
| 1 | E | 4628 | 0 | 4700 | 51 | 0 |
| 1 | F | 4185 | 0 | 4278 | 35 | 0 |
| 2 | G | 70 | 0 | 19 | 0 | 0 |
| 3 | A | 27 | 0 | 9 | 0 | 0 |
| 4 | B | 31 | 0 | 11 | 2 | 0 |
| 4 | C | 31 | 0 | 11 | 0 | 0 |
| 4 | D | 31 | 0 | 9 | 2 | 0 |
| 4 | E | 31 | 0 | 9 | 1 | 0 |
| 4 | F | 31 | 0 | 10 | 2 | 0 |
| All | All | 26917 | 0 | 27174 | 263 | 0 |

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 5.

All (263) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|--------|--------|--------------------------|-------------------|
| 1:A:613:LEU:HD21 | 1:A:732:PRO:HD3 | 1.72 | 0.70 |
| 1:E:752:PRO:HB3 | 1:E:1168:TRP:HE1 | 1.58 | 0.68 |
| 1:D:613:LEU:HD12 | 1:D:731:TYR:HB3 | 1.77 | 0.67 |
| 1:B:313:LYS:N | 4:B:1201:ATP:O1A | 2.24 | 0.66 |
| 1:F:455:TRP:HB3 | 1:F:458:PRO:HA | 1.79 | 0.65 |
| 1:B:380:ARG:HH22 | 1:C:415:ASN:HD22 | 1.46 | 0.64 |
| 1:B:335:MET:SD | 1:B:335:MET:N | 2.72 | 0.62 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 1:C:550:ASN:HA | 1:C:553:PHE:HB3 | 1.80 | 0.62 |
| 1:D:1185:MET:SD | 1:D:1185:MET:N | 2.75 | 0.60 |
| 1:D:1146:THR:H | 1:D:1149:GLN:HE21 | 1.49 | 0.60 |
| 1:A:646:SER:HB3 | 1:A:649:THR:HG22 | 1.84 | 0.60 |
| 1:F:610:ARG:HA | 1:F:708:PRO:HD3 | 1.84 | 0.60 |
| 1:C:294:ARG:NH2 | 1:D:456:ASP:OD1 | 2.36 | 0.59 |
| 1:A:638:THR:HA | 1:A:641:GLN:HE22 | 1.66 | 0.59 |
| 1:D:1147:VAL:HA | 1:D:1150:LEU:HB2 | 1.85 | 0.59 |
| 1:A:350:GLU:HB3 | 1:A:354:ARG:HH12 | 1.68 | 0.59 |
| 1:D:427:PRO:HG2 | 1:E:478:ASP:HB3 | 1.84 | 0.59 |
| 1:F:478:ASP:OD1 | 1:F:478:ASP:N | 2.35 | 0.58 |
| 1:D:457:PRO:HG3 | 1:D:513:LYS:HD2 | 1.85 | 0.58 |
| 1:D:493:ARG:HH12 | 1:D:515:LYS:HG3 | 1.67 | 0.58 |
| 1:B:294:ARG:NH2 | 1:C:456:ASP:OD1 | 2.37 | 0.58 |
| 1:C:705:SER:OG | 1:C:706:SER:N | 2.37 | 0.58 |
| 1:D:580:ASP:OD1 | 1:D:580:ASP:N | 2.37 | 0.58 |
| 1:B:555:ASP:OD1 | 1:B:555:ASP:N | 2.34 | 0.58 |
| 1:C:444:ARG:NH1 | 1:C:471:SER:O | 2.37 | 0.58 |
| 1:A:429:ARG:NH1 | 4:B:1201:ATP:O2G | 2.34 | 0.58 |
| 1:A:308:PRO:O | 1:A:313:LYS:NZ | 2.37 | 0.57 |
| 1:B:400:ASP:OD1 | 1:B:426:ARG:NH1 | 2.37 | 0.57 |
| 1:C:529:SER:HA | 1:C:532:ARG:HD2 | 1.86 | 0.57 |
| 1:B:427:PRO:HA | 1:B:431:ASP:HB3 | 1.87 | 0.57 |
| 1:E:440:ASP:OD1 | 1:E:440:ASP:N | 2.36 | 0.57 |
| 1:C:502:THR:HG23 | 1:C:503:LYS:HG3 | 1.87 | 0.56 |
| 1:F:615:GLN:HB2 | 1:F:704:LEU:HD22 | 1.88 | 0.56 |
| 1:E:705:SER:OG | 1:E:706:SER:N | 2.38 | 0.56 |
| 1:F:313:LYS:NZ | 1:F:414:THR:O | 2.38 | 0.56 |
| 1:F:448:ILE:HD13 | 1:F:479:LEU:HD12 | 1.87 | 0.56 |
| 1:A:426:ARG:NH2 | 1:A:427:PRO:O | 2.39 | 0.56 |
| 1:B:440:ASP:OD1 | 1:B:440:ASP:N | 2.36 | 0.56 |
| 1:B:546:LYS:NZ | 1:B:550:ASN:OD1 | 2.38 | 0.56 |
| 1:E:426:ARG:NH1 | 4:F:1201:ATP:O2G | 2.39 | 0.55 |
| 1:E:380:ARG:HH22 | 1:F:415:ASN:HD22 | 1.52 | 0.55 |
| 1:F:613:LEU:HD12 | 1:F:731:TYR:HB3 | 1.89 | 0.55 |
| 1:B:290:GLU:OE2 | 1:C:504:ARG:NH1 | 2.40 | 0.55 |
| 1:C:1129:ASP:OD1 | 1:C:1129:ASP:N | 2.40 | 0.55 |
| 1:D:442:ASP:OD1 | 1:D:442:ASP:N | 2.40 | 0.55 |
| 1:D:427:PRO:HA | 1:D:431:ASP:HB3 | 1.88 | 0.55 |
| 1:B:1176:GLU:HA | 1:B:1179:ARG:HG3 | 1.88 | 0.55 |
| 1:C:508:ASP:OD1 | 1:C:508:ASP:N | 2.40 | 0.55 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 1:E:557:GLU:OE2 | 1:E:625:GLN:NE2 | 2.40 | 0.54 |
| 1:C:425:ARG:O | 1:D:532:ARG:NH1 | 2.40 | 0.54 |
| 1:A:1147:VAL:HA | 1:A:1150:LEU:HD12 | 1.89 | 0.54 |
| 1:D:635:ASP:OD1 | 1:D:635:ASP:N | 2.38 | 0.54 |
| 1:E:314:THR:OG1 | 4:E:1201:ATP:O2A | 2.26 | 0.54 |
| 1:F:555:ASP:OD1 | 1:F:555:ASP:N | 2.41 | 0.54 |
| 1:E:277:GLN:OE1 | 1:E:432:ARG:NH1 | 2.41 | 0.54 |
| 1:E:583:GLU:OE2 | 1:E:589:GLN:NE2 | 2.41 | 0.54 |
| 1:B:697:ASP:OD1 | 1:B:697:ASP:N | 2.39 | 0.53 |
| 1:C:380:ARG:HH22 | 1:D:415:ASN:HD22 | 1.56 | 0.53 |
| 1:E:615:GLN:HB2 | 1:E:704:LEU:HD12 | 1.89 | 0.53 |
| 1:F:334:TYR:HB2 | 1:F:368:ILE:HG13 | 1.90 | 0.53 |
| 1:A:694:ASP:OD1 | 1:A:694:ASP:N | 2.41 | 0.53 |
| 1:F:604:ARG:HB3 | 1:F:720:PHE:HD1 | 1.74 | 0.53 |
| 1:D:343:SER:OG | 1:D:344:LYS:N | 2.42 | 0.53 |
| 1:F:444:ARG:NH2 | 1:F:468:ALA:O | 2.43 | 0.52 |
| 1:C:1170:ARG:HH21 | 1:C:1173:VAL:HG11 | 1.73 | 0.52 |
| 1:E:444:ARG:HA | 1:E:447:ILE:HG22 | 1.90 | 0.52 |
| 1:C:444:ARG:HA | 1:C:447:ILE:HG22 | 1.89 | 0.52 |
| 1:C:1146:THR:H | 1:C:1149:GLN:HE21 | 1.57 | 0.52 |
| 1:E:576:VAL:HG21 | 1:F:493:ARG:HA | 1.92 | 0.52 |
| 1:B:1146:THR:H | 1:B:1149:GLN:HE21 | 1.56 | 0.52 |
| 1:E:694:ASP:OD1 | 1:E:694:ASP:N | 2.40 | 0.52 |
| 1:F:329:LYS:HB3 | 1:F:330:LYS:HG2 | 1.92 | 0.52 |
| 1:E:429:ARG:NH2 | 4:F:1201:ATP:O2G | 2.41 | 0.52 |
| 1:F:267:SER:HA | 1:F:450:ILE:HD11 | 1.90 | 0.52 |
| 1:A:332:SER:OG | 1:A:333:PHE:N | 2.44 | 0.51 |
| 1:A:433:GLU:OE2 | 1:B:532:ARG:NH1 | 2.43 | 0.51 |
| 1:C:494:THR:HG21 | 1:C:512:ILE:HG12 | 1.92 | 0.51 |
| 1:D:439:PRO:HD2 | 1:D:475:GLY:HA2 | 1.92 | 0.51 |
| 1:A:665:ILE:HG12 | 1:A:700:LEU:HD21 | 1.93 | 0.51 |
| 1:A:739:ALA:HA | 1:A:742:GLN:HB2 | 1.92 | 0.51 |
| 1:D:308:PRO:O | 1:D:313:LYS:NZ | 2.43 | 0.51 |
| 1:D:568:SER:OG | 1:D:569:LYS:N | 2.44 | 0.51 |
| 1:E:501:SER:OG | 1:E:502:THR:N | 2.44 | 0.51 |
| 1:A:604:ARG:NH2 | 1:A:719:TRP:O | 2.44 | 0.51 |
| 1:A:1159:GLN:NE2 | 1:A:1176:GLU:OE2 | 2.37 | 0.51 |
| 1:B:713:HIS:O | 1:B:715:GLN:N | 2.39 | 0.51 |
| 1:D:583:GLU:HG2 | 1:E:517:LYS:HD3 | 1.92 | 0.51 |
| 1:B:355:LEU:HA | 1:B:358:GLU:HB2 | 1.93 | 0.50 |
| 1:A:1159:GLN:O | 1:A:1163:ASN:ND2 | 2.44 | 0.50 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 1:D:705:SER:OG | 1:D:706:SER:N | 2.43 | 0.50 |
| 1:B:722:SER:OG | 1:B:723:LYS:N | 2.45 | 0.50 |
| 1:D:722:SER:OG | 1:D:723:LYS:N | 2.45 | 0.50 |
| 1:B:426:ARG:NH2 | 1:B:427:PRO:O | 2.44 | 0.50 |
| 1:D:314:THR:OG1 | 4:D:1201:ATP:O2A | 2.29 | 0.50 |
| 1:D:501:SER:OG | 1:D:502:THR:N | 2.45 | 0.50 |
| 1:B:751:SER:O | 1:B:753:THR:N | 2.45 | 0.50 |
| 1:D:534:SER:OG | 1:D:535:ILE:N | 2.44 | 0.50 |
| 1:D:452:THR:O | 1:D:452:THR:OG1 | 2.29 | 0.50 |
| 1:C:440:ASP:OD1 | 1:C:440:ASP:N | 2.37 | 0.49 |
| 1:E:478:ASP:N | 1:E:478:ASP:OD1 | 2.36 | 0.49 |
| 1:D:615:GLN:HB2 | 1:D:704:LEU:HD23 | 1.94 | 0.49 |
| 1:D:713:HIS:HD2 | 1:D:715:GLN:H | 1.59 | 0.49 |
| 1:E:454:ASN:HD22 | 1:E:459:VAL:HG12 | 1.77 | 0.49 |
| 1:B:585:ASP:HB3 | 1:B:587:GLU:HG2 | 1.92 | 0.49 |
| 1:B:1146:THR:HG23 | 1:B:1149:GLN:HE21 | 1.77 | 0.49 |
| 1:C:664:SER:HB2 | 1:C:699:ILE:HG22 | 1.93 | 0.49 |
| 1:A:374:ASP:N | 1:A:374:ASP:OD1 | 2.45 | 0.49 |
| 1:B:571:ASN:ND2 | 1:B:574:GLU:OE1 | 2.43 | 0.49 |
| 1:A:380:ARG:HD2 | 1:B:416:ARG:HE | 1.77 | 0.49 |
| 1:F:444:ARG:HA | 1:F:447:ILE:HG22 | 1.94 | 0.49 |
| 1:C:635:ASP:OD1 | 1:C:635:ASP:N | 2.40 | 0.49 |
| 1:A:404:SER:OG | 1:A:405:ARG:N | 2.45 | 0.48 |
| 1:C:603:PRO:HB2 | 1:C:700:LEU:HD23 | 1.95 | 0.48 |
| 1:B:509:PRO:O | 1:B:511:THR:N | 2.40 | 0.48 |
| 1:B:1140:ASP:OD1 | 1:B:1140:ASP:N | 2.46 | 0.48 |
| 1:D:441:ARG:NH2 | 1:D:469:GLU:OE2 | 2.46 | 0.48 |
| 1:D:536:SER:O | 1:D:536:SER:OG | 2.30 | 0.48 |
| 1:D:642:ASP:OD1 | 1:D:642:ASP:N | 2.46 | 0.48 |
| 1:E:587:GLU:HA | 1:E:590:GLN:HG2 | 1.96 | 0.48 |
| 1:B:1141:SER:O | 1:B:1141:SER:OG | 2.31 | 0.48 |
| 1:C:585:ASP:OD1 | 1:C:585:ASP:N | 2.46 | 0.48 |
| 1:F:1176:GLU:OE2 | 1:F:1179:ARG:NH2 | 2.47 | 0.48 |
| 1:A:324:CYS:SG | 1:A:325:SER:N | 2.86 | 0.48 |
| 1:B:497:GLN:HA | 1:B:500:ARG:HD3 | 1.95 | 0.48 |
| 1:A:646:SER:OG | 1:A:647:ILE:N | 2.46 | 0.47 |
| 1:B:440:ASP:HB2 | 1:B:627:GLU:HG3 | 1.96 | 0.47 |
| 1:E:1146:THR:OG1 | 1:E:1148:ASP:OD1 | 2.32 | 0.47 |
| 1:E:571:ASN:OD1 | 1:E:571:ASN:N | 2.47 | 0.47 |
| 1:D:571:ASN:N | 1:D:571:ASN:OD1 | 2.47 | 0.47 |
| 1:E:294:ARG:HH11 | 1:F:510:LYS:HG2 | 1.78 | 0.47 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 1:B:301:ARG:NH1 | 1:B:406:GLY:O | 2.47 | 0.47 |
| 1:A:613:LEU:HG | 1:A:1147:VAL:HG21 | 1.95 | 0.47 |
| 1:A:723:LYS:NZ | 1:B:1183:GLU:O | 2.37 | 0.47 |
| 1:C:1146:THR:HG23 | 1:C:1149:GLN:HE21 | 1.79 | 0.47 |
| 1:F:734:ARG:NH1 | 1:F:735:ASP:OD1 | 2.47 | 0.47 |
| 1:E:1169:ASN:O | 1:E:1172:SER:OG | 2.32 | 0.47 |
| 1:C:635:ASP:HB3 | 1:C:669:PRO:HD2 | 1.97 | 0.46 |
| 1:D:1142:THR:OG1 | 1:D:1143:THR:N | 2.45 | 0.46 |
| 1:C:330:LYS:HD2 | 1:C:330:LYS:HA | 1.74 | 0.46 |
| 1:B:427:PRO:HG2 | 1:C:478:ASP:HA | 1.97 | 0.46 |
| 1:A:414:THR:OG1 | 1:A:415:ASN:N | 2.49 | 0.46 |
| 1:B:497:GLN:HB3 | 1:B:766:LEU:HD22 | 1.98 | 0.46 |
| 1:A:623:LEU:HD21 | 1:A:631:VAL:HG11 | 1.98 | 0.46 |
| 1:B:481:ALA:HA | 1:B:484:THR:HG22 | 1.98 | 0.46 |
| 1:C:580:ASP:OD2 | 1:D:761:ARG:NH2 | 2.48 | 0.46 |
| 1:C:493:ARG:NH1 | 1:C:518:ASP:OD2 | 2.48 | 0.46 |
| 1:E:1175:ASP:OD1 | 1:E:1175:ASP:N | 2.44 | 0.46 |
| 1:B:502:THR:HG23 | 1:B:503:LYS:HG3 | 1.96 | 0.46 |
| 1:C:643:SER:O | 1:C:643:SER:OG | 2.32 | 0.46 |
| 1:E:582:LYS:HA | 1:E:582:LYS:HD3 | 1.78 | 0.46 |
| 1:A:440:ASP:O | 1:A:444:ARG:N | 2.49 | 0.46 |
| 1:B:499:TYR:O | 1:B:501:SER:N | 2.49 | 0.46 |
| 1:B:709:LEU:HD11 | 1:B:728:SER:HB3 | 1.98 | 0.46 |
| 1:D:627:GLU:O | 1:D:629:VAL:N | 2.46 | 0.46 |
| 1:A:741:PHE:O | 1:A:745:LEU:N | 2.41 | 0.45 |
| 1:B:583:GLU:HG2 | 1:C:517:LYS:HD3 | 1.98 | 0.45 |
| 1:E:688:SER:O | 1:E:688:SER:OG | 2.32 | 0.45 |
| 1:F:1172:SER:O | 1:F:1172:SER:OG | 2.34 | 0.45 |
| 1:F:645:GLN:HE21 | 1:F:649:THR:HG23 | 1.81 | 0.45 |
| 1:B:529:SER:HA | 1:B:532:ARG:HD2 | 1.98 | 0.45 |
| 1:E:329:LYS:HA | 1:E:330:LYS:HA | 1.80 | 0.45 |
| 1:B:444:ARG:NH1 | 1:B:471:SER:OG | 2.50 | 0.45 |
| 1:A:400:ASP:OD2 | 1:A:426:ARG:NH1 | 2.46 | 0.45 |
| 1:D:374:ASP:OD2 | 1:D:416:ARG:NE | 2.48 | 0.45 |
| 1:E:367:ILE:HG22 | 1:E:409:ILE:HB | 1.99 | 0.45 |
| 1:A:427:PRO:HA | 1:A:431:ASP:HB3 | 1.99 | 0.45 |
| 1:A:399:MET:O | 1:A:405:ARG:NH2 | 2.50 | 0.44 |
| 1:B:712:LEU:HD23 | 1:B:712:LEU:HA | 1.87 | 0.44 |
| 1:D:280:GLU:OE2 | 1:E:499:TYR:OH | 2.30 | 0.44 |
| 1:D:694:ASP:N | 1:D:694:ASP:OD1 | 2.45 | 0.44 |
| 1:F:450:ILE:HG23 | 1:F:451:HIS:HD2 | 1.81 | 0.44 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 1:D:481:ALA:HA | 1:D:484:THR:HG22 | 2.00 | 0.44 |
| 1:F:329:LYS:HA | 1:F:330:LYS:HA | 1.82 | 0.44 |
| 1:E:675:LEU:HD22 | 1:E:713:HIS:HE1 | 1.82 | 0.44 |
| 1:F:706:SER:OG | 1:F:707:SER:N | 2.40 | 0.44 |
| 1:A:613:LEU:O | 1:A:615:GLN:NE2 | 2.50 | 0.44 |
| 1:E:706:SER:OG | 1:E:707:SER:N | 2.35 | 0.44 |
| 1:B:641:GLN:H | 1:B:641:GLN:HG3 | 1.70 | 0.44 |
| 1:A:269:GLY:HA3 | 1:A:447:ILE:HD12 | 2.00 | 0.44 |
| 1:B:509:PRO:HG2 | 1:B:510:LYS:HG2 | 2.00 | 0.44 |
| 1:E:472:LYS:HD2 | 1:E:472:LYS:HA | 1.77 | 0.44 |
| 1:E:579:ASP:HB2 | 1:F:764:ARG:HB3 | 2.00 | 0.44 |
| 1:E:1146:THR:OG1 | 1:E:1149:GLN:OE1 | 2.26 | 0.44 |
| 1:E:1136:GLN:NE2 | 1:E:1140:ASP:OD2 | 2.50 | 0.43 |
| 1:A:607:ILE:HG22 | 1:A:727:TYR:HB3 | 1.99 | 0.43 |
| 1:B:501:SER:OG | 1:B:502:THR:N | 2.50 | 0.43 |
| 1:D:312:GLY:N | 4:D:1201:ATP:O1A | 2.51 | 0.43 |
| 1:E:479:LEU:HD23 | 1:E:479:LEU:HA | 1.80 | 0.43 |
| 1:F:539:LYS:HB2 | 1:F:539:LYS:HE3 | 1.78 | 0.43 |
| 1:B:560:LEU:HD23 | 1:B:560:LEU:HA | 1.90 | 0.43 |
| 1:C:769:LEU:HD23 | 1:C:769:LEU:HA | 1.84 | 0.43 |
| 1:A:579:ASP:HB2 | 1:B:762:LYS:HB2 | 2.00 | 0.43 |
| 1:A:598:LEU:HD12 | 1:A:598:LEU:HA | 1.90 | 0.43 |
| 1:B:303:VAL:HA | 1:B:432:ARG:HB2 | 2.00 | 0.43 |
| 1:E:613:LEU:HD11 | 1:E:731:TYR:HA | 2.00 | 0.43 |
| 1:A:590:GLN:O | 1:A:594:THR:OG1 | 2.36 | 0.43 |
| 1:B:646:SER:OG | 1:B:647:ILE:N | 2.52 | 0.43 |
| 1:D:648:GLU:OE2 | 1:D:681:THR:OG1 | 2.31 | 0.43 |
| 1:E:1170:ARG:HH11 | 1:E:1173:VAL:HG11 | 1.84 | 0.43 |
| 1:C:336:ARG:NH1 | 1:C:341:CYS:SG | 2.92 | 0.42 |
| 1:C:459:VAL:HA | 1:C:460:PRO:HD3 | 1.91 | 0.42 |
| 1:B:424:LEU:HD12 | 1:B:429:ARG:HD3 | 2.01 | 0.42 |
| 1:D:400:ASP:OD2 | 1:D:426:ARG:NH1 | 2.49 | 0.42 |
| 1:E:541:LEU:HD23 | 1:E:541:LEU:HA | 1.89 | 0.42 |
| 1:A:536:SER:HA | 1:A:537:PRO:HD3 | 1.92 | 0.42 |
| 1:F:1143:THR:OG1 | 1:F:1144:GLY:N | 2.52 | 0.42 |
| 1:A:373:ILE:HD12 | 1:A:373:ILE:HA | 1.94 | 0.42 |
| 1:D:440:ASP:OD1 | 1:D:440:ASP:N | 2.45 | 0.42 |
| 1:C:1165:LYS:HE2 | 1:C:1165:LYS:HB3 | 1.83 | 0.42 |
| 1:D:1155:SER:O | 1:D:1155:SER:OG | 2.34 | 0.42 |
| 1:E:632:GLN:HE21 | 1:E:634:PHE:HE1 | 1.65 | 0.42 |
| 1:F:1131:LEU:HD23 | 1:F:1131:LEU:HA | 1.91 | 0.42 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 1:A:307:GLY:HA3 | 1:A:308:PRO:HD3 | 1.82 | 0.42 |
| 1:A:665:ILE:HG21 | 1:A:702:LEU:HD12 | 2.02 | 0.42 |
| 1:A:1146:THR:O | 1:A:1149:GLN:NE2 | 2.32 | 0.42 |
| 1:B:306:HIS:HA | 1:B:313:LYS:HZ1 | 1.85 | 0.42 |
| 1:B:329:LYS:HD3 | 1:B:329:LYS:HA | 1.75 | 0.42 |
| 1:B:340:ASP:OD1 | 1:B:340:ASP:N | 2.52 | 0.42 |
| 1:C:326:SER:OG | 1:C:327:GLU:OE2 | 2.33 | 0.42 |
| 1:D:643:SER:O | 1:D:643:SER:OG | 2.36 | 0.42 |
| 1:A:583:GLU:HB2 | 1:B:517:LYS:HB2 | 2.01 | 0.42 |
| 1:B:635:ASP:OD1 | 1:B:635:ASP:N | 2.44 | 0.42 |
| 1:C:414:THR:OG1 | 1:C:415:ASN:N | 2.52 | 0.42 |
| 1:B:400:ASP:N | 1:B:400:ASP:OD2 | 2.53 | 0.41 |
| 1:C:613:LEU:HA | 1:C:613:LEU:HD23 | 1.87 | 0.41 |
| 1:D:479:LEU:HD23 | 1:D:479:LEU:HA | 1.91 | 0.41 |
| 1:E:542:SER:HA | 1:E:543:PRO:HD3 | 1.93 | 0.41 |
| 1:A:1172:SER:O | 1:A:1172:SER:OG | 2.32 | 0.41 |
| 1:B:1146:THR:OG1 | 1:B:1148:ASP:OD1 | 2.32 | 0.41 |
| 1:F:441:ARG:NH2 | 1:F:469:GLU:OE2 | 2.54 | 0.41 |
| 1:A:558:LYS:O | 1:A:562:LYS:NZ | 2.41 | 0.41 |
| 1:B:1148:ASP:OD1 | 1:B:1148:ASP:N | 2.50 | 0.41 |
| 1:D:444:ARG:HE | 1:D:444:ARG:HB2 | 1.69 | 0.41 |
| 1:E:417:PRO:O | 1:E:425:ARG:NH2 | 2.54 | 0.41 |
| 1:E:660:ARG:HB3 | 1:E:661:HIS:H | 1.63 | 0.41 |
| 1:D:472:LYS:HG2 | 1:D:624:GLN:HG3 | 2.02 | 0.41 |
| 1:D:749:LYS:HD2 | 1:D:749:LYS:HA | 1.89 | 0.41 |
| 1:E:622:ILE:HD11 | 1:E:702:LEU:HD11 | 2.02 | 0.41 |
| 1:C:598:LEU:HA | 1:C:598:LEU:HD23 | 1.87 | 0.41 |
| 1:E:290:GLU:O | 1:E:293:GLN:NE2 | 2.47 | 0.41 |
| 1:F:647:ILE:O | 1:F:650:SER:OG | 2.38 | 0.41 |
| 1:A:705:SER:OG | 1:A:706:SER:N | 2.54 | 0.41 |
| 1:B:370:PHE:HB3 | 1:B:373:ILE:HD11 | 2.03 | 0.41 |
| 1:B:593:GLU:OE1 | 1:B:594:THR:OG1 | 2.39 | 0.41 |
| 1:B:629:VAL:HG12 | 1:B:663:PRO:HB2 | 2.02 | 0.41 |
| 1:C:713:HIS:O | 1:C:715:GLN:N | 2.54 | 0.41 |
| 1:E:464:CYS:HA | 1:E:465:SER:HA | 1.78 | 0.41 |
| 1:E:639:LEU:HD23 | 1:E:639:LEU:HA | 1.94 | 0.41 |
| 1:E:1170:ARG:HH11 | 1:E:1173:VAL:HG21 | 1.86 | 0.41 |
| 1:F:694:ASP:OD1 | 1:F:694:ASP:N | 2.50 | 0.41 |
| 1:C:510:LYS:HA | 1:C:510:LYS:HD3 | 1.79 | 0.41 |
| 1:F:634:PHE:HE1 | 1:F:654:LEU:HB3 | 1.86 | 0.41 |
| 1:B:598:LEU:HD23 | 1:B:598:LEU:HA | 1.91 | 0.40 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 1:D:573:LEU:HD23 | 1:D:573:LEU:HA | 1.96 | 0.40 |
| 1:D:613:LEU:HA | 1:D:1147:VAL:HG12 | 2.04 | 0.40 |
| 1:F:647:ILE:HD11 | 1:F:678:LEU:HD22 | 2.02 | 0.40 |
| 1:B:752:PRO:HG3 | 1:B:1168:TRP:HE1 | 1.86 | 0.40 |
| 1:D:503:LYS:HB2 | 1:D:503:LYS:HE2 | 1.84 | 0.40 |
| 1:D:400:ASP:N | 1:D:400:ASP:OD1 | 2.54 | 0.40 |
| 1:F:444:ARG:NH2 | 1:F:471:SER:O | 2.54 | 0.40 |
| 1:F:713:HIS:HA | 1:F:714:PRO:HD3 | 1.95 | 0.40 |
| 1:D:397:ALA:HB2 | 1:E:372:GLN:HG3 | 2.04 | 0.40 |
| 1:E:498:LEU:HD23 | 1:E:498:LEU:HA | 1.89 | 0.40 |

There are no symmetry-related clashes.

## 5.3  Torsion angles (i)

### 5.3.1  Protein backbone (i)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

| Mol | Chain | Analysed | Favoured | Allowed | Outliers | Percentiles | |
|---|---|---|---|---|---|---|---|
| 1 | A | 508/1198 (42%) | 449 (88%) | 56 (11%) | 3 (1%) | 25 | 65 |
| 1 | B | 567/1198 (47%) | 492 (87%) | 69 (12%) | 6 (1%) | 14 | 54 |
| 1 | C | 565/1198 (47%) | 505 (89%) | 58 (10%) | 2 (0%) | 34 | 71 |
| 1 | D | 562/1198 (47%) | 475 (84%) | 83 (15%) | 4 (1%) | 22 | 62 |
| 1 | E | 573/1198 (48%) | 491 (86%) | 81 (14%) | 1 (0%) | 47 | 80 |
| 1 | F | 516/1198 (43%) | 434 (84%) | 80 (16%) | 2 (0%) | 34 | 71 |
| All | All | 3291/7188 (46%) | 2846 (86%) | 427 (13%) | 18 (0%) | 32 | 68 |

All (18) Ramachandran outliers are listed below:

| Mol | Chain | Res | Type |
|---|---|---|---|
| 1 | B | 500 | ARG |
| 1 | B | 510 | LYS |

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| Mol | Chain | Res | Type |
|-----|-------|------|------|
| 1 | D | 628 | GLY |
| 1 | B | 509 | PRO |
| 1 | D | 721 | SER |
| 1 | D | 1143 | THR |
| 1 | A | 431 | ASP |
| 1 | B | 378 | PRO |
| 1 | C | 615 | GLN |
| 1 | D | 299 | PRO |
| 1 | E | 299 | PRO |
| 1 | F | 767 | PRO |
| 1 | B | 537 | PRO |
| 1 | F | 720 | PHE |
| 1 | A | 365 | PRO |
| 1 | A | 364 | GLN |
| 1 | B | 663 | PRO |
| 1 | C | 714 | PRO |

### 5.3.2   Protein sidechains ⓘ

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

| Mol | Chain | Analysed | Rotameric | Outliers | Percentiles | |
|-----|-------|----------|-----------|----------|-------------|---|
| 1 | A | 466/1086 (43%) | 463 (99%) | 3 (1%) | 86 | 94 |
| 1 | B | 517/1086 (48%) | 513 (99%) | 4 (1%) | 81 | 92 |
| 1 | C | 515/1086 (47%) | 514 (100%) | 1 (0%) | 93 | 98 |
| 1 | D | 512/1086 (47%) | 512 (100%) | 0 | 100 | 100 |
| 1 | E | 522/1086 (48%) | 520 (100%) | 2 (0%) | 91 | 97 |
| 1 | F | 470/1086 (43%) | 466 (99%) | 4 (1%) | 78 | 90 |
| All | All | 3002/6516 (46%) | 2988 (100%) | 14 (0%) | 89 | 95 |

All (14) residues with a non-rotameric sidechain are listed below:

| Mol | Chain | Res | Type |
|-----|-------|------|------|
| 1 | A | 337 | LYS |
| 1 | A | 1132 | THR |

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| Mol | Chain | Res | Type |
|-----|-------|------|------|
| 1 | A | 1165 | LYS |
| 1 | B | 602 | LYS |
| 1 | B | 613 | LEU |
| 1 | B | 1152 | HIS |
| 1 | B | 1185 | MET |
| 1 | C | 333 | PHE |
| 1 | E | 591 | ARG |
| 1 | E | 1179 | ARG |
| 1 | F | 429 | ARG |
| 1 | F | 613 | LEU |
| 1 | F | 723 | LYS |
| 1 | F | 1142 | THR |

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (23) such sidechains are listed below:

| Mol | Chain | Res | Type |
|-----|-------|------|------|
| 1 | A | 589 | GLN |
| 1 | B | 1149 | GLN |
| 1 | C | 415 | ASN |
| 1 | C | 1149 | GLN |
| 1 | D | 328 | ASN |
| 1 | D | 352 | GLN |
| 1 | D | 364 | GLN |
| 1 | D | 415 | ASN |
| 1 | D | 454 | ASN |
| 1 | D | 589 | GLN |
| 1 | D | 676 | ASN |
| 1 | D | 713 | HIS |
| 1 | D | 1149 | GLN |
| 1 | E | 407 | GLN |
| 1 | E | 590 | GLN |
| 1 | E | 625 | GLN |
| 1 | E | 653 | HIS |
| 1 | E | 676 | ASN |
| 1 | E | 715 | GLN |
| 1 | F | 561 | GLN |
| 1 | F | 645 | GLN |
| 1 | F | 713 | HIS |
| 1 | F | 1163 | ASN |

### 5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

## 5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

There are no non-standard protein/DNA/RNA residues in this entry.

## 5.5 Carbohydrates ⓘ

There are no monosaccharides in this entry.

## 5.6 Ligand geometry ⓘ

6 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

| Mol | Type | Chain | Res | Link | Bond lengths | | | Bond angles | | |
|-----|------|-------|-----|------|--------|------|------------|--------|------|------------|
| | | | | | Counts | RMSZ | $\#|Z| > 2$ | Counts | RMSZ | $\#|Z| > 2$ |
| 3 | ADP | A | 1201 | 1 | 24,29,29 | 0.98 | 1 (4%) | 29,45,45 | 1.52 | 4 (13%) |
| 4 | ATP | E | 1201 | 1 | 26,33,33 | 0.97 | 1 (3%) | 31,52,52 | 1.88 | 6 (19%) |
| 4 | ATP | C | 1201 | 1 | 26,33,33 | 0.97 | 1 (3%) | 31,52,52 | 1.88 | 5 (16%) |
| 4 | ATP | D | 1201 | 1 | 26,33,33 | 0.97 | 1 (3%) | 31,52,52 | 1.88 | 6 (19%) |
| 4 | ATP | F | 1201 | 1 | 26,33,33 | 0.97 | 1 (3%) | 31,52,52 | 1.89 | 5 (16%) |
| 4 | ATP | B | 1201 | 1 | 26,33,33 | 0.96 | 1 (3%) | 31,52,52 | 1.88 | 5 (16%) |

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

| Mol | Type | Chain | Res | Link | Chirals | Torsions | Rings |
|-----|------|-------|-----|------|---------|----------|-------|
| 3 | ADP | A | 1201 | 1 | - | 4/12/32/32 | 0/3/3/3 |
| 4 | ATP | E | 1201 | 1 | - | 0/18/38/38 | 0/3/3/3 |
| 4 | ATP | C | 1201 | 1 | - | 0/18/38/38 | 0/3/3/3 |

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| Mol | Type | Chain | Res | Link | Chirals | Torsions | Rings |
|-----|------|-------|------|------|---------|----------|-------|
| 4 | ATP | D | 1201 | 1 | - | 0/18/38/38 | 0/3/3/3 |
| 4 | ATP | F | 1201 | 1 | - | 0/18/38/38 | 0/3/3/3 |
| 4 | ATP | B | 1201 | 1 | - | 0/18/38/38 | 0/3/3/3 |

All (6) bond length outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed(Å) | Ideal(Å) |
|-----|-------|------|------|-------|------|-------------|----------|
| 3 | A | 1201 | ADP | C5-C4 | 2.39 | 1.47 | 1.40 |
| 4 | C | 1201 | ATP | C5-C4 | 2.32 | 1.47 | 1.40 |
| 4 | D | 1201 | ATP | C5-C4 | 2.32 | 1.47 | 1.40 |
| 4 | F | 1201 | ATP | C5-C4 | 2.32 | 1.47 | 1.40 |
| 4 | B | 1201 | ATP | C5-C4 | 2.32 | 1.47 | 1.40 |
| 4 | E | 1201 | ATP | C5-C4 | 2.29 | 1.47 | 1.40 |

All (31) bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed($^o$) | Ideal($^o$) |
|-----|-------|------|------|-------|------|------------|---------|
| 4 | E | 1201 | ATP | N3-C2-N1 | -5.00 | 120.87 | 128.68 |
| 4 | F | 1201 | ATP | N3-C2-N1 | -4.99 | 120.88 | 128.68 |
| 4 | C | 1201 | ATP | N3-C2-N1 | -4.98 | 120.89 | 128.68 |
| 4 | B | 1201 | ATP | N3-C2-N1 | -4.98 | 120.90 | 128.68 |
| 4 | D | 1201 | ATP | N3-C2-N1 | -4.96 | 120.92 | 128.68 |
| 4 | D | 1201 | ATP | PB-O3B-PG | -4.30 | 118.08 | 132.83 |
| 4 | B | 1201 | ATP | PB-O3B-PG | -4.30 | 118.08 | 132.83 |
| 4 | E | 1201 | ATP | PB-O3B-PG | -4.30 | 118.08 | 132.83 |
| 4 | F | 1201 | ATP | PB-O3B-PG | -4.29 | 118.09 | 132.83 |
| 4 | C | 1201 | ATP | PB-O3B-PG | -4.29 | 118.11 | 132.83 |
| 4 | F | 1201 | ATP | C3'-C2'-C1' | 3.83 | 106.75 | 100.98 |
| 4 | D | 1201 | ATP | C3'-C2'-C1' | 3.81 | 106.71 | 100.98 |
| 4 | B | 1201 | ATP | C3'-C2'-C1' | 3.80 | 106.70 | 100.98 |
| 4 | C | 1201 | ATP | C3'-C2'-C1' | 3.80 | 106.69 | 100.98 |
| 4 | E | 1201 | ATP | C3'-C2'-C1' | 3.79 | 106.69 | 100.98 |
| 4 | F | 1201 | ATP | PA-O3A-PB | -3.66 | 120.26 | 132.83 |
| 4 | D | 1201 | ATP | PA-O3A-PB | -3.66 | 120.27 | 132.83 |
| 4 | B | 1201 | ATP | PA-O3A-PB | -3.65 | 120.28 | 132.83 |
| 4 | C | 1201 | ATP | PA-O3A-PB | -3.65 | 120.29 | 132.83 |
| 4 | E | 1201 | ATP | PA-O3A-PB | -3.65 | 120.30 | 132.83 |
| 3 | A | 1201 | ADP | N3-C2-N1 | -3.28 | 123.55 | 128.68 |
| 3 | A | 1201 | ADP | C3'-C2'-C1' | 3.15 | 105.72 | 100.98 |
| 3 | A | 1201 | ADP | PA-O3A-PB | -3.02 | 122.46 | 132.83 |
| 3 | A | 1201 | ADP | C4-C5-N7 | -2.92 | 106.36 | 109.40 |
| 4 | F | 1201 | ATP | C2-N1-C6 | 2.77 | 123.50 | 118.75 |

*Continued on next page...*

*Continued from previous page...*

| Mol | Chain | Res | Type | Atoms | Z | Observed($^o$) | Ideal($^o$) |
|---|---|---|---|---|---|---|---|
| 4 | C | 1201 | ATP | C2-N1-C6 | 2.77 | 123.48 | 118.75 |
| 4 | B | 1201 | ATP | C2-N1-C6 | 2.76 | 123.47 | 118.75 |
| 4 | E | 1201 | ATP | C2-N1-C6 | 2.76 | 123.47 | 118.75 |
| 4 | D | 1201 | ATP | C2-N1-C6 | 2.75 | 123.45 | 118.75 |
| 4 | D | 1201 | ATP | O2B-PB-O1B | 2.01 | 122.18 | 112.24 |
| 4 | E | 1201 | ATP | O2B-PB-O1B | 2.00 | 122.14 | 112.24 |

There are no chirality outliers.

All (4) torsion outliers are listed below:

| Mol | Chain | Res | Type | Atoms |
|---|---|---|---|---|
| 3 | A | 1201 | ADP | C5'-O5'-PA-O2A |
| 3 | A | 1201 | ADP | PA-O3A-PB-O1B |
| 3 | A | 1201 | ADP | C5'-O5'-PA-O3A |
| 3 | A | 1201 | ADP | C5'-O5'-PA-O1A |

There are no ring outliers.

4 monomers are involved in 7 short contacts:

| Mol | Chain | Res | Type | Clashes | Symm-Clashes |
|---|---|---|---|---|---|
| 4 | E | 1201 | ATP | 1 | 0 |
| 4 | D | 1201 | ATP | 2 | 0 |
| 4 | F | 1201 | ATP | 2 | 0 |
| 4 | B | 1201 | ATP | 2 | 0 |

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

## Ligand ADP A 1201


Bond lengths


Bond angles


Torsions


Rings

## Ligand ATP E 1201


Bond lengths


Bond angles


Torsions


Rings

## Ligand ATP C 1201



Bond lengths



Bond angles



Torsions



Rings

## Ligand ATP D 1201



Bond lengths



Bond angles



Torsions



Rings

## Ligand ATP F 1201



Bond lengths

Bond angles

Torsions

Rings

## Ligand ATP B 1201



**Bond lengths**



**Bond angles**



**Torsions**



**Rings**
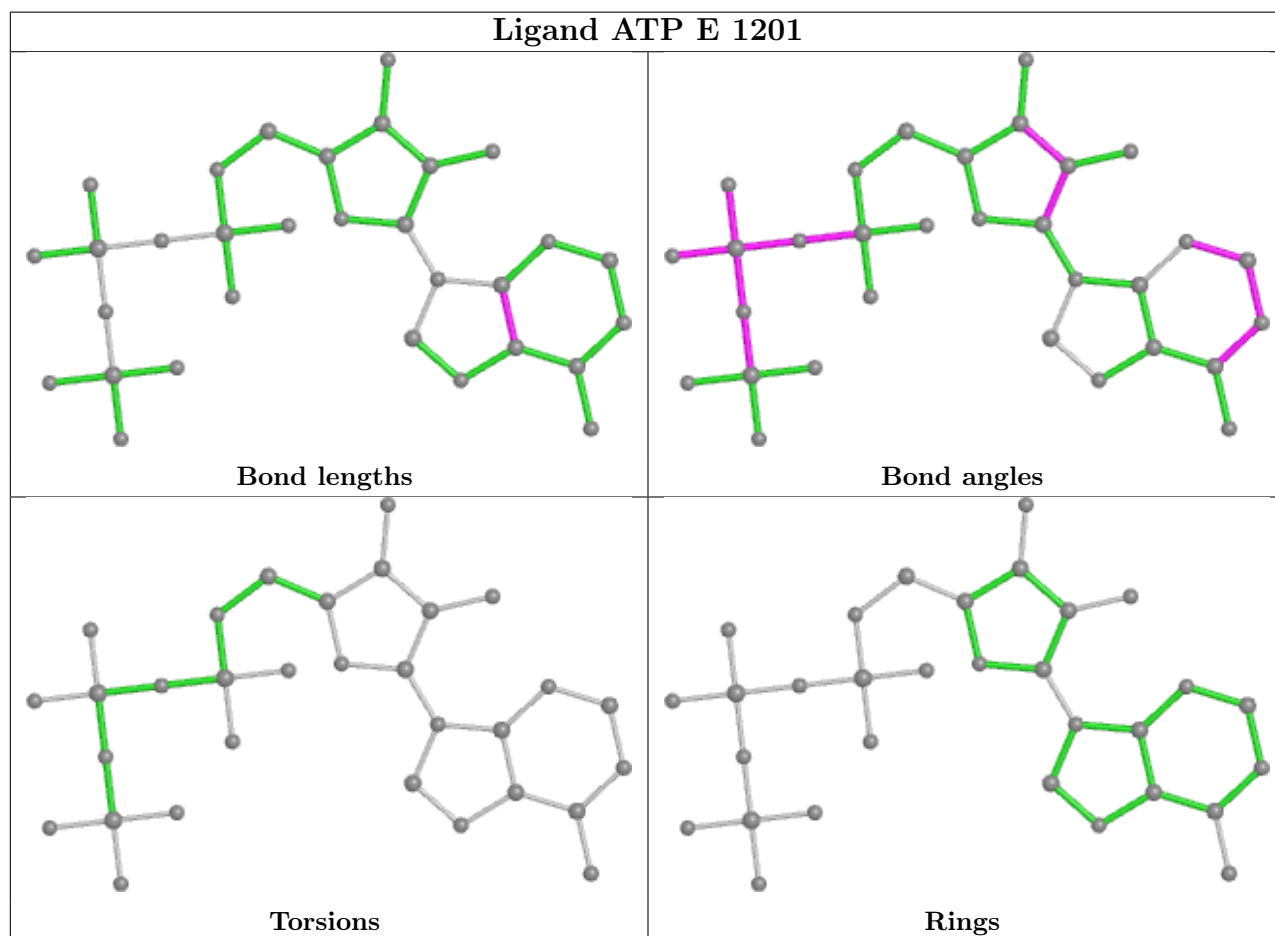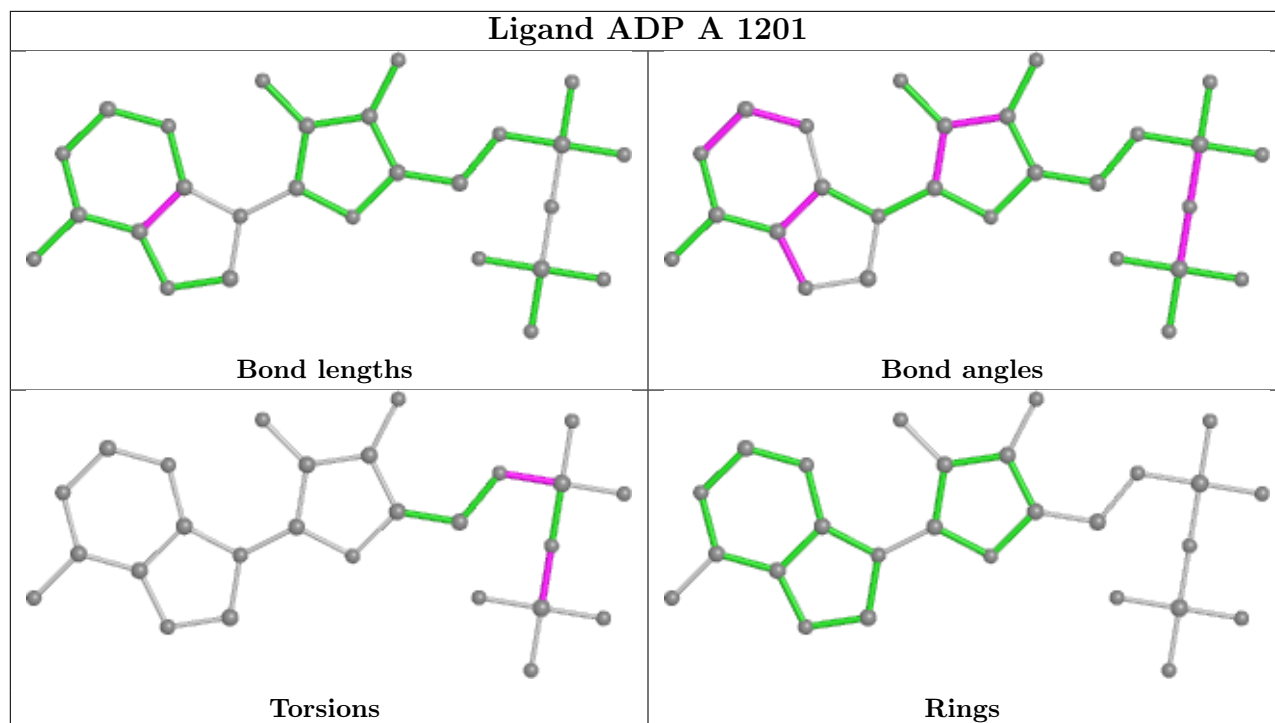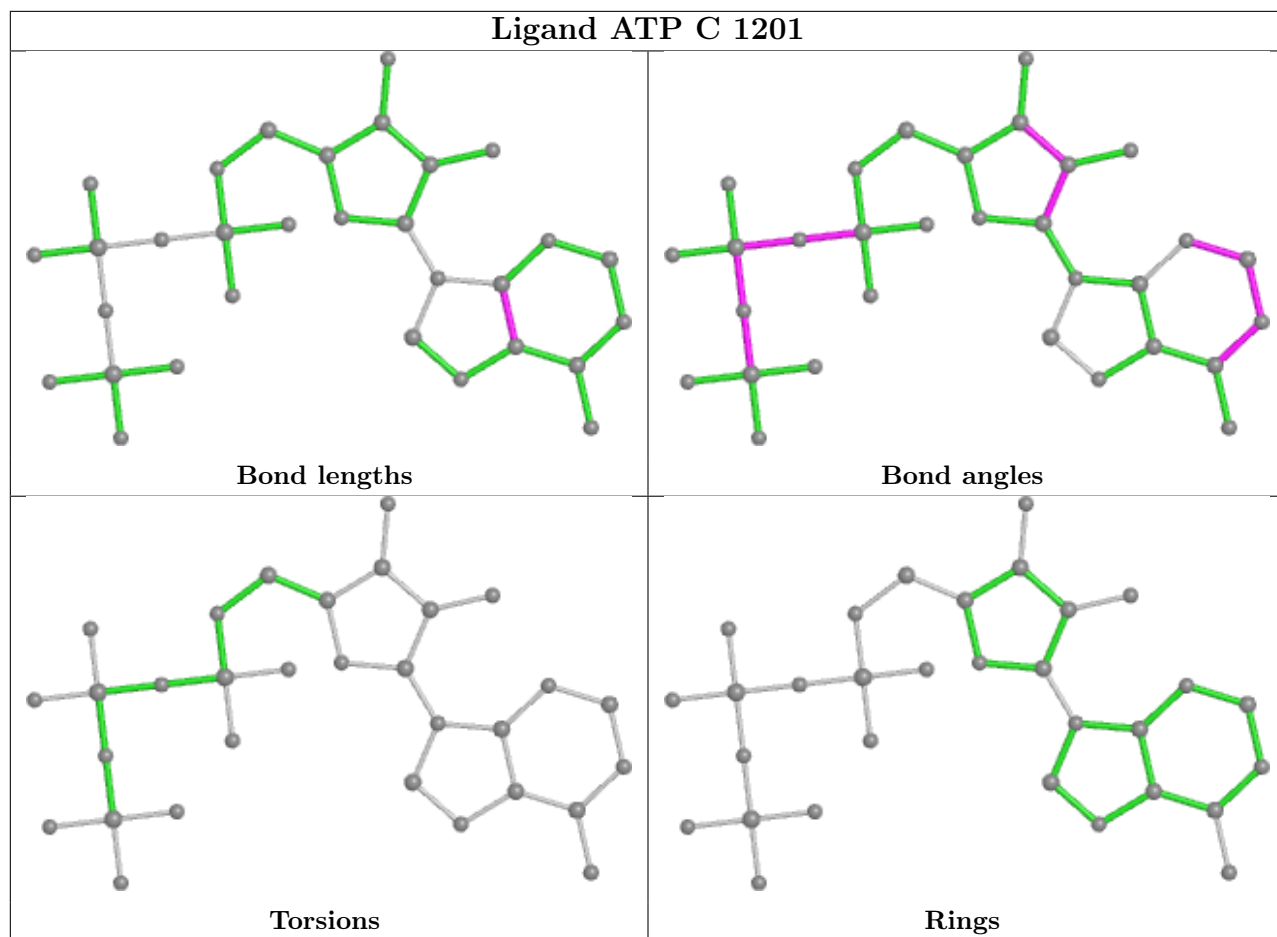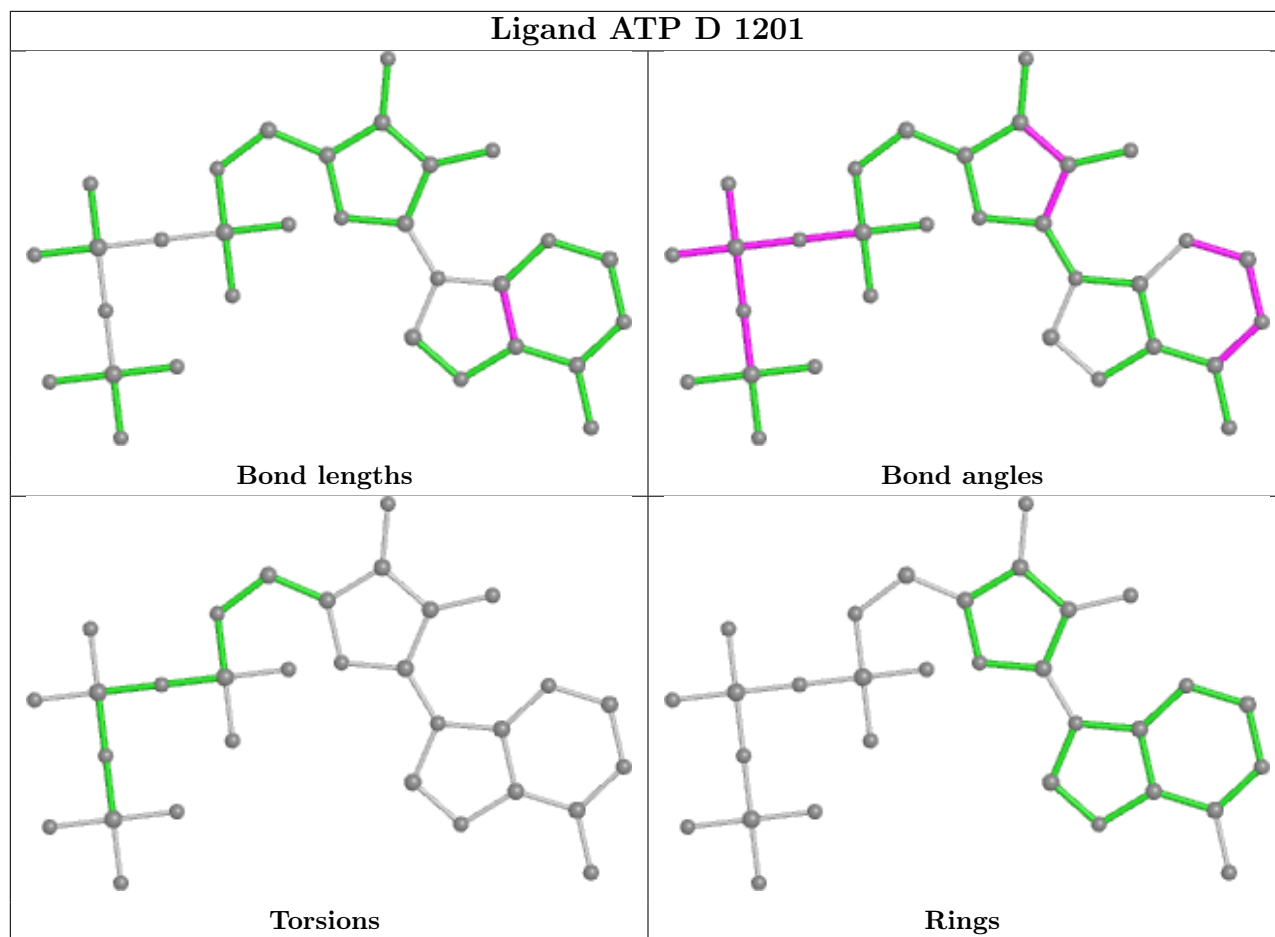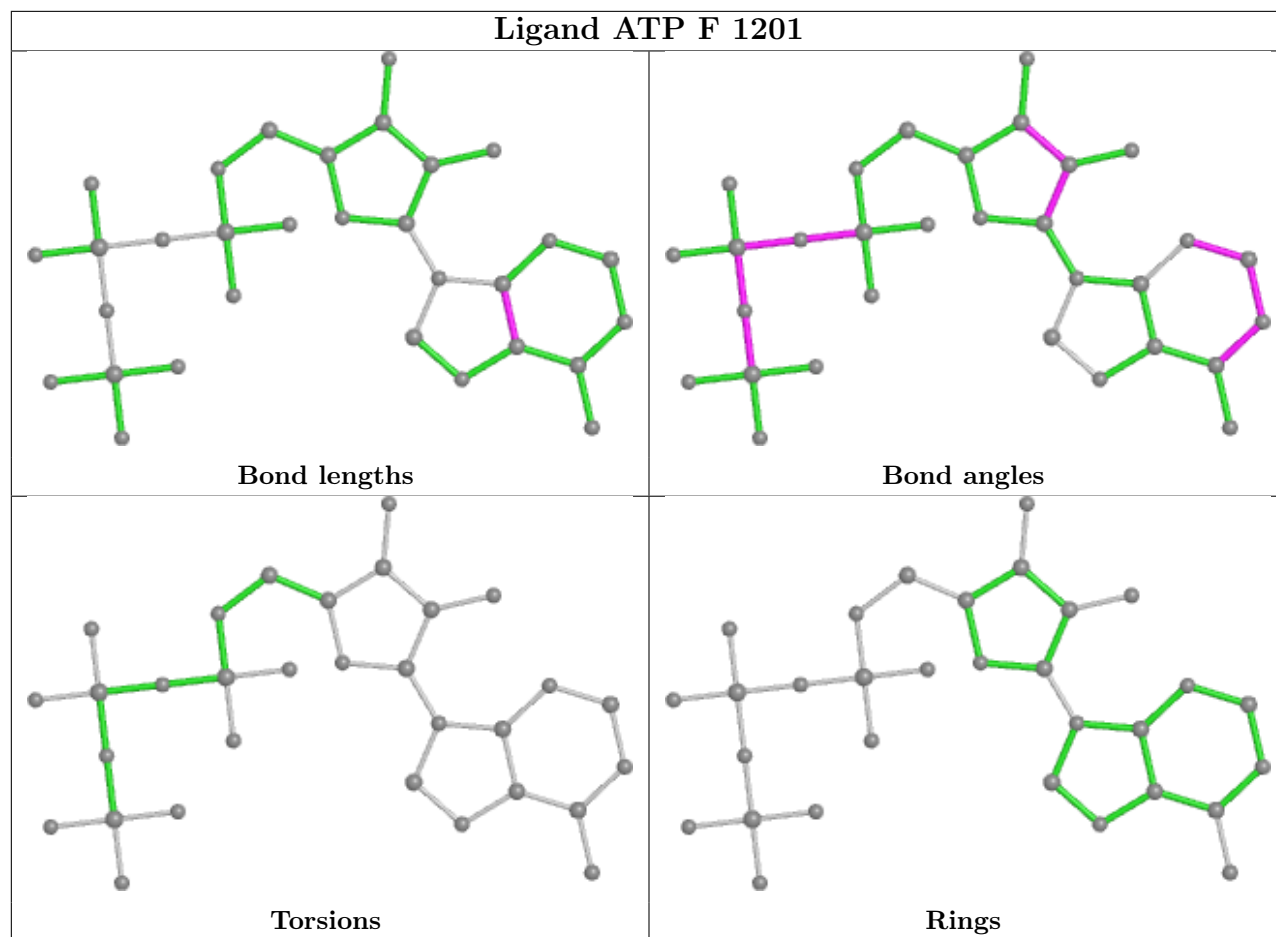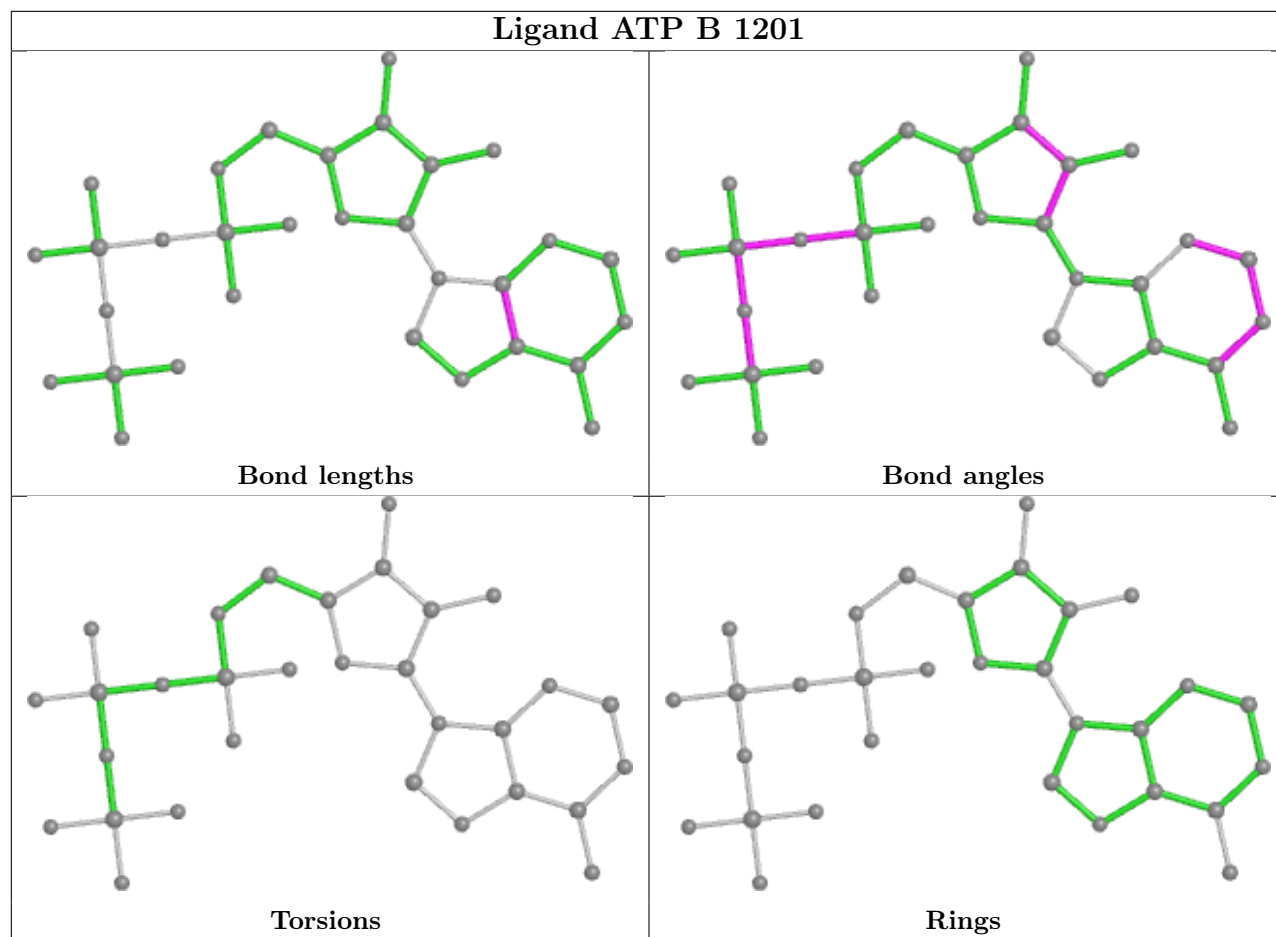
## 5.7　Other polymers　ⓘ

There are no such residues in this entry.

## 5.8　Polymer linkage issues　ⓘ

There are no chain breaks in this entry.

# 6　Map visualisation　ⓘ

This section contains visualisations of the EMDB entry EMD-9872. These allow visual inspection of the internal detail of the map and identification of artifacts.

No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

## 6.1　Orthogonal projections　ⓘ

### 6.1.1　Primary map



|     |     |     |
| :-: | :-: | :-: |
| X | Y | Z |
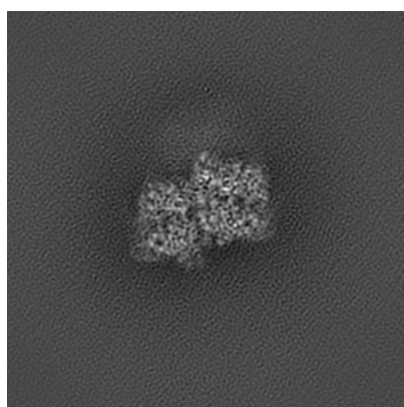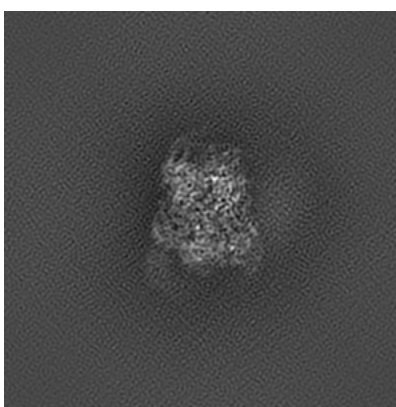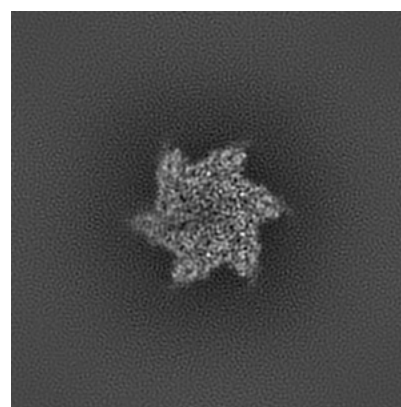
The images above show the map projected in three orthogonal directions.

## 6.2　Central slices　ⓘ
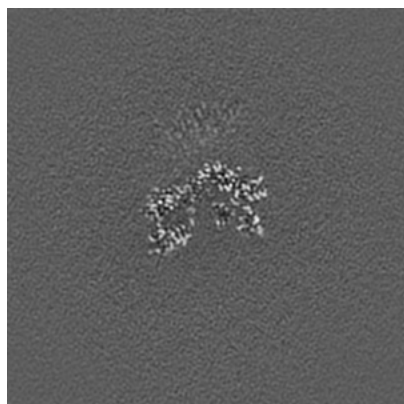
### 6.2.1　Primary map
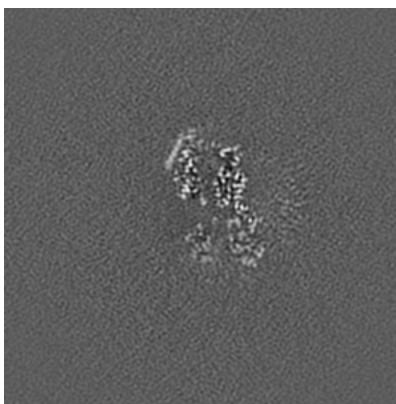


|     |     |     |
| :-: | :-: | :-: |
| X Index: 170 | Y Index: 170 | Z Index: 170 |
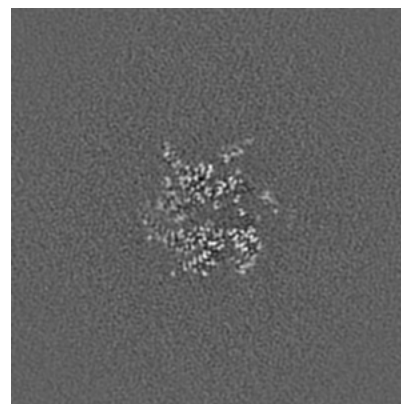
The images above show central slices of the map in three orthogonal directions.

## 6.3　Largest variance slices ⓘ
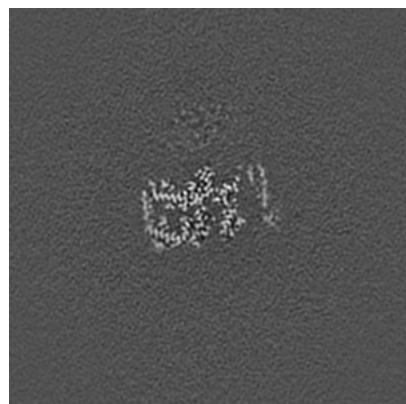
### 6.3.1　Primary map
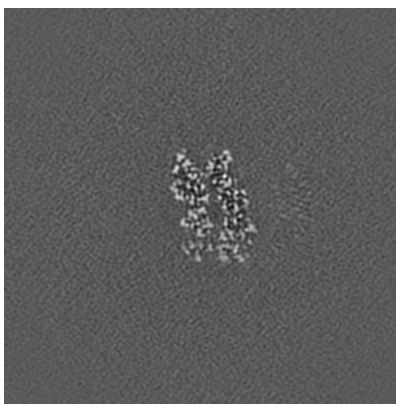


| X Index: 197 | Y Index: 186 | Z Index: 188 |
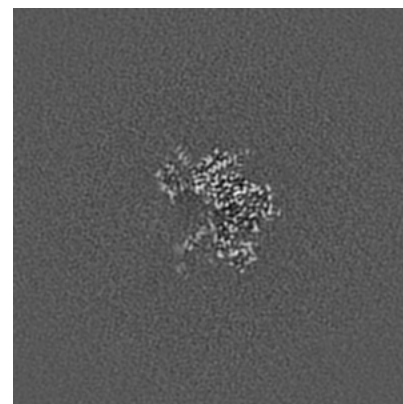
The images above show the largest variance slices of the map in three orthogonal directions.

## 6.4　Orthogonal surface views ⓘ

### 6.4.1　Primary map



| X | Y | Z |

The images above show the 3D surface view of the map at the recommended contour level 5.5. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

## 6.5   Mask visualisation ⓘ

This section was not generated. No masks/segmentation were deposited.

# 7   Map analysis ⓘ

This section contains the results of statistical analysis of the map.

## 7.1   Map-value distribution ⓘ
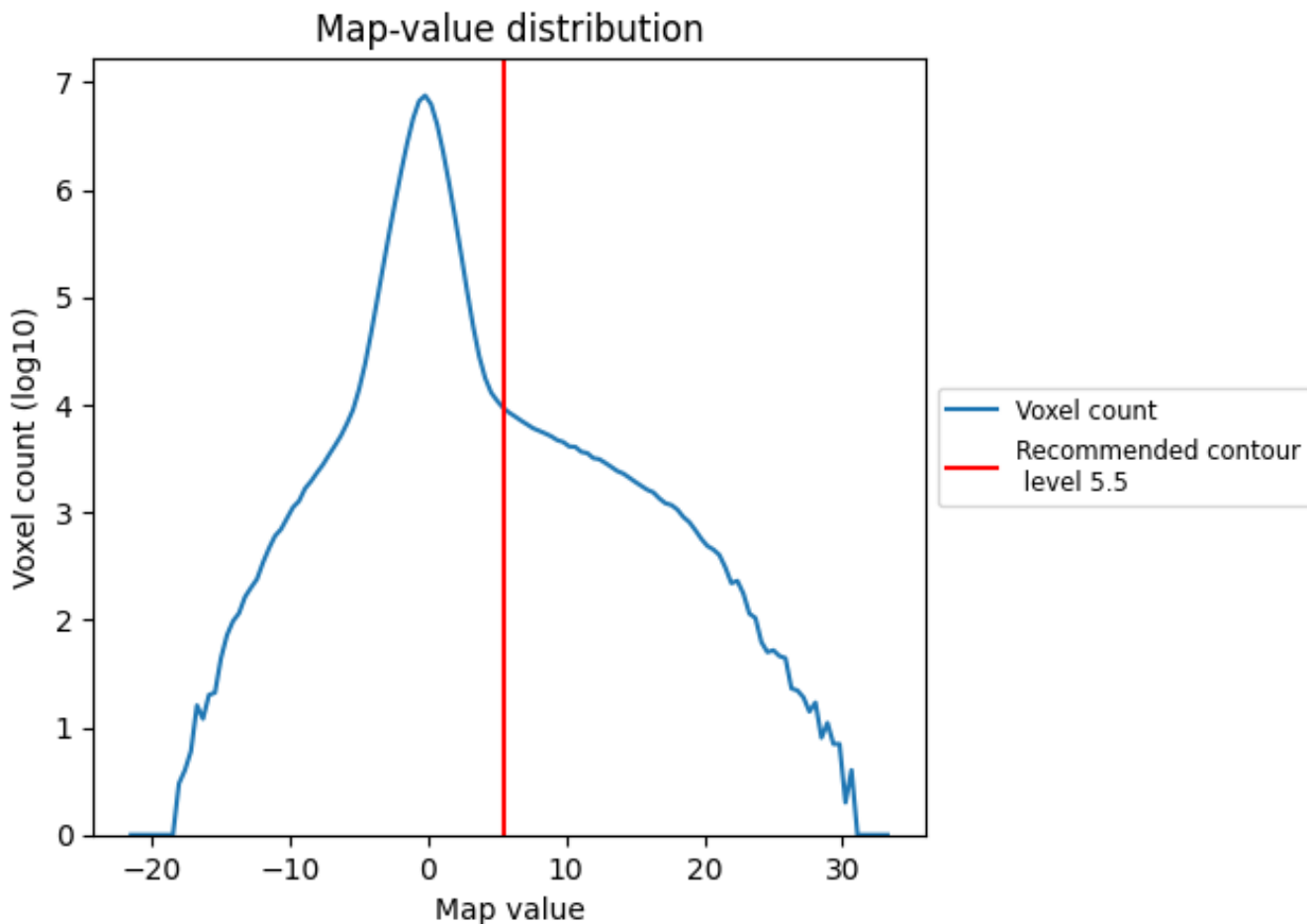


The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

## 7.2 Volume estimate ⓘ
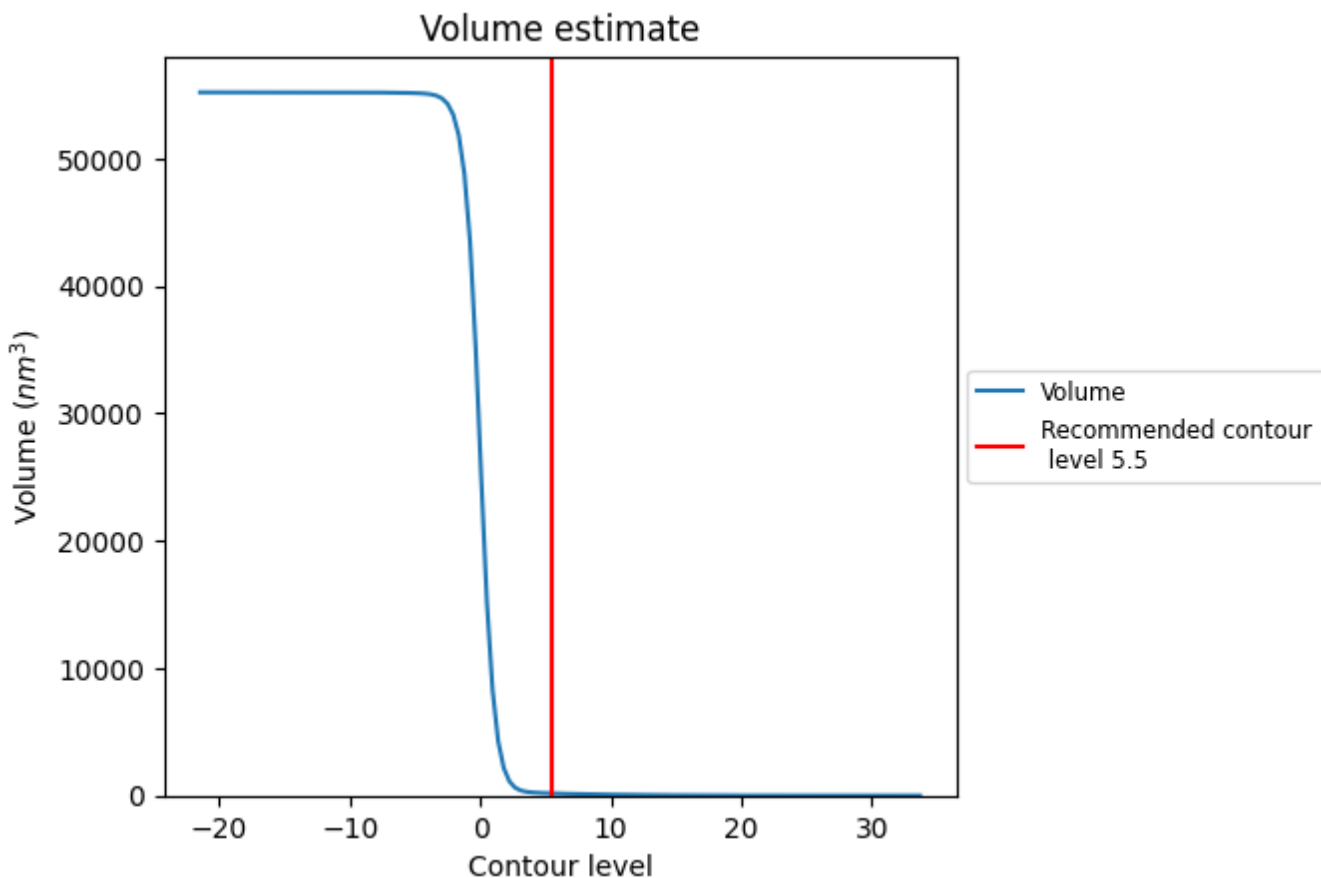


The volume at the recommended contour level is 170 nm$^3$; this corresponds to an approximate mass of 154 kDa.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.

## 7.3 Rotationally averaged power spectrum ⓘ
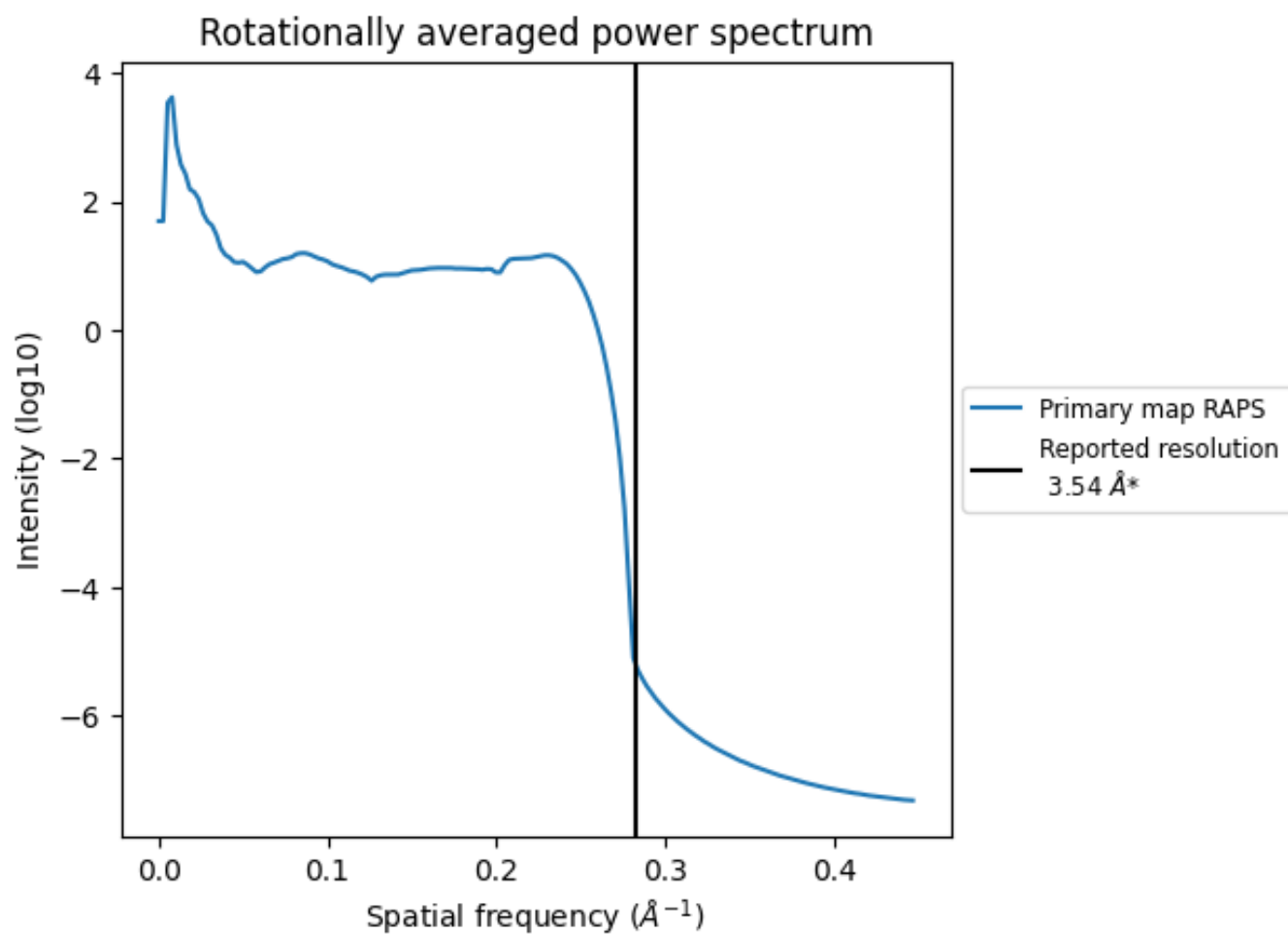


*Reported resolution corresponds to spatial frequency of 0.282 $\text{Å}^{-1}$

# 8 Fourier-Shell correlation ⓘ

This section was not generated. No FSC curve or half-maps provided.

# 9 Map-model fit ⓘ

This section contains information regarding the fit between EMDB map EMD-9872 and PDB model 6JQ0. Per-residue inclusion information can be found in section 3 on page 7.

## 9.1 Map-model overlay ⓘ



X          Y          Z
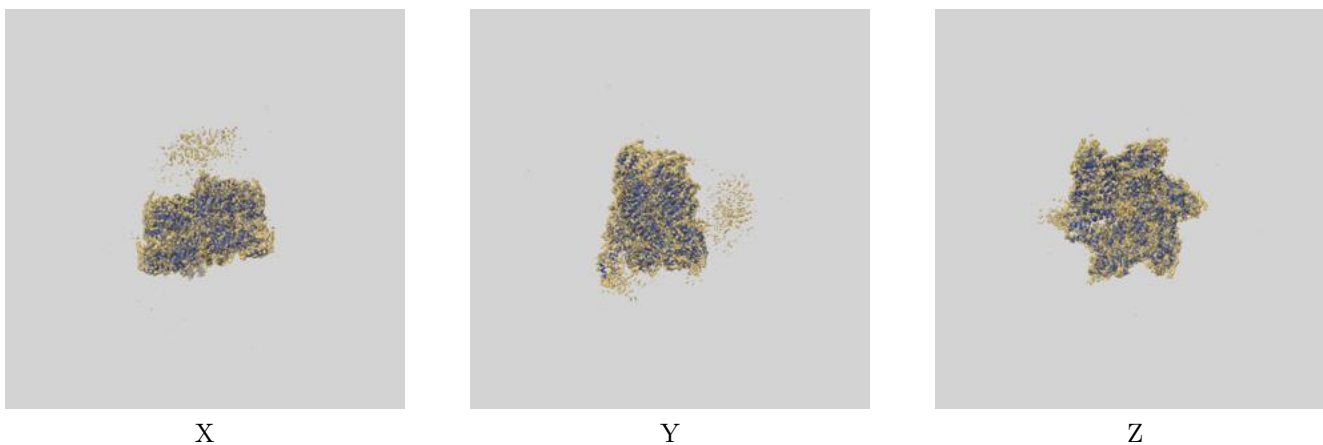
The images above show the 3D surface view of the map at the recommended contour level 5.5 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

## 9.2 Q-score mapped to coordinate model ⓘ



X      Y      Z
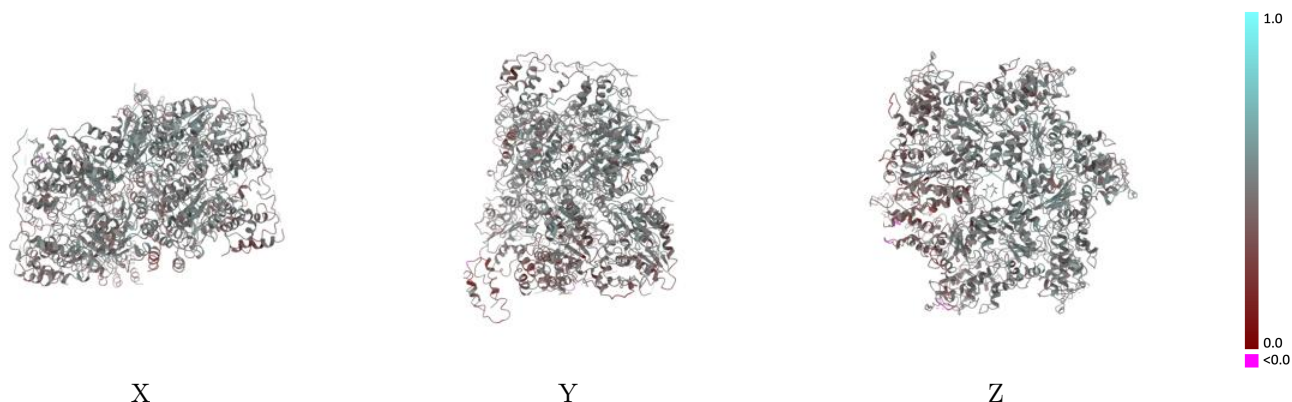
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions at which atoms can be resolved. Low Q-score values may therefore be expected for many entries.

## 9.3 Atom inclusion mapped to coordinate model ⓘ



X      Y      Z
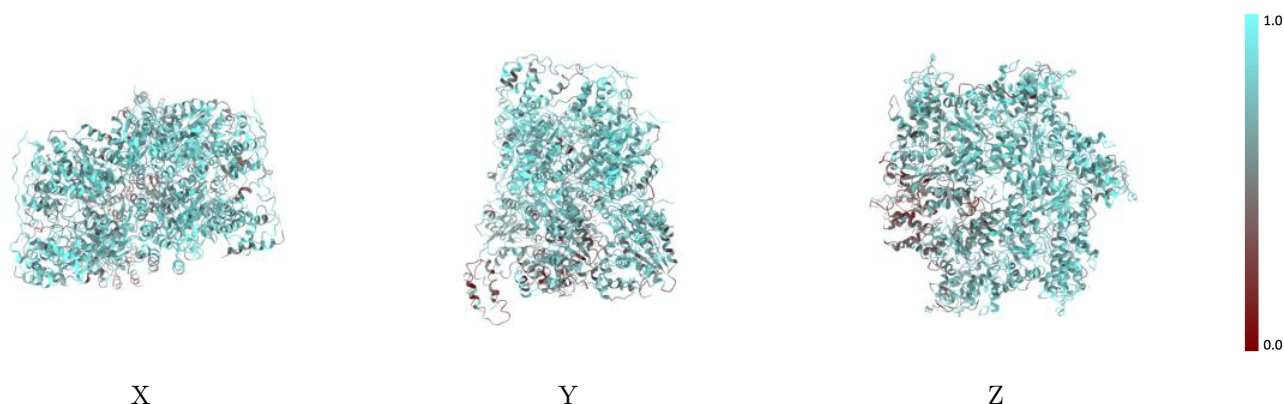
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (5.5).

## 9.4 Atom inclusion (i)
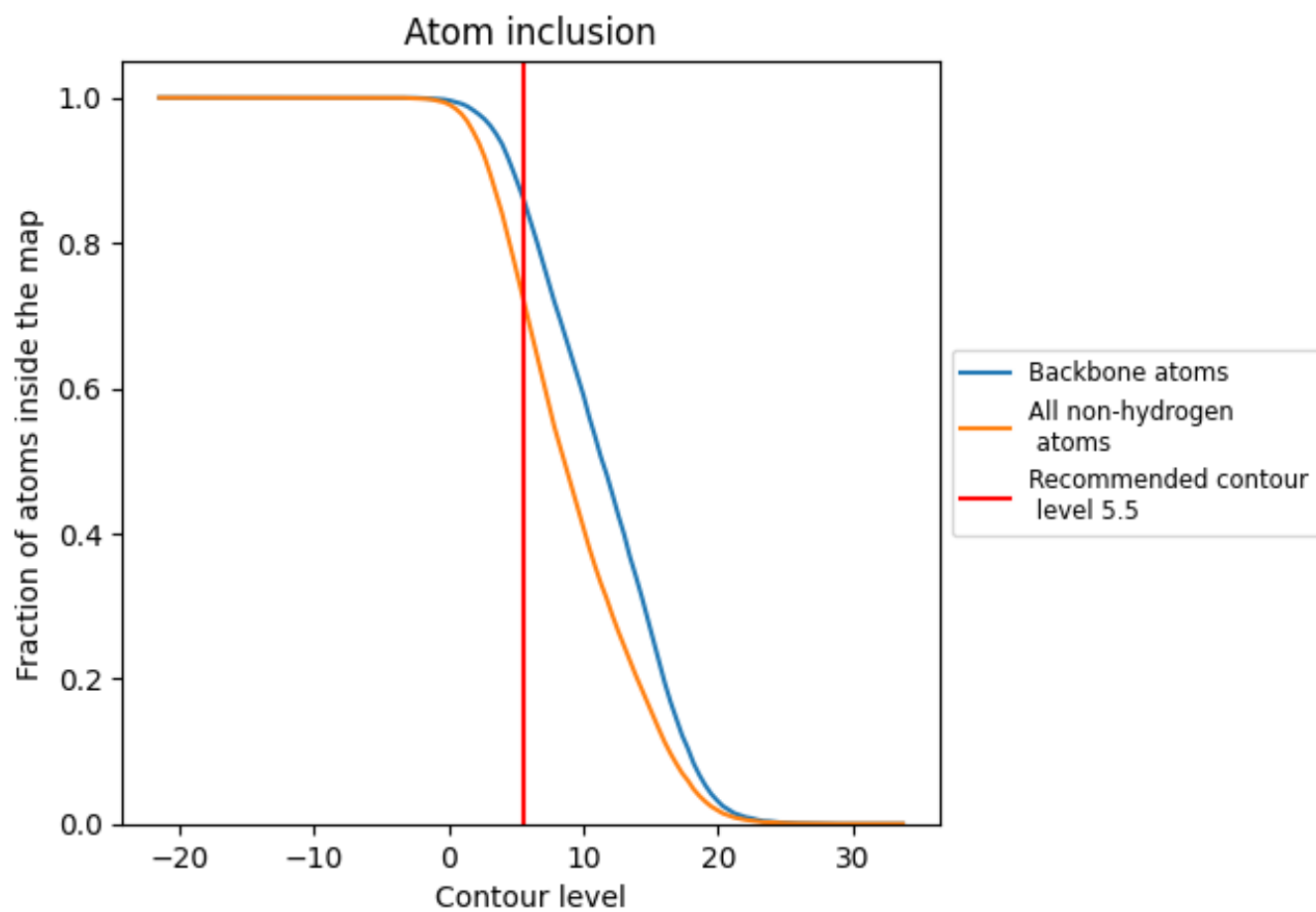


At the recommended contour level, 86% of all backbone atoms, 72% of all non-hydrogen atoms, are inside the map.

## 9.5 Map-model fit summary (i)

The table lists the average atom inclusion at the recommended contour level (5.5) and Q-score for the entire model and for each chain.

| Chain | Atom inclusion | Q-score |
|:-----:|:--------------:|:-------:|
| All | 0.7244 | 0.4630 |
| A | 0.5715 | 0.4220 |
| B | 0.7616 | 0.4710 |
| C | 0.8086 | 0.4910 |
| D | 0.8020 | 0.4900 |
| E | 0.7640 | 0.4720 |
| F | 0.6145 | 0.4220 |
| G | 0.7571 | 0.5510 |