# Full wwPDB EM Validation Report

Apr 20, 2026 – 01:48 PM EDT

| | | |
|---|---|---|
| PDB ID | : | 9Y07 / pdb_00009y07 |
| EMDB ID | : | EMD-72387 |
| Title | : | Cryo-EM structure of human VCP/p97-T122P mutant bound to ATPgammaS |
| Authors | : | Lehman, A.; Ahmed, S.; Mohajeri, A.; Yang, G.X.; Berezuk, A.M.; Mannar, D.; Cholak, S.; Tuttle, K.S.; Bennett, J.T.; Magno, J.A.; Hannibal, M.; Kovacevic, G.; Kuburovic, V.; Lewis, M.E.S.; Moldovan, O.; Nelson, Z.; Raskin, S.; Vandersteen, A.M.; Roach, J.C.; Subramaniam, S.; Patel, M.S. |
| Deposited on | : | 2025-08-28 |
| Resolution | : | 2.41 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 ⓘ symbol.

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

---

The following versions of software and data (see references ⓘ) were used in the production of this report:

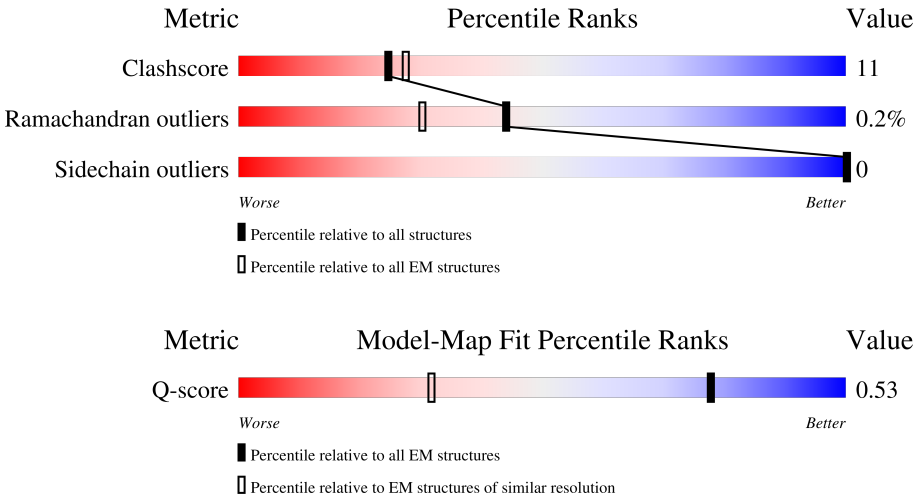
| | | |
|---|---|---|
| EMDB validation analysis | : | 0.0.1.dev132 |
| Mogul | : | 2022.3.0, CSD as543be (2022) |
| MolProbity | : | 4-5-2 with Phenix2.0 |
| Buster-report | : | wwPDB partial adaption of 1.1.7 (2018) |
| Percentile statistics | : | 20250101.v01 (using entries in the PDB archive January 1st 2025) |
| EM percentile statistics | : | 202505.v01 (Using data in the EMDB archive up until May 2025) |
| MapQ | : | 1.9.13 |
| Ideal geometry (proteins) | : | Engh & Huber (2001) |
| Ideal geometry (DNA, RNA) | : | Parkinson et al. (1996) |
| Validation Pipeline (wwPDB-VP) | : | 2.49 |

# 1 Overall quality at a glance (i)

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

The reported resolution of this entry is 2.41 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.







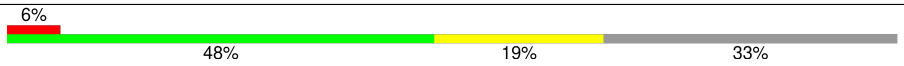
| Metric | Whole archive (#Entries) | EM structures (#Entries) | Similar EM resolution (#Entries, resolution range(Å)) |
|---|---|---|---|
| Clashscore | 229148 | 23984 | - |
| Ramachandran outliers | 224038 | 23583 | - |
| Sidechain outliers | 223484 | 23102 | - |
| Q-score | - | 25397 | 5662 ( 1.92 - 2.91 ) |

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 | 822 | 6% 50% 17% 33% |
| 1 | B | 822 | 6% 48% 19% 33% |
| 1 | C | 822 | 6% 49% 18% 33% |

*Continued on next page...*

*Continued from previous page...*

| Mol | Chain | Length | Quality of chain |
|---|---|---|---|
| 1 | D | 822 |   |
| 1 | E | 822 |   |
| 1 | F | 822 |   |

## 2 Entry composition (i)

There are 3 unique types of molecules in this entry. The entry contains 25998 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 Transitional endoplasmic reticulum ATPase.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 1 | A | 549 | Total 4269 | C 2689 | N 751 | O 807 | S 22 | 0 | 0 |
| 1 | B | 549 | Total 4269 | C 2689 | N 751 | O 807 | S 22 | 0 | 0 |
| 1 | C | 549 | Total 4269 | C 2689 | N 751 | O 807 | S 22 | 0 | 0 |
| 1 | D | 549 | Total 4269 | C 2689 | N 751 | O 807 | S 22 | 0 | 0 |
| 1 | E | 549 | Total 4269 | C 2689 | N 751 | O 807 | S 22 | 0 | 0 |
| 1 | F | 549 | Total 4269 | C 2689 | N 751 | O 807 | S 22 | 0 | 0 |

There are 102 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
|---|---|---|---|---|---|
| A | -15 | HIS | - | expression tag | UNP P55072 |
| A | -14 | HIS | - | expression tag | UNP P55072 |
| A | -13 | HIS | - | expression tag | UNP P55072 |
| A | -12 | HIS | - | expression tag | UNP P55072 |
| A | -11 | HIS | - | expression tag | UNP P55072 |
| A | -10 | HIS | - | expression tag | UNP P55072 |
| A | -9 | SER | - | expression tag | UNP P55072 |
| A | -8 | SER | - | expression tag | UNP P55072 |
| A | -7 | GLY | - | expression tag | UNP P55072 |
| A | -6 | LEU | - | expression tag | UNP P55072 |
| A | -5 | VAL | - | expression tag | UNP P55072 |
| A | -4 | PRO | - | expression tag | UNP P55072 |
| A | -3 | ARG | - | expression tag | UNP P55072 |
| A | -2 | GLY | - | expression tag | UNP P55072 |
| A | -1 | SER | - | expression tag | UNP P55072 |
| A | 0 | HIS | - | expression tag | UNP P55072 |
| A | 122 | PRO | THR | engineered mutation | UNP P55072 |
| B | -15 | HIS | - | expression tag | UNP P55072 |

*Continued on next page...*

*Continued from previous page...*

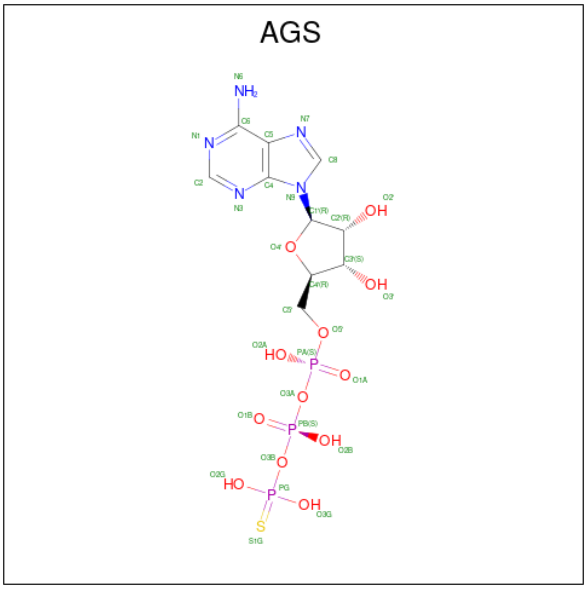
| Chain | Residue | Modelled | Actual | Comment | Reference |
|---|---|---|---|---|---|
| B | -14 | HIS | - | expression tag | UNP P55072 |
| B | -13 | HIS | - | expression tag | UNP P55072 |
| B | -12 | HIS | - | expression tag | UNP P55072 |
| B | -11 | HIS | - | expression tag | UNP P55072 |
| B | -10 | HIS | - | expression tag | UNP P55072 |
| B | -9 | SER | - | expression tag | UNP P55072 |
| B | -8 | SER | - | expression tag | UNP P55072 |
| B | -7 | GLY | - | expression tag | UNP P55072 |
| B | -6 | LEU | - | expression tag | UNP P55072 |
| B | -5 | VAL | - | expression tag | UNP P55072 |
| B | -4 | PRO | - | expression tag | UNP P55072 |
| B | -3 | ARG | - | expression tag | UNP P55072 |
| B | -2 | GLY | - | expression tag | UNP P55072 |
| B | -1 | SER | - | expression tag | UNP P55072 |
| B | 0 | HIS | - | expression tag | UNP P55072 |
| B | 122 | PRO | THR | engineered mutation | UNP P55072 |
| C | -15 | HIS | - | expression tag | UNP P55072 |
| C | -14 | HIS | - | expression tag | UNP P55072 |
| C | -13 | HIS | - | expression tag | UNP P55072 |
| C | -12 | HIS | - | expression tag | UNP P55072 |
| C | -11 | HIS | - | expression tag | UNP P55072 |
| C | -10 | HIS | - | expression tag | UNP P55072 |
| C | -9 | SER | - | expression tag | UNP P55072 |
| C | -8 | SER | - | expression tag | UNP P55072 |
| C | -7 | GLY | - | expression tag | UNP P55072 |
| C | -6 | LEU | - | expression tag | UNP P55072 |
| C | -5 | VAL | - | expression tag | UNP P55072 |
| C | -4 | PRO | - | expression tag | UNP P55072 |
| C | -3 | ARG | - | expression tag | UNP P55072 |
| C | -2 | GLY | - | expression tag | UNP P55072 |
| C | -1 | SER | - | expression tag | UNP P55072 |
| C | 0 | HIS | - | expression tag | UNP P55072 |
| C | 122 | PRO | THR | engineered mutation | UNP P55072 |
| D | -15 | HIS | - | expression tag | UNP P55072 |
| D | -14 | HIS | - | expression tag | UNP P55072 |
| D | -13 | HIS | - | expression tag | UNP P55072 |
| D | -12 | HIS | - | expression tag | UNP P55072 |
| D | -11 | HIS | - | expression tag | UNP P55072 |
| D | -10 | HIS | - | expression tag | UNP P55072 |
| D | -9 | SER | - | expression tag | UNP P55072 |
| D | -8 | SER | - | expression tag | UNP P55072 |
| D | -7 | GLY | - | expression tag | UNP P55072 |

*Continued on next page...*

*Continued from previous page...*

| Chain | Residue | Modelled | Actual | Comment | Reference |
|---|---|---|---|---|---|
| D | -6 | LEU | - | expression tag | UNP P55072 |
| D | -5 | VAL | - | expression tag | UNP P55072 |
| D | -4 | PRO | - | expression tag | UNP P55072 |
| D | -3 | ARG | - | expression tag | UNP P55072 |
| D | -2 | GLY | - | expression tag | UNP P55072 |
| D | -1 | SER | - | expression tag | UNP P55072 |
| D | 0 | HIS | - | expression tag | UNP P55072 |
| D | 122 | PRO | THR | engineered mutation | UNP P55072 |
| E | -15 | HIS | - | expression tag | UNP P55072 |
| E | -14 | HIS | - | expression tag | UNP P55072 |
| E | -13 | HIS | - | expression tag | UNP P55072 |
| E | -12 | HIS | - | expression tag | UNP P55072 |
| E | -11 | HIS | - | expression tag | UNP P55072 |
| E | -10 | HIS | - | expression tag | UNP P55072 |
| E | -9 | SER | - | expression tag | UNP P55072 |
| E | -8 | SER | - | expression tag | UNP P55072 |
| E | -7 | GLY | - | expression tag | UNP P55072 |
| E | -6 | LEU | - | expression tag | UNP P55072 |
| E | -5 | VAL | - | expression tag | UNP P55072 |
| E | -4 | PRO | - | expression tag | UNP P55072 |
| E | -3 | ARG | - | expression tag | UNP P55072 |
| E | -2 | GLY | - | expression tag | UNP P55072 |
| E | -1 | SER | - | expression tag | UNP P55072 |
| E | 0 | HIS | - | expression tag | UNP P55072 |
| E | 122 | PRO | THR | engineered mutation | UNP P55072 |
| F | -15 | HIS | - | expression tag | UNP P55072 |
| F | -14 | HIS | - | expression tag | UNP P55072 |
| F | -13 | HIS | - | expression tag | UNP P55072 |
| F | -12 | HIS | - | expression tag | UNP P55072 |
| F | -11 | HIS | - | expression tag | UNP P55072 |
| F | -10 | HIS | - | expression tag | UNP P55072 |
| F | -9 | SER | - | expression tag | UNP P55072 |
| F | -8 | SER | - | expression tag | UNP P55072 |
| F | -7 | GLY | - | expression tag | UNP P55072 |
| F | -6 | LEU | - | expression tag | UNP P55072 |
| F | -5 | VAL | - | expression tag | UNP P55072 |
| F | -4 | PRO | - | expression tag | UNP P55072 |
| F | -3 | ARG | - | expression tag | UNP P55072 |
| F | -2 | GLY | - | expression tag | UNP P55072 |
| F | -1 | SER | - | expression tag | UNP P55072 |
| F | 0 | HIS | - | expression tag | UNP P55072 |
| F | 122 | PRO | THR | engineered mutation | UNP P55072 |

- Molecule 2 is PHOSPHOTHIOPHOSPHORIC ACID-ADENYLATE ESTER (CCD ID: AGS) (formula: $C_{10}H_{16}N_5O_{12}P_3S$) (labeled as "Ligand of Interest" by depositor).




| Mol | Chain | Residues | Atoms | | | | | | AltConf |
|---|---|---|---|---|---|---|---|---|---|
| 2 | A | 1 | Total | C | N | O | P | S | 0 |
| | | | 31 | 10 | 5 | 12 | 3 | 1 | |
| 2 | A | 1 | Total | C | N | O | P | S | 0 |
| | | | 31 | 10 | 5 | 12 | 3 | 1 | |
| 2 | B | 1 | Total | C | N | O | P | S | 0 |
| | | | 31 | 10 | 5 | 12 | 3 | 1 | |
| 2 | B | 1 | Total | C | N | O | P | S | 0 |
| | | | 31 | 10 | 5 | 12 | 3 | 1 | |
| 2 | C | 1 | Total | C | N | O | P | S | 0 |
| | | | 31 | 10 | 5 | 12 | 3 | 1 | |
| 2 | C | 1 | Total | C | N | O | P | S | 0 |
| | | | 31 | 10 | 5 | 12 | 3 | 1 | |
| 2 | D | 1 | Total | C | N | O | P | S | 0 |
| | | | 31 | 10 | 5 | 12 | 3 | 1 | |
| 2 | D | 1 | Total | C | N | O | P | S | 0 |
| | | | 31 | 10 | 5 | 12 | 3 | 1 | |
| 2 | E | 1 | Total | C | N | O | P | S | 0 |
| | | | 31 | 10 | 5 | 12 | 3 | 1 | |
| 2 | E | 1 | Total | C | N | O | P | S | 0 |
| | | | 31 | 10 | 5 | 12 | 3 | 1 | |
| 2 | F | 1 | Total | C | N | O | P | S | 0 |
| | | | 31 | 10 | 5 | 12 | 3 | 1 | |
| 2 | F | 1 | Total | C | N | O | P | S | 0 |
| | | | 31 | 10 | 5 | 12 | 3 | 1 | |

- Molecule 3 is MAGNESIUM ION (CCD ID: MG) (formula: Mg) (labeled as "Ligand of Interest" by depositor).

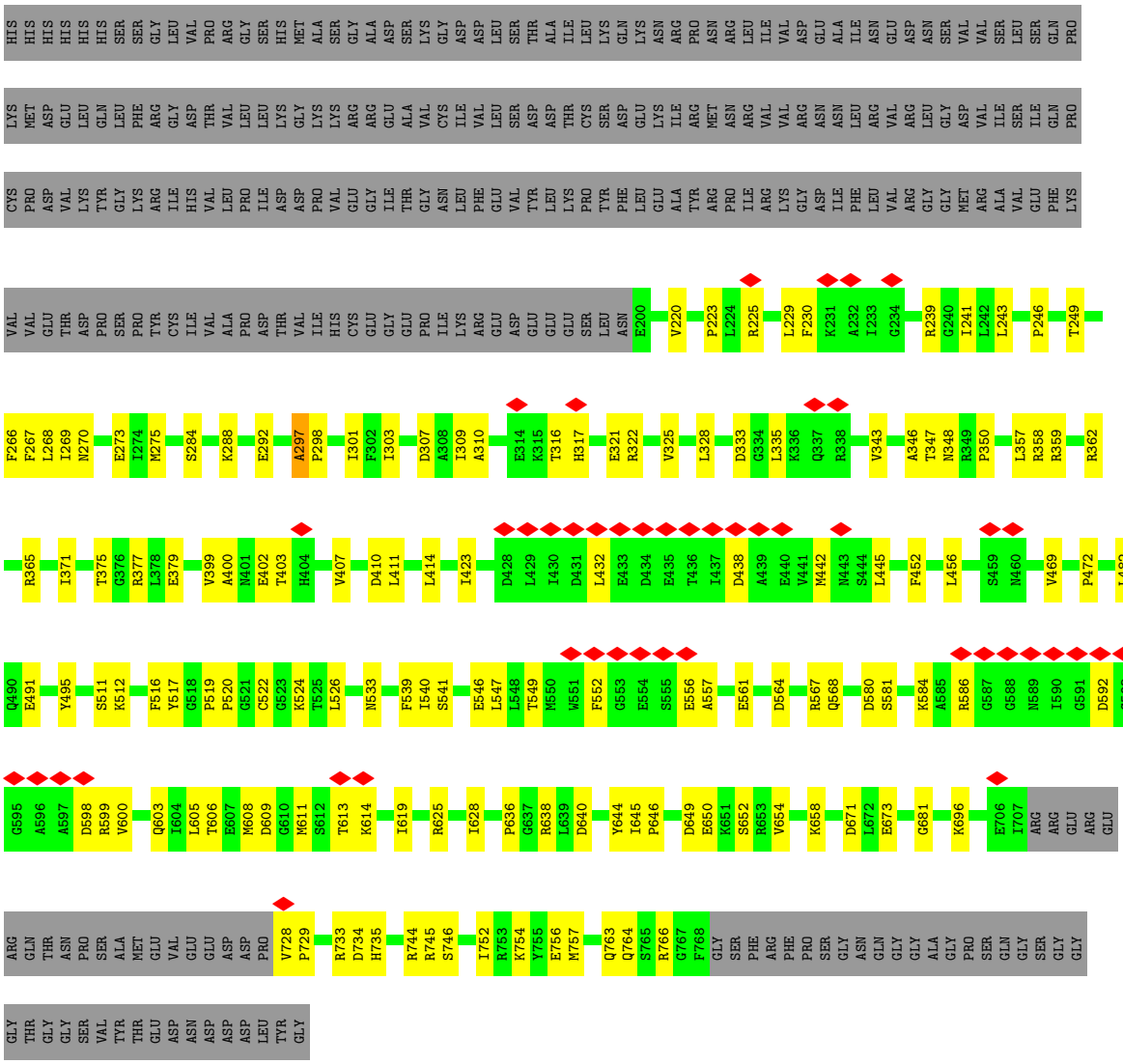
| Mol | Chain | Residues | Atoms | AltConf |
|---|---|---|---|---|
| 3 | A | 2 | Total Mg<br>2 2 | 0 |
| 3 | B | 2 | Total Mg<br>2 2 | 0 |
| 3 | C | 2 | Total Mg<br>2 2 | 0 |
| 3 | D | 2 | Total Mg<br>2 2 | 0 |
| 3 | E | 2 | Total Mg<br>2 2 | 0 |
| 3 | F | 2 | Total Mg<br>2 2 | 0 |

# 3 Residue-property plots (i)

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.

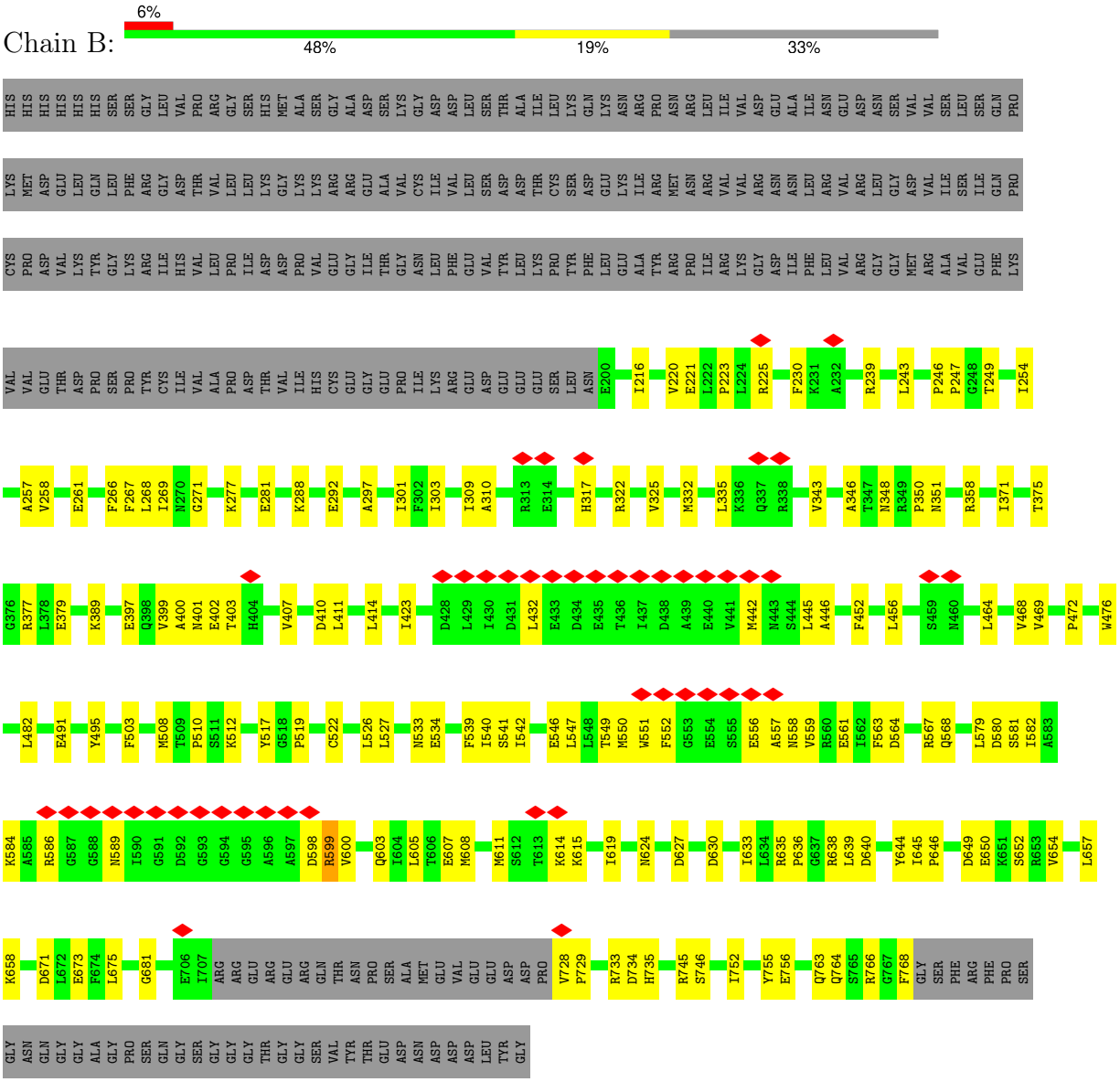
• Molecule 1: Transitional endoplasmic reticulum ATPase

Chain A:

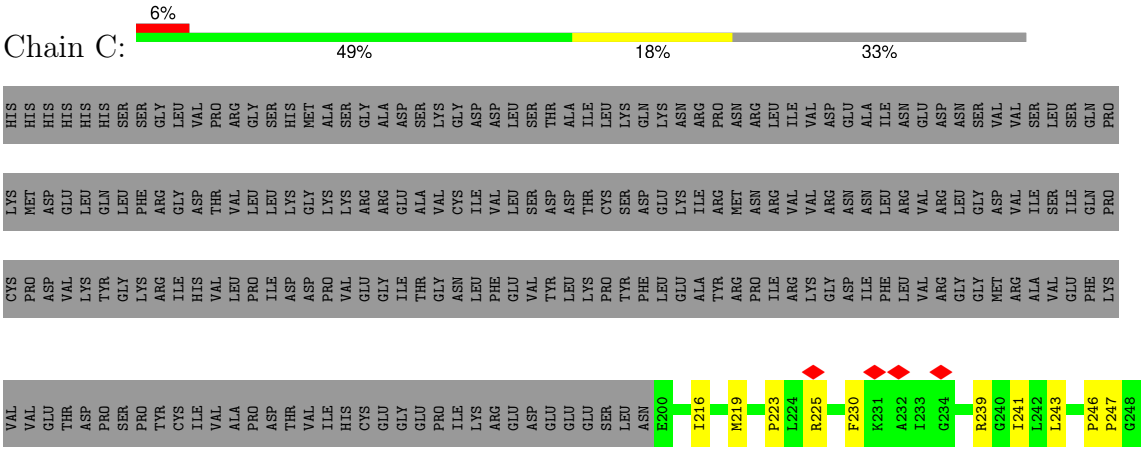
• Molecule 1: Transitional endoplasmic reticulum ATPase

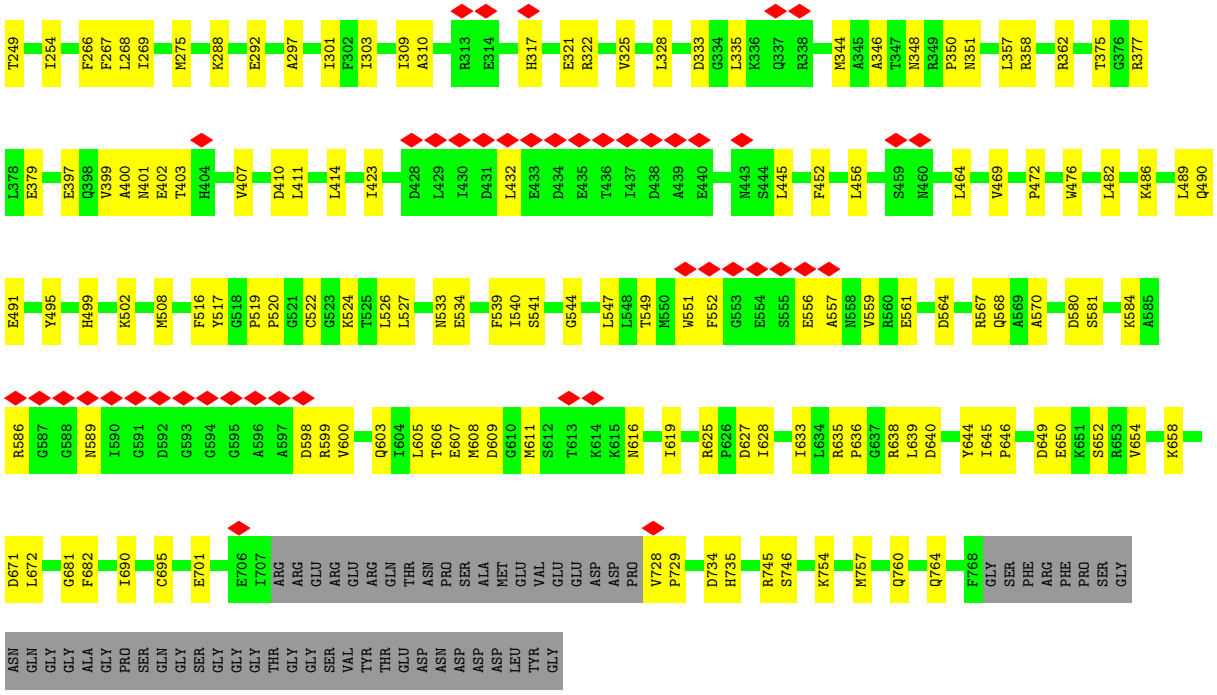
Chain B:




• Molecule 1: Transitional endoplasmic reticulum ATPase

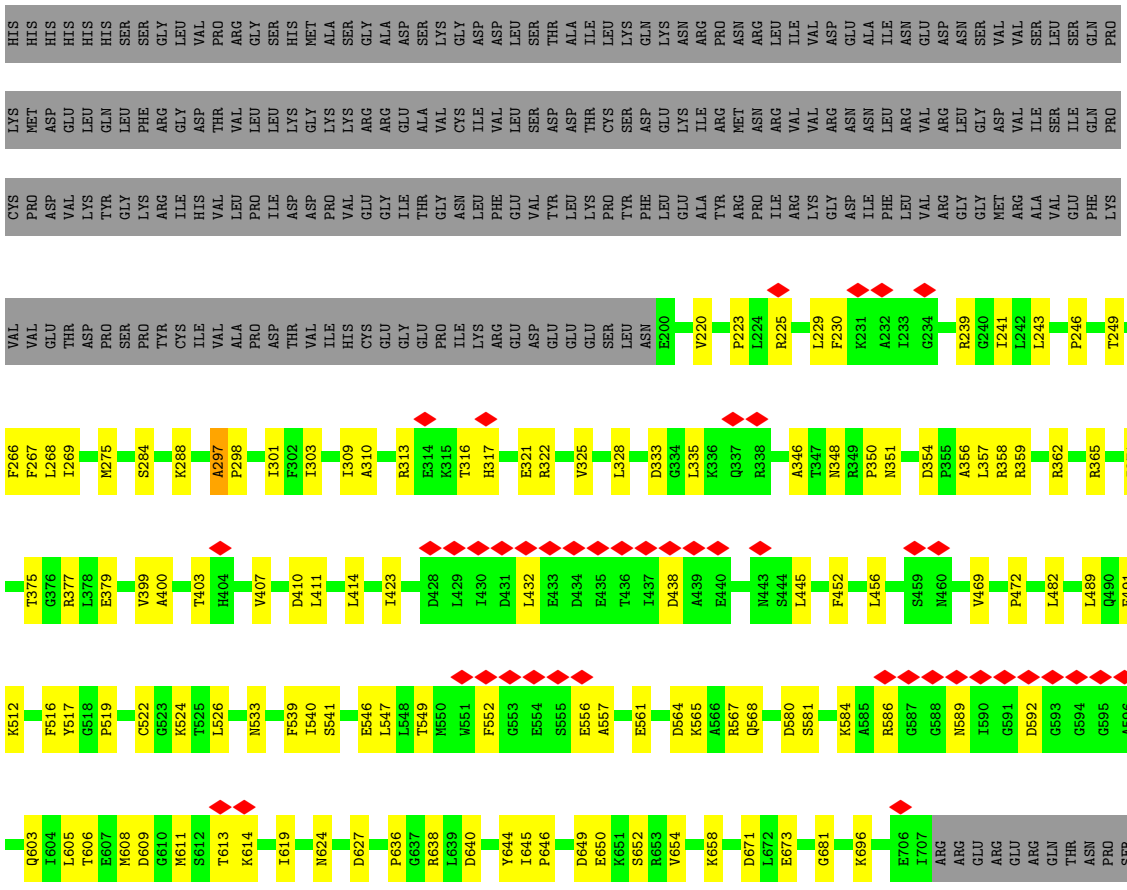
Chain C:

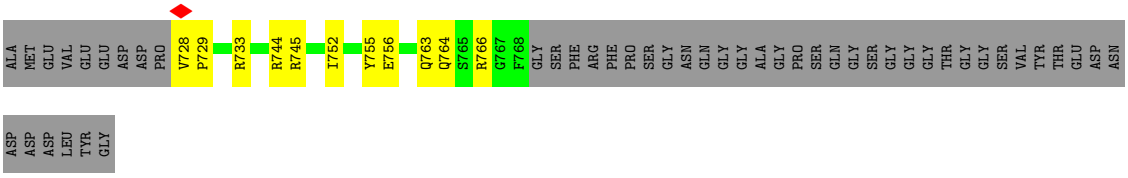




• Molecule 1: Transitional endoplasmic reticulum ATPase

Chain D:

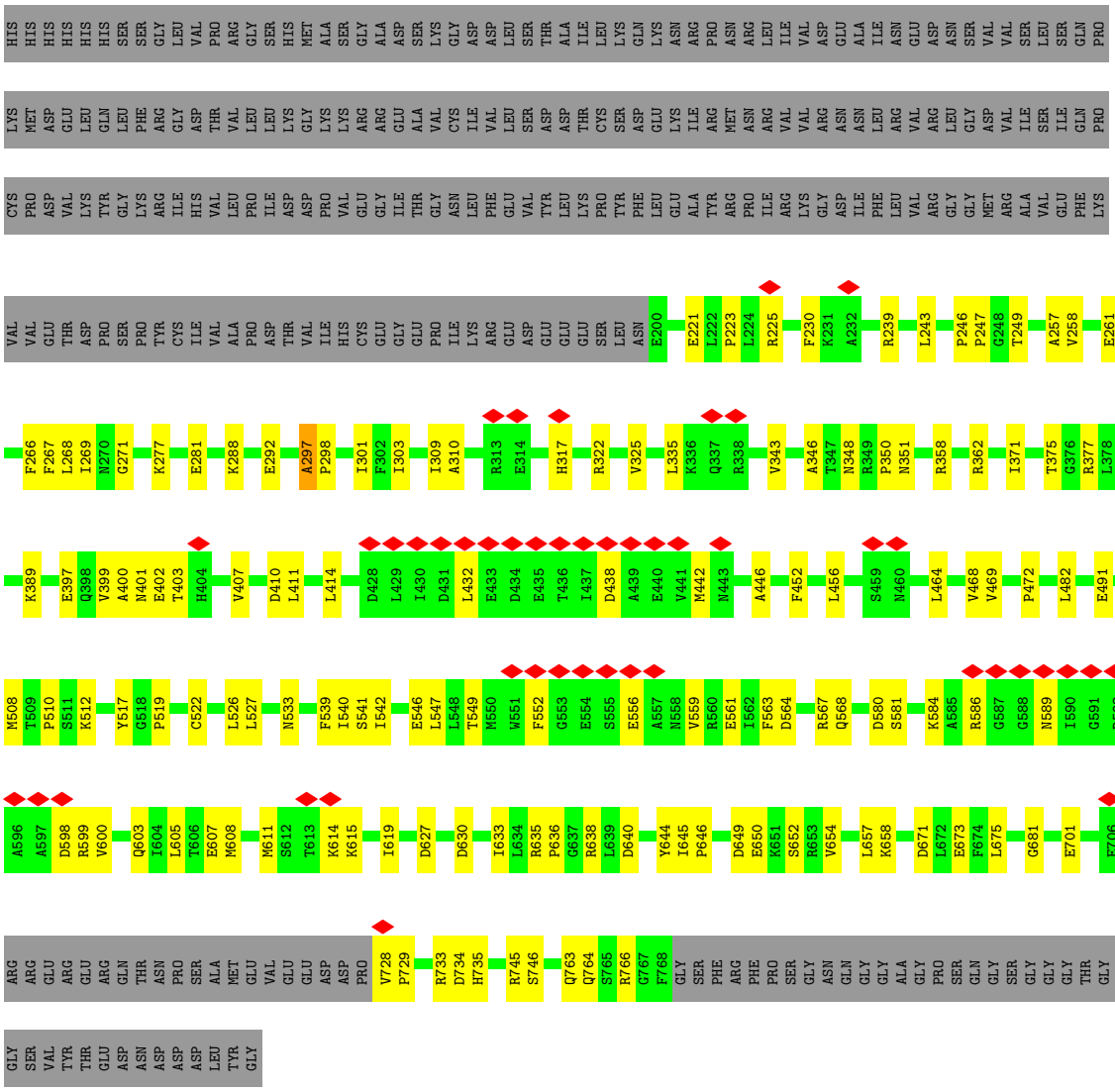







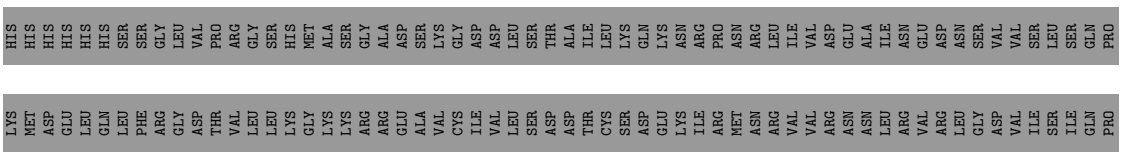
• Molecule 1: Transitional endoplasmic reticulum ATPase

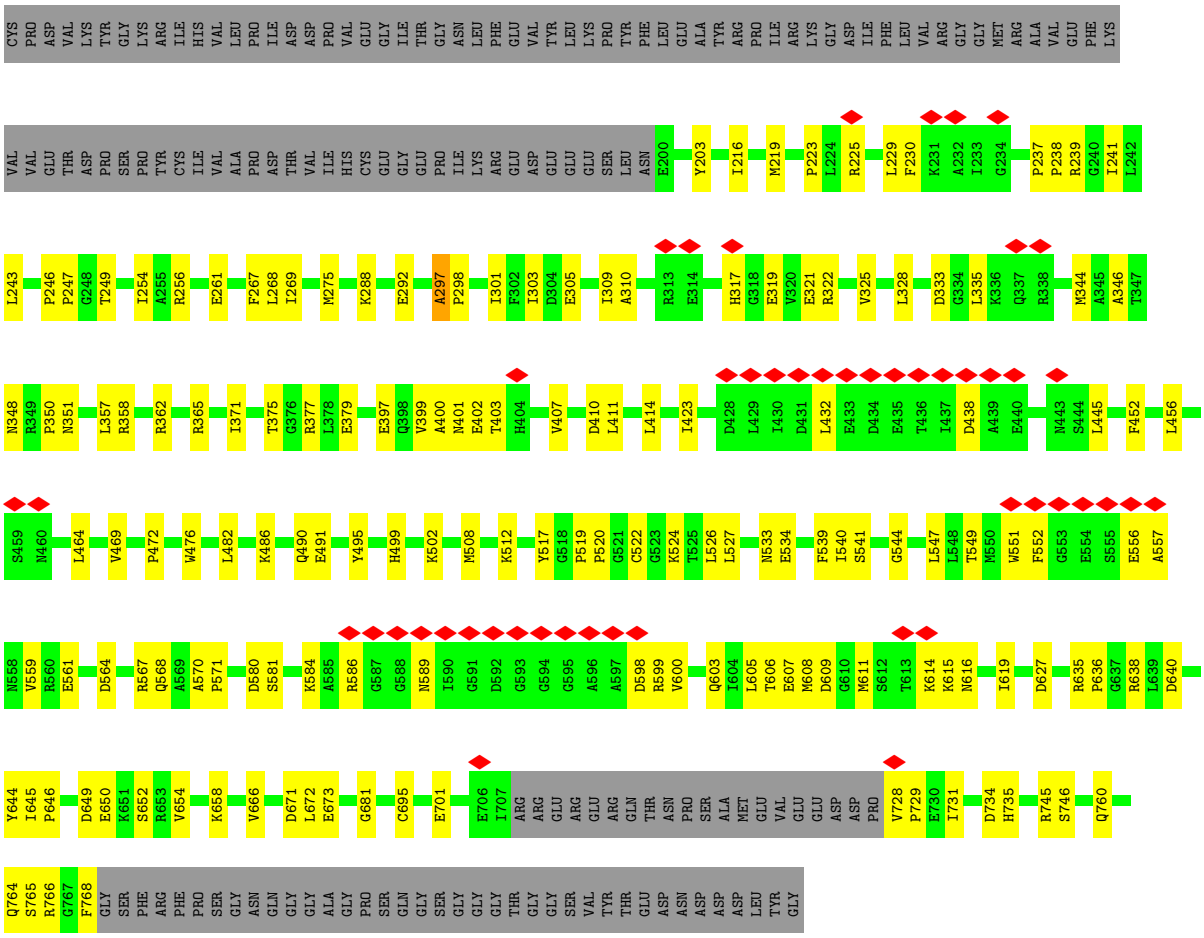
Chain E:

• Molecule 1: Transitional endoplasmic reticulum ATPase

Chain F:


CYS PRO ASP VAL LYS TYR GLY LYS ARG ILE HIS VAL LEU PRO ILE ASP ASP PRO VAL GLU GLY ILE THR GLY ASN LEU PHE GLU VAL TYR LEU LYS PRO TYR PHE LEU GLU ALA TYR ARG PRO ILE ARG LYS GLY ASP ILE PHE LEU VAL ARG GLY GLY MET ARG ALA VAL GLU PHE LYS
VAL VAL GLU THR ASP PRO SER PRO TYR CYS ILE VAL ALA PRO ASP THR VAL ILE HIS CYS GLU GLY GLU PRO ILE LYS ARG GLU ASP GLU GLU GLU SER LEU ASN E200 Y203 I216 M219 P223 L224 R225 L229 F230 K231 A232 I233 G234 P237 P238 R239 G240 I241 L242
L243 P246 P247 G248 T249 I254 A255 R256 E261 F267 L268 I269 M275 K288 E292 A297 P298 I301 F302 I303 D304 E305 I309 A310 R313 E314 H317 G318 E319 V320 E321 R322 V325 L328 D333 G334 L335 K336 Q337 R338 M344 A345 A346 T347
N348 R349 P350 N351 L357 R358 R362 R365 I371 T375 G376 R377 L378 E379 E397 Q398 V399 A400 N401 E402 T403 H404 V407 D410 L411 L414 I423 D428 L429 I430 D431 L432 E433 D434 E435 T436 I437 D438 A439 E440 N443 S444 L445 F452 L456
S459 N460 L464 V469 P472 W476 L482 K486 Q490 E491 Y495 H499 K502 M508 K512 Y517 G518 P519 P520 G521 C522 G523 K524 T525 L526 L527 N533 E534 F539 I540 S541 G544 L547 L548 T549 M550 W551 F552 G553 E554 S555 E556 A557
N558 V559 R560 E561 D564 R567 Q568 A569 A570 P571 D580 S581 K584 A585 R586 G587 G588 N589 I590 G591 D592 G593 G594 G595 A596 A597 D598 R599 V600 Q603 I604 L605 T606 E607 M608 D609 G610 M611 S612 T613 K614 K615 N616 I619 D627 R635 P636 G637 R638 L639 D640
Y644 I645 P646 D649 E650 K651 S652 R653 V654 K658 V666 D671 L672 E673 G681 C695 E701 E706 I707 ARG ARG GLU ARG GLU ARG GLN THR ASN PRO SER ALA MET GLU VAL GLU GLU ASP ASP PRO V728 P729 E730 I731 D734 H735 R745 S746 Q760
Q764 S765 R766 G767 F768 GLY SER PHE ARG PHE PRO SER GLY ASN GLN GLY GLY ALA GLY PRO SER GLN GLY SER GLY GLY GLY THR GLY GLY GLY SER VAL TYR THR GLU ASP ASN ASP ASP ASP LEU TYR GLY

# 4 Experimental information (i)

| Property | Value | Source |
|---|---|---|
| EM reconstruction method | SINGLE PARTICLE | Depositor |
| Imposed symmetry | POINT, C6 | Depositor |
| Number of particles used | 279421 | Depositor |
| Resolution determination method | FSC 0.143 CUT-OFF | Depositor |
| CTF correction method | PHASE FLIPPING AND AMPLITUDE CORRECTION | Depositor |
| Microscope | TFS KRIOS | Depositor |
| Voltage (kV) | 300 | Depositor |
| Electron dose ($e^-/Å^2$) | 40 | Depositor |
| Minimum defocus (nm) | 1000 | Depositor |
| Maximum defocus (nm) | 2000 | Depositor |
| Magnification | Not provided | |
| Image detector | FEI FALCON IV (4k x 4k) | Depositor |
| Maximum map value | 1.340 | Depositor |
| Minimum map value | -0.414 | Depositor |
| Average map value | -0.001 | Depositor |
| Map value standard deviation | 0.020 | Depositor |
| Recommended contour level | 0.15 | Depositor |
| Map size (Å) | 400.0, 400.0, 400.0 | wwPDB |
| Map dimensions | 400, 400, 400 | wwPDB |
| Map angles (°) | 90.0, 90.0, 90.0 | wwPDB |
| Pixel spacing (Å) | 1.0, 1.0, 1.0 | Depositor |

# 5 Model quality

## 5.1 Standard geometry

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

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 | 0.12 | 0/4339 | 0.31 | 1/5855 (0.0%) |
| 1 | B | 0.13 | 0/4339 | 0.33 | 1/5855 (0.0%) |
| 1 | C | 0.12 | 0/4339 | 0.32 | 1/5855 (0.0%) |
| 1 | D | 0.12 | 0/4339 | 0.31 | 1/5855 (0.0%) |
| 1 | E | 0.12 | 0/4339 | 0.32 | 1/5855 (0.0%) |
| 1 | F | 0.12 | 0/4339 | 0.33 | 1/5855 (0.0%) |
| All | All | 0.12 | 0/26034 | 0.32 | 6/35130 (0.0%) |

There are no bond length outliers.

All (6) bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed($^o$) | Ideal($^o$) |
|---|---|---|---|---|---|---|---|
| 1 | C | 599 | ARG | CB-CA-C | -5.39 | 109.91 | 117.23 |
| 1 | F | 599 | ARG | CB-CA-C | -5.38 | 109.91 | 117.23 |
| 1 | E | 599 | ARG | CB-CA-C | -5.38 | 109.92 | 117.23 |
| 1 | A | 599 | ARG | CB-CA-C | -5.35 | 109.95 | 117.23 |
| 1 | D | 599 | ARG | CB-CA-C | -5.32 | 110.00 | 117.23 |
| 1 | B | 599 | ARG | CB-CA-C | -5.22 | 110.12 | 117.23 |

There are no chirality outliers.

There are no planarity outliers.

## 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 | 4269 | 0 | 4314 | 103 | 0 |
| 1 | B | 4269 | 0 | 4313 | 105 | 0 |
| 1 | C | 4269 | 0 | 4313 | 105 | 0 |
| 1 | D | 4269 | 0 | 4314 | 97 | 0 |
| 1 | E | 4269 | 0 | 4313 | 94 | 0 |
| 1 | F | 4269 | 0 | 4313 | 114 | 0 |
| 2 | A | 62 | 0 | 24 | 3 | 0 |
| 2 | B | 62 | 0 | 24 | 3 | 0 |
| 2 | C | 62 | 0 | 24 | 5 | 0 |
| 2 | D | 62 | 0 | 24 | 3 | 0 |
| 2 | E | 62 | 0 | 24 | 3 | 0 |
| 2 | F | 62 | 0 | 24 | 4 | 0 |
| 3 | A | 2 | 0 | 0 | 0 | 0 |
| 3 | B | 2 | 0 | 0 | 0 | 0 |
| 3 | C | 2 | 0 | 0 | 0 | 0 |
| 3 | D | 2 | 0 | 0 | 0 | 0 |
| 3 | E | 2 | 0 | 0 | 0 | 0 |
| 3 | F | 2 | 0 | 0 | 0 | 0 |
| All | All | 25998 | 0 | 26024 | 549 | 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 11.

All (549) 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:D:547:LEU:HB3 | 1:D:600:VAL:HG11 | 1.63 | 0.80 |
| 1:A:547:LEU:HB3 | 1:A:600:VAL:HG11 | 1.64 | 0.79 |
| 1:E:547:LEU:HB3 | 1:E:600:VAL:HG11 | 1.65 | 0.78 |
| 1:B:547:LEU:HB3 | 1:B:600:VAL:HG11 | 1.65 | 0.77 |
| 1:C:760:GLN:O | 1:D:744:ARG:NH2 | 2.20 | 0.75 |
| 1:D:269:ILE:HD11 | 1:D:303:ILE:HG12 | 1.70 | 0.74 |
| 1:F:269:ILE:HD11 | 1:F:303:ILE:HG12 | 1.68 | 0.73 |
| 1:E:764:GLN:NE2 | 1:F:745:ARG:O | 2.21 | 0.73 |
| 1:A:744:ARG:NH2 | 1:F:760:GLN:O | 2.20 | 0.73 |
| 1:D:764:GLN:NE2 | 1:E:745:ARG:O | 2.22 | 0.73 |
| 1:A:269:ILE:HD11 | 1:A:303:ILE:HG12 | 1.70 | 0.72 |
| 1:A:764:GLN:NE2 | 1:B:745:ARG:O | 2.22 | 0.72 |
| 1:B:269:ILE:HD11 | 1:B:303:ILE:HG12 | 1.72 | 0.71 |
| 1:E:269:ILE:HD11 | 1:E:303:ILE:HG12 | 1.72 | 0.70 |
| 1:C:269:ILE:HD11 | 1:C:303:ILE:HG12 | 1.72 | 0.69 |
| 1:F:764:GLN:O | 1:F:766:ARG:N | 2.27 | 0.67 |

*Continued on next page...*

*Continued from previous page...*

| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 1:D:766:ARG:NH2 | 2:E:902:AGS:O3G | 2.28 | 0.67 |
| 1:C:551:TRP:HZ2 | 1:C:603:GLN:HE22 | 1.43 | 0.67 |
| 1:F:551:TRP:HZ2 | 1:F:603:GLN:HE22 | 1.42 | 0.66 |
| 1:A:766:ARG:NH2 | 2:B:902:AGS:O3G | 2.28 | 0.66 |
| 1:C:423:ILE:HG12 | 1:C:445:LEU:HD21 | 1.77 | 0.65 |
| 1:A:317:HIS:HB3 | 1:F:322:ARG:HH22 | 1.62 | 0.65 |
| 1:C:764:GLN:NE2 | 1:D:745:ARG:O | 2.30 | 0.64 |
| 1:C:239:ARG:NH1 | 1:C:335:LEU:O | 2.31 | 0.64 |
| 1:C:603:GLN:HG2 | 1:D:549:THR:HG23 | 1.80 | 0.64 |
| 1:F:239:ARG:NH1 | 1:F:335:LEU:O | 2.31 | 0.64 |
| 1:A:549:THR:HG23 | 1:F:603:GLN:HG2 | 1.80 | 0.64 |
| 1:D:350:PRO:O | 1:D:358:ARG:NH2 | 2.31 | 0.63 |
| 1:A:552:PHE:HD2 | 1:F:556:GLU:HB3 | 1.64 | 0.63 |
| 1:B:764:GLN:NE2 | 1:C:745:ARG:O | 2.31 | 0.63 |
| 1:C:322:ARG:HH22 | 1:D:317:HIS:HB3 | 1.61 | 0.63 |
| 1:D:556:GLU:HB3 | 1:E:552:PHE:HD2 | 1.63 | 0.63 |
| 1:A:442:MET:HE1 | 1:F:229:LEU:HA | 1.81 | 0.63 |
| 1:B:766:ARG:NH2 | 2:C:902:AGS:O3G | 2.28 | 0.62 |
| 1:B:766:ARG:HH21 | 1:C:520:PRO:HB3 | 1.65 | 0.62 |
| 1:E:766:ARG:NH2 | 2:F:902:AGS:O3G | 2.28 | 0.62 |
| 1:A:556:GLU:HB3 | 1:B:552:PHE:HD2 | 1.64 | 0.61 |
| 1:B:556:GLU:HB3 | 1:C:552:PHE:HD2 | 1.65 | 0.61 |
| 1:A:239:ARG:NH1 | 1:A:335:LEU:O | 2.34 | 0.61 |
| 1:C:219:MET:HE3 | 1:C:241:ILE:HD12 | 1.82 | 0.61 |
| 1:C:275:MET:HE1 | 1:C:321:GLU:HG2 | 1.83 | 0.61 |
| 1:F:547:LEU:HB3 | 1:F:600:VAL:HG11 | 1.83 | 0.61 |
| 1:C:472:PRO:O | 1:C:533:ASN:ND2 | 2.30 | 0.60 |
| 1:C:476:TRP:NE1 | 1:C:534:GLU:OE1 | 2.26 | 0.60 |
| 1:C:556:GLU:HB3 | 1:D:552:PHE:HD2 | 1.64 | 0.60 |
| 1:B:239:ARG:NH1 | 1:B:335:LEU:O | 2.34 | 0.60 |
| 1:B:476:TRP:NE1 | 1:B:534:GLU:OE1 | 2.32 | 0.60 |
| 1:C:547:LEU:HB3 | 1:C:600:VAL:HG11 | 1.82 | 0.60 |
| 1:C:760:GLN:HA | 1:D:744:ARG:HH22 | 1.66 | 0.60 |
| 1:E:556:GLU:HB3 | 1:F:552:PHE:HD2 | 1.67 | 0.60 |
| 1:F:635:ARG:HH21 | 1:F:638:ARG:HE | 1.48 | 0.60 |
| 1:A:350:PRO:O | 1:A:358:ARG:NH2 | 2.35 | 0.59 |
| 1:F:267:PHE:HB3 | 1:F:301:ILE:HG22 | 1.84 | 0.59 |
| 1:C:350:PRO:O | 1:C:358:ARG:NH2 | 2.36 | 0.59 |
| 1:E:350:PRO:O | 1:E:358:ARG:NH2 | 2.35 | 0.59 |
| 1:F:219:MET:HE3 | 1:F:241:ILE:HD12 | 1.84 | 0.59 |
| 1:F:350:PRO:O | 1:F:358:ARG:NH2 | 2.36 | 0.59 |

*Continued on next page...*

*Continued from previous page...*

| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 1:A:744:ARG:HH22 | 1:F:760:GLN:HA | 1.67 | 0.59 |
| 1:C:635:ARG:HH21 | 1:C:638:ARG:HE | 1.48 | 0.59 |
| 1:D:239:ARG:NH1 | 1:D:335:LEU:O | 2.36 | 0.59 |
| 1:F:288:LYS:O | 1:F:292:GLU:HG2 | 2.03 | 0.59 |
| 1:F:476:TRP:NE1 | 1:F:534:GLU:OE1 | 2.26 | 0.58 |
| 1:B:377:ARG:HB2 | 1:B:411:LEU:HD11 | 1.86 | 0.58 |
| 1:F:397:GLU:OE2 | 1:F:401:ASN:ND2 | 2.37 | 0.58 |
| 1:B:472:PRO:O | 1:B:533:ASN:ND2 | 2.31 | 0.58 |
| 1:B:267:PHE:HB3 | 1:B:301:ILE:HG22 | 1.86 | 0.57 |
| 1:E:239:ARG:NH1 | 1:E:335:LEU:O | 2.38 | 0.57 |
| 1:E:377:ARG:HB2 | 1:E:411:LEU:HD11 | 1.86 | 0.57 |
| 1:B:246:PRO:HD2 | 1:B:249:THR:HG21 | 1.87 | 0.57 |
| 1:B:630:ASP:O | 1:B:633:ILE:HG22 | 2.05 | 0.57 |
| 1:E:397:GLU:OE2 | 1:E:401:ASN:ND2 | 2.38 | 0.57 |
| 1:D:472:PRO:O | 1:D:533:ASN:ND2 | 2.32 | 0.56 |
| 1:B:350:PRO:O | 1:B:358:ARG:NH2 | 2.38 | 0.56 |
| 1:C:267:PHE:HB3 | 1:C:301:ILE:HG22 | 1.87 | 0.56 |
| 1:E:472:PRO:O | 1:E:533:ASN:ND2 | 2.30 | 0.56 |
| 1:B:580:ASP:OD1 | 1:B:581:SER:N | 2.39 | 0.56 |
| 1:E:322:ARG:HH22 | 1:F:317:HIS:HB3 | 1.70 | 0.56 |
| 1:F:423:ILE:HG12 | 1:F:445:LEU:HD21 | 1.85 | 0.56 |
| 1:B:586:ARG:NE | 1:B:598:ASP:OD2 | 2.38 | 0.56 |
| 1:D:603:GLN:HG2 | 1:E:549:THR:HG23 | 1.88 | 0.56 |
| 1:C:288:LYS:O | 1:C:292:GLU:HG2 | 2.05 | 0.56 |
| 1:E:630:ASP:O | 1:E:633:ILE:HG22 | 2.05 | 0.56 |
| 1:F:472:PRO:O | 1:F:533:ASN:ND2 | 2.28 | 0.56 |
| 1:D:375:THR:O | 1:D:379:GLU:HG3 | 2.06 | 0.56 |
| 1:F:275:MET:HE1 | 1:F:321:GLU:HG2 | 1.88 | 0.56 |
| 1:E:586:ARG:NE | 1:E:598:ASP:OD2 | 2.38 | 0.56 |
| 1:E:246:PRO:HD2 | 1:E:249:THR:HG21 | 1.87 | 0.56 |
| 1:B:288:LYS:O | 1:B:292:GLU:HG2 | 2.06 | 0.55 |
| 1:C:397:GLU:OE2 | 1:C:401:ASN:ND2 | 2.37 | 0.55 |
| 1:D:356:ALA:HA | 1:D:359:ARG:HH11 | 1.71 | 0.55 |
| 1:C:246:PRO:HD2 | 1:C:249:THR:HG21 | 1.87 | 0.55 |
| 1:D:229:LEU:HA | 1:E:442:MET:HE1 | 1.87 | 0.55 |
| 1:E:267:PHE:HB3 | 1:E:301:ILE:HG22 | 1.87 | 0.55 |
| 1:B:763:GLN:HG2 | 1:C:746:SER:HA | 1.89 | 0.55 |
| 1:C:377:ARG:HB2 | 1:C:411:LEU:HD11 | 1.89 | 0.55 |
| 1:F:580:ASP:OD1 | 1:F:581:SER:N | 2.40 | 0.55 |
| 1:A:603:GLN:HG2 | 1:B:549:THR:HG23 | 1.88 | 0.55 |
| 1:B:348:ASN:ND2 | 2:B:901:AGS:S1G | 2.76 | 0.55 |

*Continued on next page...*

*Continued from previous page...*

| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 1:A:267:PHE:HB3 | 1:A:301:ILE:HG22 | 1.89 | 0.54 |
| 1:D:586:ARG:NE | 1:D:598:ASP:OD2 | 2.40 | 0.54 |
| 1:E:580:ASP:OD1 | 1:E:581:SER:N | 2.40 | 0.54 |
| 1:A:375:THR:O | 1:A:379:GLU:HG3 | 2.06 | 0.54 |
| 1:A:586:ARG:NE | 1:A:598:ASP:OD2 | 2.40 | 0.54 |
| 1:E:288:LYS:O | 1:E:292:GLU:HG2 | 2.07 | 0.54 |
| 1:A:348:ASN:ND2 | 2:A:901:AGS:S1G | 2.78 | 0.54 |
| 1:D:609:ASP:OD2 | 1:D:638:ARG:NH2 | 2.40 | 0.54 |
| 1:F:375:THR:O | 1:F:379:GLU:HG3 | 2.08 | 0.54 |
| 1:F:526:LEU:HD11 | 2:F:902:AGS:H2' | 1.88 | 0.54 |
| 1:C:526:LEU:HD11 | 2:C:902:AGS:H2' | 1.89 | 0.54 |
| 1:C:580:ASP:OD1 | 1:C:581:SER:N | 2.40 | 0.54 |
| 1:E:414:LEU:HD11 | 1:E:456:LEU:HD23 | 1.90 | 0.54 |
| 1:A:229:LEU:HA | 1:B:442:MET:HE1 | 1.88 | 0.54 |
| 1:A:377:ARG:HB2 | 1:A:411:LEU:HD11 | 1.90 | 0.54 |
| 1:C:375:THR:O | 1:C:379:GLU:HG3 | 2.08 | 0.54 |
| 1:D:377:ARG:HB2 | 1:D:411:LEU:HD11 | 1.90 | 0.54 |
| 1:A:546:GLU:HG2 | 1:F:606:THR:HG23 | 1.90 | 0.54 |
| 1:D:526:LEU:HD11 | 2:D:902:AGS:H2' | 1.88 | 0.54 |
| 1:D:636:PRO:HA | 1:D:640:ASP:HB3 | 1.90 | 0.54 |
| 1:E:681:GLY:HA3 | 1:E:745:ARG:HH21 | 1.72 | 0.54 |
| 1:E:763:GLN:HG2 | 1:F:746:SER:HA | 1.90 | 0.54 |
| 1:A:399:VAL:HG13 | 1:A:456:LEU:HD21 | 1.89 | 0.53 |
| 1:B:397:GLU:OE2 | 1:B:401:ASN:ND2 | 2.38 | 0.53 |
| 1:D:348:ASN:ND2 | 2:D:901:AGS:S1G | 2.78 | 0.53 |
| 1:F:377:ARG:HB2 | 1:F:411:LEU:HD11 | 1.89 | 0.53 |
| 1:A:482:LEU:HD21 | 1:A:645:ILE:HG23 | 1.91 | 0.53 |
| 1:D:267:PHE:HB3 | 1:D:301:ILE:HG22 | 1.89 | 0.53 |
| 1:D:399:VAL:HG13 | 1:D:456:LEU:HD21 | 1.89 | 0.53 |
| 1:C:348:ASN:ND2 | 2:C:901:AGS:S1G | 2.75 | 0.53 |
| 1:D:580:ASP:OD1 | 1:D:581:SER:N | 2.41 | 0.53 |
| 1:A:580:ASP:OD1 | 1:A:581:SER:N | 2.41 | 0.53 |
| 1:E:375:THR:O | 1:E:379:GLU:HG3 | 2.09 | 0.53 |
| 1:A:636:PRO:HA | 1:A:640:ASP:HB3 | 1.90 | 0.53 |
| 1:B:277:LYS:HB3 | 1:B:281:GLU:HG3 | 1.90 | 0.53 |
| 1:D:351:ASN:ND2 | 1:D:561:GLU:OE2 | 2.42 | 0.53 |
| 1:E:636:PRO:HA | 1:E:640:ASP:HB3 | 1.89 | 0.53 |
| 1:B:414:LEU:HD11 | 1:B:456:LEU:HD23 | 1.89 | 0.53 |
| 1:B:322:ARG:HH22 | 1:C:317:HIS:HB3 | 1.73 | 0.53 |
| 1:C:351:ASN:ND2 | 1:C:561:GLU:OE2 | 2.42 | 0.53 |
| 1:A:414:LEU:HD11 | 1:A:456:LEU:HD23 | 1.91 | 0.53 |

*Continued on next page...*

*Continued from previous page...*

| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 1:B:636:PRO:HA | 1:B:640:ASP:HB3 | 1.90 | 0.53 |
| 1:C:589:ASN:ND2 | 1:C:627:ASP:O | 2.37 | 0.53 |
| 1:B:375:THR:O | 1:B:379:GLU:HG3 | 2.09 | 0.52 |
| 1:C:482:LEU:HD21 | 1:C:645:ILE:HG23 | 1.91 | 0.52 |
| 1:C:606:THR:HG23 | 1:D:546:GLU:HG2 | 1.90 | 0.52 |
| 1:A:472:PRO:O | 1:A:533:ASN:ND2 | 2.32 | 0.52 |
| 1:B:608:MET:HG2 | 1:B:619:ILE:HD13 | 1.92 | 0.52 |
| 1:D:482:LEU:HD21 | 1:D:645:ILE:HG23 | 1.91 | 0.52 |
| 1:A:526:LEU:HD11 | 2:A:902:AGS:H2' | 1.90 | 0.52 |
| 1:A:681:GLY:HA3 | 1:A:745:ARG:HH21 | 1.75 | 0.52 |
| 1:B:603:GLN:HG2 | 1:C:549:THR:HG23 | 1.92 | 0.52 |
| 1:C:636:PRO:HA | 1:C:640:ASP:HB3 | 1.92 | 0.52 |
| 1:B:482:LEU:HD21 | 1:B:645:ILE:HG23 | 1.92 | 0.52 |
| 1:D:414:LEU:HD11 | 1:D:456:LEU:HD23 | 1.91 | 0.52 |
| 1:F:351:ASN:ND2 | 1:F:561:GLU:OE2 | 2.42 | 0.52 |
| 1:F:636:PRO:HA | 1:F:640:ASP:HB3 | 1.92 | 0.52 |
| 1:B:399:VAL:HG13 | 1:B:456:LEU:HD21 | 1.92 | 0.52 |
| 1:D:608:MET:HG2 | 1:D:619:ILE:HD13 | 1.92 | 0.52 |
| 1:E:277:LYS:HB3 | 1:E:281:GLU:HG3 | 1.91 | 0.52 |
| 1:F:414:LEU:HD11 | 1:F:456:LEU:HD23 | 1.92 | 0.52 |
| 1:B:223:PRO:HG3 | 1:B:230:PHE:HE2 | 1.74 | 0.52 |
| 1:C:247:PRO:HD2 | 1:C:464:LEU:HD22 | 1.93 | 0.51 |
| 1:E:603:GLN:HG2 | 1:F:549:THR:HG23 | 1.93 | 0.51 |
| 1:F:469:VAL:HG22 | 1:F:540:ILE:HG12 | 1.92 | 0.51 |
| 1:F:609:ASP:OD2 | 1:F:638:ARG:NH2 | 2.41 | 0.51 |
| 1:B:681:GLY:HA3 | 1:B:745:ARG:HH21 | 1.73 | 0.51 |
| 1:C:414:LEU:HD11 | 1:C:456:LEU:HD23 | 1.92 | 0.51 |
| 1:F:247:PRO:HD2 | 1:F:464:LEU:HD22 | 1.92 | 0.51 |
| 1:E:608:MET:HG2 | 1:E:619:ILE:HD13 | 1.93 | 0.51 |
| 1:A:511:SER:OG | 1:A:640:ASP:OD1 | 2.29 | 0.51 |
| 1:A:322:ARG:HH22 | 1:B:317:HIS:HB3 | 1.76 | 0.51 |
| 1:B:540:ILE:HG22 | 1:B:542:ILE:HD11 | 1.92 | 0.51 |
| 1:E:351:ASN:ND2 | 1:E:561:GLU:OE2 | 2.43 | 0.51 |
| 1:A:608:MET:HG2 | 1:A:619:ILE:HD13 | 1.92 | 0.51 |
| 1:E:399:VAL:HG13 | 1:E:456:LEU:HD21 | 1.92 | 0.51 |
| 1:F:482:LEU:HD21 | 1:F:645:ILE:HG23 | 1.91 | 0.51 |
| 1:C:469:VAL:HG22 | 1:C:540:ILE:HG12 | 1.92 | 0.51 |
| 1:D:681:GLY:HA3 | 1:D:745:ARG:HH21 | 1.76 | 0.51 |
| 1:E:482:LEU:HD21 | 1:E:645:ILE:HG23 | 1.92 | 0.51 |
| 1:F:551:TRP:HZ2 | 1:F:603:GLN:NE2 | 2.09 | 0.51 |
| 1:F:650:GLU:O | 1:F:654:VAL:HG23 | 2.11 | 0.51 |

*Continued on next page...*

*Continued from previous page...*

| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 1:C:310:ALA:HA | 1:C:325:VAL:HG22 | 1.93 | 0.51 |
| 1:B:351:ASN:ND2 | 1:B:561:GLU:OE2 | 2.44 | 0.50 |
| 1:F:517:TYR:CZ | 1:F:644:TYR:HB2 | 2.46 | 0.50 |
| 1:F:589:ASN:ND2 | 1:F:627:ASP:O | 2.36 | 0.50 |
| 1:E:673:GLU:N | 1:E:673:GLU:OE1 | 2.45 | 0.50 |
| 1:A:609:ASP:OD2 | 1:A:638:ARG:NH2 | 2.40 | 0.50 |
| 1:C:701:GLU:HG3 | 1:C:735:HIS:HE2 | 1.76 | 0.50 |
| 1:A:469:VAL:HG22 | 1:A:540:ILE:HG12 | 1.93 | 0.50 |
| 1:C:635:ARG:HH21 | 1:C:638:ARG:NE | 2.09 | 0.50 |
| 1:E:671:ASP:H | 1:E:733:ARG:NH1 | 2.09 | 0.50 |
| 1:D:511:SER:OG | 1:D:640:ASP:OD1 | 2.29 | 0.50 |
| 1:F:671:ASP:OD1 | 1:F:672:LEU:N | 2.44 | 0.50 |
| 1:B:517:TYR:CZ | 1:B:644:TYR:HB2 | 2.47 | 0.50 |
| 1:E:540:ILE:HG22 | 1:E:542:ILE:HD11 | 1.93 | 0.50 |
| 1:B:671:ASP:H | 1:B:733:ARG:NH1 | 2.09 | 0.50 |
| 1:C:605:LEU:HD22 | 1:C:638:ARG:HH11 | 1.77 | 0.50 |
| 1:C:671:ASP:OD1 | 1:C:672:LEU:N | 2.45 | 0.50 |
| 1:E:348:ASN:ND2 | 2:E:901:AGS:S1G | 2.79 | 0.50 |
| 1:C:517:TYR:CZ | 1:C:644:TYR:HB2 | 2.47 | 0.50 |
| 1:C:608:MET:HG2 | 1:C:619:ILE:HD13 | 1.94 | 0.50 |
| 1:F:605:LEU:HD22 | 1:F:638:ARG:HH11 | 1.77 | 0.50 |
| 1:F:635:ARG:HH21 | 1:F:638:ARG:NE | 2.10 | 0.50 |
| 1:C:564:ASP:O | 1:C:568:GLN:HG2 | 2.12 | 0.49 |
| 1:F:701:GLU:HG3 | 1:F:735:HIS:HE2 | 1.77 | 0.49 |
| 1:C:486:LYS:O | 1:C:490:GLN:HG3 | 2.12 | 0.49 |
| 1:C:650:GLU:O | 1:C:654:VAL:HG23 | 2.11 | 0.49 |
| 1:E:526:LEU:HD11 | 2:E:902:AGS:H2' | 1.94 | 0.49 |
| 1:E:766:ARG:HH21 | 1:F:520:PRO:HB3 | 1.78 | 0.49 |
| 1:F:348:ASN:ND2 | 2:F:901:AGS:S1G | 2.73 | 0.49 |
| 1:F:399:VAL:HG13 | 1:F:456:LEU:HD21 | 1.94 | 0.49 |
| 1:F:486:LYS:O | 1:F:490:GLN:HG3 | 2.13 | 0.49 |
| 1:F:681:GLY:HA3 | 1:F:745:ARG:HH21 | 1.78 | 0.49 |
| 1:D:322:ARG:HH22 | 1:E:317:HIS:HB3 | 1.76 | 0.49 |
| 1:D:469:VAL:HG22 | 1:D:540:ILE:HG12 | 1.93 | 0.49 |
| 1:E:517:TYR:CZ | 1:E:644:TYR:HB2 | 2.47 | 0.49 |
| 1:B:673:GLU:OE1 | 1:B:673:GLU:N | 2.44 | 0.49 |
| 1:C:609:ASP:OD2 | 1:C:638:ARG:NH2 | 2.41 | 0.49 |
| 1:E:559:VAL:HG12 | 1:E:607:GLU:HG3 | 1.95 | 0.49 |
| 1:C:499:HIS:HB3 | 1:C:502:LYS:HG2 | 1.95 | 0.49 |
| 1:C:681:GLY:HA3 | 1:C:745:ARG:HH21 | 1.76 | 0.49 |
| 1:F:564:ASP:O | 1:F:568:GLN:HG2 | 2.13 | 0.49 |

*Continued on next page...*

*Continued from previous page...*

| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 1:B:469:VAL:HG22 | 1:B:540:ILE:HG12 | 1.95 | 0.49 |
| 1:D:310:ALA:HA | 1:D:325:VAL:HG22 | 1.95 | 0.49 |
| 1:A:763:GLN:HG2 | 1:B:746:SER:HA | 1.95 | 0.49 |
| 1:E:266:PHE:HE1 | 1:E:268:LEU:HB2 | 1.78 | 0.49 |
| 1:E:310:ALA:HA | 1:E:325:VAL:HG22 | 1.94 | 0.49 |
| 1:F:275:MET:HG2 | 1:F:309:ILE:HG22 | 1.95 | 0.49 |
| 1:C:399:VAL:HG13 | 1:C:456:LEU:HD21 | 1.95 | 0.48 |
| 1:E:371:ILE:HD11 | 1:E:468:VAL:HG12 | 1.96 | 0.48 |
| 1:C:605:LEU:HD22 | 1:C:638:ARG:NH1 | 2.29 | 0.48 |
| 1:F:310:ALA:HA | 1:F:325:VAL:HG22 | 1.94 | 0.48 |
| 1:A:359:ARG:HG3 | 1:A:359:ARG:HH11 | 1.78 | 0.48 |
| 1:A:423:ILE:HG12 | 1:A:445:LEU:HD21 | 1.96 | 0.48 |
| 1:B:526:LEU:HD11 | 2:B:902:AGS:H2' | 1.94 | 0.48 |
| 1:C:333:ASP:OD2 | 1:C:362:ARG:NH2 | 2.43 | 0.48 |
| 1:C:452:PHE:O | 1:C:456:LEU:HG | 2.14 | 0.48 |
| 1:F:605:LEU:HD22 | 1:F:638:ARG:NH1 | 2.28 | 0.48 |
| 1:B:266:PHE:HE1 | 1:B:268:LEU:HB2 | 1.77 | 0.48 |
| 1:B:310:ALA:HA | 1:B:325:VAL:HG22 | 1.94 | 0.48 |
| 1:B:635:ARG:HA | 1:B:766:ARG:NH1 | 2.28 | 0.48 |
| 1:C:760:GLN:CA | 1:D:744:ARG:HH22 | 2.26 | 0.48 |
| 1:F:203:TYR:N | 1:F:261:GLU:OE2 | 2.42 | 0.48 |
| 1:F:499:HIS:HB3 | 1:F:502:LYS:HG2 | 1.95 | 0.48 |
| 1:F:608:MET:HG2 | 1:F:619:ILE:HD13 | 1.95 | 0.48 |
| 1:C:559:VAL:HG12 | 1:C:607:GLU:HG3 | 1.95 | 0.48 |
| 1:F:452:PHE:O | 1:F:456:LEU:HG | 2.14 | 0.48 |
| 1:F:559:VAL:HG12 | 1:F:607:GLU:HG3 | 1.95 | 0.48 |
| 1:C:275:MET:HG2 | 1:C:309:ILE:HG22 | 1.94 | 0.48 |
| 1:D:246:PRO:HG2 | 1:D:371:ILE:HD11 | 1.95 | 0.48 |
| 1:A:246:PRO:HG2 | 1:A:371:ILE:HD11 | 1.96 | 0.48 |
| 1:A:310:ALA:HA | 1:A:325:VAL:HG22 | 1.94 | 0.48 |
| 1:A:564:ASP:O | 1:A:568:GLN:HG2 | 2.14 | 0.48 |
| 1:A:606:THR:HG23 | 1:B:546:GLU:HG2 | 1.96 | 0.48 |
| 1:D:452:PHE:O | 1:D:456:LEU:HG | 2.14 | 0.48 |
| 1:F:673:GLU:OE1 | 1:F:673:GLU:N | 2.45 | 0.48 |
| 1:A:491:GLU:HG2 | 1:A:495:TYR:CE2 | 2.49 | 0.47 |
| 1:A:658:LYS:HA | 1:A:658:LYS:HE2 | 1.96 | 0.47 |
| 1:A:452:PHE:O | 1:A:456:LEU:HG | 2.14 | 0.47 |
| 1:C:482:LEU:HD13 | 1:C:527:LEU:HD11 | 1.96 | 0.47 |
| 1:B:564:ASP:O | 1:B:568:GLN:HG2 | 2.14 | 0.47 |
| 1:C:322:ARG:HD2 | 1:D:321:GLU:OE2 | 2.14 | 0.47 |
| 1:A:519:PRO:HG2 | 1:A:522:CYS:SG | 2.55 | 0.47 |

*Continued on next page...*

*Continued from previous page...*

| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 1:B:589:ASN:ND2 | 1:B:627:ASP:O | 2.38 | 0.47 |
| 1:D:650:GLU:O | 1:D:654:VAL:HG23 | 2.14 | 0.47 |
| 1:E:589:ASN:ND2 | 1:E:627:ASP:O | 2.38 | 0.47 |
| 1:F:333:ASP:OD2 | 1:F:362:ARG:NH2 | 2.43 | 0.47 |
| 1:F:586:ARG:NE | 1:F:598:ASP:OD2 | 2.47 | 0.47 |
| 1:A:744:ARG:HH22 | 1:F:760:GLN:CA | 2.26 | 0.47 |
| 1:C:658:LYS:HE2 | 1:C:658:LYS:HA | 1.96 | 0.47 |
| 1:D:763:GLN:HG2 | 1:E:746:SER:HA | 1.95 | 0.47 |
| 1:E:539:PHE:CE2 | 1:E:541:SER:HB2 | 2.50 | 0.47 |
| 1:E:564:ASP:O | 1:E:568:GLN:HG2 | 2.14 | 0.47 |
| 1:A:316:THR:O | 1:A:322:ARG:NH2 | 2.47 | 0.47 |
| 1:E:650:GLU:O | 1:E:654:VAL:HG23 | 2.14 | 0.47 |
| 1:A:246:PRO:HD2 | 1:A:249:THR:HG21 | 1.95 | 0.47 |
| 1:B:371:ILE:HD11 | 1:B:468:VAL:HG12 | 1.96 | 0.47 |
| 1:B:658:LYS:HE2 | 1:B:658:LYS:HA | 1.96 | 0.47 |
| 1:D:491:GLU:HG2 | 1:D:495:TYR:CE2 | 2.49 | 0.47 |
| 1:D:606:THR:HG23 | 1:E:546:GLU:HG2 | 1.97 | 0.47 |
| 1:E:469:VAL:HG22 | 1:E:540:ILE:HG12 | 1.95 | 0.47 |
| 1:F:482:LEU:HD13 | 1:F:527:LEU:HD11 | 1.97 | 0.47 |
| 1:F:658:LYS:HA | 1:F:658:LYS:HE2 | 1.97 | 0.47 |
| 1:A:650:GLU:O | 1:A:654:VAL:HG23 | 2.15 | 0.47 |
| 1:C:551:TRP:HZ2 | 1:C:603:GLN:NE2 | 2.09 | 0.47 |
| 1:D:517:TYR:CZ | 1:D:644:TYR:HB2 | 2.50 | 0.47 |
| 1:D:564:ASP:O | 1:D:568:GLN:HG2 | 2.14 | 0.47 |
| 1:B:257:ALA:O | 1:B:261:GLU:HG2 | 2.15 | 0.47 |
| 1:D:605:LEU:HD22 | 1:D:638:ARG:HH11 | 1.80 | 0.47 |
| 1:D:658:LYS:HE2 | 1:D:658:LYS:HA | 1.96 | 0.47 |
| 1:C:570:ALA:HB1 | 1:C:616:ASN:OD1 | 2.14 | 0.46 |
| 1:D:316:THR:O | 1:D:322:ARG:NH2 | 2.47 | 0.46 |
| 1:E:247:PRO:HD2 | 1:E:464:LEU:HD22 | 1.97 | 0.46 |
| 1:D:246:PRO:HD2 | 1:D:249:THR:HG21 | 1.96 | 0.46 |
| 1:F:567:ARG:HH21 | 1:F:611:MET:HA | 1.81 | 0.46 |
| 1:A:223:PRO:HG3 | 1:A:230:PHE:HE2 | 1.81 | 0.46 |
| 1:A:605:LEU:HD22 | 1:A:638:ARG:HH11 | 1.80 | 0.46 |
| 1:B:247:PRO:HD2 | 1:B:464:LEU:HD22 | 1.98 | 0.46 |
| 1:B:559:VAL:HG12 | 1:B:607:GLU:HG3 | 1.97 | 0.46 |
| 1:C:586:ARG:NE | 1:C:598:ASP:OD2 | 2.48 | 0.46 |
| 1:E:225:ARG:HH21 | 1:F:432:LEU:HD22 | 1.80 | 0.46 |
| 1:A:225:ARG:HH21 | 1:B:432:LEU:HD22 | 1.79 | 0.46 |
| 1:E:258:VAL:HA | 1:E:261:GLU:HG2 | 1.98 | 0.46 |
| 1:F:644:TYR:CE2 | 1:F:646:PRO:HB3 | 2.51 | 0.46 |

*Continued on next page...*

*Continued from previous page...*

| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 1:B:225:ARG:HH21 | 1:C:432:LEU:HD22 | 1.80 | 0.46 |
| 1:A:580:ASP:O | 1:A:584:LYS:HG2 | 2.15 | 0.46 |
| 1:A:649:ASP:N | 1:A:652:SER:OG | 2.49 | 0.46 |
| 1:E:635:ARG:HA | 1:E:766:ARG:NH1 | 2.31 | 0.46 |
| 1:A:517:TYR:CZ | 1:A:644:TYR:HB2 | 2.51 | 0.46 |
| 1:A:567:ARG:HH21 | 1:A:611:MET:HA | 1.81 | 0.46 |
| 1:B:452:PHE:O | 1:B:456:LEU:HG | 2.15 | 0.46 |
| 1:B:539:PHE:CE2 | 1:B:541:SER:HB2 | 2.50 | 0.46 |
| 1:D:567:ARG:HH21 | 1:D:611:MET:HA | 1.81 | 0.46 |
| 1:D:580:ASP:O | 1:D:584:LYS:HG2 | 2.15 | 0.46 |
| 1:F:407:VAL:HG22 | 1:F:410:ASP:OD2 | 2.16 | 0.46 |
| 1:B:650:GLU:O | 1:B:654:VAL:HG23 | 2.15 | 0.46 |
| 1:E:243:LEU:O | 1:E:346:ALA:HA | 2.16 | 0.46 |
| 1:E:658:LYS:HE2 | 1:E:658:LYS:HA | 1.97 | 0.45 |
| 1:A:241:ILE:HD13 | 1:A:365:ARG:HB2 | 1.99 | 0.45 |
| 1:A:321:GLU:OE2 | 1:F:322:ARG:HD2 | 2.16 | 0.45 |
| 1:C:491:GLU:HG2 | 1:C:495:TYR:CE2 | 2.51 | 0.45 |
| 1:C:580:ASP:O | 1:C:584:LYS:HG2 | 2.17 | 0.45 |
| 1:D:243:LEU:O | 1:D:346:ALA:HA | 2.16 | 0.45 |
| 1:D:752:ILE:O | 1:D:756:GLU:HG2 | 2.16 | 0.45 |
| 1:E:322:ARG:HD2 | 1:F:321:GLU:OE2 | 2.16 | 0.45 |
| 1:E:407:VAL:HG22 | 1:E:410:ASP:OD2 | 2.16 | 0.45 |
| 1:B:221:GLU:OE1 | 1:B:225:ARG:NH1 | 2.49 | 0.45 |
| 1:A:243:LEU:O | 1:A:346:ALA:HA | 2.16 | 0.45 |
| 1:A:407:VAL:HG22 | 1:A:410:ASP:OD2 | 2.16 | 0.45 |
| 1:B:258:VAL:HA | 1:B:261:GLU:HG2 | 1.99 | 0.45 |
| 1:C:407:VAL:HG22 | 1:C:410:ASP:OD2 | 2.15 | 0.45 |
| 1:D:519:PRO:HG2 | 1:D:522:CYS:SG | 2.55 | 0.45 |
| 1:E:452:PHE:O | 1:E:456:LEU:HG | 2.15 | 0.45 |
| 1:F:570:ALA:HB1 | 1:F:616:ASN:OD1 | 2.17 | 0.45 |
| 1:D:356:ALA:HA | 1:D:359:ARG:NH1 | 2.30 | 0.45 |
| 1:D:671:ASP:H | 1:D:733:ARG:NH1 | 2.15 | 0.45 |
| 1:E:257:ALA:O | 1:E:261:GLU:HG2 | 2.16 | 0.45 |
| 1:F:246:PRO:HD2 | 1:F:249:THR:HG21 | 1.97 | 0.45 |
| 1:B:243:LEU:O | 1:B:346:ALA:HA | 2.16 | 0.45 |
| 1:C:644:TYR:CE2 | 1:C:646:PRO:HB3 | 2.51 | 0.45 |
| 1:A:288:LYS:O | 1:A:292:GLU:HG2 | 2.17 | 0.45 |
| 1:B:491:GLU:HG2 | 1:B:495:TYR:CE2 | 2.52 | 0.45 |
| 1:D:223:PRO:HG3 | 1:D:230:PHE:HE2 | 1.81 | 0.45 |
| 1:A:752:ILE:O | 1:A:756:GLU:HG2 | 2.17 | 0.45 |
| 1:B:579:LEU:HD23 | 1:B:582:ILE:HD12 | 1.97 | 0.45 |

*Continued on next page...*

*Continued from previous page...*

| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 1:C:519:PRO:HG2 | 1:C:522:CYS:SG | 2.56 | 0.45 |
| 1:C:603:GLN:CG | 1:D:549:THR:HG23 | 2.45 | 0.45 |
| 1:D:225:ARG:HH21 | 1:E:432:LEU:HD22 | 1.80 | 0.45 |
| 1:D:313:ARG:N | 1:D:354:ASP:OD2 | 2.41 | 0.45 |
| 1:F:491:GLU:HG2 | 1:F:495:TYR:CE2 | 2.51 | 0.45 |
| 1:A:432:LEU:HD22 | 1:F:225:ARG:HH21 | 1.81 | 0.45 |
| 1:C:266:PHE:HE1 | 1:C:268:LEU:HB2 | 1.80 | 0.45 |
| 1:E:377:ARG:NH1 | 1:E:403:THR:O | 2.50 | 0.45 |
| 1:F:544:GLY:HA2 | 1:F:547:LEU:HD12 | 1.99 | 0.45 |
| 1:A:671:ASP:H | 1:A:733:ARG:NH1 | 2.15 | 0.45 |
| 1:D:328:LEU:HD23 | 1:D:357:LEU:HD11 | 1.98 | 0.45 |
| 1:D:407:VAL:HG22 | 1:D:410:ASP:OD2 | 2.16 | 0.45 |
| 1:F:649:ASP:N | 1:F:652:SER:OG | 2.50 | 0.45 |
| 1:C:649:ASP:N | 1:C:652:SER:OG | 2.51 | 0.44 |
| 1:A:284:SER:O | 1:A:288:LYS:HG3 | 2.17 | 0.44 |
| 1:A:328:LEU:HD23 | 1:A:357:LEU:HD11 | 2.00 | 0.44 |
| 1:A:673:GLU:OE1 | 1:A:673:GLU:N | 2.44 | 0.44 |
| 1:B:377:ARG:NH1 | 1:B:403:THR:O | 2.51 | 0.44 |
| 1:B:614:LYS:HG2 | 1:C:402:GLU:OE2 | 2.17 | 0.44 |
| 1:E:221:GLU:OE1 | 1:E:225:ARG:NH1 | 2.50 | 0.44 |
| 1:E:580:ASP:O | 1:E:584:LYS:HG2 | 2.16 | 0.44 |
| 1:F:246:PRO:HG2 | 1:F:371:ILE:HD11 | 1.99 | 0.44 |
| 1:A:549:THR:HG23 | 1:F:603:GLN:CG | 2.45 | 0.44 |
| 1:A:603:GLN:CG | 1:B:549:THR:HG23 | 2.47 | 0.44 |
| 1:C:544:GLY:HA2 | 1:C:547:LEU:HD12 | 1.99 | 0.44 |
| 1:C:567:ARG:HH21 | 1:C:611:MET:HA | 1.82 | 0.44 |
| 1:D:649:ASP:N | 1:D:652:SER:OG | 2.50 | 0.44 |
| 1:B:508:MET:HG3 | 1:C:695:CYS:HB2 | 1.99 | 0.44 |
| 1:D:284:SER:O | 1:D:288:LYS:HG3 | 2.17 | 0.44 |
| 1:D:673:GLU:OE1 | 1:D:673:GLU:N | 2.44 | 0.44 |
| 2:C:902:AGS:O2G | 2:C:902:AGS:O1A | 2.35 | 0.44 |
| 1:E:614:LYS:HG2 | 1:F:402:GLU:OE2 | 2.18 | 0.44 |
| 1:B:407:VAL:HG22 | 1:B:410:ASP:OD2 | 2.17 | 0.44 |
| 1:A:377:ARG:HD2 | 1:A:400:ALA:O | 2.17 | 0.44 |
| 1:A:625:ARG:HB3 | 1:A:628:ILE:HG12 | 2.00 | 0.44 |
| 1:B:581:SER:HA | 1:B:584:LYS:HE2 | 2.00 | 0.44 |
| 1:B:644:TYR:CE2 | 1:B:646:PRO:HB3 | 2.53 | 0.44 |
| 1:C:754:LYS:HA | 1:C:757:MET:HG3 | 1.99 | 0.44 |
| 1:E:649:ASP:N | 1:E:652:SER:OG | 2.51 | 0.44 |
| 1:A:754:LYS:HA | 1:A:757:MET:HG3 | 2.00 | 0.44 |
| 1:B:580:ASP:O | 1:B:584:LYS:HG2 | 2.18 | 0.44 |

*Continued on next page...*

*Continued from previous page...*

| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 1:D:284:SER:HB2 | 1:D:288:LYS:NZ | 2.33 | 0.44 |
| 1:E:491:GLU:HG2 | 1:E:495:TYR:CE2 | 2.52 | 0.44 |
| 1:A:557:ALA:O | 1:A:561:GLU:HG3 | 2.18 | 0.43 |
| 1:D:359:ARG:HE | 1:E:247:PRO:HG3 | 1.83 | 0.43 |
| 1:D:377:ARG:HD2 | 1:D:400:ALA:O | 2.17 | 0.43 |
| 1:E:482:LEU:HD13 | 1:E:527:LEU:HD11 | 2.00 | 0.43 |
| 1:A:266:PHE:HE1 | 1:A:268:LEU:HB2 | 1.83 | 0.43 |
| 1:F:580:ASP:O | 1:F:584:LYS:HG2 | 2.17 | 0.43 |
| 1:A:539:PHE:CE2 | 1:A:541:SER:HB2 | 2.54 | 0.43 |
| 1:A:754:LYS:HD2 | 1:F:768:PHE:CG | 2.52 | 0.43 |
| 1:B:582:ILE:HD13 | 1:B:600:VAL:HG21 | 2.00 | 0.43 |
| 1:D:241:ILE:HD13 | 1:D:365:ARG:HB2 | 1.99 | 0.43 |
| 1:D:489:LEU:HD21 | 1:D:516:PHE:HZ | 1.83 | 0.43 |
| 1:D:603:GLN:CG | 1:E:549:THR:HG23 | 2.48 | 0.43 |
| 1:E:728:VAL:HB | 1:E:729:PRO:HD3 | 2.01 | 0.43 |
| 1:A:744:ARG:HH22 | 1:F:760:GLN:C | 2.26 | 0.43 |
| 1:B:482:LEU:HD13 | 1:B:527:LEU:HD11 | 2.00 | 0.43 |
| 1:B:563:PHE:HD2 | 1:B:611:MET:HE3 | 1.84 | 0.43 |
| 1:E:644:TYR:CE2 | 1:E:646:PRO:HB3 | 2.53 | 0.43 |
| 1:C:407:VAL:H | 1:C:410:ASP:HB2 | 1.84 | 0.43 |
| 1:E:508:MET:HG3 | 1:F:695:CYS:HB2 | 1.99 | 0.43 |
| 1:F:557:ALA:O | 1:F:561:GLU:HG3 | 2.19 | 0.43 |
| 1:A:284:SER:HB2 | 1:A:288:LYS:NZ | 2.33 | 0.43 |
| 1:D:539:PHE:CE2 | 1:D:541:SER:HB2 | 2.53 | 0.43 |
| 1:E:519:PRO:HG2 | 1:E:522:CYS:SG | 2.58 | 0.43 |
| 1:A:275:MET:HG2 | 1:A:309:ILE:HG22 | 2.01 | 0.43 |
| 1:B:624:ASN:O | 1:B:755:TYR:OH | 2.27 | 0.43 |
| 1:B:649:ASP:N | 1:B:652:SER:OG | 2.52 | 0.43 |
| 1:B:734:ASP:OD1 | 1:B:735:HIS:N | 2.52 | 0.43 |
| 1:D:423:ILE:HG12 | 1:D:445:LEU:HD21 | 2.01 | 0.43 |
| 1:C:216:ILE:HD13 | 1:C:254:ILE:HG21 | 2.01 | 0.43 |
| 1:D:297:ALA:HB1 | 1:D:298:PRO:HD2 | 2.01 | 0.43 |
| 1:D:589:ASN:ND2 | 1:D:627:ASP:O | 2.39 | 0.43 |
| 1:F:328:LEU:HD23 | 1:F:357:LEU:HD11 | 2.01 | 0.43 |
| 1:B:681:GLY:HA3 | 1:B:745:ARG:HE | 1.84 | 0.42 |
| 1:C:241:ILE:HB | 1:C:344:MET:HG2 | 2.01 | 0.42 |
| 1:D:266:PHE:HE1 | 1:D:268:LEU:HB2 | 1.83 | 0.42 |
| 1:E:657:LEU:HD13 | 1:E:675:LEU:HD23 | 2.01 | 0.42 |
| 1:B:220:VAL:C | 1:B:223:PRO:HD2 | 2.44 | 0.42 |
| 1:C:557:ALA:O | 1:C:561:GLU:HG3 | 2.20 | 0.42 |
| 1:F:223:PRO:HG3 | 1:F:230:PHE:HE2 | 1.84 | 0.42 |

*Continued on next page...*

*Continued from previous page...*

| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 1:A:746:SER:O | 1:F:764:GLN:HA | 2.20 | 0.42 |
| 1:B:503:PHE:CE2 | 1:B:510:PRO:HB3 | 2.54 | 0.42 |
| 1:C:734:ASP:OD1 | 1:C:735:HIS:N | 2.52 | 0.42 |
| 1:F:734:ASP:OD1 | 1:F:735:HIS:N | 2.52 | 0.42 |
| 1:B:423:ILE:HG12 | 1:B:445:LEU:HD21 | 2.02 | 0.42 |
| 1:C:328:LEU:HD23 | 1:C:357:LEU:HD11 | 2.01 | 0.42 |
| 1:C:508:MET:HE1 | 1:D:696:LYS:HG2 | 2.01 | 0.42 |
| 1:C:625:ARG:HB3 | 1:C:628:ILE:HG12 | 2.01 | 0.42 |
| 1:E:563:PHE:HD2 | 1:E:611:MET:HE3 | 1.84 | 0.42 |
| 1:E:567:ARG:HG3 | 1:E:611:MET:HE1 | 2.01 | 0.42 |
| 1:F:241:ILE:HB | 1:F:344:MET:HG2 | 2.02 | 0.42 |
| 1:A:333:ASP:OD2 | 1:A:362:ARG:NH2 | 2.46 | 0.42 |
| 1:B:519:PRO:HG2 | 1:B:522:CYS:SG | 2.59 | 0.42 |
| 1:B:728:VAL:HB | 1:B:729:PRO:HD3 | 2.01 | 0.42 |
| 1:F:407:VAL:H | 1:F:410:ASP:HB2 | 1.84 | 0.42 |
| 1:B:567:ARG:HG3 | 1:B:611:MET:HE1 | 2.01 | 0.42 |
| 1:B:605:LEU:HD22 | 1:B:638:ARG:HD3 | 2.02 | 0.42 |
| 1:B:764:GLN:N | 1:B:764:GLN:OE1 | 2.53 | 0.42 |
| 1:D:524:LYS:HG2 | 1:D:645:ILE:HD13 | 2.01 | 0.42 |
| 1:D:557:ALA:O | 1:D:561:GLU:HG3 | 2.19 | 0.42 |
| 1:D:614:LYS:HG2 | 1:E:402:GLU:OE2 | 2.20 | 0.42 |
| 1:F:519:PRO:HG2 | 1:F:522:CYS:SG | 2.59 | 0.42 |
| 1:F:524:LYS:HG2 | 1:F:645:ILE:HD13 | 2.01 | 0.42 |
| 1:A:377:ARG:NH1 | 1:A:403:THR:O | 2.53 | 0.42 |
| 1:A:402:GLU:OE2 | 1:F:614:LYS:HG2 | 2.20 | 0.42 |
| 1:A:489:LEU:HD21 | 1:A:516:PHE:HZ | 1.83 | 0.42 |
| 1:B:271:GLY:HA2 | 1:B:309:ILE:HG23 | 2.01 | 0.42 |
| 1:C:377:ARG:HD2 | 1:C:400:ALA:O | 2.19 | 0.42 |
| 1:F:728:VAL:HB | 1:F:729:PRO:HD3 | 2.01 | 0.42 |
| 1:B:512:LYS:HZ1 | 1:B:615:LYS:HB3 | 1.85 | 0.42 |
| 1:B:768:PHE:CD2 | 1:C:754:LYS:HD2 | 2.54 | 0.42 |
| 1:A:297:ALA:HB1 | 1:A:298:PRO:HD2 | 2.01 | 0.42 |
| 1:A:611:MET:SD | 1:A:619:ILE:HD11 | 2.60 | 0.42 |
| 1:E:362:ARG:HH22 | 1:F:305:GLU:CD | 2.28 | 0.42 |
| 1:F:377:ARG:HD2 | 1:F:400:ALA:O | 2.19 | 0.42 |
| 1:A:614:LYS:HG2 | 1:B:402:GLU:OE2 | 2.19 | 0.42 |
| 1:D:377:ARG:NH1 | 1:D:403:THR:O | 2.53 | 0.42 |
| 1:E:605:LEU:HD22 | 1:E:638:ARG:HD3 | 2.02 | 0.42 |
| 1:E:605:LEU:HD22 | 1:E:638:ARG:HH11 | 1.85 | 0.42 |
| 1:F:243:LEU:O | 1:F:346:ALA:HA | 2.20 | 0.42 |
| 1:A:696:LYS:HG2 | 1:F:508:MET:HE1 | 2.01 | 0.41 |

*Continued on next page...*

*Continued from previous page...*

| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 1:C:539:PHE:CE2 | 1:C:541:SER:HB2 | 2.55 | 0.41 |
| 1:E:503:PHE:CE2 | 1:E:510:PRO:HB3 | 2.55 | 0.41 |
| 1:F:539:PHE:CE2 | 1:F:541:SER:HB2 | 2.55 | 0.41 |
| 1:C:760:GLN:C | 1:D:744:ARG:HH22 | 2.27 | 0.41 |
| 1:D:275:MET:HG2 | 1:D:309:ILE:HG22 | 2.01 | 0.41 |
| 1:D:333:ASP:OD2 | 1:D:362:ARG:NH2 | 2.46 | 0.41 |
| 1:D:438:ASP:N | 1:D:438:ASP:OD1 | 2.53 | 0.41 |
| 1:A:519:PRO:HA | 1:A:520:PRO:HD3 | 1.97 | 0.41 |
| 1:B:389:LYS:NZ | 1:B:446:ALA:HB2 | 2.35 | 0.41 |
| 1:C:243:LEU:O | 1:C:346:ALA:HA | 2.19 | 0.41 |
| 1:C:728:VAL:HB | 1:C:729:PRO:HD3 | 2.01 | 0.41 |
| 1:D:624:ASN:O | 1:D:755:TYR:OH | 2.22 | 0.41 |
| 1:F:571:PRO:HG3 | 1:F:616:ASN:ND2 | 2.35 | 0.41 |
| 1:A:520:PRO:HG2 | 1:F:766:ARG:O | 2.20 | 0.41 |
| 1:B:657:LEU:HD13 | 1:B:675:LEU:HD23 | 2.02 | 0.41 |
| 1:E:438:ASP:OD1 | 1:E:438:ASP:N | 2.53 | 0.41 |
| 1:E:701:GLU:HG3 | 1:E:735:HIS:HE2 | 1.86 | 0.41 |
| 1:A:407:VAL:H | 1:A:410:ASP:HB2 | 1.85 | 0.41 |
| 1:B:768:PHE:CG | 1:C:754:LYS:HD2 | 2.55 | 0.41 |
| 2:C:901:AGS:O2A | 2:C:901:AGS:O2B | 2.38 | 0.41 |
| 1:D:611:MET:SD | 1:D:619:ILE:HD11 | 2.61 | 0.41 |
| 1:E:389:LYS:NZ | 1:E:446:ALA:HB2 | 2.35 | 0.41 |
| 1:F:256:ARG:NH1 | 1:F:268:LEU:HD11 | 2.35 | 0.41 |
| 1:F:512:LYS:HZ1 | 1:F:615:LYS:HB3 | 1.86 | 0.41 |
| 1:A:605:LEU:HD22 | 1:A:638:ARG:NH1 | 2.35 | 0.41 |
| 1:B:377:ARG:HD2 | 1:B:400:ALA:O | 2.21 | 0.41 |
| 1:B:752:ILE:O | 1:B:756:GLU:HG2 | 2.21 | 0.41 |
| 1:C:223:PRO:HG3 | 1:C:230:PHE:HE2 | 1.85 | 0.41 |
| 1:C:489:LEU:HD21 | 1:C:516:PHE:HZ | 1.86 | 0.41 |
| 1:A:220:VAL:C | 1:A:223:PRO:HD2 | 2.45 | 0.41 |
| 1:E:271:GLY:HA2 | 1:E:309:ILE:HG23 | 2.01 | 0.41 |
| 1:E:734:ASP:OD1 | 1:E:735:HIS:N | 2.53 | 0.41 |
| 1:F:216:ILE:HD13 | 1:F:254:ILE:HG21 | 2.02 | 0.41 |
| 1:A:512:LYS:HD2 | 1:A:613:THR:O | 2.21 | 0.41 |
| 1:B:216:ILE:HD13 | 1:B:254:ILE:HG21 | 2.03 | 0.41 |
| 1:C:524:LYS:HG2 | 1:C:645:ILE:HD13 | 2.02 | 0.41 |
| 1:D:565:LYS:HB2 | 1:D:565:LYS:HE3 | 1.82 | 0.41 |
| 1:A:524:LYS:HG2 | 1:A:645:ILE:HD13 | 2.02 | 0.41 |
| 1:A:644:TYR:CE2 | 1:A:646:PRO:HB3 | 2.56 | 0.41 |
| 1:A:728:VAL:HB | 1:A:729:PRO:HD3 | 2.02 | 0.41 |
| 1:A:734:ASP:OD1 | 1:A:735:HIS:N | 2.54 | 0.41 |

*Continued on next page...*

*Continued from previous page...*

| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 1:B:322:ARG:HD2 | 1:C:321:GLU:OE2 | 2.21 | 0.41 |
| 1:B:332:MET:HE1 | 1:B:343:VAL:HB | 2.02 | 0.41 |
| 1:B:550:MET:SD | 1:B:558:ASN:HB2 | 2.61 | 0.41 |
| 1:B:605:LEU:HD22 | 1:B:638:ARG:HH11 | 1.85 | 0.41 |
| 1:C:377:ARG:NH1 | 1:C:403:THR:O | 2.54 | 0.41 |
| 1:C:633:ILE:HG13 | 1:C:639:LEU:HD12 | 2.03 | 0.41 |
| 1:D:220:VAL:C | 1:D:223:PRO:HD2 | 2.46 | 0.41 |
| 1:D:512:LYS:HD2 | 1:D:613:THR:O | 2.21 | 0.41 |
| 1:D:605:LEU:HD22 | 1:D:638:ARG:NH1 | 2.36 | 0.41 |
| 1:E:512:LYS:HZ1 | 1:E:615:LYS:HB3 | 1.86 | 0.41 |
| 1:F:297:ALA:HB1 | 1:F:298:PRO:HD2 | 2.03 | 0.41 |
| 1:F:491:GLU:HA | 1:F:495:TYR:CD2 | 2.56 | 0.41 |
| 1:A:438:ASP:OD1 | 1:A:438:ASP:N | 2.52 | 0.41 |
| 1:D:728:VAL:HB | 1:D:729:PRO:HD3 | 2.02 | 0.41 |
| 1:F:241:ILE:HD13 | 1:F:365:ARG:HB2 | 2.03 | 0.41 |
| 1:B:551:TRP:CZ3 | 1:B:599:ARG:HB3 | 2.56 | 0.40 |
| 2:D:902:AGS:H5'1 | 2:D:902:AGS:S1G | 2.61 | 0.40 |
| 1:E:377:ARG:HD2 | 1:E:400:ALA:O | 2.21 | 0.40 |
| 1:F:237:PRO:HA | 1:F:238:PRO:HD3 | 1.98 | 0.40 |
| 1:F:319:GLU:OE2 | 1:F:322:ARG:NH1 | 2.54 | 0.40 |
| 2:F:901:AGS:O2A | 2:F:901:AGS:O2B | 2.38 | 0.40 |
| 1:A:586:ARG:HB3 | 1:A:592:ASP:OD1 | 2.22 | 0.40 |
| 1:E:297:ALA:HB1 | 1:E:298:PRO:HD2 | 2.03 | 0.40 |
| 1:E:681:GLY:HA3 | 1:E:745:ARG:HE | 1.85 | 0.40 |
| 1:F:438:ASP:OD1 | 1:F:438:ASP:N | 2.53 | 0.40 |
| 1:A:270:ASN:HB2 | 1:A:273:GLU:HB3 | 2.04 | 0.40 |
| 1:A:301:ILE:HD11 | 1:A:343:VAL:HG22 | 2.02 | 0.40 |
| 1:A:307:ASP:OD1 | 1:A:347:THR:OG1 | 2.35 | 0.40 |
| 1:C:611:MET:SD | 1:C:619:ILE:HD11 | 2.61 | 0.40 |
| 1:D:586:ARG:HB3 | 1:D:592:ASP:OD1 | 2.22 | 0.40 |
| 1:B:557:ALA:O | 1:B:561:GLU:HG3 | 2.21 | 0.40 |
| 1:C:225:ARG:HH21 | 1:D:432:LEU:HD22 | 1.85 | 0.40 |
| 1:C:491:GLU:HA | 1:C:495:TYR:CD2 | 2.56 | 0.40 |
| 1:D:644:TYR:CE2 | 1:D:646:PRO:HB3 | 2.56 | 0.40 |
| 1:E:223:PRO:HG3 | 1:E:230:PHE:HE2 | 1.87 | 0.40 |
| 2:A:902:AGS:H5'1 | 2:A:902:AGS:S1G | 2.62 | 0.40 |
| 1:B:633:ILE:HG13 | 1:B:639:LEU:HD12 | 2.04 | 0.40 |
| 1:C:682:PHE:CE2 | 1:C:690:ILE:HD11 | 2.56 | 0.40 |
| 1:E:301:ILE:HD11 | 1:E:343:VAL:HG22 | 2.04 | 0.40 |
| 1:F:377:ARG:NH1 | 1:F:403:THR:O | 2.55 | 0.40 |
| 1:F:666:VAL:HA | 1:F:731:ILE:HG23 | 2.03 | 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 | 545/822 (66%) | 528 (97%) | 16 (3%) | 1 (0%) | 43 | 57 |
| 1 | B | 545/822 (66%) | 526 (96%) | 18 (3%) | 1 (0%) | 43 | 57 |
| 1 | C | 545/822 (66%) | 528 (97%) | 16 (3%) | 1 (0%) | 43 | 57 |
| 1 | D | 545/822 (66%) | 528 (97%) | 16 (3%) | 1 (0%) | 43 | 57 |
| 1 | E | 545/822 (66%) | 528 (97%) | 16 (3%) | 1 (0%) | 43 | 57 |
| 1 | F | 545/822 (66%) | 526 (96%) | 17 (3%) | 2 (0%) | 30 | 42 |
| All | All | 3270/4932 (66%) | 3164 (97%) | 99 (3%) | 7 (0%) | 44 | 57 |

All (7) Ramachandran outliers are listed below:

| Mol | Chain | Res | Type |
|---|---|---|---|
| 1 | F | 765 | SER |
| 1 | A | 297 | ALA |
| 1 | B | 297 | ALA |
| 1 | C | 297 | ALA |
| 1 | D | 297 | ALA |
| 1 | E | 297 | ALA |
| 1 | F | 297 | ALA |

### 5.3.2 Protein sidechains (i)

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 | 455/692 (66%) | 455 (100%) | 0 | 100 | 100 |
| 1 | B | 455/692 (66%) | 455 (100%) | 0 | 100 | 100 |
| 1 | C | 455/692 (66%) | 455 (100%) | 0 | 100 | 100 |
| 1 | D | 455/692 (66%) | 455 (100%) | 0 | 100 | 100 |
| 1 | E | 455/692 (66%) | 455 (100%) | 0 | 100 | 100 |
| 1 | F | 455/692 (66%) | 455 (100%) | 0 | 100 | 100 |
| All | All | 2730/4152 (66%) | 2730 (100%) | 0 | 100 | 100 |

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (25) such sidechains are listed below:

| Mol | Chain | Res | Type |
|---|---|---|---|
| 1 | A | 215 | GLN |
| 1 | A | 285 | ASN |
| 1 | A | 296 | ASN |
| 1 | A | 499 | HIS |
| 1 | B | 285 | ASN |
| 1 | B | 296 | ASN |
| 1 | B | 499 | HIS |
| 1 | C | 285 | ASN |
| 1 | C | 296 | ASN |
| 1 | C | 327 | GLN |
| 1 | C | 458 | GLN |
| 1 | C | 490 | GLN |
| 1 | C | 603 | GLN |
| 1 | D | 285 | ASN |
| 1 | D | 296 | ASN |
| 1 | D | 499 | HIS |
| 1 | E | 285 | ASN |
| 1 | E | 296 | ASN |
| 1 | E | 499 | HIS |
| 1 | E | 764 | GLN |
| 1 | F | 285 | ASN |
| 1 | F | 327 | GLN |
| 1 | F | 458 | GLN |
| 1 | F | 490 | GLN |
| 1 | F | 603 | GLN |

### 5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

## 5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

## 5.6 Ligand geometry (i)

Of 24 ligands modelled in this entry, 12 are monoatomic - leaving 12 for Mogul analysis.

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 | $\#\|Z\| > 2$ |
| 2 | AGS | B | 901 | 3 | 32,33,33 | 0.50 | 1 (3%) | 45,52,52 | 0.66 | 1 (2%) |
| 2 | AGS | D | 901 | 3 | 32,33,33 | 0.50 | 1 (3%) | 45,52,52 | 0.66 | 1 (2%) |
| 2 | AGS | E | 901 | 3 | 32,33,33 | 0.49 | 1 (3%) | 45,52,52 | 0.66 | 1 (2%) |
| 2 | AGS | B | 902 | 3 | 32,33,33 | 0.48 | 1 (3%) | 45,52,52 | 0.70 | 1 (2%) |
| 2 | AGS | C | 901 | 3 | 32,33,33 | 0.49 | 1 (3%) | 45,52,52 | 0.67 | 1 (2%) |
| 2 | AGS | F | 901 | 3 | 32,33,33 | 0.49 | 1 (3%) | 45,52,52 | 0.67 | 1 (2%) |
| 2 | AGS | C | 902 | 3 | 32,33,33 | 0.48 | 1 (3%) | 45,52,52 | 0.69 | 1 (2%) |
| 2 | AGS | A | 902 | 3 | 32,33,33 | 0.46 | 1 (3%) | 45,52,52 | 0.66 | 1 (2%) |
| 2 | AGS | E | 902 | 3 | 32,33,33 | 0.48 | 1 (3%) | 45,52,52 | 0.70 | 1 (2%) |
| 2 | AGS | A | 901 | 3 | 32,33,33 | 0.50 | 1 (3%) | 45,52,52 | 0.66 | 1 (2%) |
| 2 | AGS | F | 902 | 3 | 32,33,33 | 0.48 | 1 (3%) | 45,52,52 | 0.69 | 1 (2%) |
| 2 | AGS | D | 902 | 3 | 32,33,33 | 0.46 | 1 (3%) | 45,52,52 | 0.67 | 1 (2%) |

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 |
|---|---|---|---|---|---|---|---|
| 2 | AGS | B | 901 | 3 | - | 8/21/38/38 | 0/3/3/3 |
| 2 | AGS | D | 901 | 3 | - | 9/21/38/38 | 0/3/3/3 |
| 2 | AGS | E | 901 | 3 | - | 8/21/38/38 | 0/3/3/3 |
| 2 | AGS | B | 902 | 3 | - | 4/21/38/38 | 0/3/3/3 |
| 2 | AGS | C | 901 | 3 | - | 7/21/38/38 | 0/3/3/3 |
| 2 | AGS | F | 901 | 3 | - | 7/21/38/38 | 0/3/3/3 |
| 2 | AGS | C | 902 | 3 | - | 3/21/38/38 | 0/3/3/3 |
| 2 | AGS | A | 902 | 3 | - | 2/21/38/38 | 0/3/3/3 |
| 2 | AGS | E | 902 | 3 | - | 4/21/38/38 | 0/3/3/3 |
| 2 | AGS | A | 901 | 3 | - | 10/21/38/38 | 0/3/3/3 |
| 2 | AGS | F | 902 | 3 | - | 3/21/38/38 | 0/3/3/3 |
| 2 | AGS | D | 902 | 3 | - | 2/21/38/38 | 0/3/3/3 |

All (12) bond length outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed(Å) | Ideal(Å) |
|---|---|---|---|---|---|---|---|
| 2 | C | 902 | AGS | PG-S1G | 2.13 | 1.95 | 1.90 |
| 2 | A | 901 | AGS | PG-S1G | 2.12 | 1.95 | 1.90 |
| 2 | C | 901 | AGS | PG-S1G | 2.11 | 1.95 | 1.90 |
| 2 | F | 902 | AGS | PG-S1G | 2.11 | 1.95 | 1.90 |
| 2 | B | 902 | AGS | PG-S1G | 2.10 | 1.95 | 1.90 |
| 2 | F | 901 | AGS | PG-S1G | 2.10 | 1.95 | 1.90 |
| 2 | A | 902 | AGS | PG-S1G | 2.09 | 1.95 | 1.90 |
| 2 | B | 901 | AGS | PG-S1G | 2.09 | 1.95 | 1.90 |
| 2 | D | 902 | AGS | PG-S1G | 2.08 | 1.95 | 1.90 |
| 2 | D | 901 | AGS | PG-S1G | 2.06 | 1.95 | 1.90 |
| 2 | E | 901 | AGS | PG-S1G | 2.05 | 1.95 | 1.90 |
| 2 | E | 902 | AGS | PG-S1G | 2.05 | 1.95 | 1.90 |

All (12) bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed($^o$) | Ideal($^o$) |
|---|---|---|---|---|---|---|---|
| 2 | E | 902 | AGS | PB-O3B-PG | -3.85 | 119.10 | 133.17 |
| 2 | B | 902 | AGS | PB-O3B-PG | -3.84 | 119.10 | 133.17 |
| 2 | C | 902 | AGS | PB-O3B-PG | -3.81 | 119.23 | 133.17 |
| 2 | F | 902 | AGS | PB-O3B-PG | -3.79 | 119.28 | 133.17 |
| 2 | F | 901 | AGS | PB-O3B-PG | -3.68 | 119.71 | 133.17 |
| 2 | E | 901 | AGS | PB-O3B-PG | -3.67 | 119.73 | 133.17 |

*Continued on next page...*

*Continued from previous page...*

| Mol | Chain | Res | Type | Atoms | Z | Observed($^o$) | Ideal($^o$) |
|---|---|---|---|---|---|---|---|
| 2 | B | 901 | AGS | PB-O3B-PG | -3.67 | 119.75 | 133.17 |
| 2 | C | 901 | AGS | PB-O3B-PG | -3.66 | 119.76 | 133.17 |
| 2 | D | 902 | AGS | PB-O3B-PG | -3.65 | 119.81 | 133.17 |
| 2 | A | 901 | AGS | PB-O3B-PG | -3.65 | 119.82 | 133.17 |
| 2 | D | 901 | AGS | PB-O3B-PG | -3.64 | 119.86 | 133.17 |
| 2 | A | 902 | AGS | PB-O3B-PG | -3.62 | 119.91 | 133.17 |

There are no chirality outliers.

All (67) torsion outliers are listed below:

| Mol | Chain | Res | Type | Atoms |
|---|---|---|---|---|
| 2 | A | 901 | AGS | C5'-O5'-PA-O2A |
| 2 | A | 901 | AGS | C5'-O5'-PA-O3A |
| 2 | A | 901 | AGS | O4'-C4'-C5'-O5' |
| 2 | B | 901 | AGS | C5'-O5'-PA-O2A |
| 2 | B | 901 | AGS | C5'-O5'-PA-O3A |
| 2 | B | 902 | AGS | PB-O3B-PG-O2G |
| 2 | B | 902 | AGS | PB-O3B-PG-O3G |
| 2 | C | 901 | AGS | C5'-O5'-PA-O2A |
| 2 | C | 901 | AGS | C5'-O5'-PA-O3A |
| 2 | C | 901 | AGS | O4'-C4'-C5'-O5' |
| 2 | D | 901 | AGS | C5'-O5'-PA-O2A |
| 2 | D | 901 | AGS | C5'-O5'-PA-O3A |
| 2 | D | 901 | AGS | O4'-C4'-C5'-O5' |
| 2 | E | 901 | AGS | C5'-O5'-PA-O2A |
| 2 | E | 901 | AGS | C5'-O5'-PA-O3A |
| 2 | E | 902 | AGS | PB-O3B-PG-O2G |
| 2 | E | 902 | AGS | PB-O3B-PG-O3G |
| 2 | F | 901 | AGS | C5'-O5'-PA-O2A |
| 2 | F | 901 | AGS | C5'-O5'-PA-O3A |
| 2 | F | 901 | AGS | O4'-C4'-C5'-O5' |
| 2 | F | 902 | AGS | PB-O3B-PG-O2G |
| 2 | F | 902 | AGS | PB-O3B-PG-O3G |
| 2 | B | 901 | AGS | O4'-C4'-C5'-O5' |
| 2 | E | 901 | AGS | O4'-C4'-C5'-O5' |
| 2 | A | 901 | AGS | C3'-C4'-C5'-O5' |
| 2 | B | 901 | AGS | C3'-C4'-C5'-O5' |
| 2 | C | 901 | AGS | C3'-C4'-C5'-O5' |
| 2 | D | 901 | AGS | C3'-C4'-C5'-O5' |
| 2 | E | 901 | AGS | C3'-C4'-C5'-O5' |
| 2 | F | 901 | AGS | C3'-C4'-C5'-O5' |
| 2 | A | 902 | AGS | PA-O3A-PB-O1B |

*Continued on next page...*

*Continued from previous page...*

| Mol | Chain | Res | Type | Atoms |
|---|---|---|---|---|
| 2 | B | 902 | AGS | PA-O3A-PB-O1B |
| 2 | C | 901 | AGS | PA-O3A-PB-O2B |
| 2 | D | 902 | AGS | PA-O3A-PB-O1B |
| 2 | E | 902 | AGS | PA-O3A-PB-O1B |
| 2 | F | 901 | AGS | PA-O3A-PB-O2B |
| 2 | A | 901 | AGS | C5'-O5'-PA-O1A |
| 2 | B | 901 | AGS | C5'-O5'-PA-O1A |
| 2 | C | 901 | AGS | C5'-O5'-PA-O1A |
| 2 | D | 901 | AGS | C5'-O5'-PA-O1A |
| 2 | E | 901 | AGS | C5'-O5'-PA-O1A |
| 2 | F | 901 | AGS | C5'-O5'-PA-O1A |
| 2 | A | 901 | AGS | PA-O3A-PB-O2B |
| 2 | B | 901 | AGS | PA-O3A-PB-O2B |
| 2 | D | 901 | AGS | PA-O3A-PB-O2B |
| 2 | E | 901 | AGS | PA-O3A-PB-O2B |
| 2 | A | 901 | AGS | C4'-C5'-O5'-PA |
| 2 | C | 901 | AGS | C4'-C5'-O5'-PA |
| 2 | D | 901 | AGS | C4'-C5'-O5'-PA |
| 2 | F | 902 | AGS | PA-O3A-PB-O1B |
| 2 | A | 901 | AGS | PB-O3B-PG-O2G |
| 2 | A | 901 | AGS | PB-O3B-PG-O3G |
| 2 | C | 902 | AGS | PB-O3B-PG-O2G |
| 2 | C | 902 | AGS | PB-O3B-PG-O3G |
| 2 | D | 901 | AGS | PB-O3B-PG-O2G |
| 2 | B | 901 | AGS | C4'-C5'-O5'-PA |
| 2 | E | 901 | AGS | C4'-C5'-O5'-PA |
| 2 | F | 901 | AGS | C4'-C5'-O5'-PA |
| 2 | A | 901 | AGS | PA-O3A-PB-O1B |
| 2 | C | 902 | AGS | PA-O3A-PB-O1B |
| 2 | D | 901 | AGS | PA-O3A-PB-O1B |
| 2 | A | 902 | AGS | PA-O3A-PB-O2B |
| 2 | B | 901 | AGS | PA-O3A-PB-O1B |
| 2 | B | 902 | AGS | PA-O3A-PB-O2B |
| 2 | D | 902 | AGS | PA-O3A-PB-O2B |
| 2 | E | 901 | AGS | PA-O3A-PB-O1B |
| 2 | E | 902 | AGS | PA-O3A-PB-O2B |

There are no ring outliers.

12 monomers are involved in 21 short contacts:

| Mol | Chain | Res | Type | Clashes | Symm-Clashes |
|---|---|---|---|---|---|
| 2 | B | 901 | AGS | 1 | 0 |

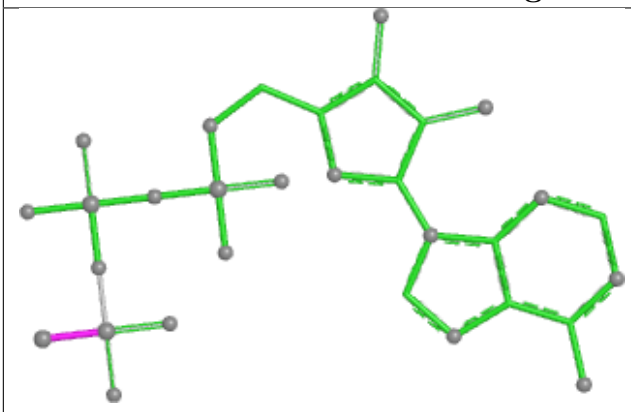
*Continued on next page...*

*Continued from previous page...*

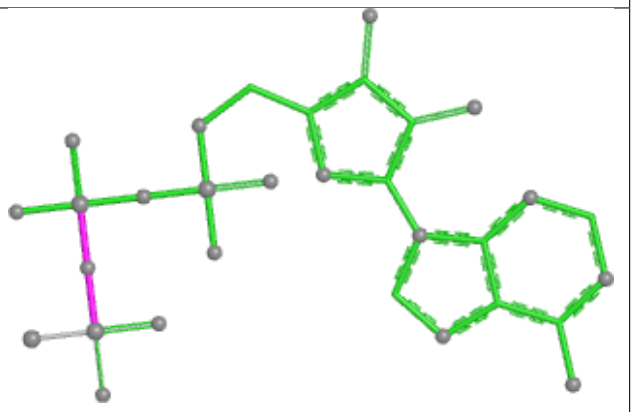
| Mol | Chain | Res | Type | Clashes | Symm-Clashes |
|---|---|---|---|---|---|
| 2 | D | 901 | AGS | 1 | 0 |
| 2 | E | 901 | AGS | 1 | 0 |
| 2 | B | 902 | AGS | 2 | 0 |
| 2 | C | 901 | AGS | 2 | 0 |
| 2 | F | 901 | AGS | 2 | 0 |
| 2 | C | 902 | AGS | 3 | 0 |
| 2 | A | 902 | AGS | 2 | 0 |
| 2 | E | 902 | AGS | 2 | 0 |
| 2 | A | 901 | AGS | 1 | 0 |
| 2 | F | 902 | AGS | 2 | 0 |
| 2 | D | 902 | AGS | 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.

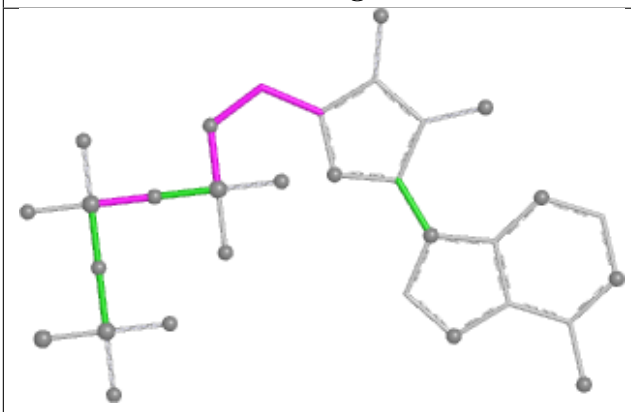
**Ligand AGS B 901**



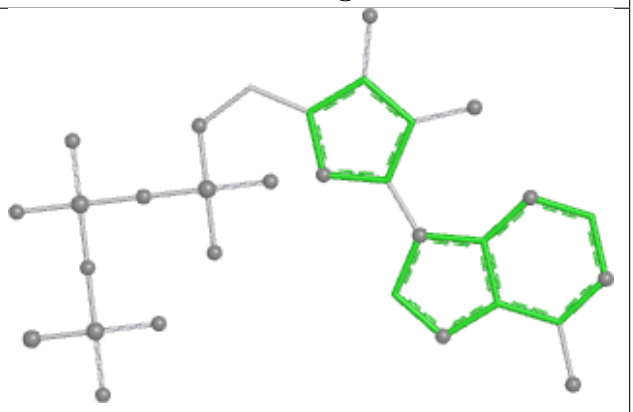
**Bond lengths**



**Bond angles**

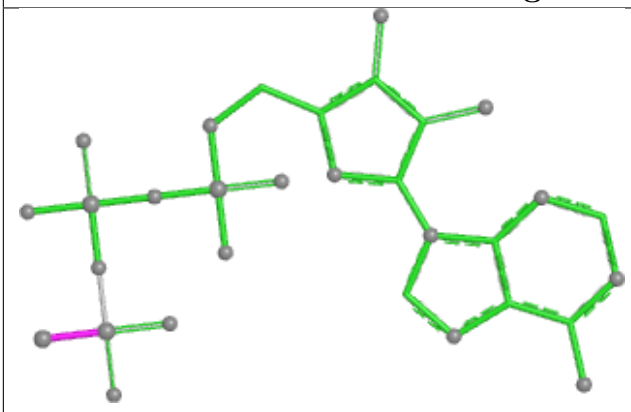


**Torsions**

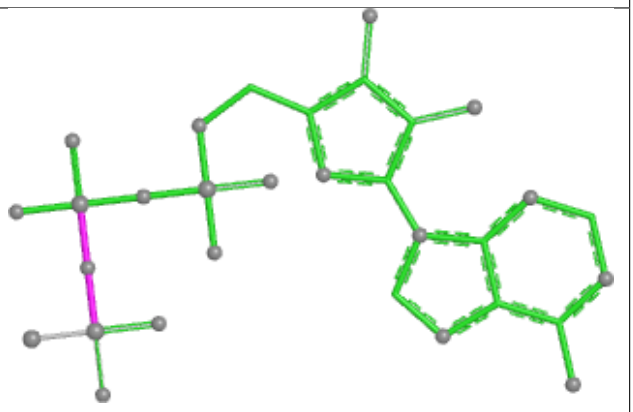


**Rings**

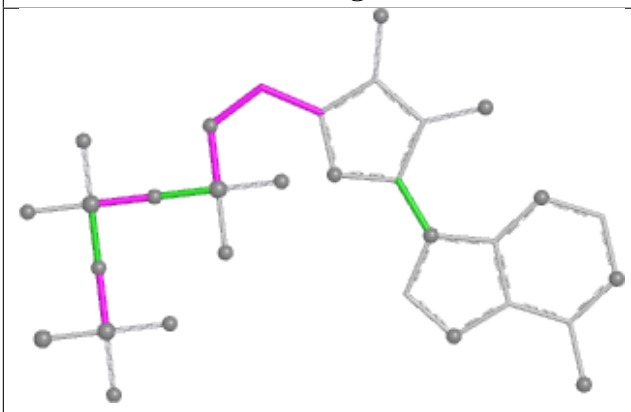
**Ligand AGS D 901**



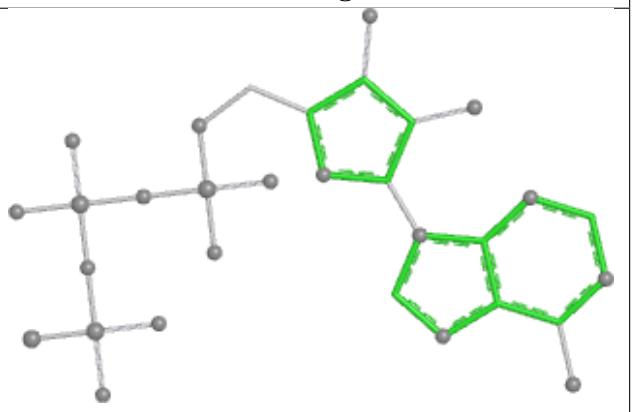
**Bond lengths**



**Bond angles**

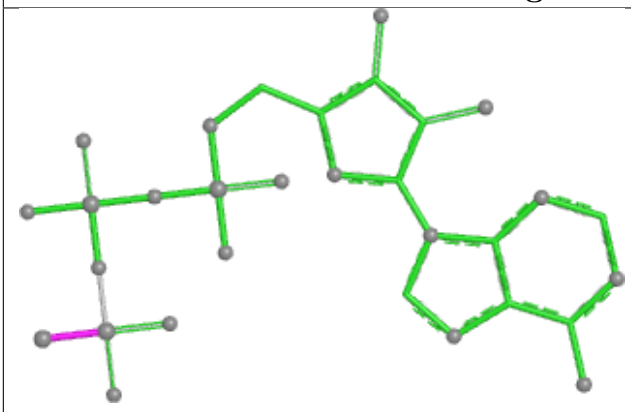


**Torsions**

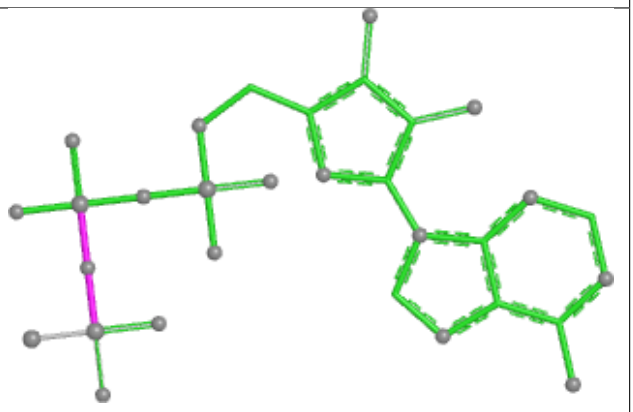


**Rings**

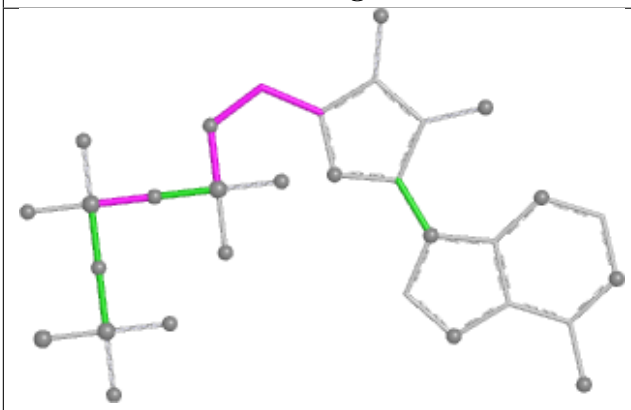
**Ligand AGS E 901**



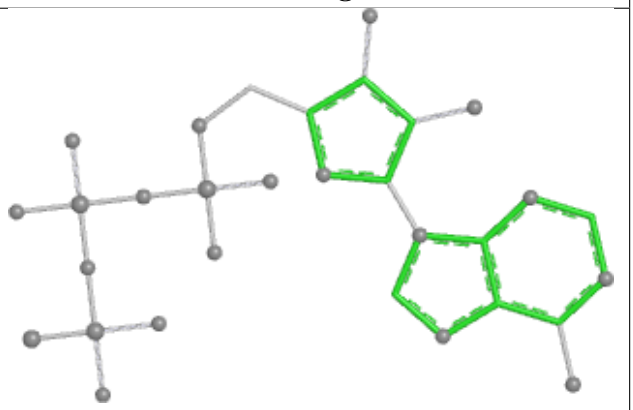
Bond lengths



Bond angles

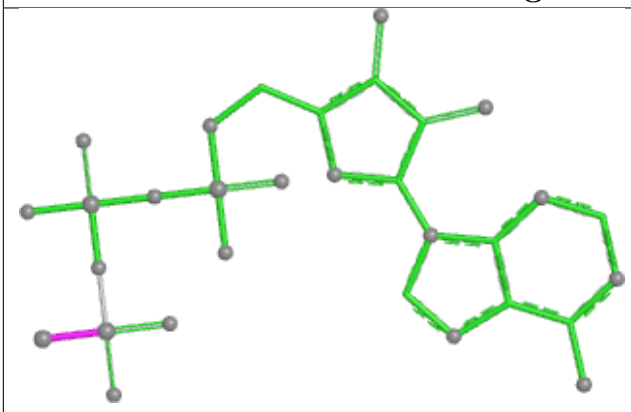


Torsions

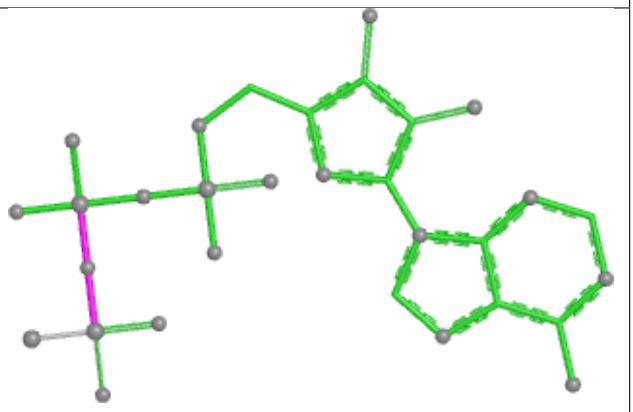


Rings

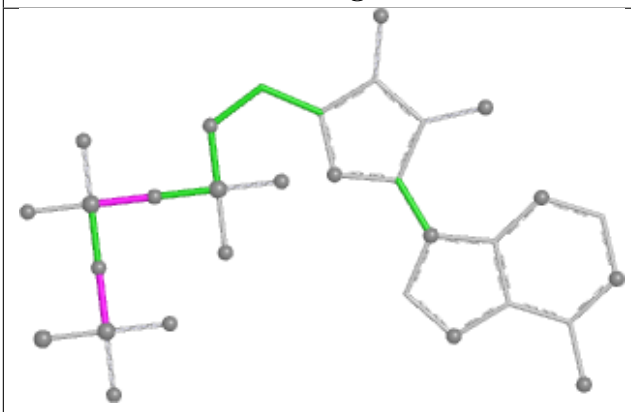
**Ligand AGS B 902**



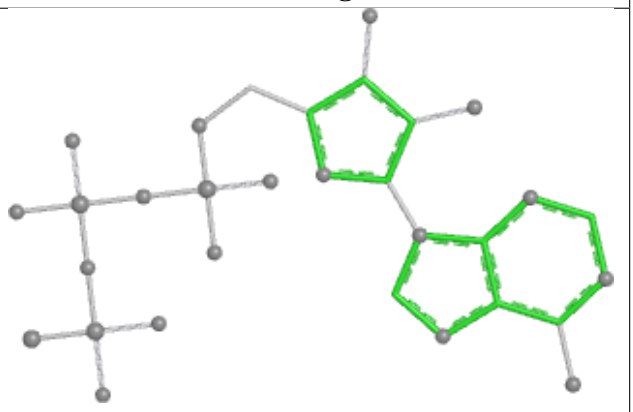
**Bond lengths**



**Bond angles**

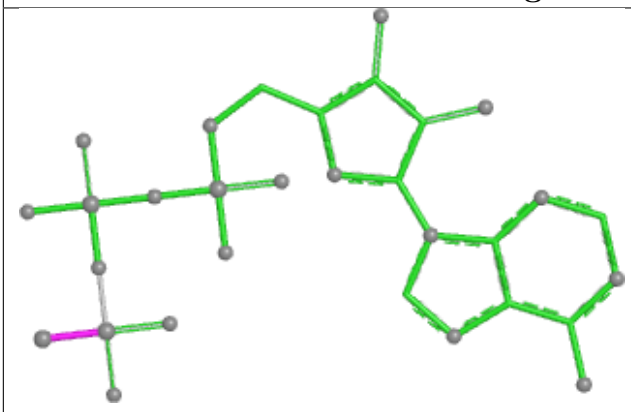


**Torsions**

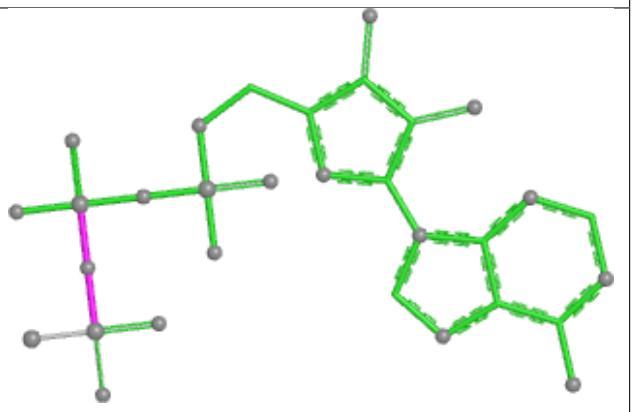


**Rings**

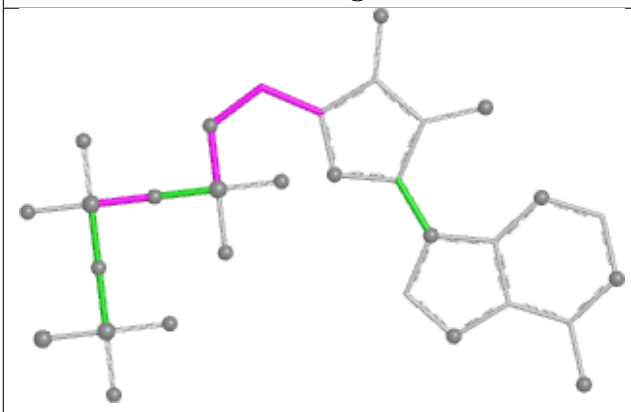
**Ligand AGS C 901**



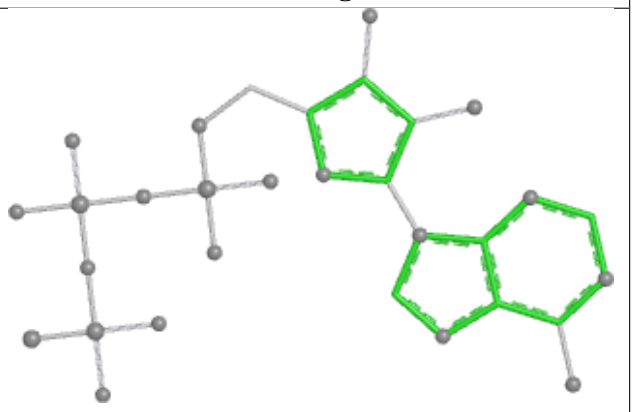
**Bond lengths**



**Bond angles**

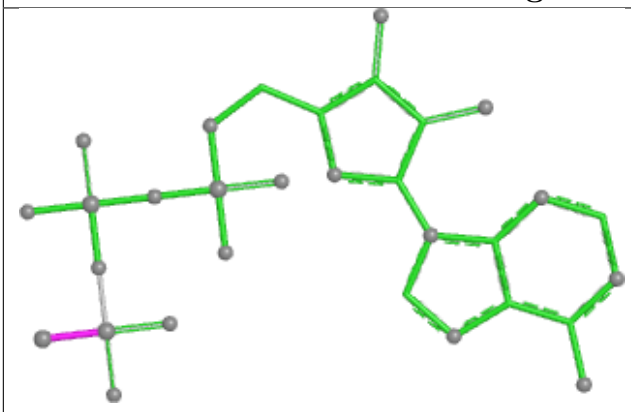


**Torsions**

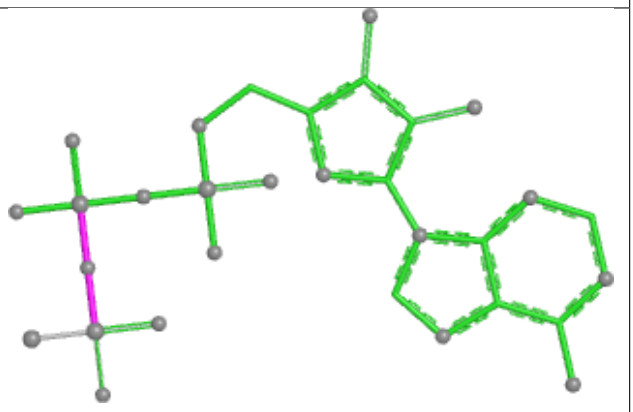


**Rings**

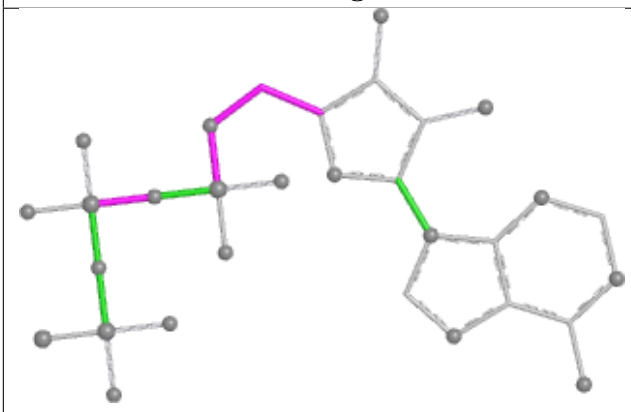
**Ligand AGS F 901**



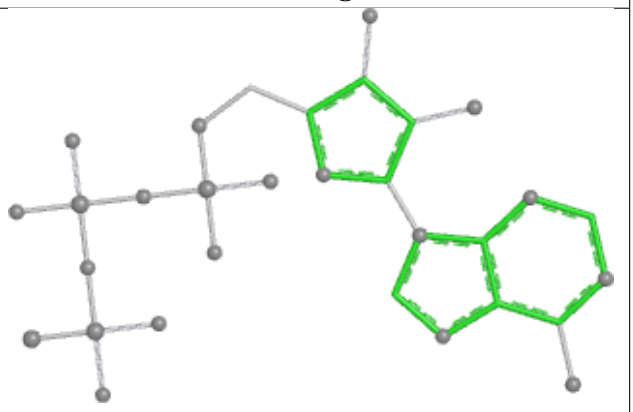
**Bond lengths**



**Bond angles**

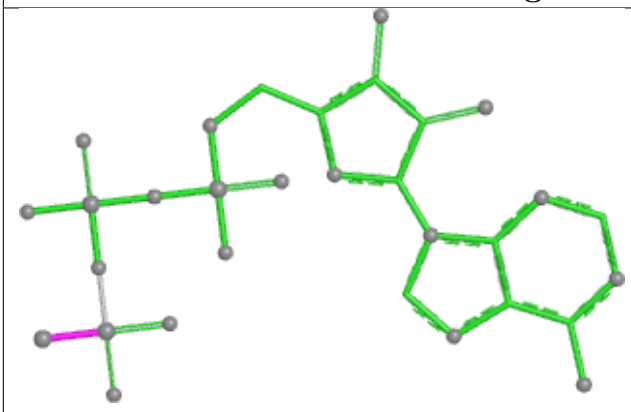


**Torsions**

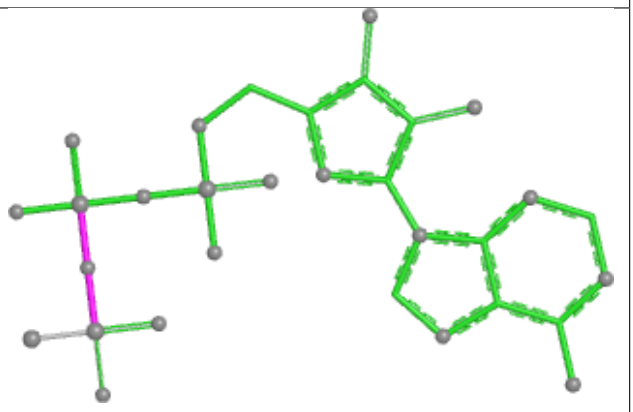


**Rings**

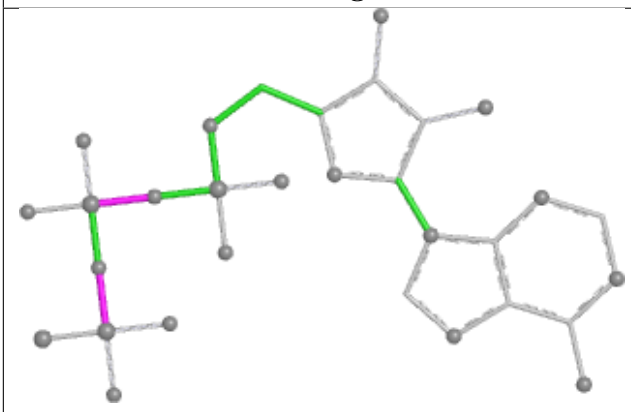
**Ligand AGS C 902**



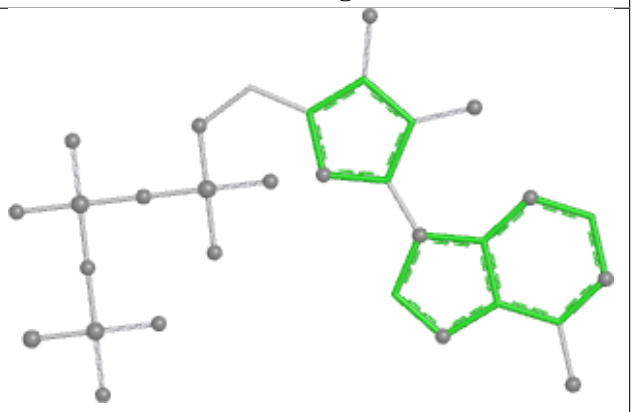
**Bond lengths**



**Bond angles**

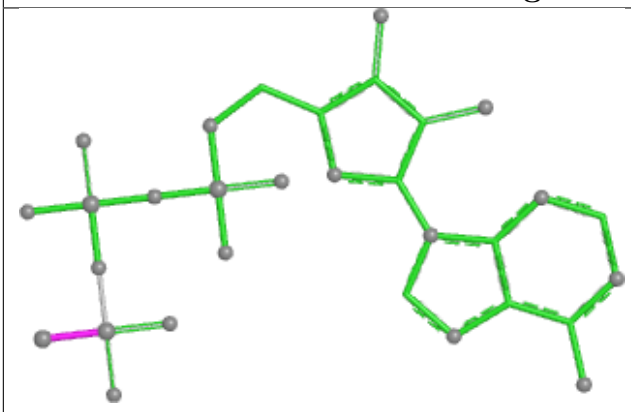


**Torsions**

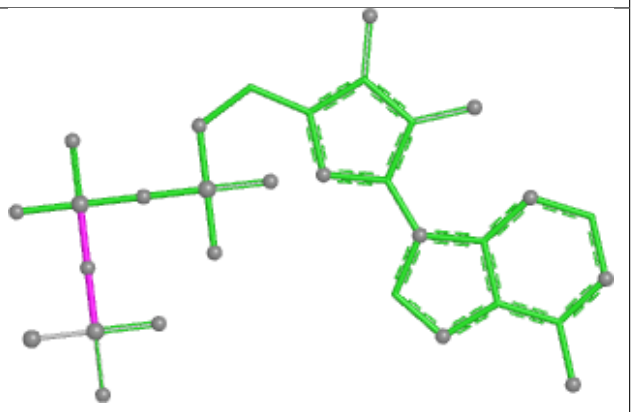


**Rings**

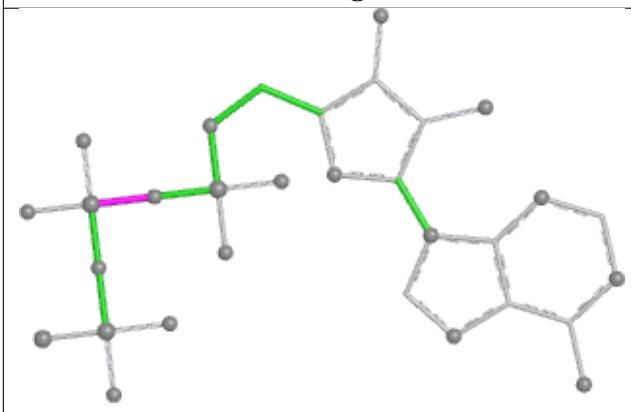
**Ligand AGS A 902**



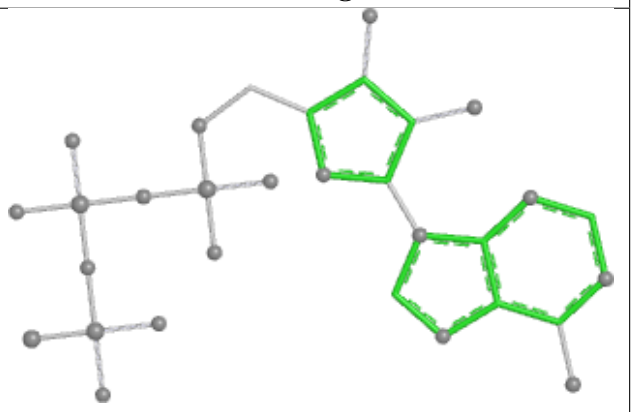
**Bond lengths**



**Bond angles**

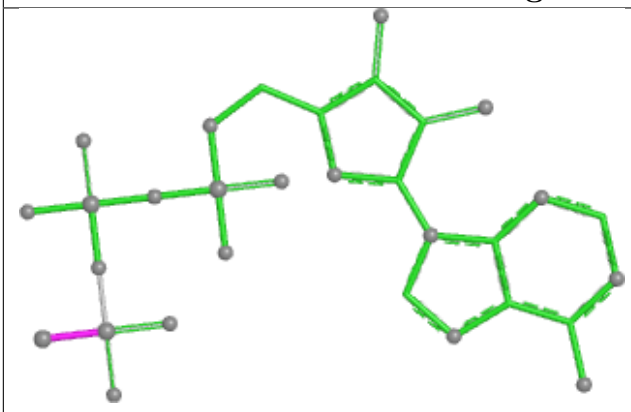


**Torsions**

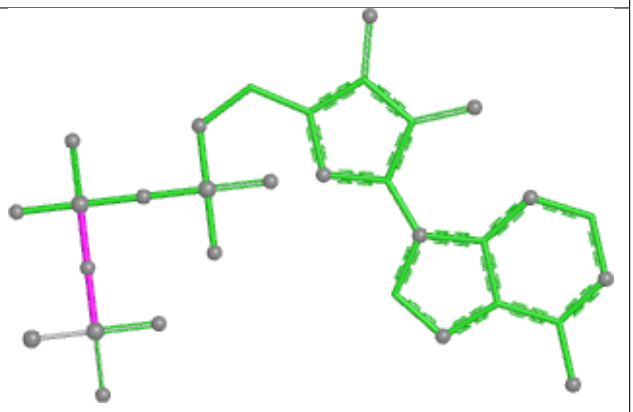


**Rings**

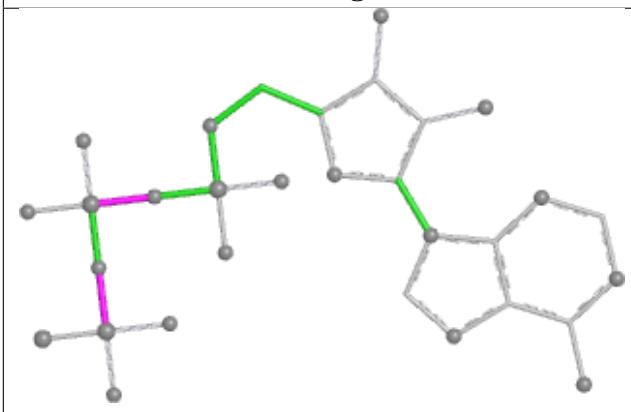
**Ligand AGS E 902**



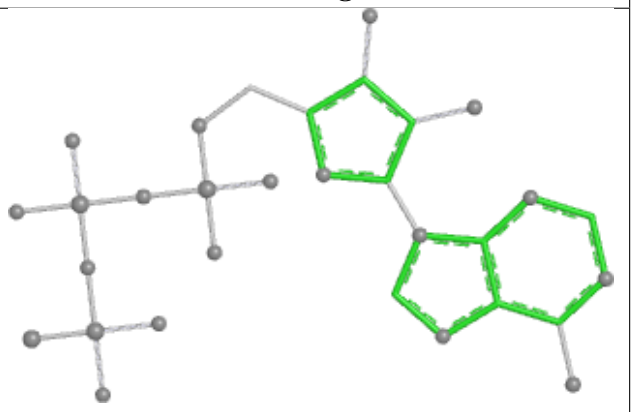
**Bond lengths**



**Bond angles**

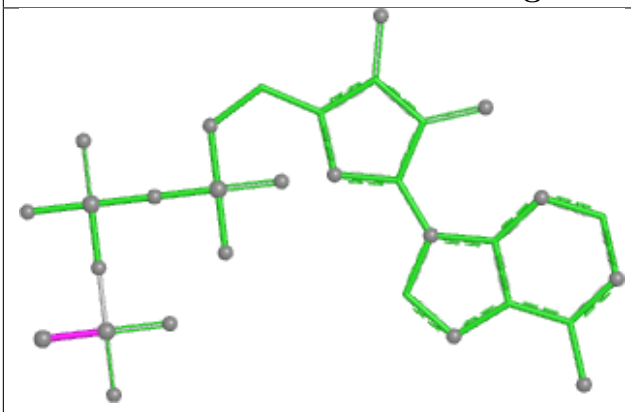


**Torsions**

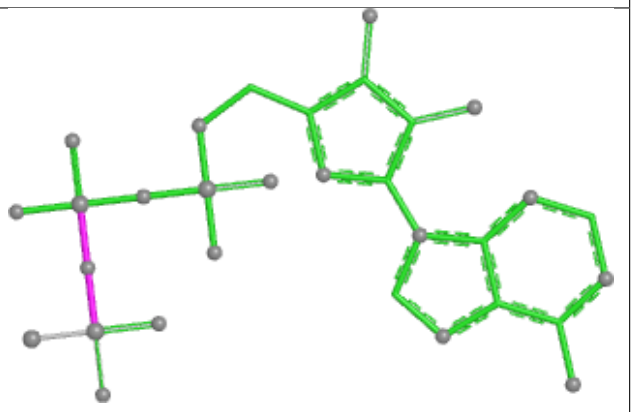


**Rings**

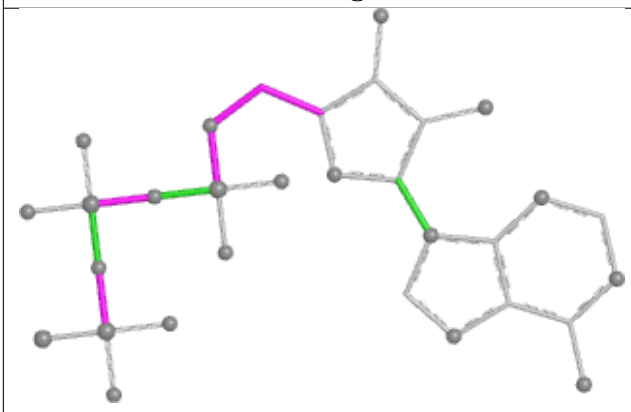
**Ligand AGS A 901**



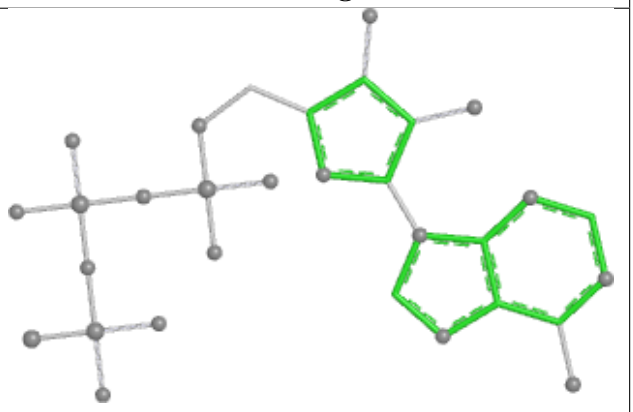
**Bond lengths**



**Bond angles**

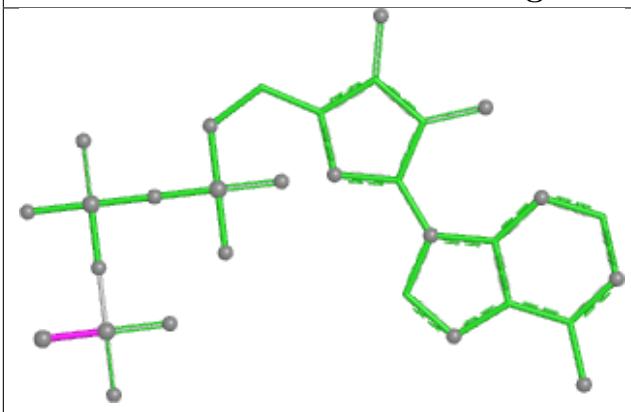


**Torsions**

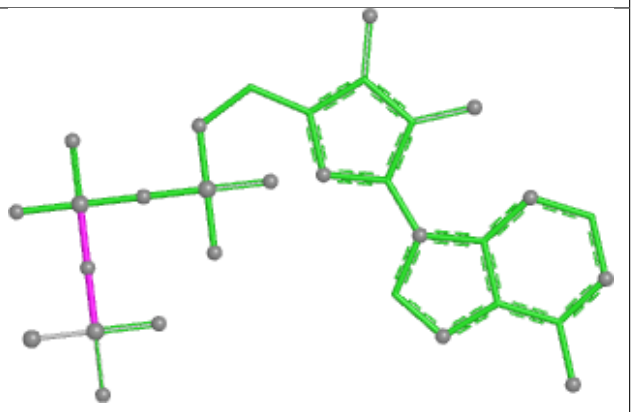


**Rings**

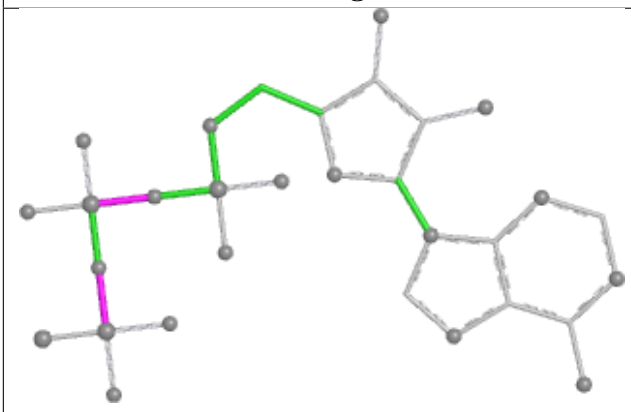
**Ligand AGS F 902**



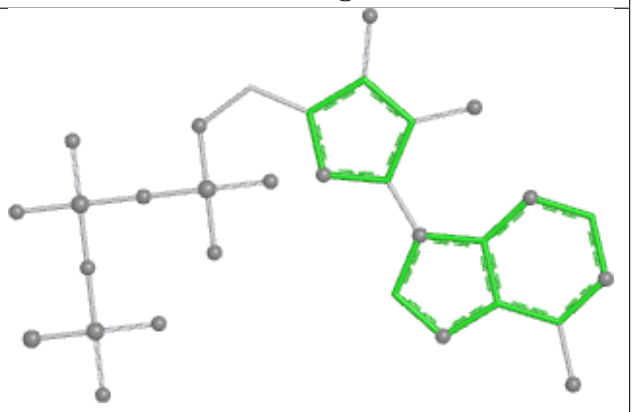
**Bond lengths**



**Bond angles**

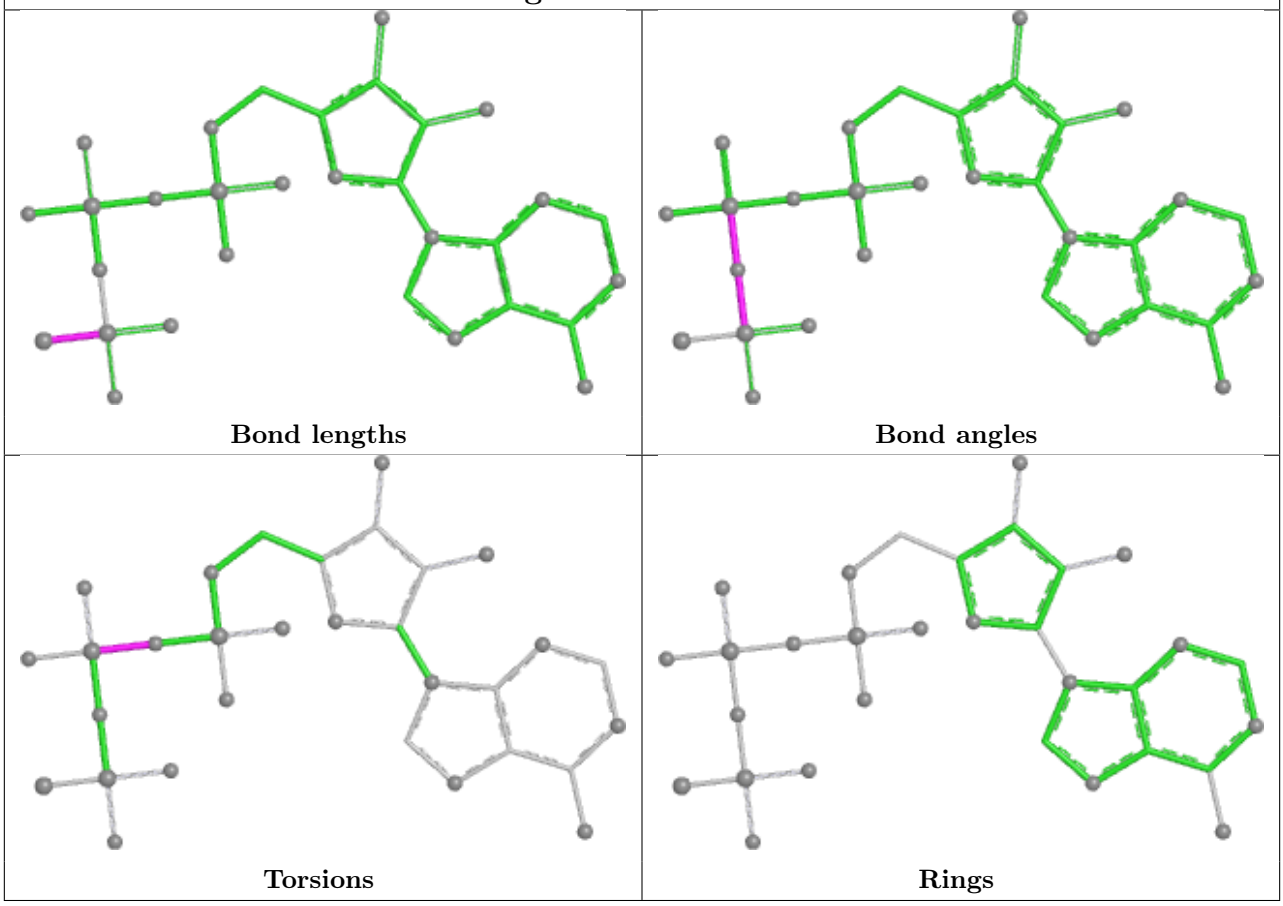


**Torsions**



**Rings**

**Ligand AGS D 902**




## 5.7 Other polymers (i)

There are no such residues in this entry.

## 5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

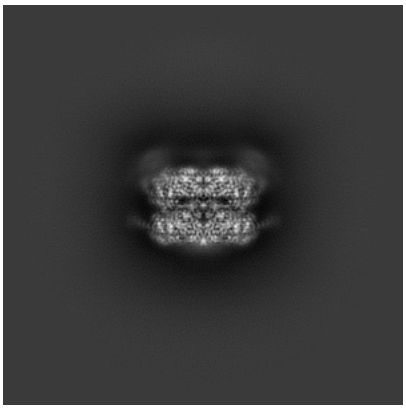
# 6 Map visualisation

This section contains visualisations of the EMDB entry EMD-72387. These allow visual inspection of the internal detail of the map and identification of artifacts.

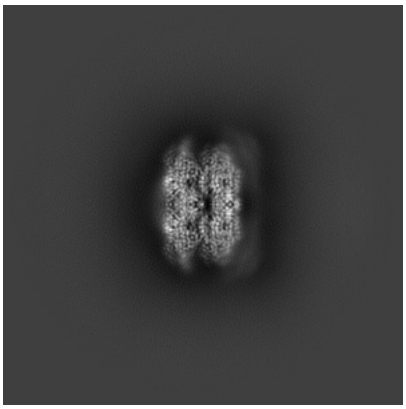
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

## 6.1 Orthogonal projections

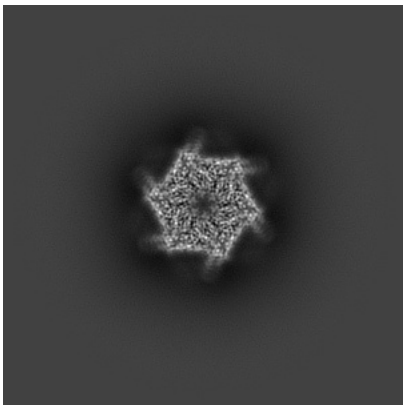
### 6.1.1 Primary map



X

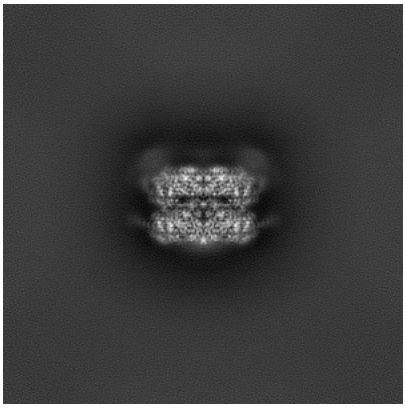


Y

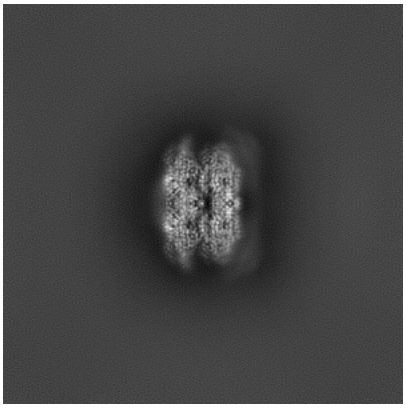


Z

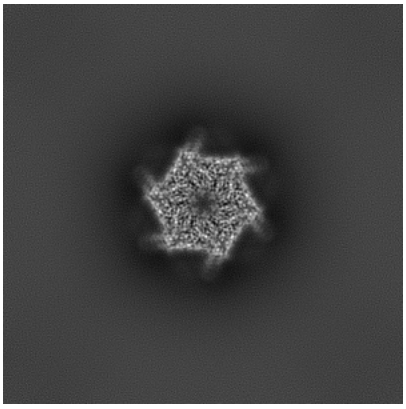
### 6.1.2 Raw map



X



Y

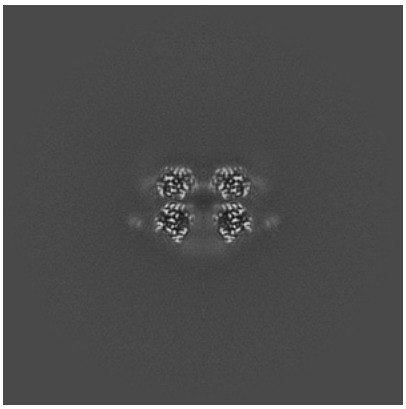


Z

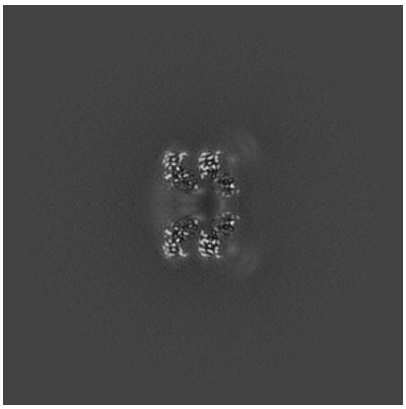
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices (i)

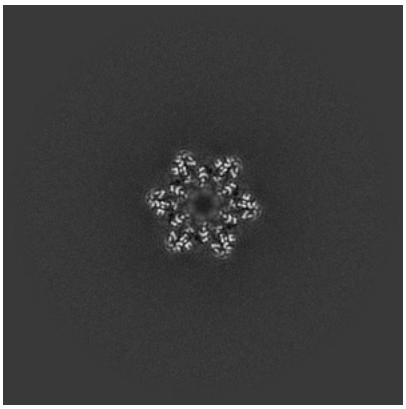
### 6.2.1 Primary map



X Index: 200

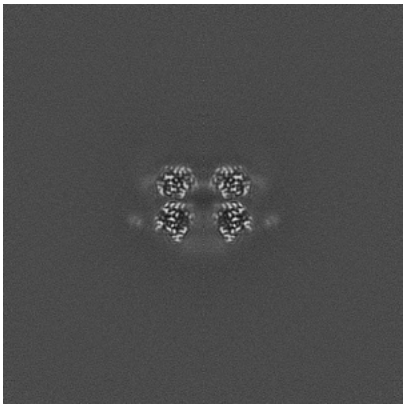


Y Index: 200

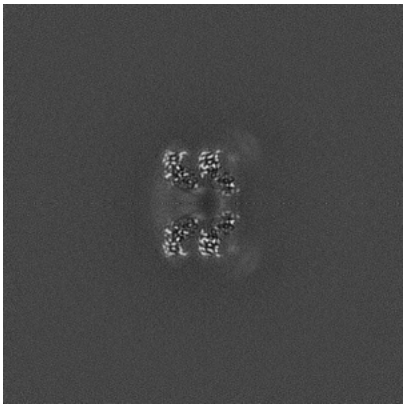


Z Index: 200

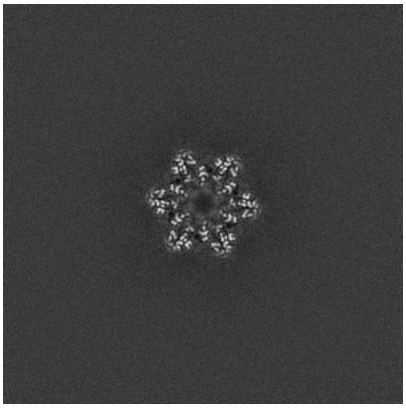
### 6.2.2 Raw map



X Index: 200



Y Index: 200

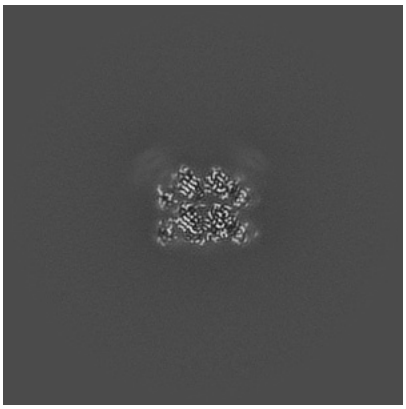


Z Index: 200

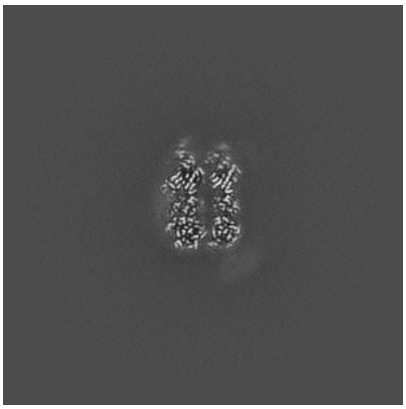
The images above show central slices of the map in three orthogonal directions.

## 6.3 Largest variance slices (i)

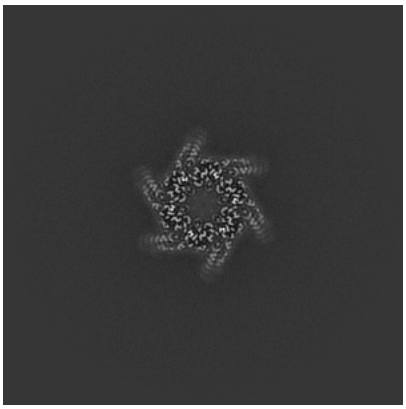
### 6.3.1 Primary map



X Index: 173

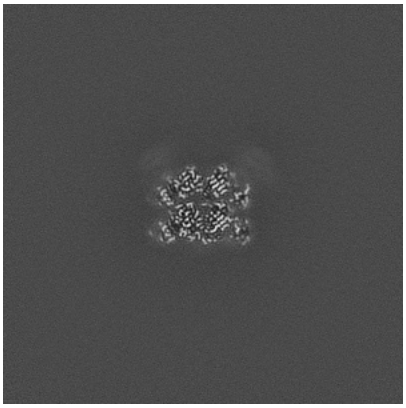


Y Index: 182

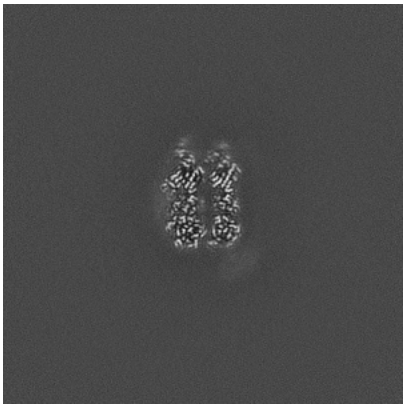


Z Index: 178

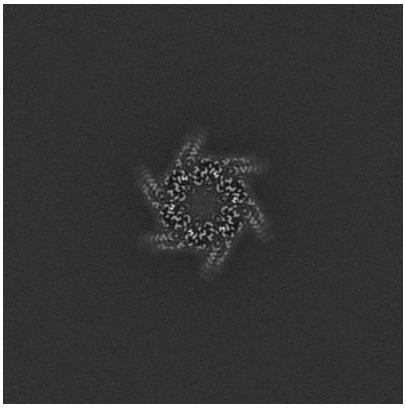
### 6.3.2 Raw map



X Index: 227



Y Index: 182

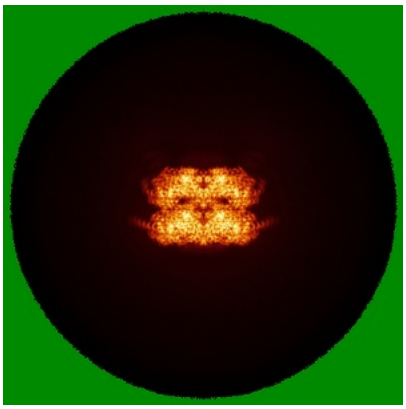


Z Index: 178

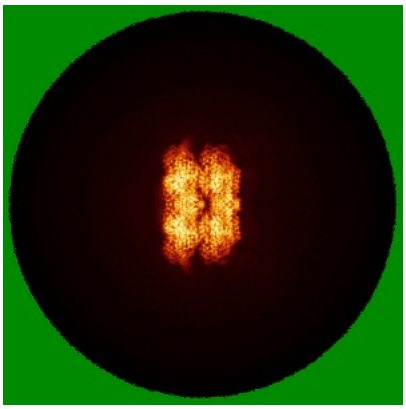
The images above show the largest variance slices of the map in three orthogonal directions.

## 6.4 Orthogonal standard-deviation projections (False-color) (i)

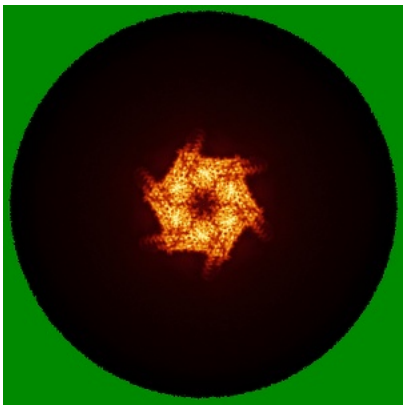
### 6.4.1 Primary map



X

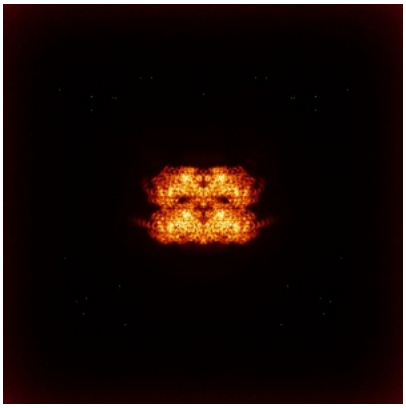


Y

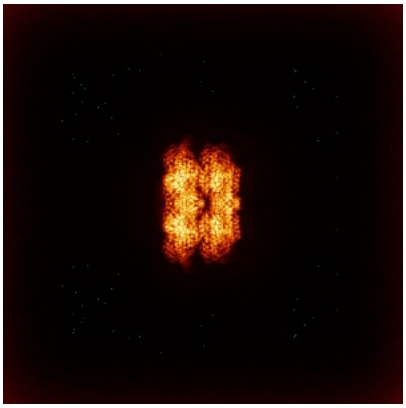


Z

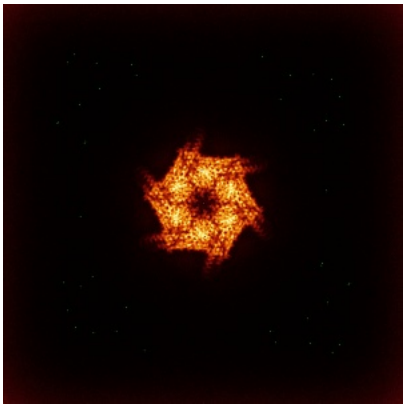
### 6.4.2 Raw map



X



Y

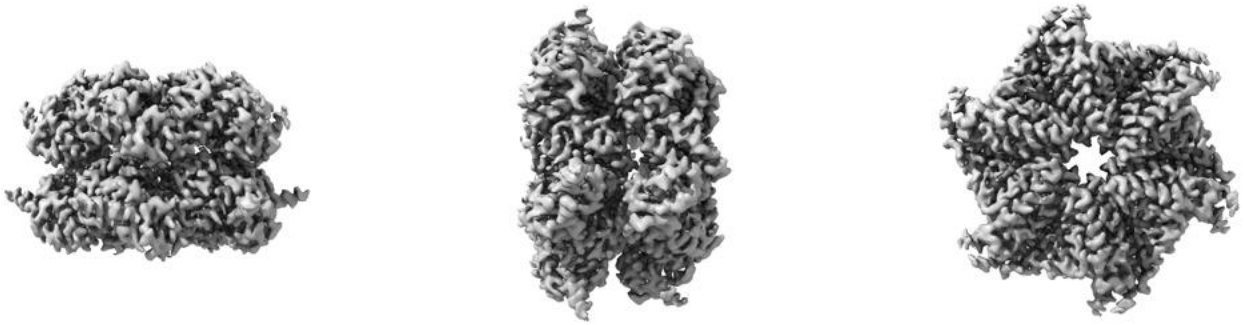


Z

The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

## 6.5 Orthogonal surface views (i)

### 6.5.1 Primary map



X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.15. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

### 6.5.2 Raw map

X Y Z

These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

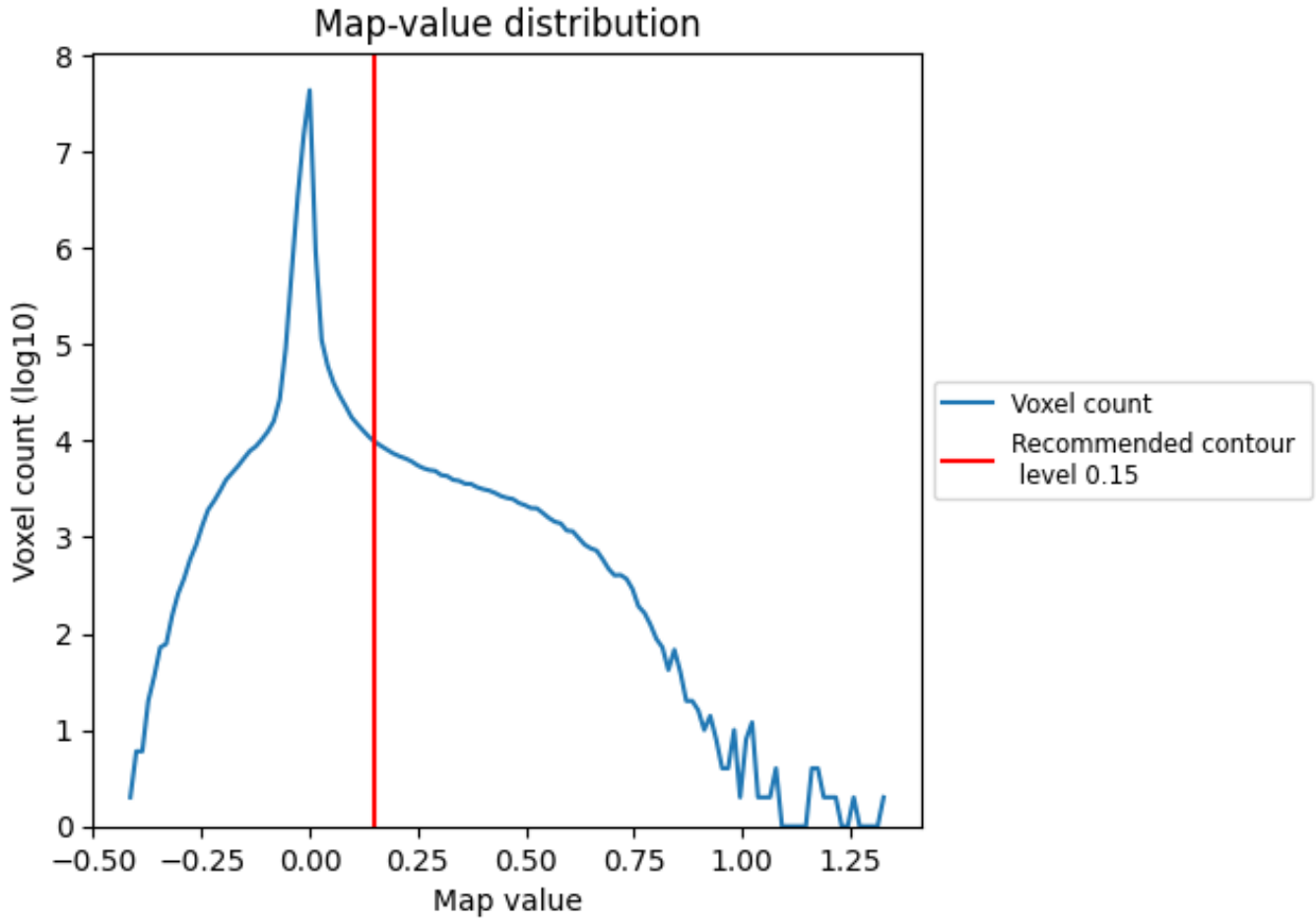
## 6.6 Mask visualisation (i)

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

# 7 Map analysis

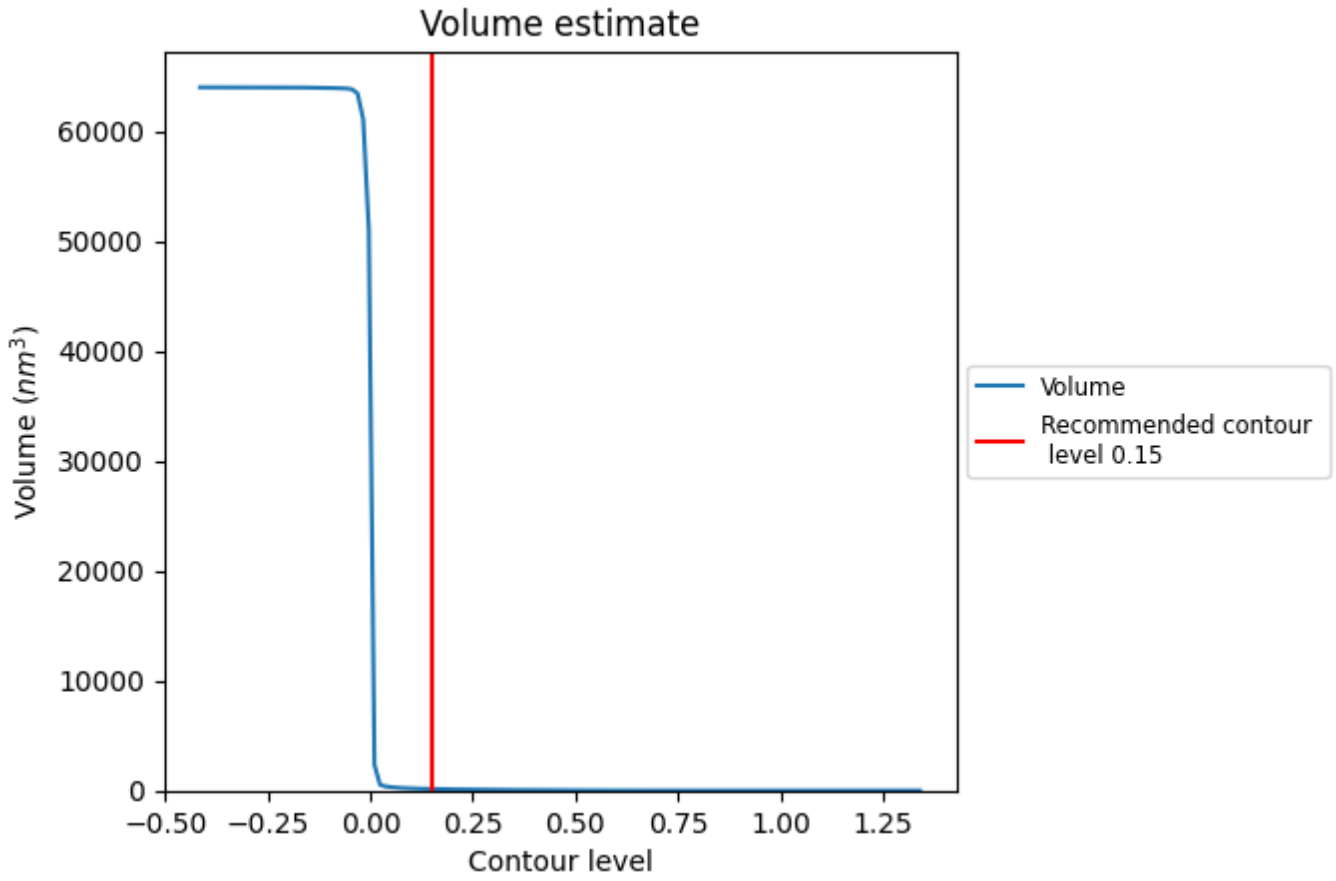
This section contains the results of statistical analysis of the map.

## 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.

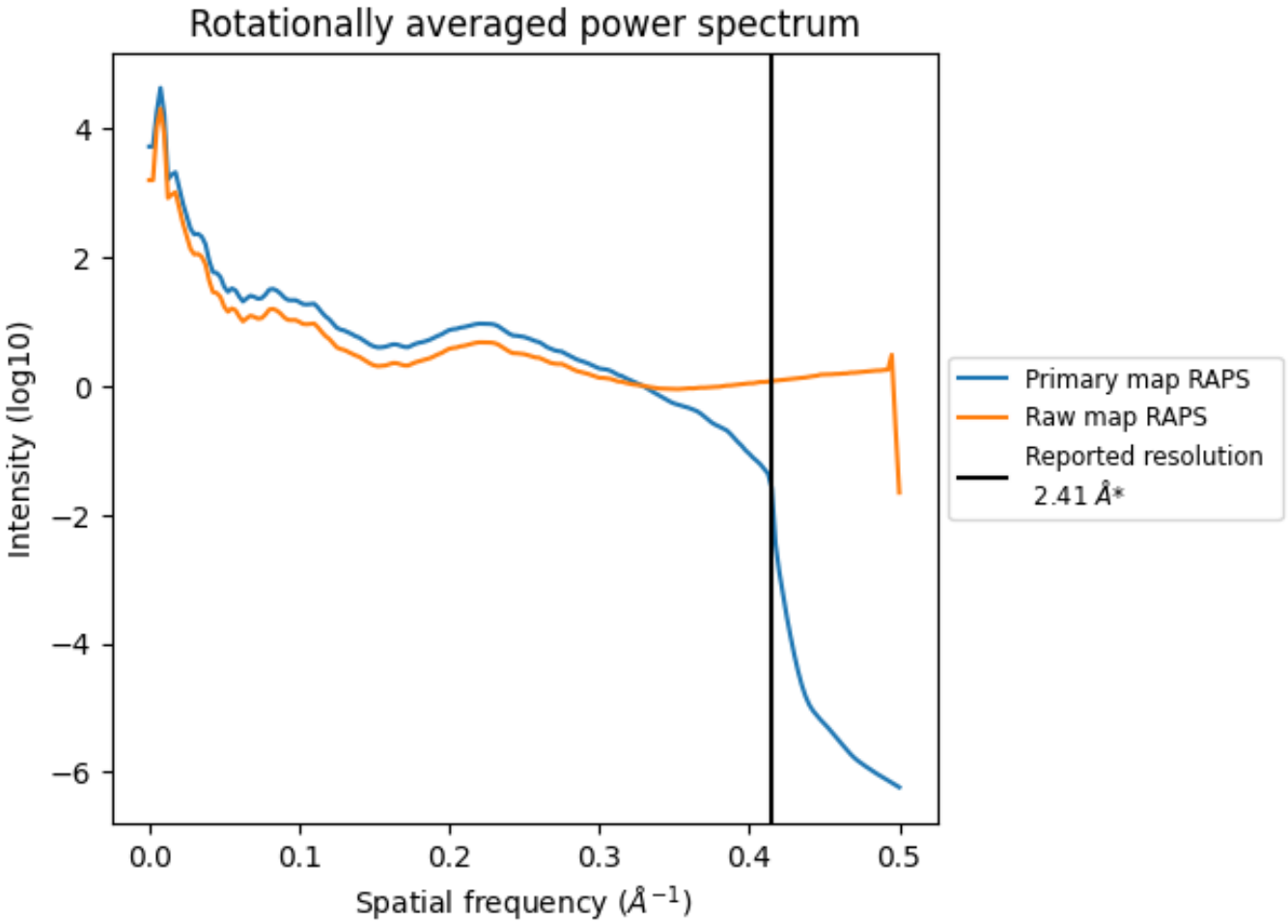
## 7.2 Volume estimate (i)




The volume at the recommended contour level is 143 $nm^3$; this corresponds to an approximate mass of 130 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 (i)

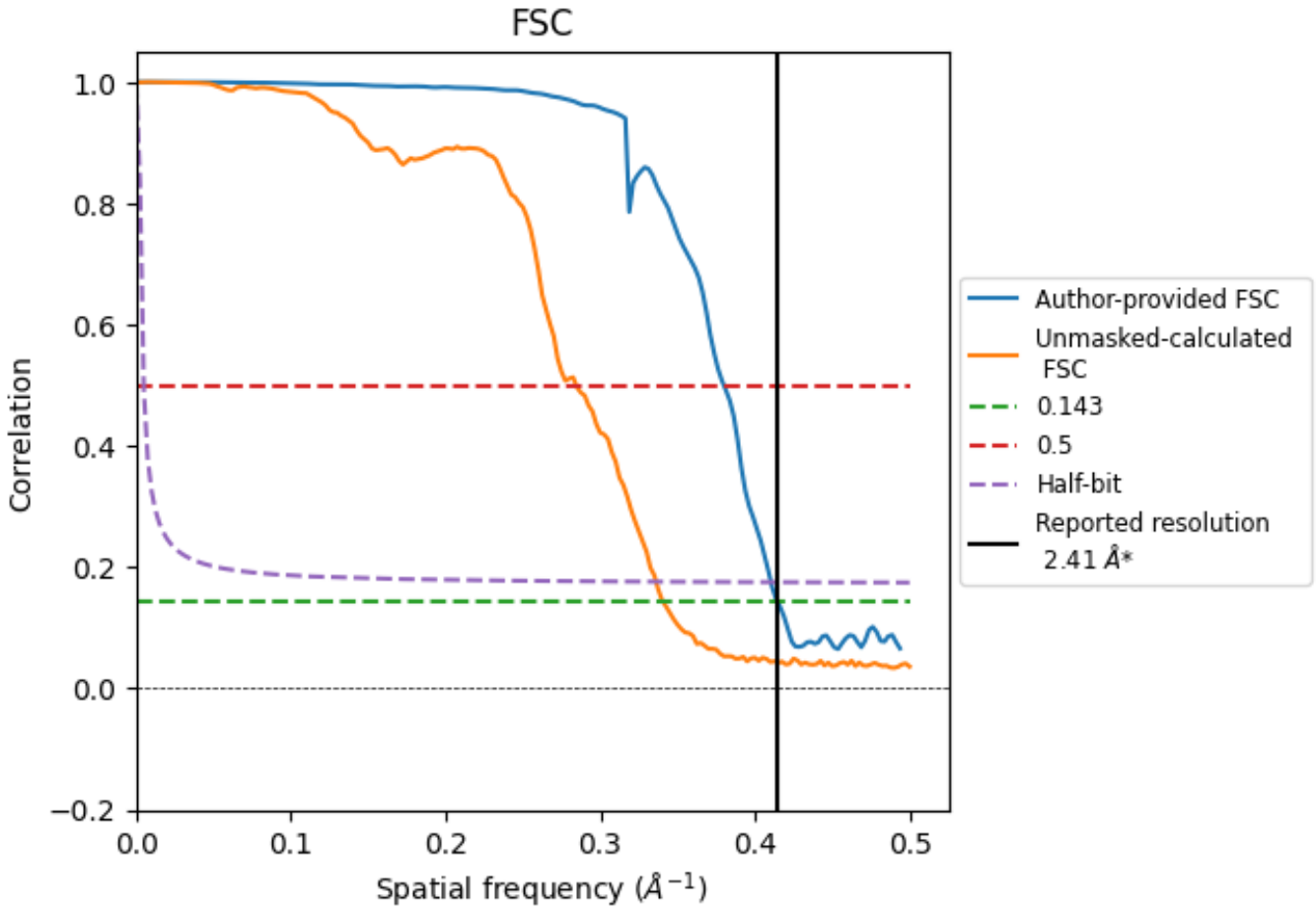



*Reported resolution corresponds to spatial frequency of 0.415 Å$^{-1}$

# 8 Fourier-Shell correlation

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

## 8.1 FSC




*Reported resolution corresponds to spatial frequency of 0.415 Å$^{-1}$

## 8.2 Resolution estimates (i)

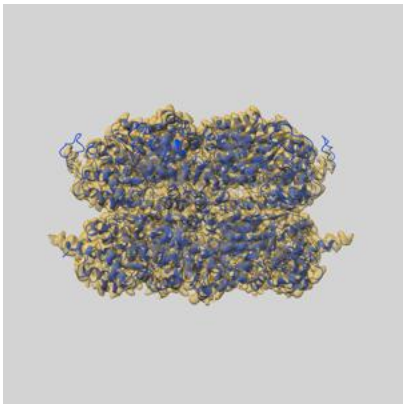
| Resolution estimate (Å) | Estimation criterion (FSC cut-off) | | |
|---|---|---|---|
| | 0.143 | 0.5 | Half-bit |
| Reported by author | 2.41 | - | - |
| Author-provided FSC curve | 2.41 | 2.63 | 2.44 |
| Unmasked-calculated* | 2.94 | 3.51 | 2.98 |

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 2.94 differs from the reported value 2.41 by more than 10 %

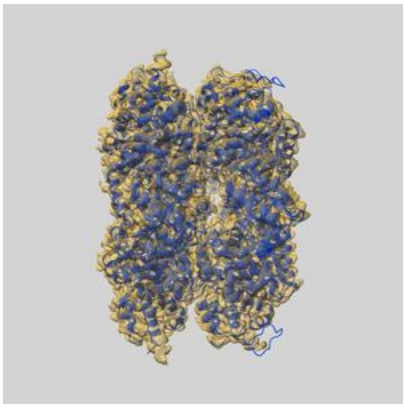
# 9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-72387 and PDB model 9Y07. Per-residue inclusion information can be found in section 3 on page 9.

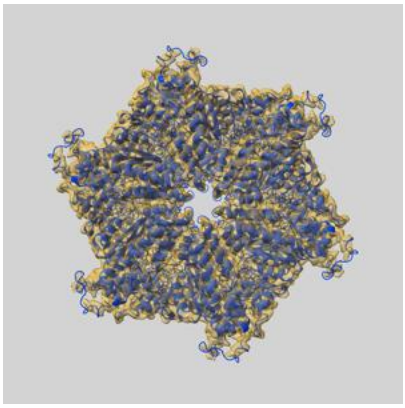
## 9.1 Map-model overlay



X



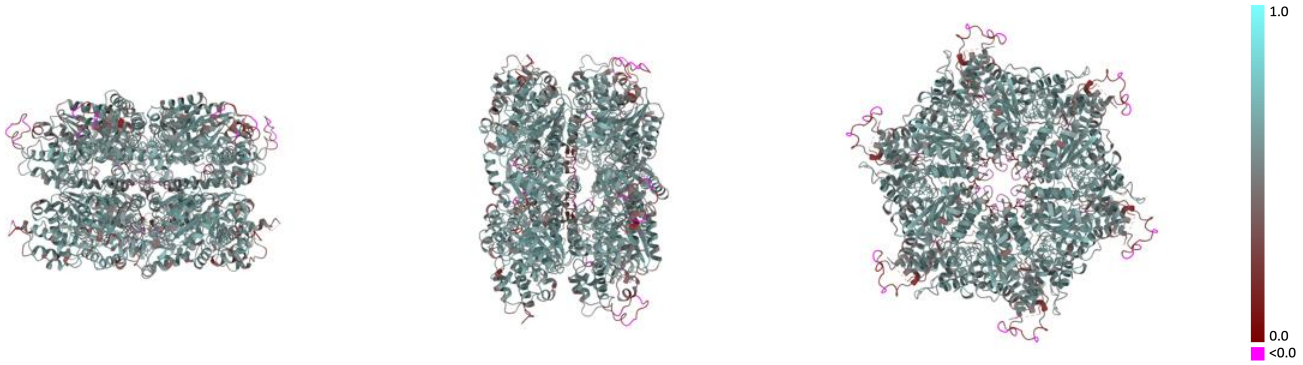
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.15 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.

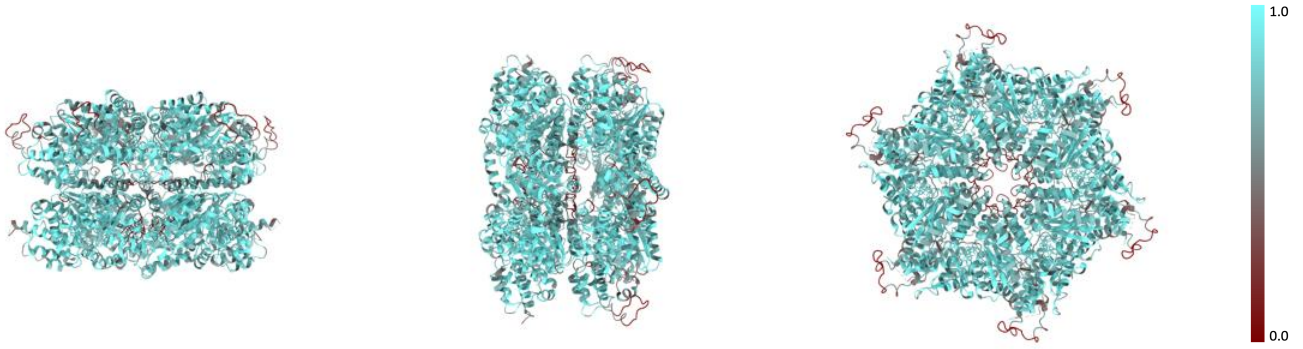
## 9.2 Q-score mapped to coordinate model (i)




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.

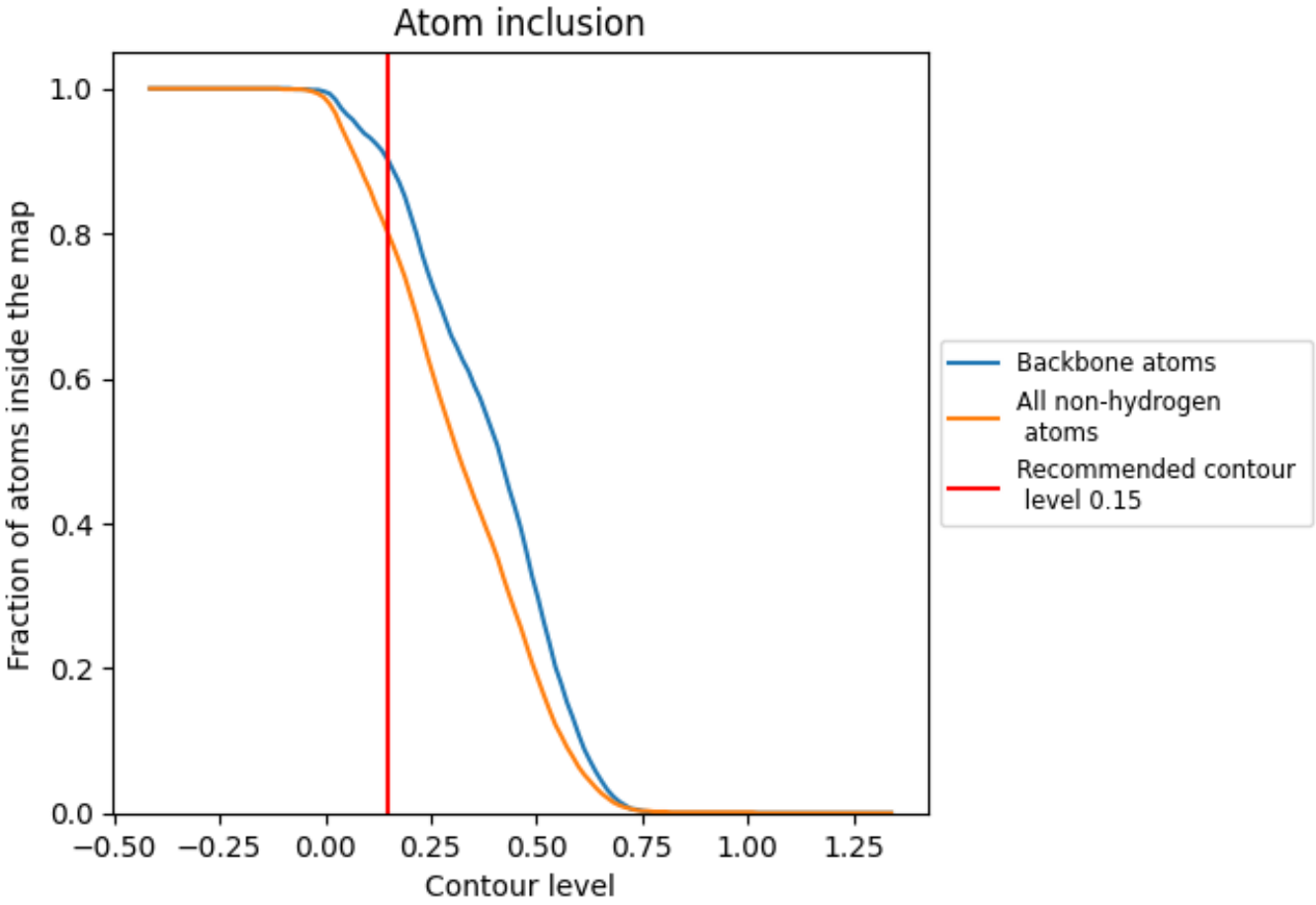
## 9.3 Atom inclusion mapped to coordinate model (i)




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 (0.15).

## 9.4 Atom inclusion (i)




At the recommended contour level, 90% of all backbone atoms, 80% of all non-hydrogen atoms, are inside the map.

## 9.5 Map-model fit summary

The table lists the average atom inclusion at the recommended contour level (0.15) and Q-score for the entire model and for each chain.

| Chain | Atom inclusion | Q-score |
|---|---|---|
| All | 0.7990 | 0.5300 |
| A | 0.8000 | 0.5330 |
| B | 0.7980 | 0.5300 |
| C | 0.8000 | 0.5290 |
| D | 0.8000 | 0.5310 |
| E | 0.7990 | 0.5300 |
| F | 0.7980 | 0.5310 |