



wwPDB EM Validation Summary Report ⓘ

Oct 28, 2024 – 10:56 am GMT

PDB ID : 5A0Q
EMDB ID : EMD-2981
Title : Cryo-EM reveals the conformation of a substrate analogue in the human 20S proteasome core
Authors : daFonseca, P.C.A.; Morris, E.P.
Deposited on : 2015-04-22
Resolution : 3.50 Å(reported)
Based on initial model : 3UNE

This is a wwPDB EM Validation Summary 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:

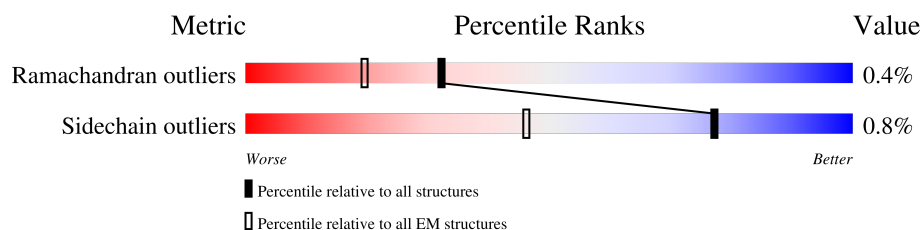
EMDB validation analysis : 0.0.1.dev113
Mogul : 1.8.4, CSD as541be (2020)
MolProbity : 4.02b-467
buster-report : 1.1.7 (2018)
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.39

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 3.50 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) |
|-----------------------|-----------------------------|-----------------------------|
| Ramachandran outliers | 207382 | 16835 |
| Sidechain outliers | 206894 | 16415 |

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 $\leq 5\%$. 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 | 246 | <div> <div>11%</div> <div>78%</div> <div>21%</div> </div> |
| 1 | O | 246 | <div> <div>11%</div> <div>78%</div> <div>21%</div> </div> |
| 2 | B | 234 | <div> <div>12%</div> <div>86%</div> <div>5%</div> <div>9%</div> </div> |
| 2 | P | 234 | <div> <div>12%</div> <div>86%</div> <div>5%</div> <div>9%</div> </div> |
| 3 | C | 261 | <div> <div>12%</div> <div>87%</div> <div>9%</div> </div> |
| 3 | Q | 261 | <div> <div>12%</div> <div>87%</div> <div>9%</div> </div> |
| 4 | D | 248 | <div> <div>16%</div> <div>85%</div> <div>14%</div> </div> |
| 4 | R | 248 | <div> <div>16%</div> <div>85%</div> <div>14%</div> </div> |
| 5 | E | 241 | <div> <div>14%</div> <div>86%</div> <div>11%</div> </div> |

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| Mol | Chain | Length | Quality of chain |
|-----|-------|--------|------------------|
| 5 | S | 241 | |
| 6 | F | 263 | |
| 6 | T | 263 | |
| 7 | G | 255 | |
| 7 | U | 255 | |
| 8 | H | 205 | |
| 8 | V | 205 | |
| 9 | I | 234 | |
| 9 | W | 234 | |
| 10 | J | 204 | |
| 10 | X | 204 | |
| 11 | K | 201 | |
| 11 | Y | 201 | |
| 12 | L | 204 | |
| 12 | Z | 204 | |
| 13 | M | 213 | |
| 13 | a | 213 | |
| 14 | N | 219 | |
| 14 | b | 219 | |

2 Entry composition

There are 15 unique types of molecules in this entry. The entry contains 43448 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 PROTEASOME SUBUNIT ALPHA TYPE-6.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|----|---------|-------|
| 1 | A | 195 | Total | C | N | O | S | 0 | 0 |
| | | | 1514 | 963 | 254 | 284 | 13 | | |
| 1 | O | 195 | Total | C | N | O | S | 0 | 0 |
| | | | 1514 | 963 | 254 | 284 | 13 | | |

- Molecule 2 is a protein called PROTEASOME SUBUNIT ALPHA TYPE-2.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 2 | B | 214 | Total | C | N | O | S | 0 | 0 |
| | | | 1671 | 1072 | 285 | 309 | 5 | | |
| 2 | P | 214 | Total | C | N | O | S | 0 | 0 |
| | | | 1671 | 1072 | 285 | 309 | 5 | | |

- Molecule 3 is a protein called PROTEASOME SUBUNIT ALPHA TYPE-4.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 3 | C | 237 | Total | C | N | O | S | 0 | 0 |
| | | | 1860 | 1175 | 321 | 354 | 10 | | |
| 3 | Q | 237 | Total | C | N | O | S | 0 | 0 |
| | | | 1860 | 1175 | 321 | 354 | 10 | | |

- Molecule 4 is a protein called PROTEASOME SUBUNIT ALPHA TYPE-7.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 4 | D | 214 | Total | C | N | O | S | 0 | 0 |
| | | | 1674 | 1056 | 300 | 313 | 5 | | |
| 4 | R | 214 | Total | C | N | O | S | 0 | 0 |
| | | | 1674 | 1056 | 300 | 313 | 5 | | |

- Molecule 5 is a protein called PROTEASOME SUBUNIT ALPHA TYPE-5.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 5 | E | 215 | Total | C | N | O | S | 0 | 0 |
| | | | 1643 | 1036 | 272 | 325 | 10 | | |
| 5 | S | 215 | Total | C | N | O | S | 0 | 0 |
| | | | 1643 | 1036 | 272 | 325 | 10 | | |

- Molecule 6 is a protein called PROTEASOME SUBUNIT ALPHA TYPE-1.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|----|---------|-------|
| 6 | F | 195 | Total | C | N | O | S | 0 | 0 |
| | | | 1535 | 969 | 278 | 278 | 10 | | |
| 6 | T | 195 | Total | C | N | O | S | 0 | 0 |
| | | | 1535 | 969 | 278 | 278 | 10 | | |

- Molecule 7 is a protein called PROTEASOME SUBUNIT ALPHA TYPE-3.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 7 | G | 209 | Total | C | N | O | S | 0 | 0 |
| | | | 1626 | 1032 | 279 | 304 | 11 | | |
| 7 | U | 209 | Total | C | N | O | S | 0 | 0 |
| | | | 1626 | 1032 | 279 | 304 | 11 | | |

- Molecule 8 is a protein called PROTEASOME SUBUNIT BETA TYPE-6.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|----|---------|-------|
| 8 | H | 183 | Total | C | N | O | S | 0 | 0 |
| | | | 1372 | 858 | 236 | 266 | 12 | | |
| 8 | V | 183 | Total | C | N | O | S | 0 | 0 |
| | | | 1372 | 858 | 236 | 266 | 12 | | |

- Molecule 9 is a protein called PROTEASOME SUBUNIT BETA TYPE-7.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|----|---------|-------|
| 9 | I | 198 | Total | C | N | O | S | 0 | 0 |
| | | | 1490 | 939 | 251 | 288 | 12 | | |
| 9 | W | 198 | Total | C | N | O | S | 0 | 0 |
| | | | 1490 | 939 | 251 | 288 | 12 | | |

- Molecule 10 is a protein called PROTEASOME SUBUNIT BETA TYPE-3.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|----|---------|-------|
| 10 | J | 176 | Total | C | N | O | S | 0 | 0 |
| | | | 1374 | 882 | 227 | 251 | 14 | | |

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| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|----|---------|-------|
| 10 | X | 176 | Total | C | N | O | S | 0 | 0 |
| | | | 1374 | 882 | 227 | 251 | 14 | | |

- Molecule 11 is a protein called PROTEASOME SUBUNIT BETA TYPE-2.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 11 | K | 189 | Total | C | N | O | S | 0 | 0 |
| | | | 1512 | 970 | 259 | 275 | 8 | | |
| 11 | Y | 189 | Total | C | N | O | S | 0 | 0 |
| | | | 1512 | 970 | 259 | 275 | 8 | | |

- Molecule 12 is a protein called PROTEASOME SUBUNIT BETA TYPE-5.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 12 | L | 192 | Total | C | N | O | S | 0 | 0 |
| | | | 1480 | 933 | 258 | 280 | 9 | | |
| 12 | Z | 192 | Total | C | N | O | S | 0 | 0 |
| | | | 1480 | 933 | 258 | 280 | 9 | | |

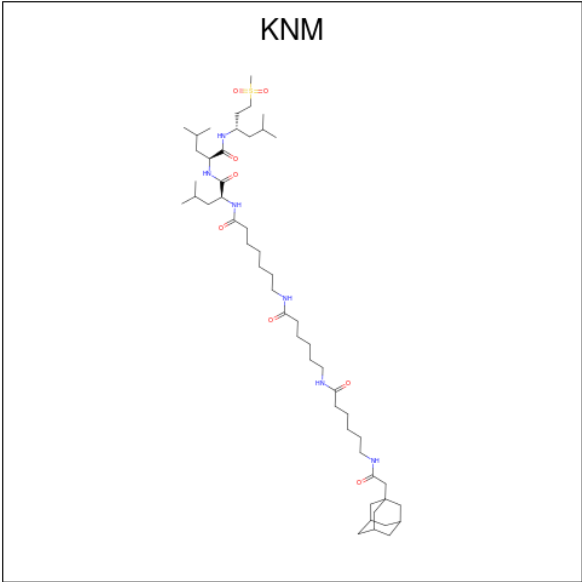
- Molecule 13 is a protein called PROTEASOME SUBUNIT BETA TYPE-1.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 13 | M | 190 | Total | C | N | O | S | 0 | 0 |
| | | | 1453 | 919 | 250 | 275 | 9 | | |
| 13 | a | 190 | Total | C | N | O | S | 0 | 0 |
| | | | 1453 | 919 | 250 | 275 | 9 | | |

- Molecule 14 is a protein called PROTEASOME SUBUNIT BETA TYPE-4.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|----|---------|-------|
| 14 | N | 184 | Total | C | N | O | S | 0 | 0 |
| | | | 1428 | 905 | 245 | 267 | 11 | | |
| 14 | b | 184 | Total | C | N | O | S | 0 | 0 |
| | | | 1428 | 905 | 245 | 267 | 11 | | |

- Molecule 15 is ADA-(AHX)3-(LEU)3-VINYL SULFONE (three-letter code: KNM) (formula: C₅₁H₉₂N₆O₈S).

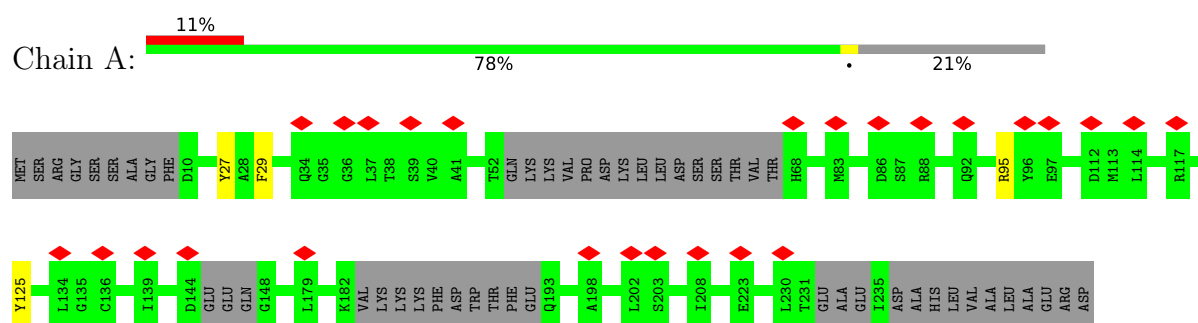


| Mol | Chain | Residues | Atoms | | | | | AltConf |
|-----|-------|----------|-------|----|---|---|---|---------|
| 15 | H | 1 | Total | C | N | O | S | 0 |
| | | | 31 | 22 | 3 | 5 | 1 | |
| 15 | I | 1 | Total | C | N | O | S | 0 |
| | | | 30 | 22 | 3 | 4 | 1 | |
| 15 | L | 1 | Total | C | N | O | S | 0 |
| | | | 31 | 22 | 3 | 5 | 1 | |
| 15 | V | 1 | Total | C | N | O | S | 0 |
| | | | 31 | 22 | 3 | 5 | 1 | |
| 15 | W | 1 | Total | C | N | O | S | 0 |
| | | | 30 | 22 | 3 | 4 | 1 | |
| 15 | Z | 1 | Total | C | N | O | S | 0 |
| | | | 31 | 22 | 3 | 5 | 1 | |

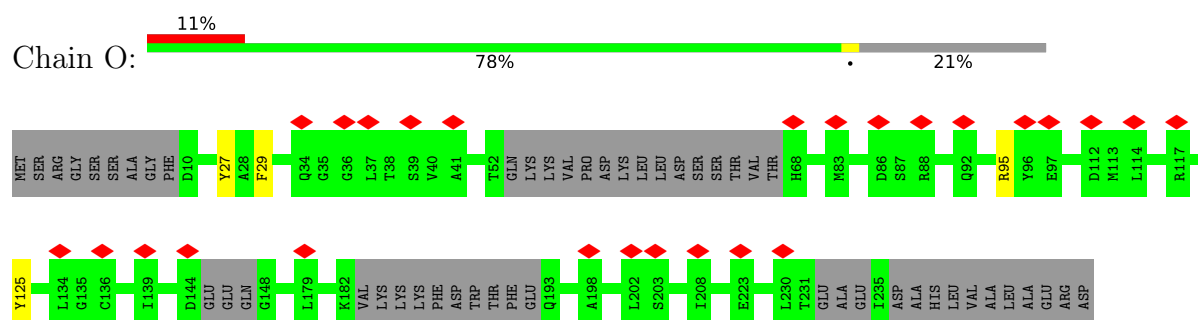
3 Residue-property plots [i](#)

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.

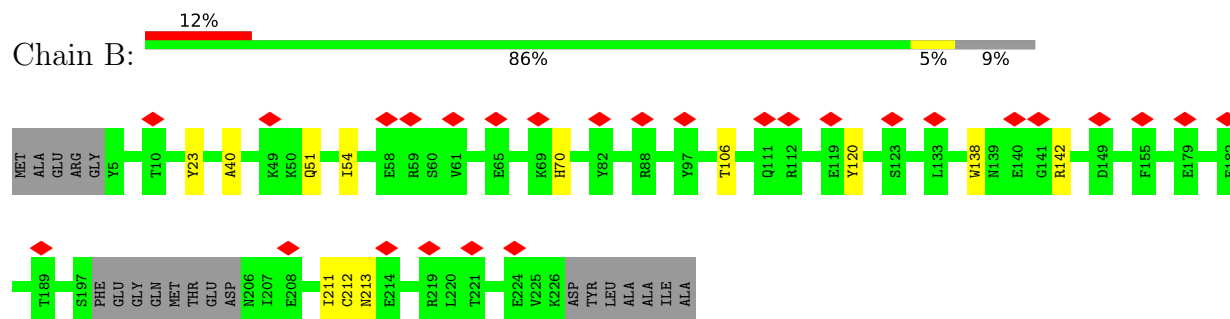
- Molecule 1: PROTEASOME SUBUNIT ALPHA TYPE-6



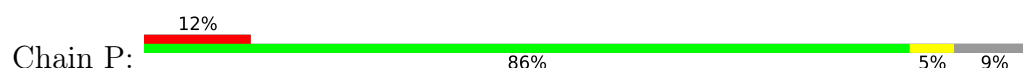
- Molecule 1: PROTEASOME SUBUNIT ALPHA TYPE-6

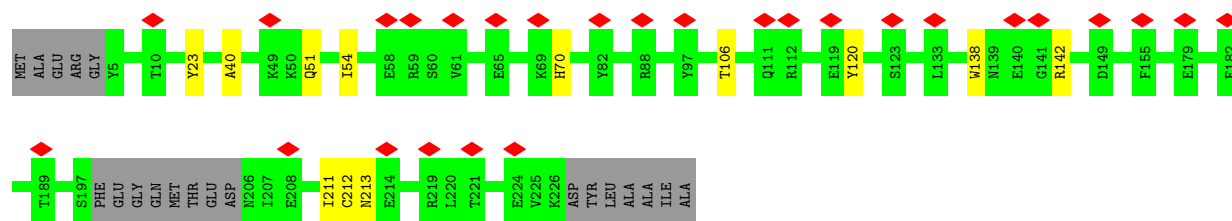


- Molecule 2: PROTEASOME SUBUNIT ALPHA TYPE-2

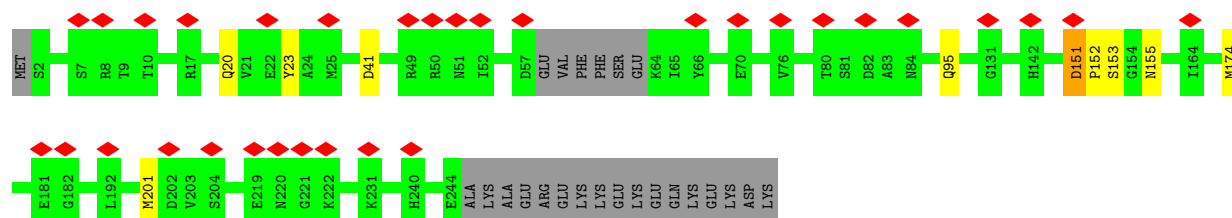
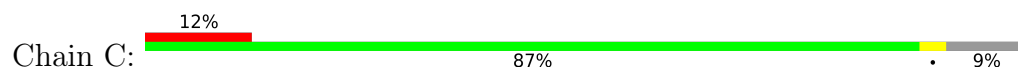


- Molecule 2: PROTEASOME SUBUNIT ALPHA TYPE-2

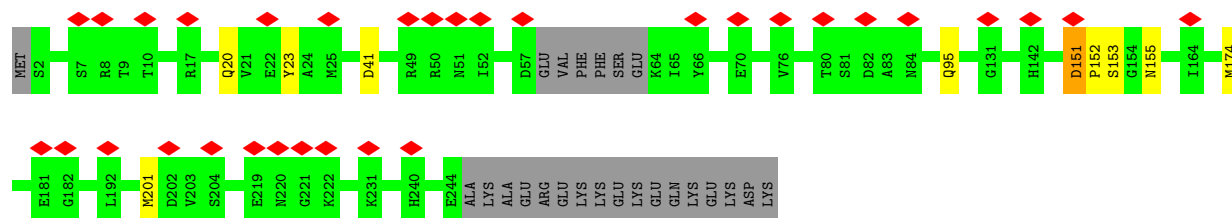
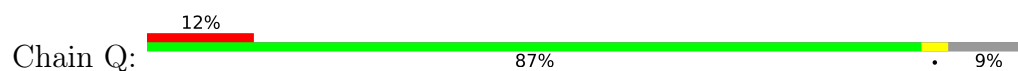




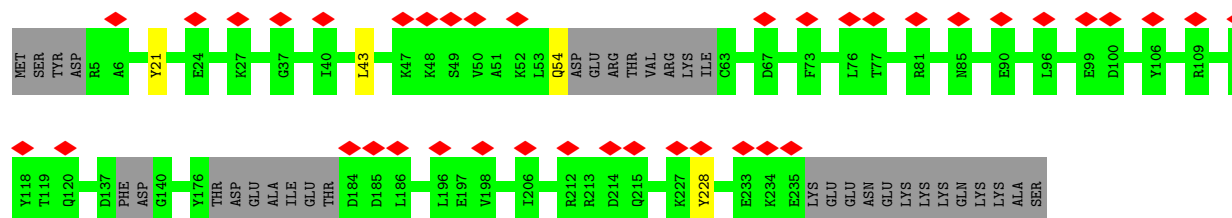
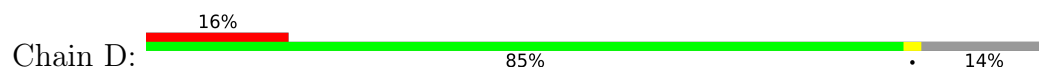
• Molecule 3: PROTEASOME SUBUNIT ALPHA TYPE-4



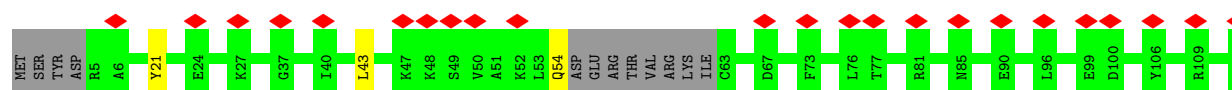
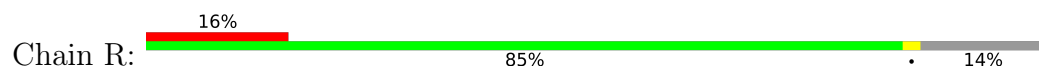
• Molecule 3: PROTEASOME SUBUNIT ALPHA TYPE-4

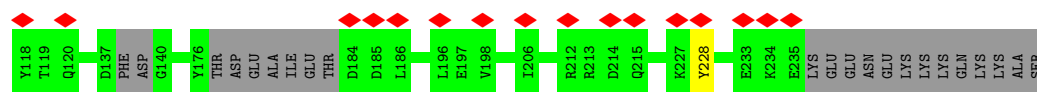


• Molecule 4: PROTEASOME SUBUNIT ALPHA TYPE-7

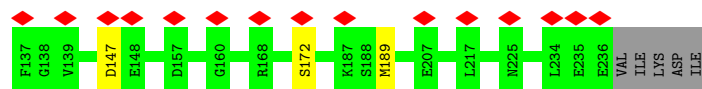
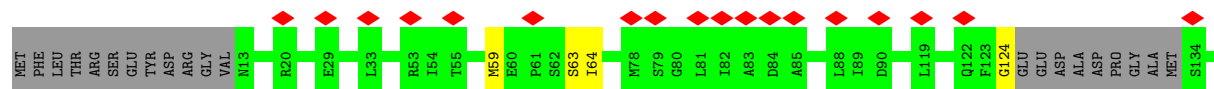
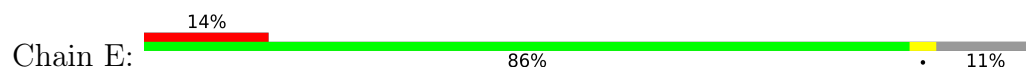


• Molecule 4: PROTEASOME SUBUNIT ALPHA TYPE-7

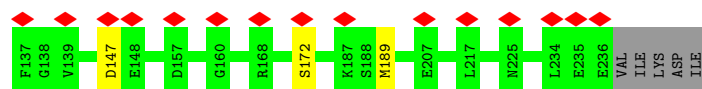
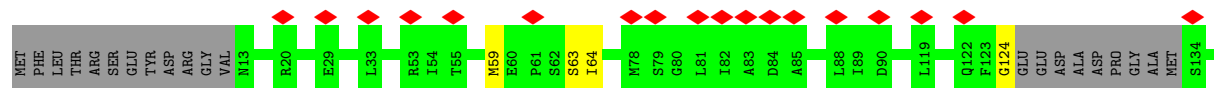
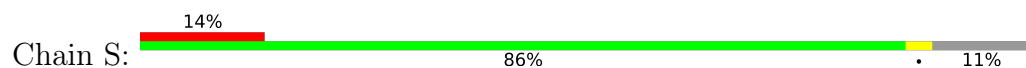




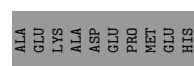
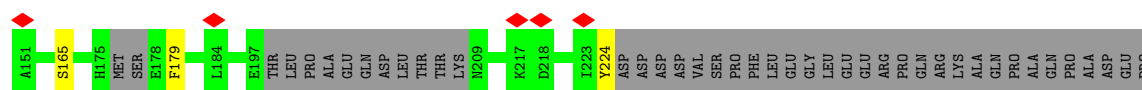
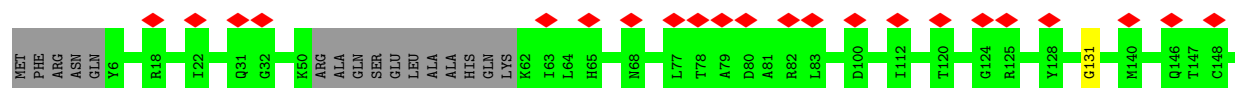
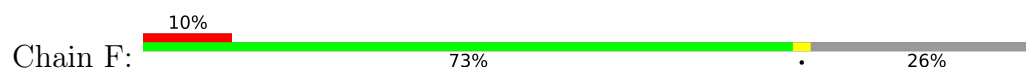
• Molecule 5: PROTEASOME SUBUNIT ALPHA TYPE-5



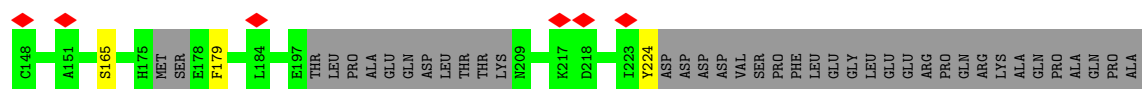
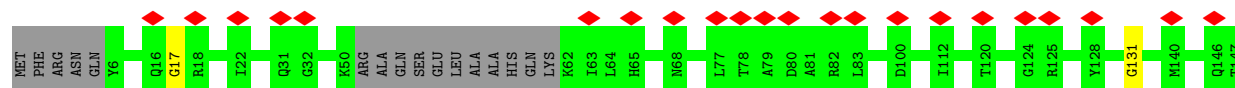
• Molecule 5: PROTEASOME SUBUNIT ALPHA TYPE-5



• Molecule 6: PROTEASOME SUBUNIT ALPHA TYPE-1



• Molecule 6: PROTEASOME SUBUNIT ALPHA TYPE-1



GLU
PRO
ALA
GLU
LYS
LYS
ASP
GLU
PRO
MET
GLU
HIS

• Molecule 7: PROTEASOME SUBUNIT ALPHA TYPE-3

Chain G: 13% 81% 18%

MET SER SER ILE GLY THR GLY TYR D8 L9 S10 Y25 T35 E50 LYS LEU VAL LEU SER LYS LEU LEU LEU LEU TYR LYS GLU GLY GLY SER ASN LYS ARG L66 D70 R71 A78 G79 L80 L81 A82 D83 A84 R85 D89 E93 N105 K109 D113 H120 S126

S141 V142 N143 D144 Y158 E175 M181 R187 V193 A194 I197 H201 ASP GLU VAL LYS ASP LYS A208 D230 E233 E234 A235 E236 K237 TYR ALA LYS LYS SER LEU LYS GLU ASP GLU SER ASP ASP ASN MET

• Molecule 7: PROTEASOME SUBUNIT ALPHA TYPE-3

Chain U: 13% 81% 18%

MET SER SER ILE GLY THR GLY TYR D8 L9 S10 Y25 T35 E50 LYS LEU VAL LEU SER LYS LEU LEU LEU LEU TYR LYS GLU GLY GLY SER ASN LYS ARG L66 D70 R71 A78 G79 L80 L81 A82 D83 A84 R85 D89 E93 N105 K109 D113 H120 S126

S141 V142 N143 D144 Y158 E175 M181 R187 V193 A194 I197 H201 ASP GLU VAL LYS ASP LYS A208 D230 E233 E234 A235 E236 K237 TYR ALA LYS LYS SER LEU LYS GLU ASP GLU SER ASP ASP ASN MET

• Molecule 8: PROTEASOME SUBUNIT BETA TYPE-6

Chain H: 13% 84% 11%

T1 F8 D9 G23 S24 Y25 N28 R29 V30 K33 L34 T35 P36 I37 R40 T41 F42 C43 S46 G47 D51 T52 Q53 Y61 E92 D93 L94 M95 A96 G97 W103 ASP PRO GLN GLY G109 M116 G129 S130 R144 E145 G146 F155 L176

L179 A180 E181 S182 V188 LEU LEU GLY ASP GLN ILE PRO LYS PHE VAL T35 P36 I37 R40 T41 F42 C43 S46 G47 D51 T52 Q53 Y61 E92 D93 L94 M95 A96 G97 W103 ASP PRO GLN GLY G109 M116 G129 S130 R144 E145 G146 F155 L176

• Molecule 8: PROTEASOME SUBUNIT BETA TYPE-6

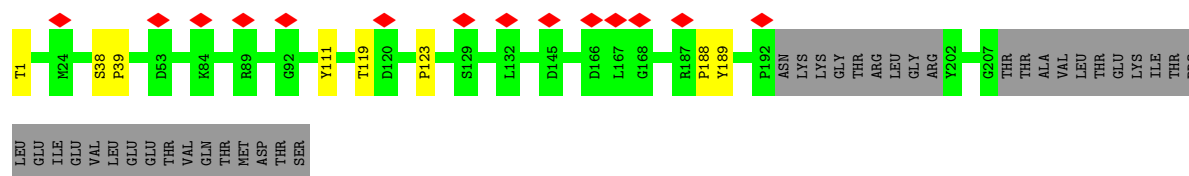
Chain V: 12% 84% 5% 11%

T1 Q7 F8 D9 G23 S24 Y25 N28 R29 V30 K33 L34 T35 P36 I37 R40 T41 F42 C43 S46 G47 D51 T52 Q53 Y61 E92 D93 L94 M95 A96 G97 W103 ASP PRO GLN GLY G109 M116 G129 S130 R144 E145 G146 F155 L176

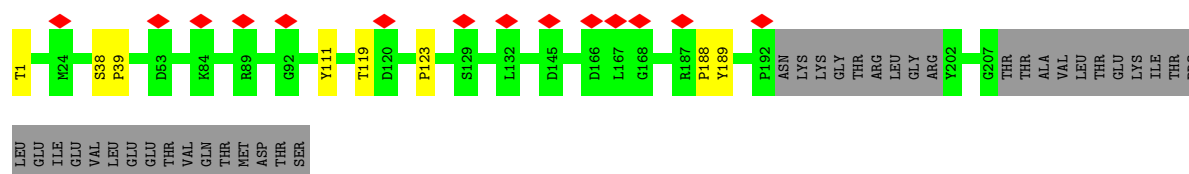
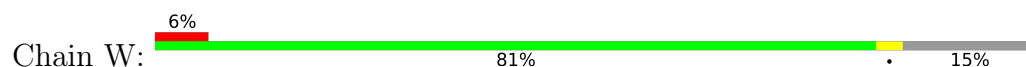
L179 A180 E181 S182 V188 LEU LEU GLY ASP GLN ILE PRO LYS PHE VAL T35 P36 I37 R40 T41 F42 C43 S46 G47 D51 T52 Q53 Y61 E92 D93 L94 M95 A96 G97 W103 ASP PRO GLN GLY G109 M116 G129 S130 R144 E145 G146 F155 L176

• Molecule 9: PROTEASOME SUBUNIT BETA TYPE-7

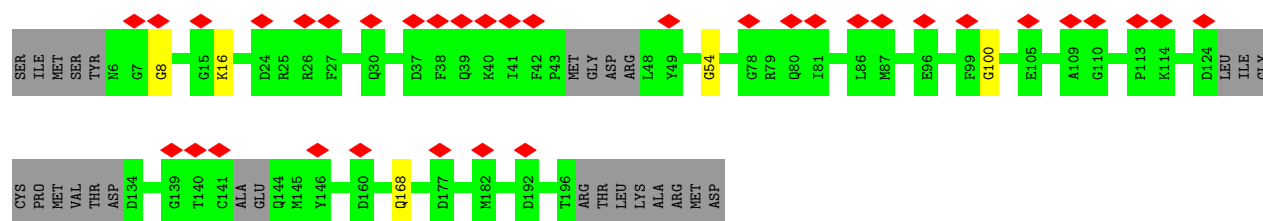
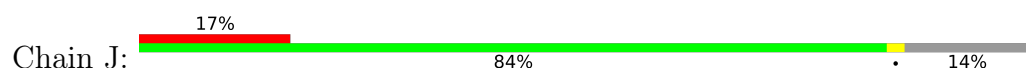
Chain I: 6% 81% 15%



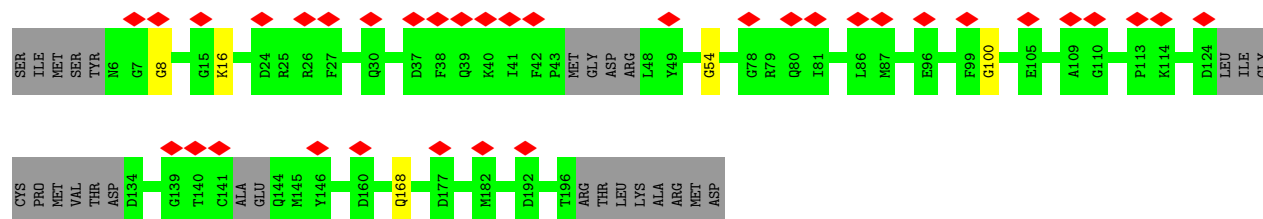
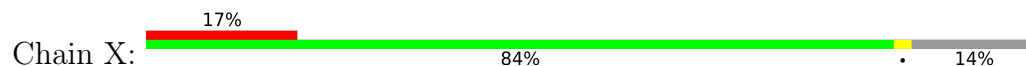
• Molecule 9: PROTEASOME SUBUNIT BETA TYPE-7



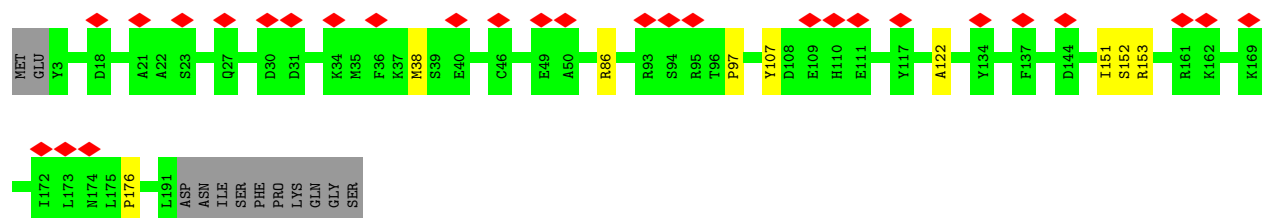
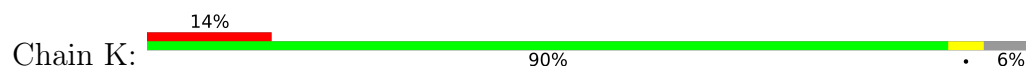
• Molecule 10: PROTEASOME SUBUNIT BETA TYPE-3



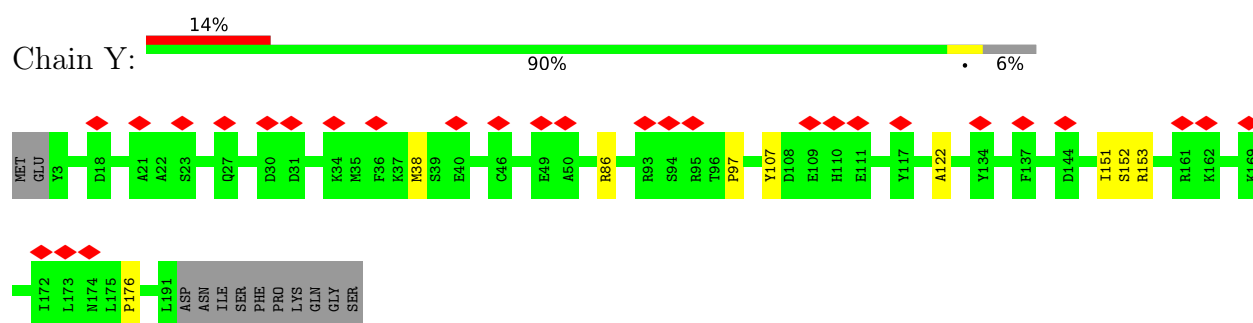
• Molecule 10: PROTEASOME SUBUNIT BETA TYPE-3



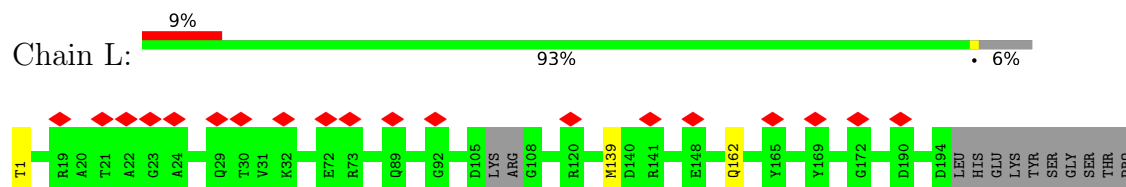
• Molecule 11: PROTEASOME SUBUNIT BETA TYPE-2



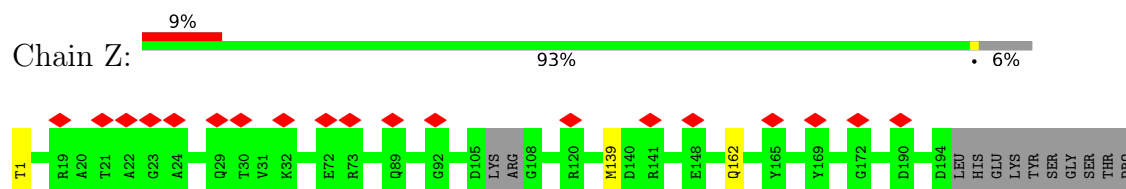
• Molecule 11: PROTEASOME SUBUNIT BETA TYPE-2



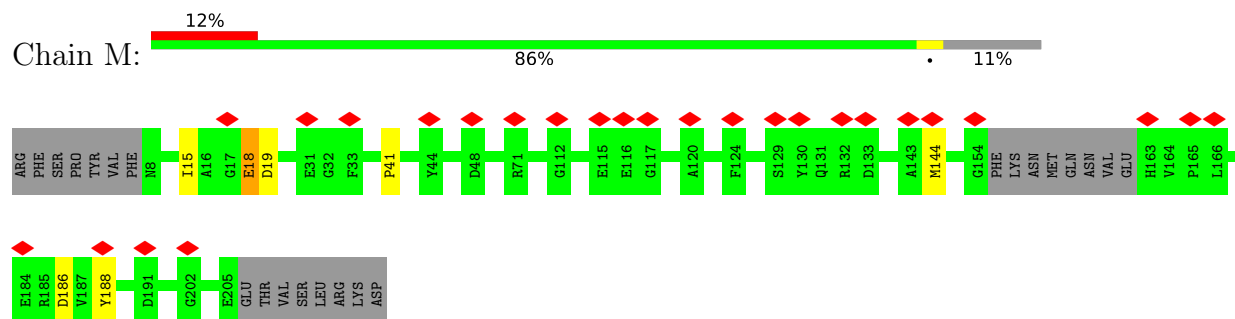
• Molecule 12: PROTEASOME SUBUNIT BETA TYPE-5



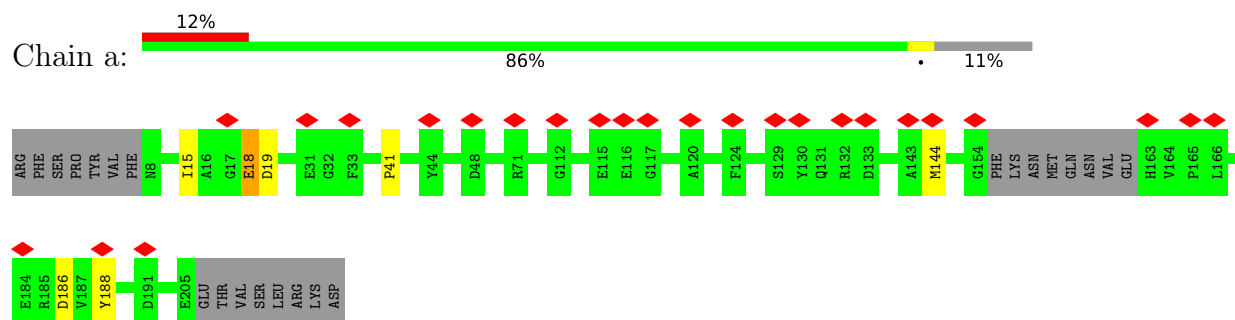
• Molecule 12: PROTEASOME SUBUNIT BETA TYPE-5



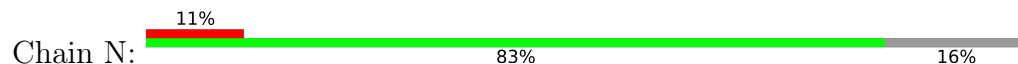
• Molecule 13: PROTEASOME SUBUNIT BETA TYPE-1

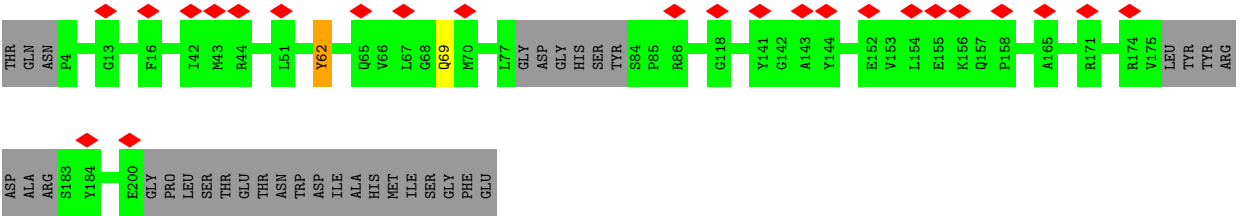


• Molecule 13: PROTEASOME SUBUNIT BETA TYPE-1

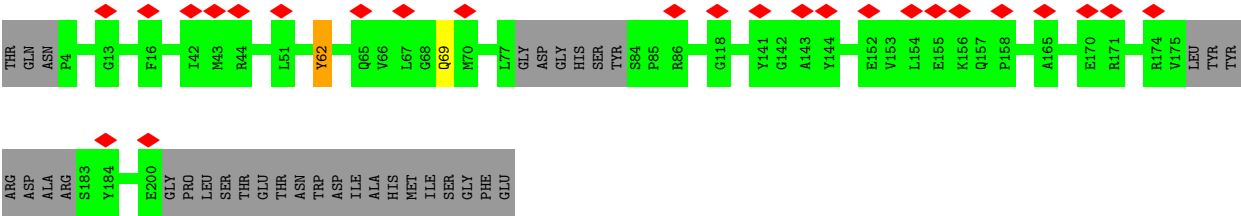
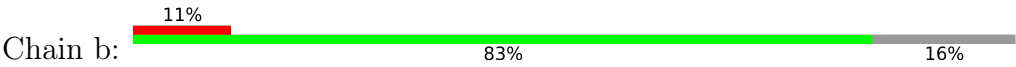


• Molecule 14: PROTEASOME SUBUNIT BETA TYPE-4





• Molecule 14: PROTEASOME SUBUNIT BETA TYPE-4



4 Experimental information

| Property | Value | Source |
|--------------------------------------|-------------------------|-----------|
| EM reconstruction method | SINGLE PARTICLE | Depositor |
| Imposed symmetry | POINT, C2 | Depositor |
| Number of particles used | 76500 | Depositor |
| Resolution determination method | Not provided | |
| CTF correction method | FULL RECORDED IMAGE | Depositor |
| Microscope | FEI TITAN KRIOS | Depositor |
| Voltage (kV) | 300 | Depositor |
| Electron dose ($e^-/\text{\AA}^2$) | 4.8 | Depositor |
| Minimum defocus (nm) | 1700 | Depositor |
| Maximum defocus (nm) | 3000 | Depositor |
| Magnification | 134461 | Depositor |
| Image detector | FEI FALCON II (4k x 4k) | Depositor |
| Maximum map value | 16.752 | Depositor |
| Minimum map value | -13.472 | Depositor |
| Average map value | 0.000 | Depositor |
| Map value standard deviation | 1.000 | Depositor |
| Recommended contour level | 3.2 | Depositor |
| Map size (\AA) | 266.24, 266.24, 266.24 | wwPDB |
| Map dimensions | 256, 256, 256 | wwPDB |
| Map angles ($^\circ$) | 90.0, 90.0, 90.0 | wwPDB |
| Pixel spacing (\AA) | 1.04, 1.04, 1.04 | Depositor |

5 Model quality ⓘ

5.1 Standard geometry ⓘ

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

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 | 0.95 | 0/1537 | 1.10 | 5/2073 (0.2%) |
| 1 | O | 0.95 | 0/1537 | 1.10 | 5/2073 (0.2%) |
| 2 | B | 0.90 | 0/1707 | 1.05 | 5/2312 (0.2%) |
| 2 | P | 0.90 | 0/1707 | 1.05 | 5/2312 (0.2%) |
| 3 | C | 0.94 | 3/1887 (0.2%) | 1.07 | 7/2542 (0.3%) |
| 3 | Q | 0.94 | 3/1887 (0.2%) | 1.07 | 7/2542 (0.3%) |
| 4 | D | 1.00 | 1/1695 (0.1%) | 1.09 | 2/2283 (0.1%) |
| 4 | R | 1.00 | 1/1695 (0.1%) | 1.09 | 2/2283 (0.1%) |
| 5 | E | 0.82 | 0/1668 | 1.02 | 4/2252 (0.2%) |
| 5 | S | 0.82 | 0/1668 | 1.02 | 4/2252 (0.2%) |
| 6 | F | 0.99 | 0/1562 | 1.12 | 6/2105 (0.3%) |
| 6 | T | 1.00 | 0/1562 | 1.19 | 7/2105 (0.3%) |
| 7 | G | 0.97 | 0/1656 | 1.12 | 2/2232 (0.1%) |
| 7 | U | 0.97 | 0/1656 | 1.12 | 2/2232 (0.1%) |
| 8 | H | 1.05 | 1/1394 (0.1%) | 1.16 | 7/1884 (0.4%) |
| 8 | V | 1.04 | 1/1394 (0.1%) | 1.16 | 7/1884 (0.4%) |
| 9 | I | 0.96 | 2/1515 (0.1%) | 1.14 | 4/2050 (0.2%) |
| 9 | W | 0.96 | 2/1515 (0.1%) | 1.14 | 4/2050 (0.2%) |
| 10 | J | 0.92 | 1/1398 (0.1%) | 1.07 | 3/1884 (0.2%) |
| 10 | X | 0.92 | 1/1398 (0.1%) | 1.07 | 3/1884 (0.2%) |
| 11 | K | 0.87 | 0/1543 | 1.06 | 4/2088 (0.2%) |
| 11 | Y | 0.87 | 0/1543 | 1.06 | 4/2088 (0.2%) |
| 12 | L | 1.06 | 2/1508 (0.1%) | 1.13 | 3/2038 (0.1%) |
| 12 | Z | 1.06 | 2/1508 (0.1%) | 1.13 | 3/2038 (0.1%) |
| 13 | M | 0.91 | 0/1477 | 1.11 | 3/1990 (0.2%) |
| 13 | a | 0.91 | 0/1477 | 1.11 | 3/1990 (0.2%) |
| 14 | N | 0.91 | 1/1451 (0.1%) | 1.08 | 2/1957 (0.1%) |
| 14 | b | 0.91 | 1/1451 (0.1%) | 1.08 | 2/1957 (0.1%) |
| All | All | 0.95 | 22/43996 (0.1%) | 1.10 | 115/59380 (0.2%) |

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 | 1 |
| 1 | O | 0 | 1 |
| 5 | E | 0 | 1 |
| 5 | S | 0 | 1 |
| 7 | G | 0 | 1 |
| 7 | U | 0 | 1 |
| 9 | I | 0 | 2 |
| 9 | W | 0 | 2 |
| 10 | J | 0 | 1 |
| 10 | X | 0 | 1 |
| 11 | K | 0 | 1 |
| 11 | Y | 0 | 1 |
| 13 | M | 0 | 2 |
| 13 | a | 0 | 2 |
| All | All | 0 | 18 |

The worst 5 of 22 bond length outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed(Å) | Ideal(Å) |
|-----|-------|-----|------|-------|-------|-------------|----------|
| 8 | H | 1 | THR | C-N | 19.41 | 1.78 | 1.34 |
| 8 | V | 1 | THR | C-N | 19.41 | 1.78 | 1.34 |
| 9 | I | 123 | PRO | N-CD | -7.63 | 1.37 | 1.47 |
| 9 | W | 123 | PRO | N-CD | -7.63 | 1.37 | 1.47 |
| 12 | L | 1 | THR | C-N | 6.47 | 1.49 | 1.34 |

The worst 5 of 115 bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed(°) | Ideal(°) |
|-----|-------|-----|------|----------|-------|-------------|----------|
| 6 | T | 17 | GLY | N-CA-C | 15.39 | 151.57 | 113.10 |
| 8 | H | 47 | GLY | N-CA-C | -9.29 | 89.87 | 113.10 |
| 8 | V | 47 | GLY | N-CA-C | -9.29 | 89.87 | 113.10 |
| 11 | Y | 38 | MET | CG-SD-CE | -8.17 | 87.13 | 100.20 |
| 11 | K | 38 | MET | CG-SD-CE | -8.15 | 87.16 | 100.20 |

There are no chirality outliers.

5 of 18 planarity outliers are listed below:

| Mol | Chain | Res | Type | Group |
|-----|-------|-----|------|-----------|
| 1 | A | 95 | ARG | Sidechain |

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| Mol | Chain | Res | Type | Group |
|-----|-------|-----|------|-----------|
| 5 | E | 147 | ASP | Peptide |
| 7 | G | 181 | MET | Peptide |
| 9 | I | 1 | THR | Mainchain |
| 9 | I | 111 | TYR | Sidechain |

5.2 Too-close contacts [i](#)

Due to software issues we are unable to calculate clashes - this section is therefore empty.

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 | 186/246 (76%) | 178 (96%) | 8 (4%) | 0 | 100 | 100 |
| 1 | O | 186/246 (76%) | 178 (96%) | 8 (4%) | 0 | 100 | 100 |
| 2 | B | 210/234 (90%) | 198 (94%) | 10 (5%) | 2 (1%) | 13 | 46 |
| 2 | P | 210/234 (90%) | 198 (94%) | 10 (5%) | 2 (1%) | 13 | 46 |
| 3 | C | 233/261 (89%) | 225 (97%) | 8 (3%) | 0 | 100 | 100 |
| 3 | Q | 233/261 (89%) | 225 (97%) | 8 (3%) | 0 | 100 | 100 |
| 4 | D | 206/248 (83%) | 201 (98%) | 5 (2%) | 0 | 100 | 100 |
| 4 | R | 206/248 (83%) | 201 (98%) | 5 (2%) | 0 | 100 | 100 |
| 5 | E | 211/241 (88%) | 201 (95%) | 9 (4%) | 1 (0%) | 25 | 59 |
| 5 | S | 211/241 (88%) | 201 (95%) | 9 (4%) | 1 (0%) | 25 | 59 |
| 6 | F | 187/263 (71%) | 184 (98%) | 3 (2%) | 0 | 100 | 100 |
| 6 | T | 187/263 (71%) | 185 (99%) | 2 (1%) | 0 | 100 | 100 |
| 7 | G | 203/255 (80%) | 196 (97%) | 7 (3%) | 0 | 100 | 100 |
| 7 | U | 203/255 (80%) | 196 (97%) | 7 (3%) | 0 | 100 | 100 |
| 8 | H | 179/205 (87%) | 164 (92%) | 13 (7%) | 2 (1%) | 12 | 45 |

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| Mol | Chain | Analysed | Favoured | Allowed | Outliers | Percentiles | |
|-----|-------|-----------------|------------|----------|----------|-------------|-----|
| 8 | V | 179/205 (87%) | 165 (92%) | 12 (7%) | 2 (1%) | 12 | 45 |
| 9 | I | 194/234 (83%) | 187 (96%) | 6 (3%) | 1 (0%) | 25 | 59 |
| 9 | W | 194/234 (83%) | 187 (96%) | 6 (3%) | 1 (0%) | 25 | 59 |
| 10 | J | 168/204 (82%) | 158 (94%) | 10 (6%) | 0 | 100 | 100 |
| 10 | X | 168/204 (82%) | 158 (94%) | 10 (6%) | 0 | 100 | 100 |
| 11 | K | 187/201 (93%) | 173 (92%) | 10 (5%) | 4 (2%) | 5 | 32 |
| 11 | Y | 187/201 (93%) | 173 (92%) | 10 (5%) | 4 (2%) | 5 | 32 |
| 12 | L | 188/204 (92%) | 182 (97%) | 6 (3%) | 0 | 100 | 100 |
| 12 | Z | 188/204 (92%) | 182 (97%) | 6 (3%) | 0 | 100 | 100 |
| 13 | M | 186/213 (87%) | 175 (94%) | 10 (5%) | 1 (0%) | 25 | 59 |
| 13 | a | 186/213 (87%) | 175 (94%) | 10 (5%) | 1 (0%) | 25 | 59 |
| 14 | N | 178/219 (81%) | 161 (90%) | 17 (10%) | 0 | 100 | 100 |
| 14 | b | 178/219 (81%) | 161 (90%) | 17 (10%) | 0 | 100 | 100 |
| All | All | 5432/6456 (84%) | 5168 (95%) | 242 (4%) | 22 (0%) | 32 | 64 |

5 of 22 Ramachandran outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 2 | B | 40 | ALA |
| 2 | B | 54 | ILE |
| 5 | E | 189 | MET |
| 8 | H | 8 | PHE |
| 11 | K | 122 | ALA |

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 | 166/210 (79%) | 166 (100%) | 0 | 100 | 100 |
| 1 | O | 166/210 (79%) | 166 (100%) | 0 | 100 | 100 |
| 2 | B | 177/191 (93%) | 170 (96%) | 7 (4%) | 27 | 56 |

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| Mol | Chain | Analysed | Rotameric | Outliers | Percentiles | |
|-----|-------|-----------------|------------|----------|-------------|-----|
| 2 | P | 177/191 (93%) | 170 (96%) | 7 (4%) | 27 | 56 |
| 3 | C | 199/221 (90%) | 197 (99%) | 2 (1%) | 73 | 84 |
| 3 | Q | 199/221 (90%) | 197 (99%) | 2 (1%) | 73 | 84 |
| 4 | D | 179/211 (85%) | 177 (99%) | 2 (1%) | 70 | 83 |
| 4 | R | 179/211 (85%) | 177 (99%) | 2 (1%) | 70 | 83 |
| 5 | E | 181/203 (89%) | 180 (99%) | 1 (1%) | 84 | 91 |
| 5 | S | 181/203 (89%) | 180 (99%) | 1 (1%) | 84 | 91 |
| 6 | F | 166/224 (74%) | 166 (100%) | 0 | 100 | 100 |
| 6 | T | 166/224 (74%) | 166 (100%) | 0 | 100 | 100 |
| 7 | G | 170/212 (80%) | 170 (100%) | 0 | 100 | 100 |
| 7 | U | 170/212 (80%) | 170 (100%) | 0 | 100 | 100 |
| 8 | H | 142/159 (89%) | 140 (99%) | 2 (1%) | 62 | 79 |
| 8 | V | 142/159 (89%) | 140 (99%) | 2 (1%) | 62 | 79 |
| 9 | I | 162/195 (83%) | 162 (100%) | 0 | 100 | 100 |
| 9 | W | 162/195 (83%) | 162 (100%) | 0 | 100 | 100 |
| 10 | J | 149/173 (86%) | 149 (100%) | 0 | 100 | 100 |
| 10 | X | 149/173 (86%) | 149 (100%) | 0 | 100 | 100 |
| 11 | K | 160/171 (94%) | 159 (99%) | 1 (1%) | 84 | 91 |
| 11 | Y | 160/171 (94%) | 159 (99%) | 1 (1%) | 84 | 91 |
| 12 | L | 148/159 (93%) | 148 (100%) | 0 | 100 | 100 |
| 12 | Z | 148/159 (93%) | 148 (100%) | 0 | 100 | 100 |
| 13 | M | 155/178 (87%) | 153 (99%) | 2 (1%) | 65 | 81 |
| 13 | a | 155/178 (87%) | 153 (99%) | 2 (1%) | 65 | 81 |
| 14 | N | 152/181 (84%) | 151 (99%) | 1 (1%) | 81 | 89 |
| 14 | b | 152/181 (84%) | 151 (99%) | 1 (1%) | 81 | 89 |
| All | All | 4612/5376 (86%) | 4576 (99%) | 36 (1%) | 77 | 88 |

5 of 36 residues with a non-rotameric sidechain are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 4 | R | 228 | TYR |
| 14 | b | 62 | TYR |
| 5 | S | 63 | SER |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 11 | Y | 86 | ARG |
| 8 | H | 9 | ASP |

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 43 such sidechains are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 5 | S | 224 | GLN |
| 10 | X | 187 | HIS |
| 7 | U | 22 | GLN |
| 9 | W | 80 | ASN |
| 11 | Y | 101 | ASN |

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](#)

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 | $\# Z > 2$ |
| 15 | KNM | I | 300 | 9 | 29,29,68 | 1.74 | 2 (6%) | 36,39,91 | 1.20 | 2 (5%) |

| Mol | Type | Chain | Res | Link | Bond lengths | | | Bond angles | | |
|-----|------|-------|-----|------|--------------|------|----------|-------------|------|----------|
| | | | | | Counts | RMSZ | # Z > 2 | Counts | RMSZ | # Z > 2 |
| 15 | KNM | H | 300 | 8 | 30,30,68 | 1.76 | 2 (6%) | 39,41,91 | 0.94 | 2 (5%) |
| 15 | KNM | W | 300 | 9 | 29,29,68 | 1.73 | 2 (6%) | 36,39,91 | 1.20 | 2 (5%) |
| 15 | KNM | Z | 300 | 12 | 30,30,68 | 1.75 | 2 (6%) | 39,41,91 | 0.91 | 2 (5%) |
| 15 | KNM | V | 300 | 8 | 30,30,68 | 1.76 | 2 (6%) | 39,41,91 | 0.94 | 2 (5%) |
| 15 | KNM | L | 300 | 12 | 30,30,68 | 1.75 | 2 (6%) | 39,41,91 | 0.92 | 2 (5%) |

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 |
|-----|------|-------|-----|------|---------|-------------|-------|
| 15 | KNM | I | 300 | 9 | - | 20/37/37/98 | - |
| 15 | KNM | H | 300 | 8 | - | 27/38/38/98 | - |
| 15 | KNM | W | 300 | 9 | - | 20/37/37/98 | - |
| 15 | KNM | Z | 300 | 12 | - | 14/38/38/98 | - |
| 15 | KNM | V | 300 | 8 | - | 27/38/38/98 | - |
| 15 | KNM | L | 300 | 12 | - | 14/38/38/98 | - |

The worst 5 of 12 bond length outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed(Å) | Ideal(Å) |
|-----|-------|-----|------|--------|-------|-------------|----------|
| 15 | H | 300 | KNM | C16-S1 | -9.19 | 1.66 | 1.78 |
| 15 | V | 300 | KNM | C16-S1 | -9.19 | 1.66 | 1.78 |
| 15 | L | 300 | KNM | C16-S1 | -8.97 | 1.66 | 1.78 |
| 15 | Z | 300 | KNM | C16-S1 | -8.95 | 1.66 | 1.78 |
| 15 | I | 300 | KNM | C16-S1 | -8.66 | 1.66 | 1.78 |

The worst 5 of 12 bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed(°) | Ideal(°) |
|-----|-------|-----|------|----------|-------|-------------|----------|
| 15 | W | 300 | KNM | C1-N1-C3 | 4.42 | 122.36 | 114.16 |
| 15 | I | 300 | KNM | C1-N1-C3 | 4.41 | 122.34 | 114.16 |
| 15 | W | 300 | KNM | O5-S1-O4 | -3.83 | 108.90 | 117.09 |
| 15 | I | 300 | KNM | O5-S1-O4 | -3.83 | 108.90 | 117.09 |
| 15 | H | 300 | KNM | O5-S1-O4 | -3.60 | 109.40 | 117.09 |

There are no chirality outliers.

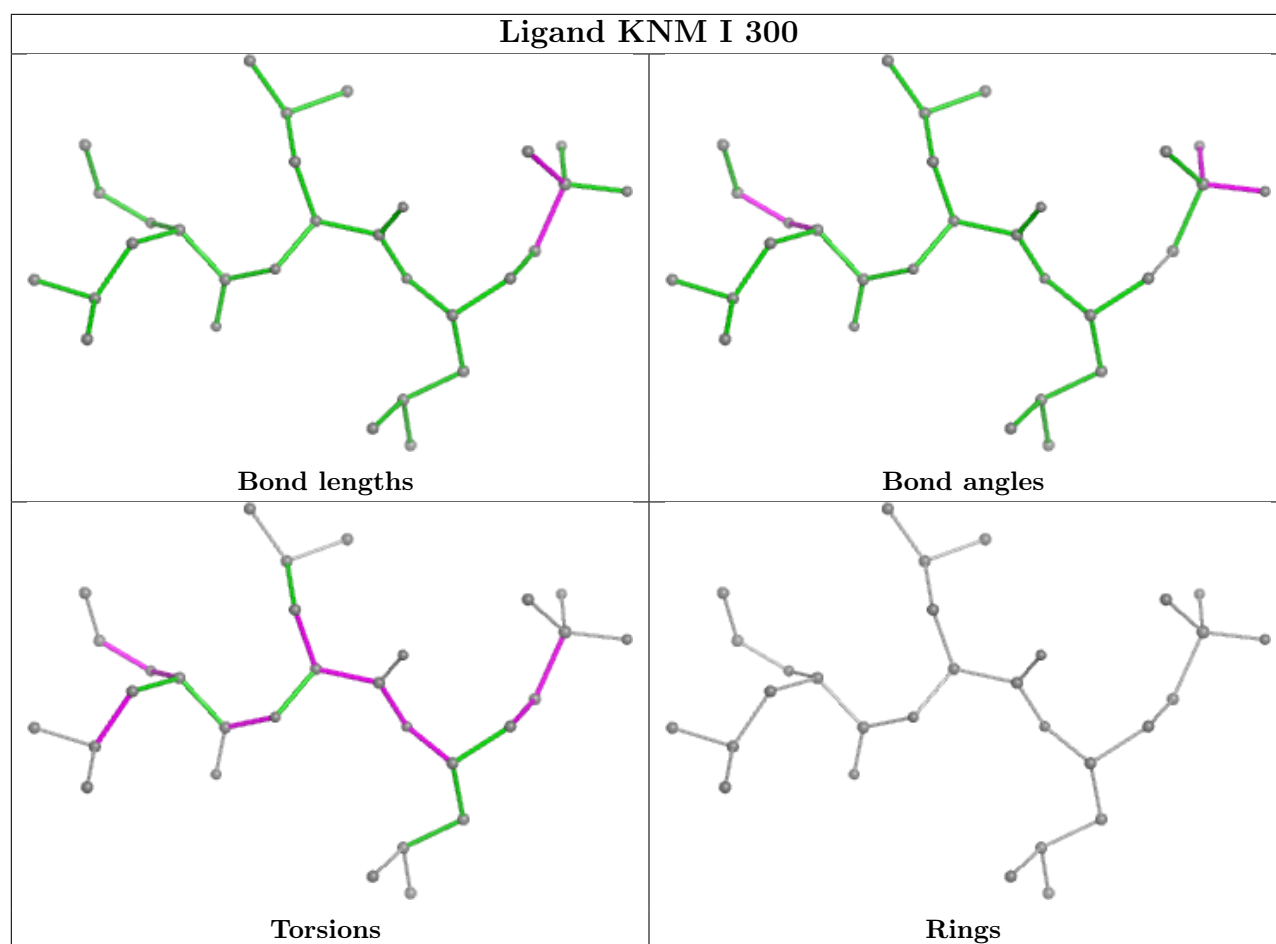
5 of 122 torsion outliers are listed below:

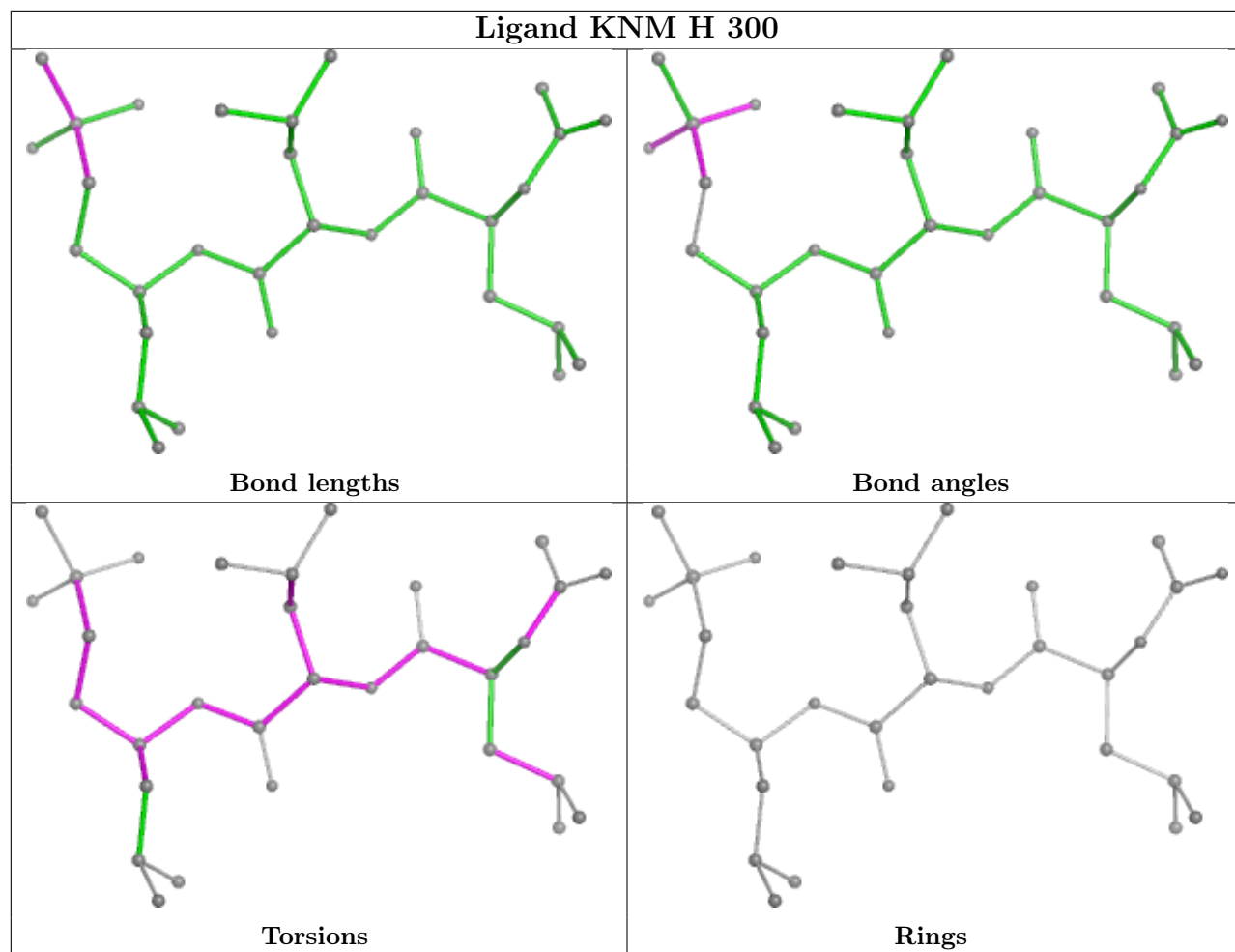
| Mol | Chain | Res | Type | Atoms |
|-----|-------|-----|------|----------------|
| 15 | H | 300 | KNM | O1-C1-N1-C3 |
| 15 | H | 300 | KNM | C2-C1-N1-C3 |
| 15 | H | 300 | KNM | C3-C8-N2-C9 |
| 15 | H | 300 | KNM | C17-C15-N3-C14 |
| 15 | H | 300 | KNM | C21-C16-S1-O4 |

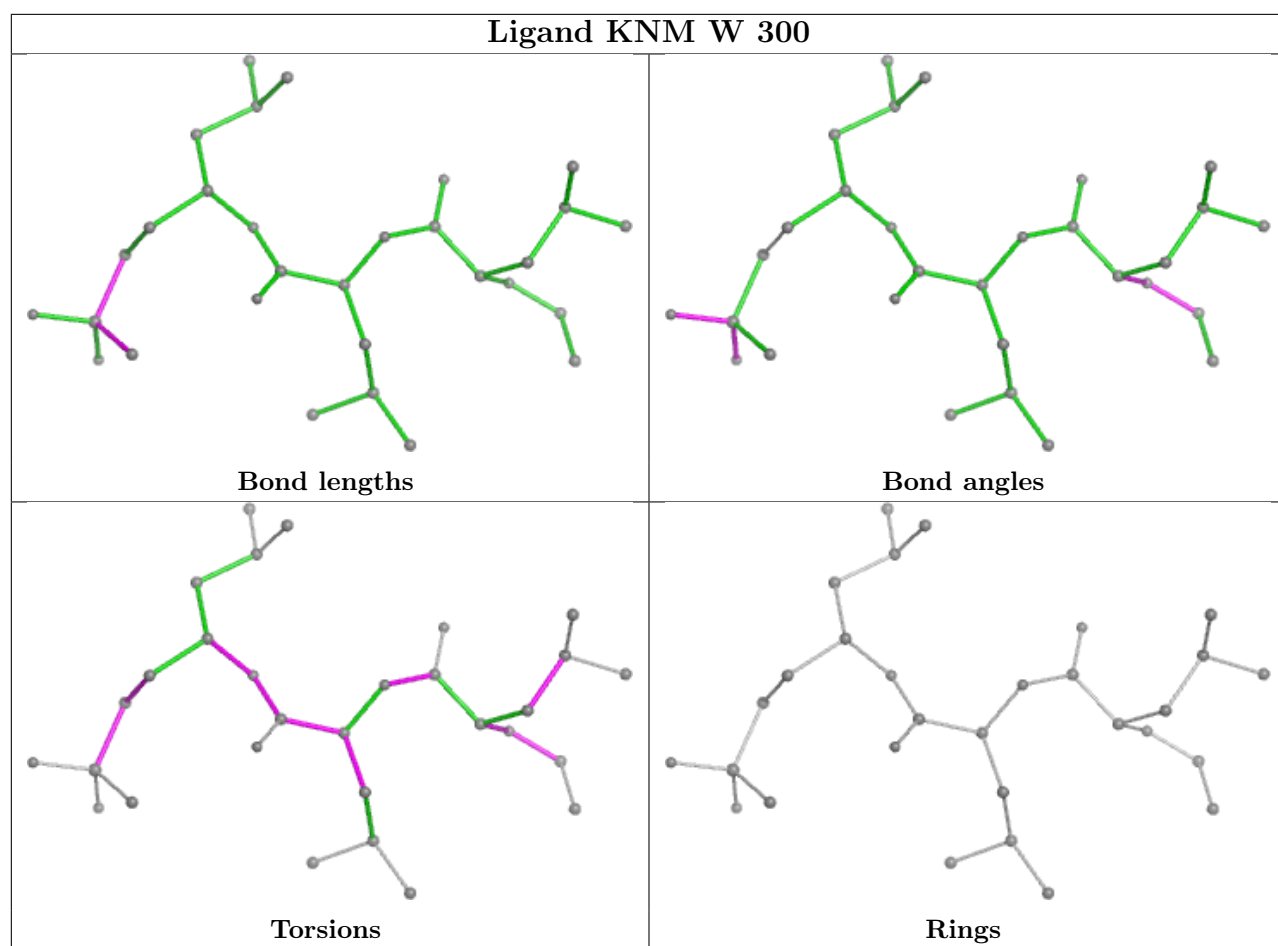
There are no ring outliers.

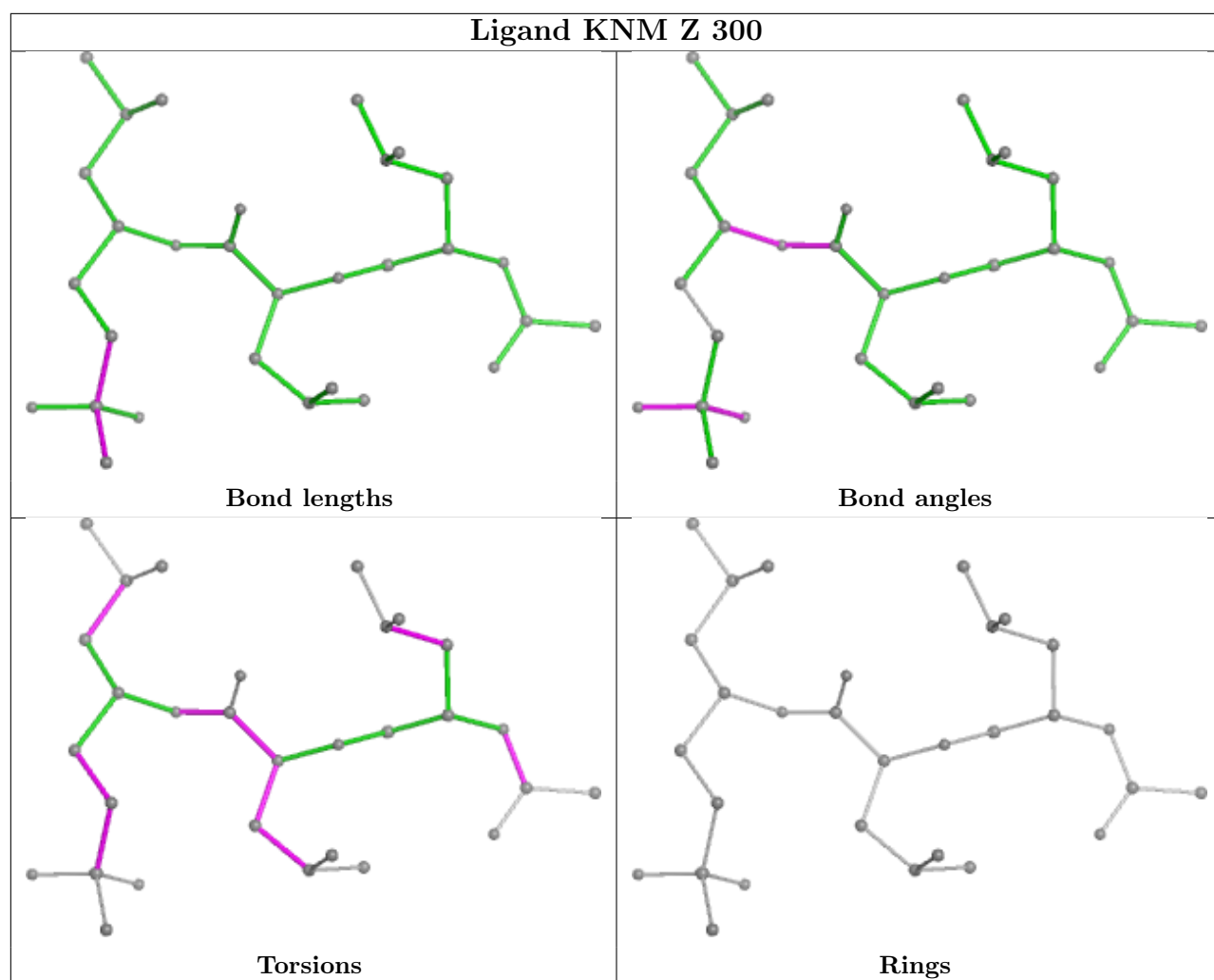
No monomer is involved in short contacts.

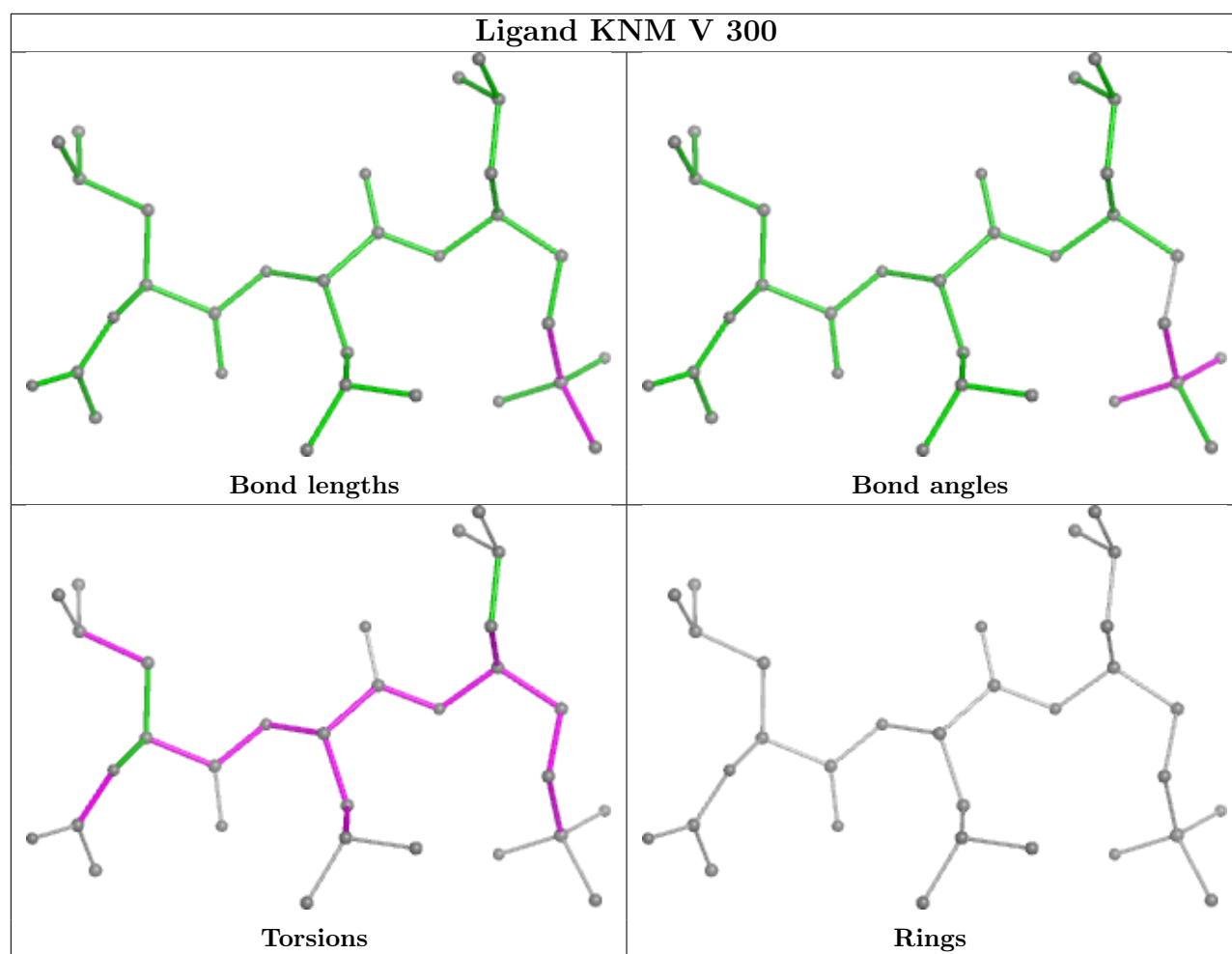
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 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.

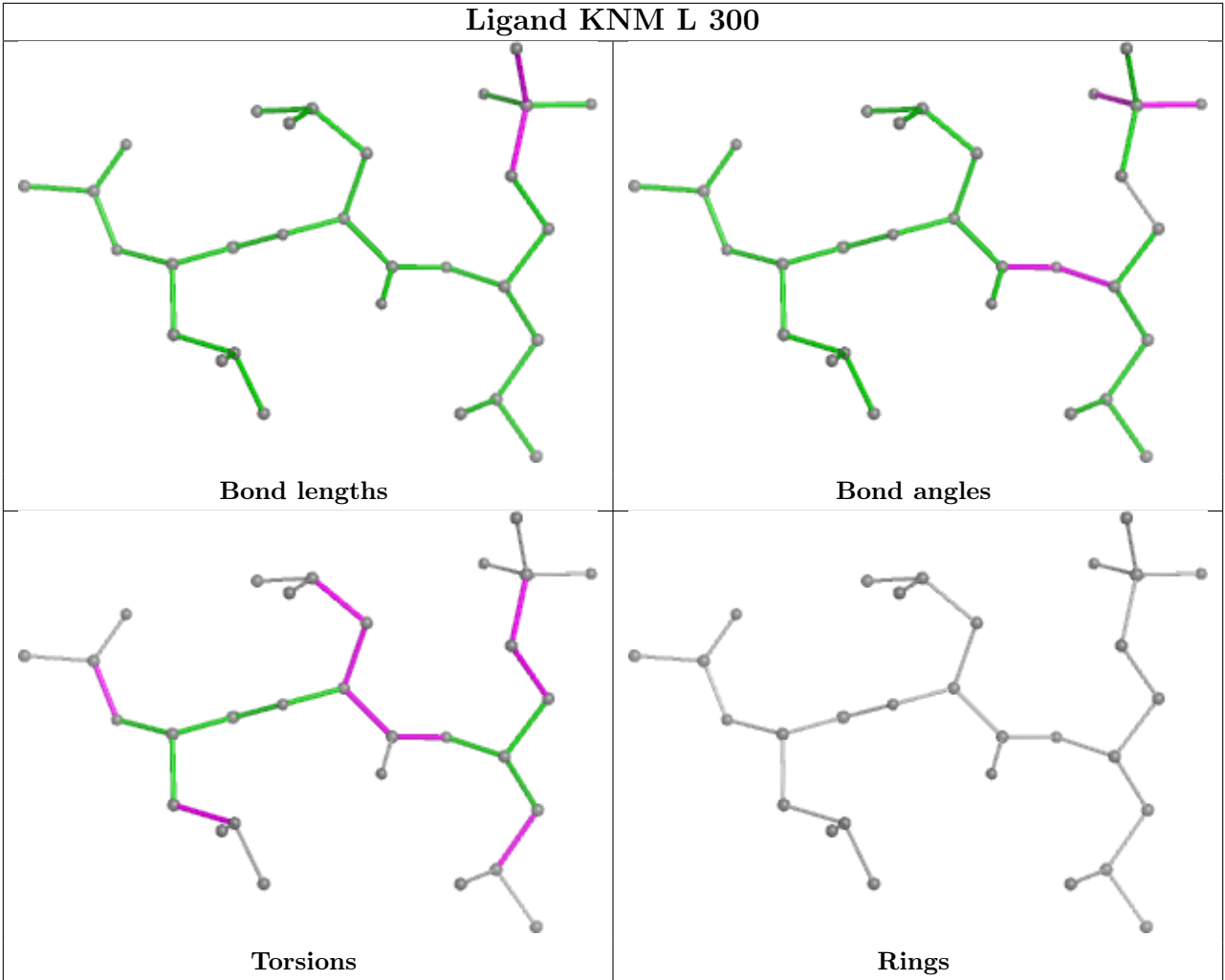












5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

The following chains have linkage breaks:

| Mol | Chain | Number of breaks |
|-----|-------|------------------|
| 8 | H | 1 |
| 8 | V | 1 |

All chain breaks are listed below:

| Model | Chain | Residue-1 | Atom-1 | Residue-2 | Atom-2 | Distance (Å) |
|-------|-------|-----------|--------|-----------|--------|--------------|
| 1 | H | 1:THR | C | 2:THR | N | 1.78 |
| 1 | V | 1:THR | C | 2:THR | N | 1.78 |

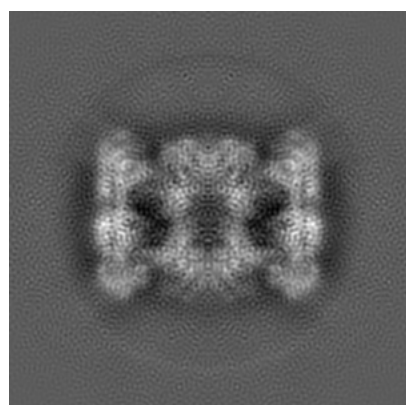
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-2981. These allow visual inspection of the internal detail of the map and identification of artifacts.

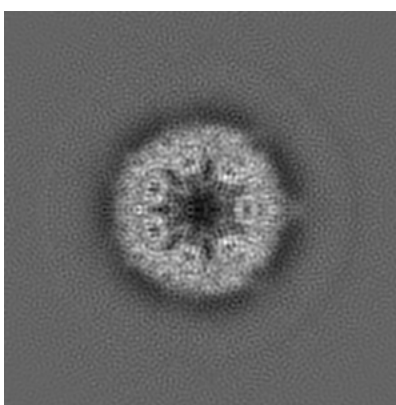
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

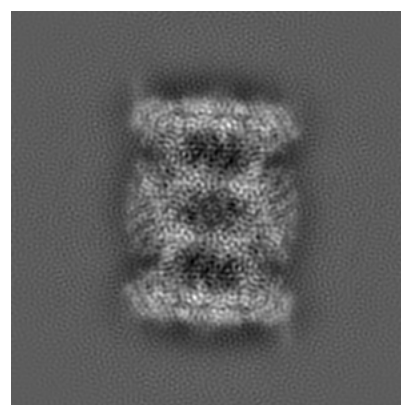
6.1.1 Primary map



X



Y

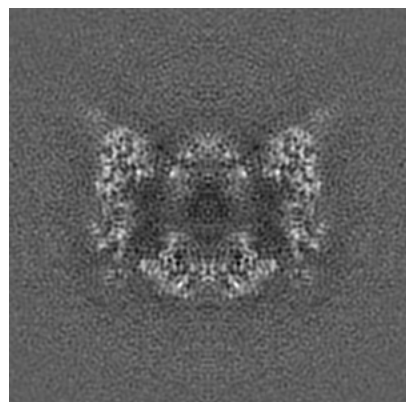


Z

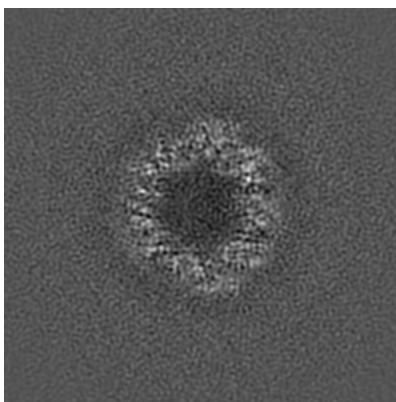
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

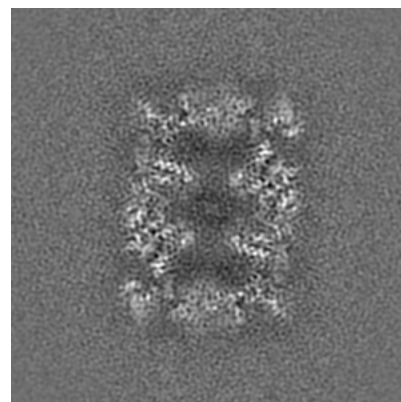
6.2.1 Primary map



X Index: 128



Y Index: 128

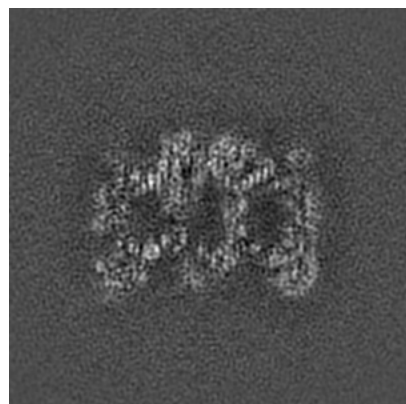


Z Index: 128

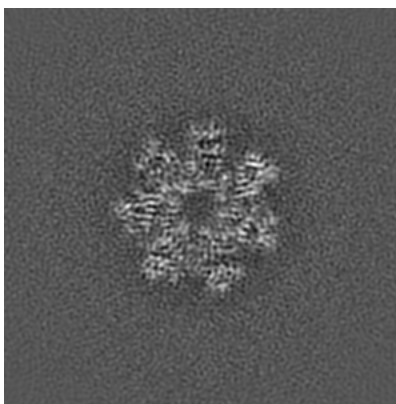
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

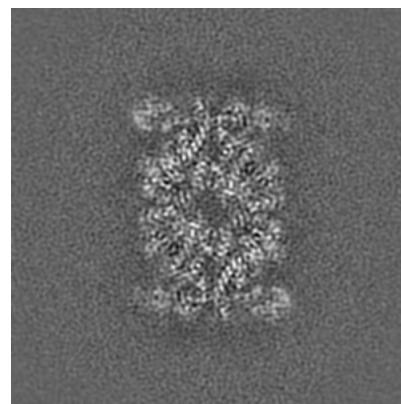
6.3.1 Primary map



X Index: 146



Y Index: 145

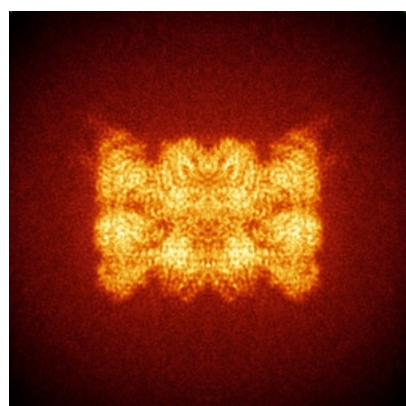


Z Index: 100

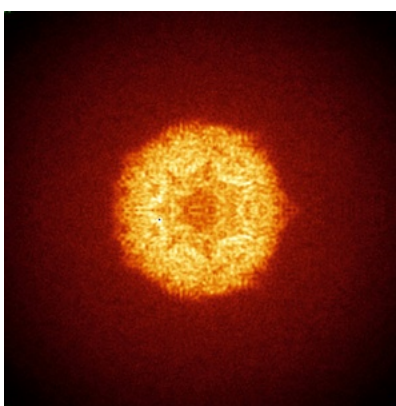
The images above show the largest variance slices of the map in three orthogonal directions.

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

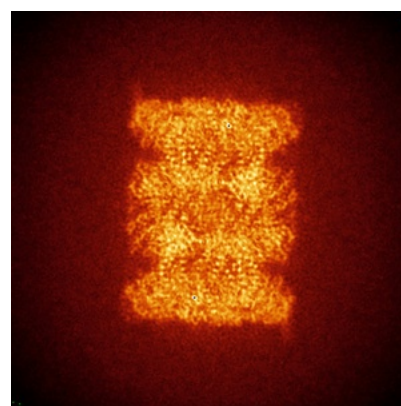
6.4.1 Primary map



X



Y

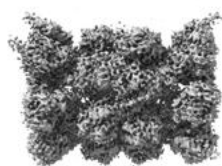


Z

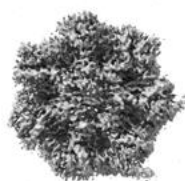
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views [i](#)

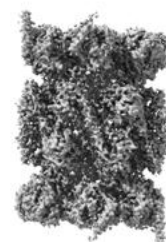
6.5.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 3.2. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

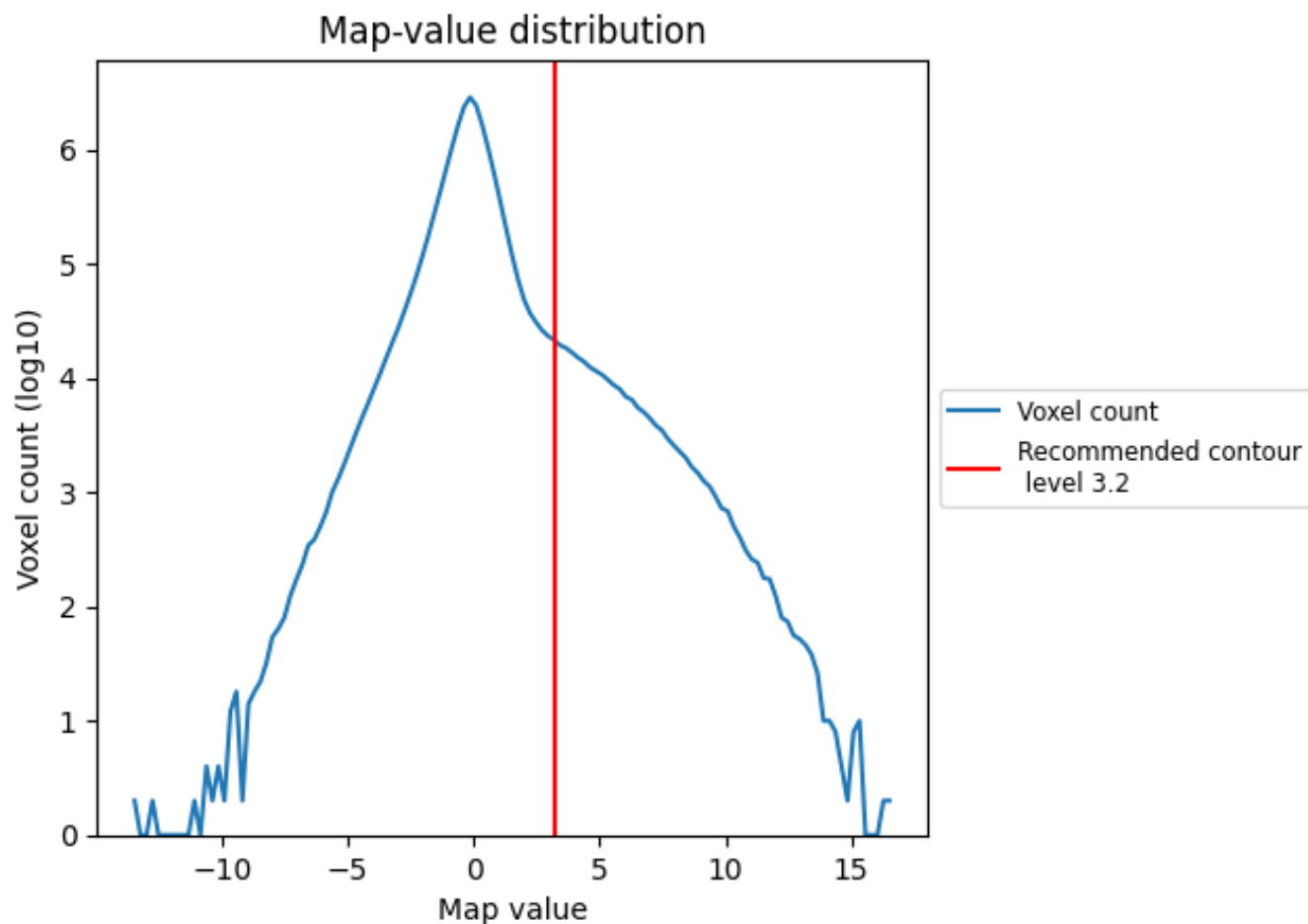
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

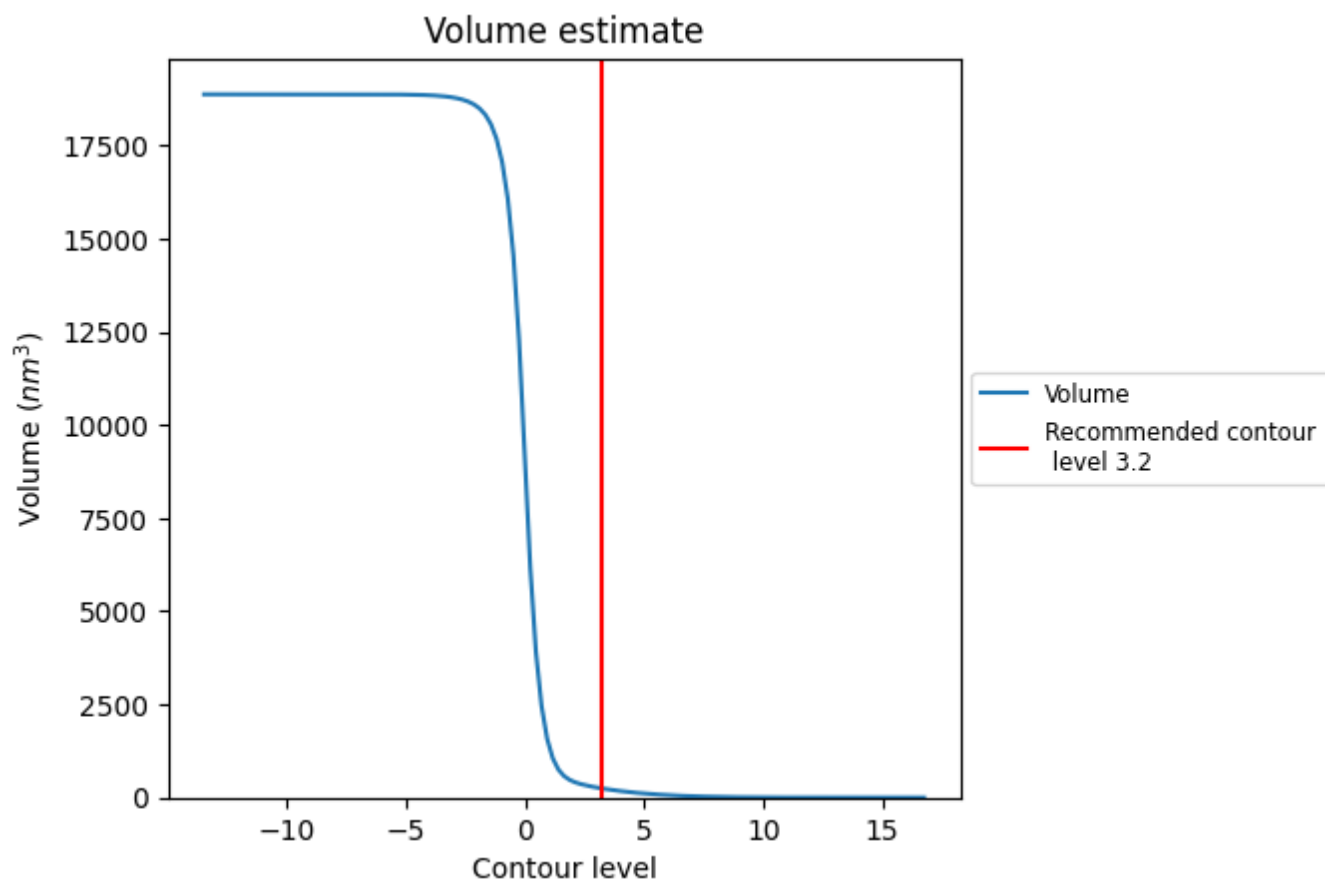
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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.

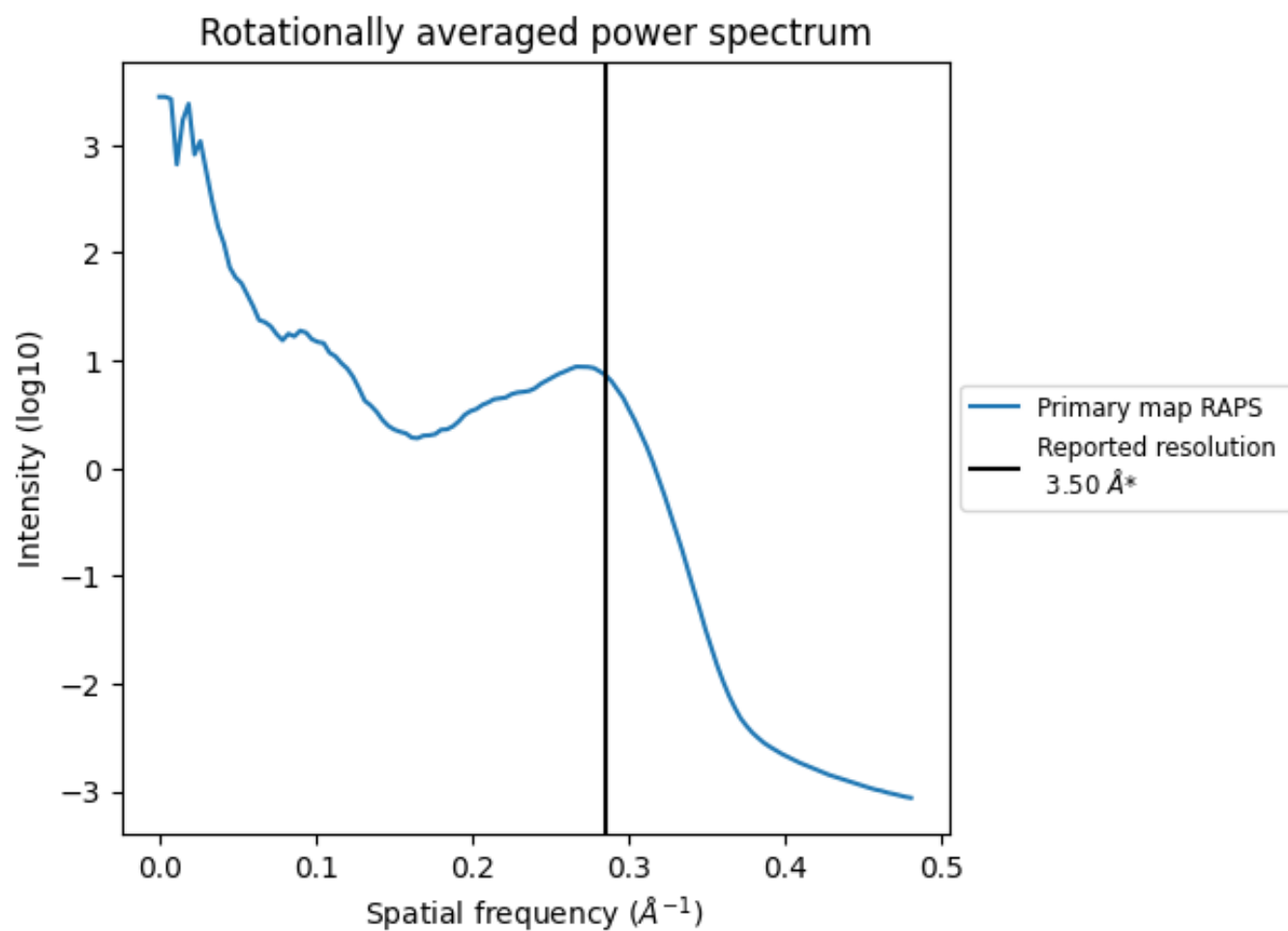
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 249 nm³; this corresponds to an approximate mass of 225 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 0.286 Å⁻¹

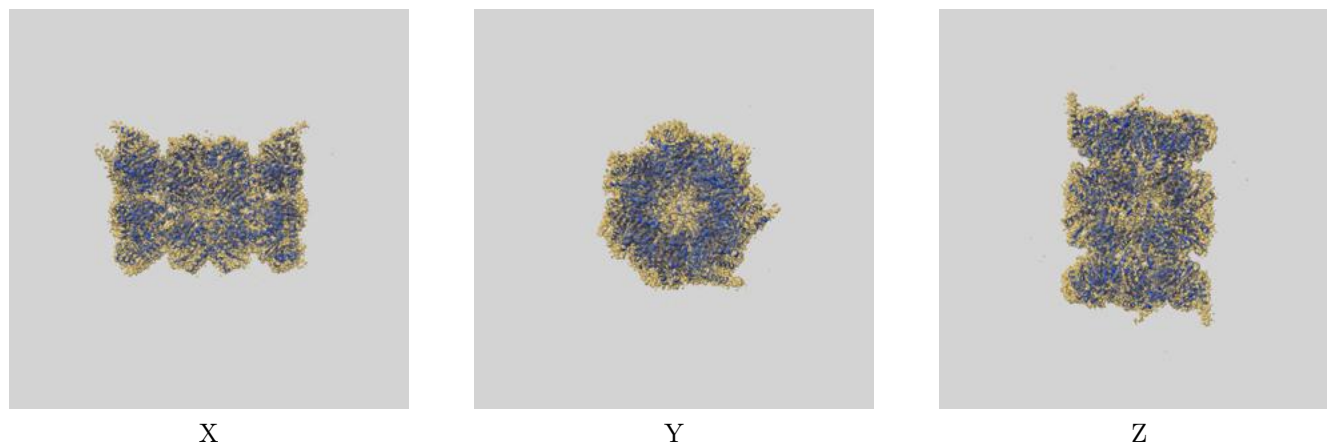
8 Fourier-Shell correlation

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

9 Map-model fit [i](#)

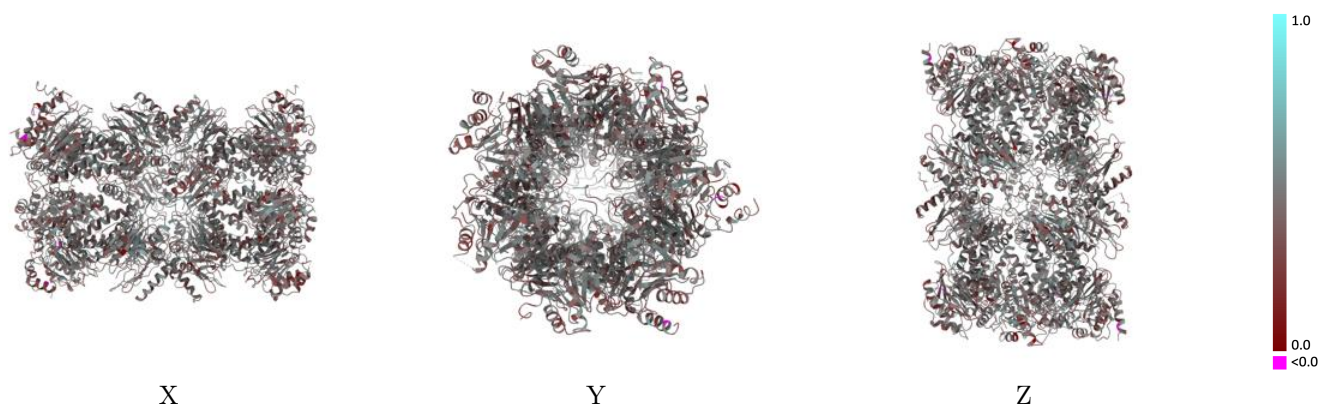
This section contains information regarding the fit between EMDB map EMD-2981 and PDB model 5A0Q. Per-residue inclusion information can be found in section [3](#) on page [8](#).

9.1 Map-model overlay [i](#)



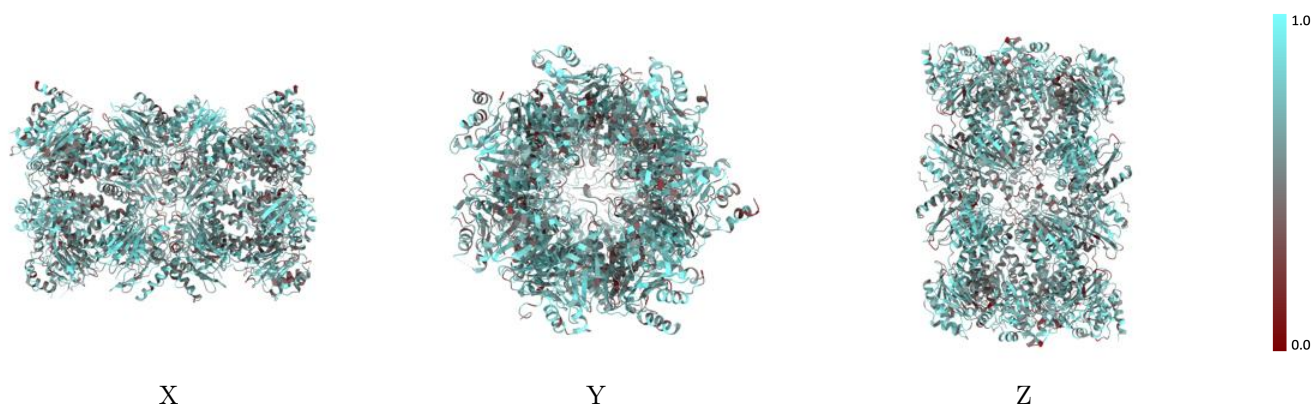
The images above show the 3D surface view of the map at the recommended contour level 3.2 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



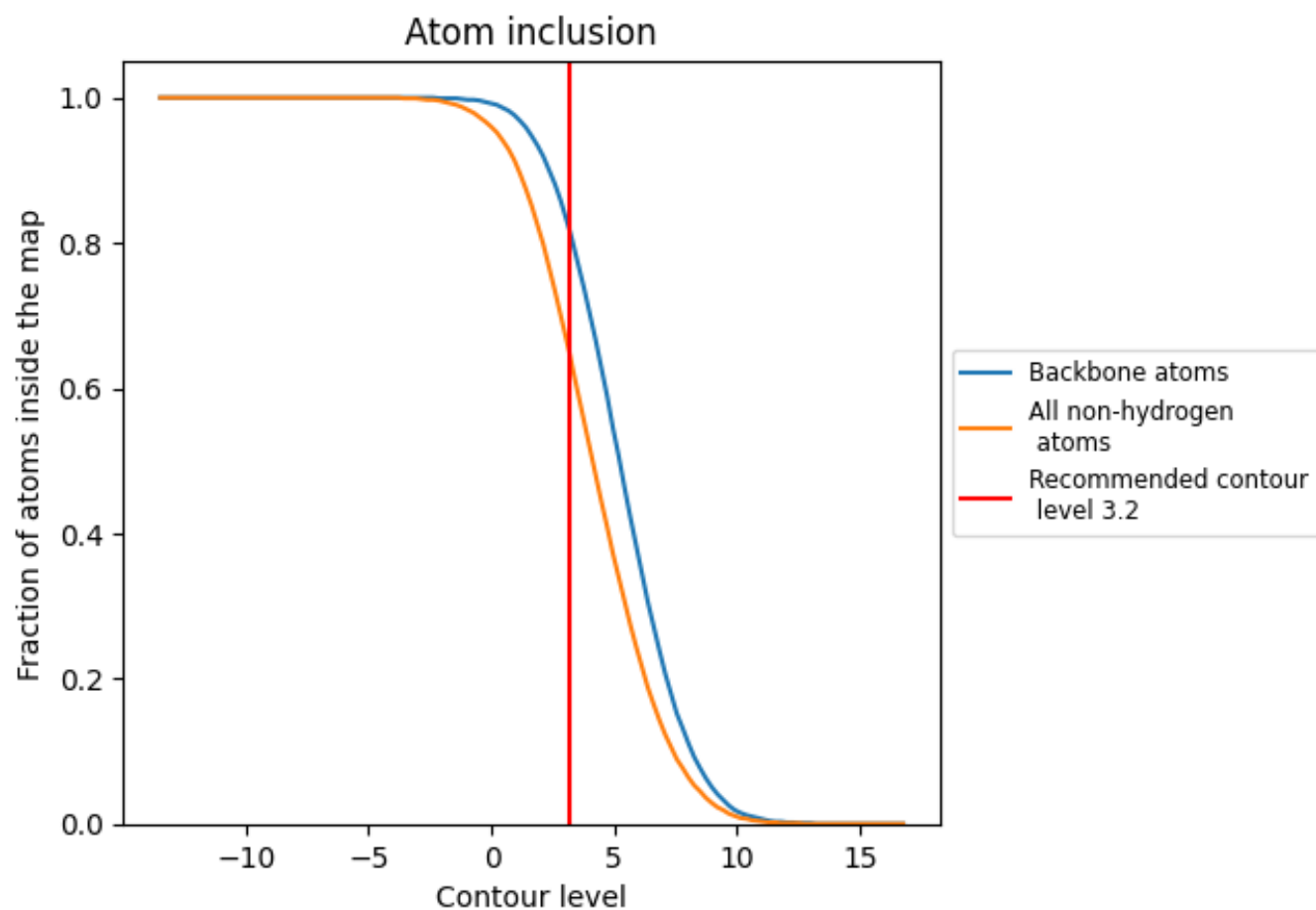
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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](#)



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 (3.2).



























































9.4 Atom inclusion [i](#)



At the recommended contour level, 82% of all backbone atoms, 64% 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 (3.2) and Q-score for the entire model and for each chain.

| Chain | Atom inclusion | Q-score |
|-------|--|--|
| All |  0.6450 |  0.4260 |
| A |  0.6340 |  0.4310 |
| B |  0.6690 |  0.4240 |
| C |  0.6450 |  0.4180 |
| D |  0.6260 |  0.4200 |
| E |  0.6460 |  0.4120 |
| F |  0.6400 |  0.4210 |
| G |  0.6330 |  0.4180 |
| H |  0.6440 |  0.4290 |
| I |  0.6710 |  0.4400 |
| J |  0.6060 |  0.4300 |
| K |  0.6340 |  0.4310 |
| L |  0.6980 |  0.4420 |
| M |  0.6280 |  0.4300 |
| N |  0.6470 |  0.4250 |
| O |  0.6350 |  0.4290 |
| P |  0.6690 |  0.4240 |
| Q |  0.6440 |  0.4210 |
| R |  0.6260 |  0.4170 |
| S |  0.6460 |  0.4120 |
| T |  0.6400 |  0.4250 |
| U |  0.6330 |  0.4150 |
| V |  0.6430 |  0.4320 |
| W |  0.6700 |  0.4400 |
| X |  0.6060 |  0.4290 |
| Y |  0.6350 |  0.4300 |
| Z |  0.6980 |  0.4420 |
| a |  0.6290 |  0.4250 |
| b |  0.6460 |  0.4270 |

