



Full wwPDB EM Validation Report ⓘ

Apr 20, 2026 – 01:47 pm BST

PDB ID : 9TZE / pdb_00009tze
EMDB ID : EMD-56466
Title : 70S Coxiella burnetii Ribosome with Doxycycline and HPFcold
Authors : Stuart, W.S.; Isupov, M.N.; Harmer, N.J.
Deposited on : 2026-01-22
Resolution : 2.48 Å(reported)
Based on initial model : .

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 : 1.8.4, CSD as541be (2020)
MolProbity : **FAILED**
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

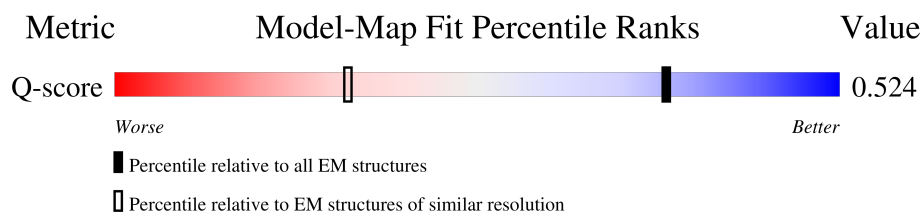
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 2.48 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 | EM structures (#Entries) | Similar EM resolution (#Entries, resolution range(Å)) |
|---------|-----------------------------|--|
| Q-score | 25397 | 6178 (1.98 - 2.98) |

MolProbity failed to run properly - the sequence quality summary graphics cannot be shown.

2 Entry composition

There are 58 unique types of molecules in this entry. The entry contains 142356 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 RNA chain called 16S ribosomal RNA.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-------|------|-------|------|---------|-------|
| 1 | A | 1535 | Total | C | N | O | P | 0 | 0 |
| | | | 32928 | 14693 | 6016 | 10684 | 1535 | | |

- Molecule 2 is a protein called Small ribosomal subunit protein uS3.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 2 | C | 206 | Total | C | N | O | S | 0 | 0 |
| | | | 1641 | 1037 | 314 | 286 | 4 | | |

- Molecule 3 is a protein called Small ribosomal subunit protein uS4.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 3 | D | 205 | Total | C | N | O | S | 0 | 0 |
| | | | 1659 | 1045 | 309 | 298 | 7 | | |

- Molecule 4 is a protein called Small ribosomal subunit protein uS5.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 4 | E | 158 | Total | C | N | O | S | 0 | 0 |
| | | | 1153 | 723 | 213 | 211 | 6 | | |

- Molecule 5 is a protein called Small ribosomal subunit protein bS6.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 5 | F | 106 | Total | C | N | O | S | 0 | 0 |
| | | | 867 | 545 | 159 | 158 | 5 | | |

- Molecule 6 is a protein called Small ribosomal subunit protein uS7.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 6 | G | 162 | Total | C | N | O | S | 0 | 0 |
| | | | 1291 | 808 | 254 | 224 | 5 | | |

- Molecule 7 is a protein called Small ribosomal subunit protein uS8.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 7 | H | 130 | Total | C | N | O | S | 0 | 0 |
| | | | 1017 | 634 | 182 | 194 | 7 | | |

- Molecule 8 is a protein called Small ribosomal subunit protein uS9.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 8 | I | 125 | Total | C | N | O | S | 0 | 0 |
| | | | 981 | 607 | 197 | 175 | 2 | | |

- Molecule 9 is a protein called Small ribosomal subunit protein uS10.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 9 | J | 102 | Total | C | N | O | S | 0 | 0 |
| | | | 828 | 517 | 157 | 153 | 1 | | |

- Molecule 10 is a protein called Small ribosomal subunit protein uS11.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 10 | K | 119 | Total | C | N | O | S | 0 | 0 |
| | | | 915 | 558 | 190 | 162 | 5 | | |

- Molecule 11 is a protein called Small ribosomal subunit protein uS12.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 11 | L | 123 | Total | C | N | O | S | 0 | 0 |
| | | | 958 | 586 | 204 | 166 | 2 | | |

- Molecule 12 is a protein called Small ribosomal subunit protein uS13.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 12 | M | 115 | Total | C | N | O | S | 0 | 0 |
| | | | 907 | 557 | 187 | 160 | 3 | | |

- Molecule 13 is a protein called Small ribosomal subunit protein uS14.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 13 | N | 98 | Total | C | N | O | S | 0 | 0 |
| | | | 800 | 496 | 167 | 132 | 5 | | |

- Molecule 14 is a protein called Small ribosomal subunit protein uS15.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 14 | O | 88 | Total | C | N | O | S | 0 | 0 |
| | | | 716 | 448 | 141 | 125 | 2 | | |

- Molecule 15 is a protein called Small ribosomal subunit protein bS16.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 15 | P | 106 | Total | C | N | O | S | 0 | 0 |
| | | | 865 | 542 | 174 | 146 | 3 | | |

- Molecule 16 is a protein called Small ribosomal subunit protein uS17.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 16 | Q | 83 | Total | C | N | O | S | 0 | 0 |
| | | | 669 | 415 | 131 | 119 | 4 | | |

- Molecule 17 is a protein called Small ribosomal subunit protein bS18.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 17 | R | 65 | Total | C | N | O | S | 0 | 0 |
| | | | 524 | 331 | 94 | 95 | 4 | | |

- Molecule 18 is a protein called Small ribosomal subunit protein uS19.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 18 | S | 84 | Total | C | N | O | S | 0 | 0 |
| | | | 668 | 419 | 131 | 114 | 4 | | |

- Molecule 19 is a protein called Small ribosomal subunit protein bS20.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 19 | T | 86 | Total | C | N | O | S | 0 | 0 |
| | | | 669 | 405 | 144 | 120 | | | |

- Molecule 20 is a protein called Small ribosomal subunit protein bS21.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|----|---|---------|-------|
| 20 | U | 68 | Total | C | N | O | S | 0 | 0 |
| | | | 565 | 354 | 111 | 97 | 3 | | |

- Molecule 21 is a protein called Coxiellaceae Large Subunit Peptide (CLaSP).

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|-----|-------|----------|-------|----|----|----|---------|-------|
| 21 | Z | 16 | Total | C | N | O | 0 | 0 |
| | | | 133 | 82 | 34 | 17 | | |

- Molecule 22 is a protein called Large ribosomal subunit protein bL33.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 22 | 0 | 68 | Total | C | N | O | S | 0 | 0 |
| | | | 550 | 349 | 99 | 99 | 3 | | |

- Molecule 23 is a protein called Large ribosomal subunit protein uL24.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---------|-------|
| 23 | 1 | 105 | Total | C | N | O | 0 | 0 |
| | | | 813 | 512 | 153 | 148 | | |

- Molecule 24 is a protein called Large ribosomal subunit protein uL18.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 24 | 2 | 116 | Total | C | N | O | S | 0 | 0 |
| | | | 913 | 566 | 188 | 157 | 2 | | |

- Molecule 25 is a protein called Large ribosomal subunit protein bL36.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 25 | 3 | 38 | Total | C | N | O | S | 0 | 0 |
| | | | 307 | 183 | 73 | 46 | 5 | | |

- Molecule 26 is a RNA chain called 5S ribosomal RNA.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|-----|---------|-------|
| 26 | b | 117 | Total | C | N | O | P | 0 | 0 |
| | | | 2488 | 1112 | 445 | 815 | 116 | | |

- Molecule 27 is a protein called Large ribosomal subunit protein bL19.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---------|-------|
| 27 | c | 113 | Total | C | N | O | 0 | 0 |
| | | | 919 | 573 | 184 | 162 | | |

- Molecule 28 is a protein called Large ribosomal subunit protein uL3.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 28 | d | 211 | Total | C | N | O | S | 0 | 0 |
| | | | 1596 | 995 | 298 | 298 | 5 | | |

- Molecule 29 is a protein called Large ribosomal subunit protein bL20.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 29 | e | 118 | Total | C | N | O | S | 0 | 0 |
| | | | 941 | 595 | 194 | 151 | 1 | | |

- Molecule 30 is a protein called Large ribosomal subunit protein uL5.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 30 | f | 182 | Total | C | N | O | S | 0 | 0 |
| | | | 1457 | 930 | 258 | 261 | 8 | | |

- Molecule 31 is a protein called Large ribosomal subunit protein uL6.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 31 | g | 174 | Total | C | N | O | S | 0 | 0 |
| | | | 1310 | 818 | 245 | 243 | 4 | | |

- Molecule 32 is a protein called Large ribosomal subunit protein bL21.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 32 | h | 104 | Total | C | N | O | S | 0 | 0 |
| | | | 813 | 511 | 150 | 148 | 4 | | |

- Molecule 33 is a protein called Large ribosomal subunit protein uL13.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 33 | i | 141 | Total | C | N | O | S | 0 | 0 |
| | | | 1108 | 707 | 206 | 193 | 2 | | |

- Molecule 34 is a protein called Large ribosomal subunit protein uL22.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 34 | j | 110 | Total | C | N | O | S | 0 | 0 |
| | | | 839 | 516 | 165 | 154 | 4 | | |

- Molecule 35 is a protein called Large ribosomal subunit protein uL15.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 35 | k | 143 | Total | C | N | O | S | 0 | 0 |
| | | | 1076 | 672 | 217 | 185 | 2 | | |

- Molecule 36 is a protein called Large ribosomal subunit protein bL17.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 36 | m | 119 | Total | C | N | O | S | 0 | 0 |
| | | | 967 | 605 | 195 | 162 | 5 | | |

- Molecule 37 is a protein called Large ribosomal subunit protein uL2.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 37 | o | 274 | Total | C | N | O | S | 0 | 0 |
| | | | 2131 | 1314 | 443 | 368 | 6 | | |

- Molecule 38 is a protein called Large ribosomal subunit protein bL9.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 38 | q | 45 | Total | C | N | O | S | 0 | 0 |
| | | | 339 | 221 | 59 | 58 | 1 | | |

- Molecule 39 is a protein called Large ribosomal subunit protein uL29.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|----|---|---------|-------|
| 39 | r | 63 | Total | C | N | O | S | 0 | 0 |
| | | | 522 | 324 | 106 | 91 | 1 | | |

- Molecule 40 is a protein called Large ribosomal subunit protein uL16.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 40 | s | 137 | Total | C | N | O | S | 0 | 0 |
| | | | 1090 | 688 | 215 | 182 | 5 | | |

- Molecule 41 is a protein called Large ribosomal subunit protein uL30.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 41 | t | 56 | Total | C | N | O | S | 0 | 0 |
| | | | 449 | 281 | 86 | 78 | 4 | | |

- Molecule 42 is a protein called Large ribosomal subunit protein bL25.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 42 | u | 191 | Total | C | N | O | S | 0 | 0 |
| | | | 1486 | 940 | 260 | 281 | 5 | | |

- Molecule 43 is a protein called Large ribosomal subunit protein bL32.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 43 | v | 54 | Total | C | N | O | S | 0 | 0 |
| | | | 436 | 263 | 95 | 76 | 2 | | |

- Molecule 44 is a protein called Large ribosomal subunit protein uL4.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 44 | w | 205 | Total | C | N | O | S | 0 | 0 |
| | | | 1571 | 974 | 296 | 296 | 5 | | |

- Molecule 45 is a protein called Large ribosomal subunit protein uL14.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 45 | x | 122 | Total | C | N | O | S | 0 | 0 |
| | | | 948 | 594 | 184 | 165 | 5 | | |

- Molecule 46 is a protein called Large ribosomal subunit protein bL34.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 46 | y | 44 | Total | C | N | O | S | 0 | 0 |
| | | | 374 | 224 | 91 | 57 | 2 | | |

- Molecule 47 is a protein called Large ribosomal subunit protein bL35.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|----|---|---------|-------|
| 47 | z | 62 | Total | C | N | O | S | 0 | 0 |
| | | | 500 | 308 | 110 | 80 | 2 | | |

- Molecule 48 is a protein called Large ribosomal subunit protein bL31.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|-----|-------|----------|-------|----|----|----|---------|-------|
| 48 | 4 | 10 | Total | C | N | O | 0 | 0 |
| | | | 93 | 61 | 19 | 13 | | |

- Molecule 49 is a protein called Ribosome hibernation promoting factor.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 49 | 9 | 175 | Total | C | N | O | S | 0 | 0 |
| | | | 1412 | 892 | 253 | 262 | 5 | | |

- Molecule 50 is a protein called Large ribosomal subunit protein bL27.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 50 | 8 | 77 | Total | C | N | O | S | 0 | 0 |
| | | | 613 | 381 | 124 | 105 | 3 | | |

- Molecule 51 is a protein called Large ribosomal subunit protein uL23.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 51 | 7 | 91 | Total | C | N | O | S | 0 | 0 |
| | | | 732 | 464 | 135 | 130 | 3 | | |

- Molecule 52 is a protein called Large ribosomal subunit protein bL28.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 52 | 6 | 77 | Total | C | N | O | S | 0 | 0 |
| | | | 631 | 395 | 128 | 106 | 2 | | |

- Molecule 53 is a RNA chain called 23S ribosomal RNA.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-------|-------|-------|------|---------|-------|
| 53 | a | 2873 | Total | C | N | O | P | 3 | 0 |
| | | | 61677 | 27530 | 11292 | 19979 | 2876 | | |

- Molecule 54 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

| Mol | Chain | Residues | Atoms | | AltConf |
|-----|-------|----------|-------|-----|---------|
| 54 | A | 52 | Total | Mg | 0 |
| | | | 52 | 52 | |
| 54 | b | 1 | Total | Mg | 0 |
| | | | 1 | 1 | |
| 54 | d | 1 | Total | Mg | 0 |
| | | | 1 | 1 | |
| 54 | o | 1 | Total | Mg | 0 |
| | | | 1 | 1 | |
| 54 | 9 | 1 | Total | Mg | 0 |
| | | | 1 | 1 | |
| 54 | a | 164 | Total | Mg | 0 |
| | | | 164 | 164 | |

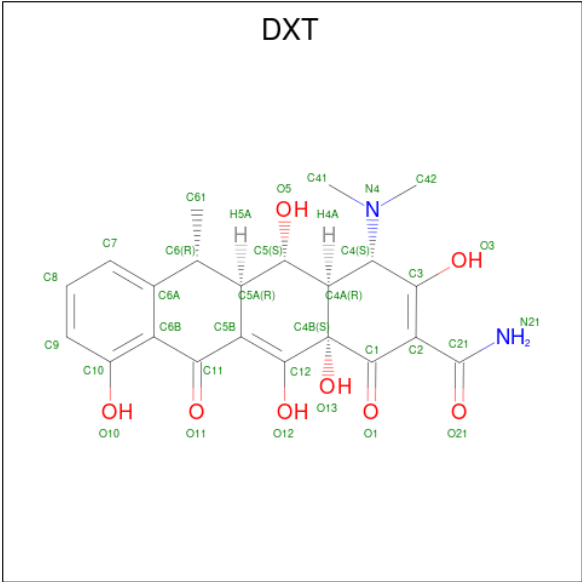
- Molecule 55 is POTASSIUM ION (CCD ID: K) (formula: K).

| Mol | Chain | Residues | Atoms | | AltConf |
|-----|-------|----------|--------------|----------|---------|
| 55 | A | 34 | Total 34 | K 34 | 0 |
| 55 | b | 1 | Total 1 | K 1 | 0 |
| 55 | d | 1 | Total 1 | K 1 | 0 |
| 55 | o | 1 | Total 1 | K 1 | 0 |
| 55 | s | 1 | Total 1 | K 1 | 0 |
| 55 | v | 1 | Total 1 | K 1 | 0 |
| 55 | w | 1 | Total 1 | K 1 | 0 |
| 55 | a | 127 | Total 127 | K 127 | 0 |

- Molecule 56 is ZINC ION (CCD ID: ZN) (formula: Zn).

| Mol | Chain | Residues | Atoms | | AltConf |
|-----|-------|----------|------------|---------|---------|
| 56 | N | 1 | Total 1 | Zn 1 | 0 |
| 56 | R | 1 | Total 1 | Zn 1 | 0 |
| 56 | 3 | 1 | Total 1 | Zn 1 | 0 |

- Molecule 57 is (4S,4AR,5S,5AR,6R,12AS)-4-(DIMETHYLAMINO)-3,5,10,12,12A-PENTAHYDROXY-6-METHYL-1,11-DIOXO-1,4,4A,5,5A,6,11,12A-OCTAHYDROTETRACENE-2-CARBOXAMIDE (CCD ID: DXT) (formula: C₂₂H₂₄N₂O₈) (labeled as "Ligand of Interest" by depositor).



| Mol | Chain | Residues | Atoms | | | | AltConf |
|-----|-------|----------|-------|----|---|---|---------|
| 57 | a | 1 | Total | C | N | O | 0 |
| | | | 32 | 22 | 2 | 8 | |
| 57 | a | 1 | Total | C | N | O | 0 |
| | | | 32 | 22 | 2 | 8 | |
| 57 | a | 1 | Total | C | N | O | 0 |
| | | | 32 | 22 | 2 | 8 | |

- Molecule 58 is water.

| Mol | Chain | Residues | Atoms | | AltConf |
|-----|-------|----------|-------|---|---------|
| 58 | A | 6 | Total | O | 0 |
| | | | 6 | 6 | |
| 58 | K | 1 | Total | O | 0 |
| | | | 1 | 1 | |
| 58 | M | 1 | Total | O | 0 |
| | | | 1 | 1 | |
| 58 | a | 7 | Total | O | 0 |
| | | | 7 | 7 | |

MolProbity failed to run properly - this section is therefore empty.

3 Experimental information

| Property | Value | Source |
|--------------------------------------|---|-----------|
| EM reconstruction method | SINGLE PARTICLE | Depositor |
| Imposed symmetry | POINT, Not provided | |
| Number of particles used | 44196 | 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 ($e^-/\text{\AA}^2$) | 45 | Depositor |
| Minimum defocus (nm) | 800 | Depositor |
| Maximum defocus (nm) | 2000 | Depositor |
| Magnification | 81000 | Depositor |
| Image detector | GATAN K3 (6k x 4k) | Depositor |
| Maximum map value | 0.467 | Depositor |
| Minimum map value | -0.127 | Depositor |
| Average map value | 0.002 | Depositor |
| Map value standard deviation | 0.018 | Depositor |
| Recommended contour level | 0.078 | Depositor |
| Map size (Å) | 423.99997, 423.99997, 423.99997 | wwPDB |
| Map dimensions | 400, 400, 400 | wwPDB |
| Map angles (°) | 90.0, 90.0, 90.0 | wwPDB |
| Pixel spacing (Å) | 1.06, 1.06, 1.06 | Depositor |

4 Model quality [i](#)

4.1 Standard geometry [i](#)

MolProbity failed to run properly - this section is therefore empty.

4.2 Too-close contacts [i](#)

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4.3 Torsion angles [i](#)

4.3.1 Protein backbone [i](#)

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4.3.2 Protein sidechains [i](#)

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4.3.3 RNA [i](#)

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4.4 Non-standard residues in protein, DNA, RNA chains [i](#)

17 non-standard protein/DNA/RNA residues 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 | $\# Z > 2$ |
| 1 | 4OC | A | 1399 | 1 | 20,23,24 | 0.89 | 1 (5%) | 26,32,35 | 1.26 | 4 (15%) |
| 53 | PSU | a | 1933 | 53 | 18,21,22 | 1.44 | 3 (16%) | 22,30,33 | 1.85 | 5 (22%) |
| 1 | UR3 | A | 1495 | 1 | 19,22,23 | 1.26 | 3 (15%) | 26,32,35 | 1.76 | 6 (23%) |

| Mol | Type | Chain | Res | Link | Bond lengths | | | Bond angles | | |
|-----|------|-------|------|-------|--------------|------|----------|-------------|------|----------|
| | | | | | Counts | RMSZ | # Z > 2 | Counts | RMSZ | # Z > 2 |
| 53 | PSU | a | 2520 | 55,53 | 18,21,22 | 1.86 | 4 (22%) | 22,30,33 | 3.28 | 6 (27%) |
| 1 | MA6 | A | 1515 | 1 | 23,26,27 | 1.57 | 5 (21%) | 34,38,41 | 2.15 | 11 (32%) |
| 1 | 2MG | A | 962 | 1 | 23,26,27 | 1.25 | 2 (8%) | 32,38,41 | 2.37 | 8 (25%) |
| 53 | OMU | a | 2568 | 53,54 | 19,22,23 | 1.20 | 2 (10%) | 26,31,34 | 1.84 | 6 (23%) |
| 53 | PSU | a | 2621 | 53 | 18,21,22 | 1.41 | 3 (16%) | 22,30,33 | 1.87 | 5 (22%) |
| 53 | 2MA | a | 2519 | 53,54 | 22,25,26 | 1.55 | 4 (18%) | 33,37,40 | 2.12 | 8 (24%) |
| 1 | MA6 | A | 1516 | 1 | 23,26,27 | 1.66 | 4 (17%) | 34,38,41 | 2.23 | 11 (32%) |
| 1 | 5MC | A | 963 | 1 | 18,22,23 | 1.05 | 1 (5%) | 26,32,35 | 1.31 | 4 (15%) |
| 1 | G7M | A | 524 | 1 | 23,26,27 | 2.33 | 5 (21%) | 35,39,42 | 2.99 | 10 (28%) |
| 53 | PSU | a | 2596 | 55,53 | 18,21,22 | 1.49 | 2 (11%) | 22,30,33 | 1.81 | 5 (22%) |
| 53 | PSU | a | 961 | 53 | 18,21,22 | 1.41 | 3 (16%) | 22,30,33 | 1.88 | 4 (18%) |
| 53 | OMG | a | 2267 | 55,53 | 23,26,27 | 1.21 | 3 (13%) | 33,38,41 | 2.08 | 9 (27%) |
| 53 | PSU | a | 1927 | 53 | 18,21,22 | 1.44 | 2 (11%) | 22,30,33 | 1.77 | 4 (18%) |
| 1 | 2MG | A | 1513 | 1 | 23,26,27 | 1.26 | 3 (13%) | 32,38,41 | 2.37 | 9 (28%) |

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 |
|-----|------|-------|------|-------|---------|------------|---------|
| 1 | 4OC | A | 1399 | 1 | - | 0/9/29/30 | 0/2/2/2 |
| 53 | PSU | a | 1933 | 53 | - | 0/7/25/26 | 0/2/2/2 |
| 1 | UR3 | A | 1495 | 1 | - | 0/7/25/26 | 0/2/2/2 |
| 53 | PSU | a | 2520 | 55,53 | - | 0/7/25/26 | 0/2/2/2 |
| 1 | MA6 | A | 1515 | 1 | - | 3/11/29/30 | 0/3/3/3 |
| 1 | 2MG | A | 962 | 1 | - | 3/9/27/28 | 0/3/3/3 |
| 53 | OMU | a | 2568 | 53,54 | - | 0/9/27/28 | 0/2/2/2 |
| 53 | PSU | a | 2621 | 53 | - | 2/7/25/26 | 0/2/2/2 |
| 53 | 2MA | a | 2519 | 53,54 | - | 2/7/25/26 | 0/3/3/3 |
| 1 | MA6 | A | 1516 | 1 | - | 6/11/29/30 | 0/3/3/3 |
| 1 | 5MC | A | 963 | 1 | - | 2/7/25/26 | 0/2/2/2 |
| 1 | G7M | A | 524 | 1 | - | 3/7/25/26 | 0/3/3/3 |
| 53 | PSU | a | 2596 | 55,53 | - | 0/7/25/26 | 0/2/2/2 |
| 53 | PSU | a | 961 | 53 | - | 0/7/25/26 | 0/2/2/2 |
| 53 | OMG | a | 2267 | 55,53 | - | 1/9/27/28 | 0/3/3/3 |
| 53 | PSU | a | 1927 | 53 | - | 0/7/25/26 | 0/2/2/2 |
| 1 | 2MG | A | 1513 | 1 | - | 2/9/27/28 | 0/3/3/3 |

All (50) bond length outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed(Å) | Ideal(Å) |
|-----|-------|------|------|-------|-------|-------------|----------|
| 1 | A | 524 | G7M | C8-N7 | 7.30 | 1.46 | 1.33 |
| 53 | a | 2520 | PSU | O2-C2 | 5.37 | 1.34 | 1.23 |
| 1 | A | 1516 | MA6 | C5-C4 | 4.91 | 1.48 | 1.39 |
| 1 | A | 1515 | MA6 | C5-C4 | 4.83 | 1.48 | 1.39 |
| 1 | A | 524 | G7M | C5-N7 | -4.82 | 1.33 | 1.39 |
| 53 | a | 1927 | PSU | C6-C5 | 4.70 | 1.40 | 1.35 |
| 53 | a | 1933 | PSU | C6-C5 | 4.53 | 1.40 | 1.35 |
| 53 | a | 2519 | 2MA | C5-C4 | 4.52 | 1.47 | 1.39 |
| 53 | a | 2596 | PSU | C6-C5 | 4.43 | 1.40 | 1.35 |
| 53 | a | 2621 | PSU | C6-C5 | 4.16 | 1.40 | 1.35 |
| 53 | a | 961 | PSU | C6-C5 | 4.15 | 1.40 | 1.35 |
| 1 | A | 524 | G7M | C8-N9 | 3.99 | 1.46 | 1.35 |
| 1 | A | 524 | G7M | C5-C4 | 3.66 | 1.47 | 1.38 |
| 53 | a | 2520 | PSU | C6-C5 | 3.42 | 1.39 | 1.35 |
| 1 | A | 1516 | MA6 | C5-C6 | 3.41 | 1.50 | 1.41 |
| 53 | a | 2267 | OMG | C5-C4 | 3.17 | 1.47 | 1.38 |
| 1 | A | 1495 | UR3 | C2-N1 | 3.16 | 1.43 | 1.38 |
| 1 | A | 1513 | 2MG | C5-C4 | 3.13 | 1.47 | 1.38 |
| 1 | A | 963 | 5MC | C6-C5 | 3.06 | 1.39 | 1.34 |
| 1 | A | 962 | 2MG | C5-C4 | 3.05 | 1.47 | 1.38 |
| 1 | A | 1515 | MA6 | C5-C6 | 3.04 | 1.49 | 1.41 |
| 53 | a | 2519 | 2MA | C5-C6 | 2.92 | 1.49 | 1.41 |
| 53 | a | 2596 | PSU | C4-N3 | -2.77 | 1.33 | 1.38 |
| 53 | a | 2568 | OMU | C2-N1 | 2.75 | 1.42 | 1.38 |
| 1 | A | 1516 | MA6 | C8-N7 | 2.64 | 1.36 | 1.31 |
| 53 | a | 2519 | 2MA | C8-N7 | 2.45 | 1.36 | 1.31 |
| 1 | A | 524 | G7M | C6-N1 | -2.44 | 1.34 | 1.38 |
| 1 | A | 1515 | MA6 | C8-N7 | 2.42 | 1.36 | 1.31 |
| 1 | A | 1513 | 2MG | C2-N3 | 2.37 | 1.36 | 1.31 |
| 1 | A | 962 | 2MG | C2-N3 | 2.35 | 1.36 | 1.31 |
| 53 | a | 961 | PSU | C4-N3 | -2.34 | 1.34 | 1.38 |
| 53 | a | 2621 | PSU | C4-N3 | -2.33 | 1.34 | 1.38 |
| 53 | a | 2520 | PSU | C2-N1 | -2.32 | 1.33 | 1.36 |
| 53 | a | 2520 | PSU | C4-C5 | 2.26 | 1.50 | 1.44 |
| 1 | A | 1516 | MA6 | C5-N7 | -2.24 | 1.34 | 1.39 |
| 53 | a | 2519 | 2MA | C5-N7 | -2.21 | 1.34 | 1.39 |
| 53 | a | 2621 | PSU | C4-C5 | 2.20 | 1.50 | 1.44 |
| 53 | a | 2568 | OMU | C4-N3 | -2.15 | 1.34 | 1.38 |
| 53 | a | 1927 | PSU | C4-C5 | 2.14 | 1.50 | 1.44 |
| 53 | a | 2267 | OMG | C5-N7 | -2.14 | 1.34 | 1.39 |
| 53 | a | 2267 | OMG | C6-N1 | -2.12 | 1.34 | 1.38 |
| 53 | a | 1933 | PSU | C4-C5 | 2.12 | 1.50 | 1.44 |

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| Mol | Chain | Res | Type | Atoms | Z | Observed(Å) | Ideal(Å) |
|-----|-------|------|------|-------|-------|-------------|----------|
| 53 | a | 1933 | PSU | C4-N3 | -2.07 | 1.35 | 1.38 |
| 1 | A | 1495 | UR3 | C6-C5 | 2.06 | 1.39 | 1.35 |
| 53 | a | 961 | PSU | C4-C5 | 2.05 | 1.50 | 1.44 |
| 1 | A | 1495 | UR3 | C2-N3 | 2.05 | 1.43 | 1.39 |
| 1 | A | 1515 | MA6 | C5-N7 | -2.05 | 1.35 | 1.39 |
| 1 | A | 1399 | 4OC | C4-N3 | 2.04 | 1.36 | 1.32 |
| 1 | A | 1515 | MA6 | C4-N9 | -2.04 | 1.33 | 1.37 |
| 1 | A | 1513 | 2MG | C5-N7 | -2.00 | 1.35 | 1.39 |

All (115) bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed(°) | Ideal(°) |
|-----|-------|------|------|-----------|--------|-------------|----------|
| 53 | a | 2520 | PSU | O2-C2-N1 | -12.02 | 109.55 | 122.79 |
| 1 | A | 1513 | 2MG | C2-N3-C4 | 7.90 | 121.83 | 112.04 |
| 1 | A | 962 | 2MG | C2-N3-C4 | 7.85 | 121.78 | 112.04 |
| 1 | A | 524 | G7M | CN7-N7-C8 | -7.67 | 113.00 | 124.84 |
| 53 | a | 2519 | 2MA | C5-C4-N3 | -7.18 | 119.11 | 127.19 |
| 1 | A | 524 | G7M | N9-C8-N7 | -6.67 | 95.71 | 112.21 |
| 1 | A | 524 | G7M | N9-C4-N3 | 6.62 | 139.22 | 125.94 |
| 1 | A | 524 | G7M | C8-N7-C5 | 6.61 | 116.05 | 107.78 |
| 53 | a | 2520 | PSU | O2-C2-N3 | 6.59 | 134.24 | 121.82 |
| 53 | a | 2267 | OMG | C5-C4-N3 | -6.08 | 118.59 | 128.46 |
| 53 | a | 961 | PSU | N1-C2-N3 | 5.81 | 121.72 | 115.13 |
| 1 | A | 1513 | 2MG | C5-C4-N3 | -5.81 | 119.04 | 128.46 |
| 1 | A | 1495 | UR3 | C4-N3-C2 | -5.78 | 119.12 | 124.56 |
| 53 | a | 1933 | PSU | N1-C2-N3 | 5.65 | 121.53 | 115.13 |
| 53 | a | 2519 | 2MA | N3-C4-N9 | 5.58 | 134.74 | 126.99 |
| 1 | A | 1516 | MA6 | C5-C4-N3 | -5.58 | 119.47 | 126.75 |
| 53 | a | 2621 | PSU | N1-C2-N3 | 5.56 | 121.43 | 115.13 |
| 1 | A | 962 | 2MG | C5-C4-N3 | -5.53 | 119.48 | 128.46 |
| 1 | A | 524 | G7M | C5-C4-N3 | -5.52 | 117.57 | 128.15 |
| 53 | a | 1927 | PSU | N1-C2-N3 | 5.40 | 121.24 | 115.13 |
| 1 | A | 1515 | MA6 | C5-C4-N3 | -5.21 | 119.96 | 126.75 |
| 53 | a | 2267 | OMG | C2-N3-C4 | 5.12 | 121.43 | 112.30 |
| 53 | a | 2596 | PSU | N1-C2-N3 | 5.10 | 120.91 | 115.13 |
| 1 | A | 1515 | MA6 | C2-N1-C6 | 4.92 | 123.36 | 111.75 |
| 1 | A | 1516 | MA6 | C4-C5-N7 | -4.78 | 104.80 | 110.62 |
| 53 | a | 2520 | PSU | C6-C5-C4 | -4.71 | 114.91 | 118.20 |
| 1 | A | 1516 | MA6 | C2-N1-C6 | 4.65 | 122.73 | 111.75 |
| 53 | a | 2267 | OMG | N9-C4-N3 | 4.51 | 134.99 | 125.94 |
| 1 | A | 524 | G7M | C8-N9-C4 | 4.30 | 118.05 | 107.16 |
| 1 | A | 524 | G7M | C2-N3-C4 | 4.28 | 119.92 | 112.30 |

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| Mol | Chain | Res | Type | Atoms | Z | Observed(°) | Ideal(°) |
|-----|-------|------|------|-------------|-------|-------------|----------|
| 53 | a | 2568 | OMU | C4-N3-C2 | -4.20 | 121.05 | 126.58 |
| 1 | A | 524 | G7M | C1'-N9-C8 | -4.13 | 112.81 | 126.74 |
| 1 | A | 962 | 2MG | C6-C5-N7 | 4.01 | 137.71 | 130.25 |
| 1 | A | 962 | 2MG | N9-C4-N3 | 4.00 | 133.96 | 125.94 |
| 53 | a | 2568 | OMU | N3-C2-N1 | 3.99 | 120.19 | 114.89 |
| 1 | A | 1515 | MA6 | N1-C2-N3 | -3.95 | 122.42 | 128.60 |
| 1 | A | 1513 | 2MG | C6-C5-N7 | 3.91 | 137.52 | 130.25 |
| 1 | A | 1515 | MA6 | C2-N3-C4 | 3.89 | 120.95 | 111.75 |
| 1 | A | 1513 | 2MG | N9-C4-N3 | 3.87 | 133.72 | 125.94 |
| 53 | a | 2568 | OMU | C5-C4-N3 | 3.84 | 120.59 | 114.84 |
| 53 | a | 961 | PSU | C4-N3-C2 | -3.79 | 120.88 | 126.34 |
| 1 | A | 1515 | MA6 | N3-C4-N9 | 3.76 | 133.27 | 127.08 |
| 1 | A | 1516 | MA6 | C2-N3-C4 | 3.73 | 120.56 | 111.75 |
| 53 | a | 1933 | PSU | C4-N3-C2 | -3.66 | 121.07 | 126.34 |
| 53 | a | 2621 | PSU | C4-N3-C2 | -3.58 | 121.19 | 126.34 |
| 53 | a | 1927 | PSU | C4-N3-C2 | -3.51 | 121.29 | 126.34 |
| 1 | A | 1515 | MA6 | C4-C5-N7 | -3.43 | 106.44 | 110.62 |
| 53 | a | 2267 | OMG | C6-C5-N7 | 3.43 | 136.62 | 130.25 |
| 1 | A | 1516 | MA6 | C5-N7-C8 | 3.42 | 108.36 | 103.51 |
| 1 | A | 524 | G7M | CN7-N7-C5 | 3.37 | 130.95 | 126.77 |
| 53 | a | 2568 | OMU | C2'-C1'-N1 | -3.36 | 107.70 | 114.22 |
| 53 | a | 2519 | 2MA | C4-C5-N7 | -3.26 | 106.65 | 110.62 |
| 53 | a | 961 | PSU | O2-C2-N1 | -3.22 | 119.25 | 122.79 |
| 1 | A | 1516 | MA6 | N3-C4-N9 | 3.15 | 132.28 | 127.08 |
| 1 | A | 1516 | MA6 | C6-C5-N7 | 3.14 | 138.55 | 133.28 |
| 1 | A | 962 | 2MG | C2'-C1'-N9 | -3.13 | 104.35 | 113.22 |
| 53 | a | 2621 | PSU | O2-C2-N1 | -3.07 | 119.41 | 122.79 |
| 53 | a | 2596 | PSU | C3'-C2'-C1' | 3.02 | 105.16 | 101.64 |
| 53 | a | 2568 | OMU | O4-C4-C5 | -3.01 | 119.87 | 125.16 |
| 53 | a | 1933 | PSU | O2-C2-N1 | -2.98 | 119.52 | 122.79 |
| 53 | a | 2596 | PSU | C4-N3-C2 | -2.96 | 122.08 | 126.34 |
| 1 | A | 1513 | 2MG | C4-C5-N7 | -2.95 | 106.05 | 110.72 |
| 1 | A | 1516 | MA6 | N1-C2-N3 | -2.94 | 124.00 | 128.60 |
| 53 | a | 1927 | PSU | O2-C2-N1 | -2.94 | 119.56 | 122.79 |
| 1 | A | 963 | 5MC | O2-C2-N3 | -2.89 | 117.63 | 122.33 |
| 53 | a | 2621 | PSU | C6-C5-C4 | -2.87 | 116.19 | 118.20 |
| 1 | A | 1515 | MA6 | N1-C6-N6 | 2.87 | 120.22 | 117.08 |
| 1 | A | 1495 | UR3 | C3'-C2'-C1' | 2.85 | 106.85 | 101.43 |
| 53 | a | 2519 | 2MA | C2-N1-C6 | 2.81 | 122.46 | 118.08 |
| 53 | a | 2519 | 2MA | C5-N7-C8 | 2.80 | 107.48 | 103.51 |
| 53 | a | 1927 | PSU | C6-C5-C4 | -2.79 | 116.25 | 118.20 |
| 1 | A | 963 | 5MC | C5-C4-N3 | -2.77 | 118.69 | 121.67 |

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| Mol | Chain | Res | Type | Atoms | Z | Observed(°) | Ideal(°) |
|-----|-------|------|------|-------------|-------|-------------|----------|
| 1 | A | 962 | 2MG | C4-C5-N7 | -2.76 | 106.35 | 110.72 |
| 53 | a | 2519 | 2MA | C4-N9-C8 | 2.76 | 108.72 | 105.73 |
| 53 | a | 2520 | PSU | C6-N1-C2 | 2.74 | 125.49 | 122.68 |
| 53 | a | 2519 | 2MA | C6-C5-N7 | 2.72 | 137.09 | 132.02 |
| 1 | A | 1516 | MA6 | O4'-C1'-N9 | 2.72 | 113.42 | 108.06 |
| 53 | a | 2596 | PSU | O2-C2-N3 | -2.71 | 116.70 | 121.82 |
| 1 | A | 1399 | 4OC | O2-C2-N3 | -2.70 | 117.94 | 122.33 |
| 1 | A | 524 | G7M | O6-C6-C5 | -2.68 | 122.02 | 128.06 |
| 53 | a | 2568 | OMU | O4'-C1'-N1 | 2.68 | 114.48 | 108.36 |
| 53 | a | 2596 | PSU | C6-C5-C4 | -2.65 | 116.35 | 118.20 |
| 1 | A | 1513 | 2MG | C2'-C1'-N9 | -2.63 | 105.76 | 113.22 |
| 53 | a | 2267 | OMG | C4-C5-N7 | -2.63 | 106.57 | 110.72 |
| 1 | A | 1495 | UR3 | C6-N1-C2 | -2.56 | 119.50 | 121.79 |
| 1 | A | 1515 | MA6 | C5-N7-C8 | 2.53 | 107.11 | 103.51 |
| 53 | a | 2267 | OMG | O2'-C2'-C1' | 2.49 | 113.93 | 109.08 |
| 53 | a | 2267 | OMG | C2'-C1'-N9 | -2.45 | 109.46 | 114.22 |
| 1 | A | 1515 | MA6 | C6-C5-N7 | 2.36 | 137.25 | 133.28 |
| 53 | a | 1933 | PSU | C3'-C2'-C1' | 2.36 | 104.38 | 101.64 |
| 53 | a | 961 | PSU | C6-C5-C4 | -2.32 | 116.57 | 118.20 |
| 1 | A | 962 | 2MG | O6-C6-C5 | -2.29 | 120.53 | 126.60 |
| 1 | A | 1399 | 4OC | O4'-C1'-N1 | 2.28 | 113.57 | 108.36 |
| 1 | A | 963 | 5MC | O4'-C1'-N1 | 2.28 | 113.57 | 108.36 |
| 1 | A | 1515 | MA6 | O4'-C1'-N9 | 2.25 | 112.50 | 108.06 |
| 53 | a | 1933 | PSU | C6-C5-C4 | -2.25 | 116.63 | 118.20 |
| 1 | A | 1513 | 2MG | CM2-N2-C2 | -2.24 | 118.91 | 123.86 |
| 53 | a | 2520 | PSU | C4-N3-C2 | -2.24 | 123.11 | 126.34 |
| 53 | a | 2267 | OMG | O6-C6-C5 | -2.22 | 120.71 | 126.60 |
| 1 | A | 1516 | MA6 | O4'-C4'-C5' | 2.21 | 116.64 | 109.37 |
| 53 | a | 2621 | PSU | C3'-C2'-C1' | 2.21 | 104.21 | 101.64 |
| 1 | A | 1495 | UR3 | C1'-N1-C2 | 2.21 | 120.71 | 116.99 |
| 1 | A | 1399 | 4OC | C2'-C1'-N1 | -2.19 | 109.97 | 114.22 |
| 1 | A | 1513 | 2MG | O6-C6-C5 | -2.19 | 120.80 | 126.60 |
| 1 | A | 1399 | 4OC | C5-C4-N4 | -2.15 | 118.23 | 122.61 |
| 1 | A | 1515 | MA6 | C4-N9-C8 | 2.15 | 108.06 | 105.73 |
| 1 | A | 962 | 2MG | C5-C6-N1 | 2.14 | 118.62 | 113.19 |
| 53 | a | 2519 | 2MA | N9-C8-N7 | -2.13 | 111.00 | 113.91 |
| 1 | A | 963 | 5MC | CM5-C5-C6 | -2.13 | 120.00 | 122.85 |
| 1 | A | 1516 | MA6 | C5-C4-N9 | 2.12 | 108.25 | 105.78 |
| 1 | A | 1495 | UR3 | O4'-C4'-C3' | 2.10 | 109.26 | 105.11 |
| 53 | a | 2267 | OMG | C5-C6-N1 | 2.09 | 118.49 | 113.19 |
| 1 | A | 1513 | 2MG | C5-C6-N1 | 2.07 | 118.44 | 113.19 |
| 53 | a | 2520 | PSU | C3'-C2'-C1' | 2.05 | 104.03 | 101.64 |

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| Mol | Chain | Res | Type | Atoms | Z | Observed(°) | Ideal(°) |
|-----|-------|------|------|----------|-------|-------------|----------|
| 1 | A | 1495 | UR3 | O4-C4-C5 | -2.00 | 118.35 | 124.37 |

There are no chirality outliers.

All (24) torsion outliers are listed below:

| Mol | Chain | Res | Type | Atoms |
|-----|-------|------|------|-----------------|
| 1 | A | 524 | G7M | C3'-C4'-C5'-O5' |
| 1 | A | 962 | 2MG | N1-C2-N2-CM2 |
| 1 | A | 962 | 2MG | N3-C2-N2-CM2 |
| 1 | A | 963 | 5MC | O4'-C4'-C5'-O5' |
| 1 | A | 1513 | 2MG | N1-C2-N2-CM2 |
| 1 | A | 1513 | 2MG | N3-C2-N2-CM2 |
| 1 | A | 1515 | MA6 | C5-C6-N6-C10 |
| 1 | A | 1516 | MA6 | C3'-C4'-C5'-O5' |
| 1 | A | 1516 | MA6 | C5-C6-N6-C10 |
| 1 | A | 1516 | MA6 | N1-C6-N6-C10 |
| 53 | a | 2267 | OMG | C1'-C2'-O2'-CM2 |
| 53 | a | 2621 | PSU | O4'-C1'-C5-C4 |
| 53 | a | 2621 | PSU | O4'-C1'-C5-C6 |
| 1 | A | 963 | 5MC | C3'-C4'-C5'-O5' |
| 53 | a | 2519 | 2MA | O4'-C4'-C5'-O5' |
| 1 | A | 1516 | MA6 | O4'-C4'-C5'-O5' |
| 1 | A | 1515 | MA6 | N1-C6-N6-C10 |
| 1 | A | 524 | G7M | C4'-C5'-O5'-P |
| 1 | A | 524 | G7M | O4'-C4'-C5'-O5' |
| 1 | A | 1515 | MA6 | C5-C6-N6-C9 |
| 53 | a | 2519 | 2MA | C3'-C4'-C5'-O5' |
| 1 | A | 1516 | MA6 | C4'-C5'-O5'-P |
| 1 | A | 1516 | MA6 | C5-C6-N6-C9 |
| 1 | A | 962 | 2MG | C4'-C5'-O5'-P |

There are no ring outliers.

No monomer is involved in short contacts.

4.5 Carbohydrates

There are no oligosaccharides in this entry.

4.6 Ligand geometry

Of 393 ligands modelled in this entry, 390 are monoatomic - leaving 3 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 |
| 57 | DXT | a | 3302 | 54 | 33,35,35 | 1.00 | 2 (6%) | 42,57,57 | 1.47 | 8 (19%) |
| 57 | DXT | a | 3303 | 54 | 33,35,35 | 1.31 | 3 (9%) | 42,57,57 | 1.20 | 5 (11%) |
| 57 | DXT | a | 3301 | 54 | 33,35,35 | 1.19 | 3 (9%) | 42,57,57 | 1.49 | 9 (21%) |

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 |
|-----|------|-------|------|------|---------|-----------|---------|
| 57 | DXT | a | 3302 | 54 | - | 8/8/74/74 | 0/4/4/4 |
| 57 | DXT | a | 3303 | 54 | - | 8/8/74/74 | 0/4/4/4 |
| 57 | DXT | a | 3301 | 54 | - | 6/8/74/74 | 0/4/4/4 |

All (8) bond length outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed(Å) | Ideal(Å) |
|-----|-------|------|------|---------|-------|-------------|----------|
| 57 | a | 3303 | DXT | C4B-C1 | -3.63 | 1.50 | 1.55 |
| 57 | a | 3303 | DXT | C4B-C12 | -3.62 | 1.48 | 1.52 |
| 57 | a | 3302 | DXT | C21-N21 | 3.33 | 1.42 | 1.33 |
| 57 | a | 3301 | DXT | C21-N21 | 3.31 | 1.42 | 1.33 |
| 57 | a | 3301 | DXT | C4B-C1 | -3.29 | 1.50 | 1.55 |
| 57 | a | 3303 | DXT | C21-N21 | 3.29 | 1.42 | 1.33 |
| 57 | a | 3302 | DXT | C4B-C1 | -2.31 | 1.52 | 1.55 |
| 57 | a | 3301 | DXT | C4B-C12 | -2.08 | 1.50 | 1.52 |

All (22) bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed(°) | Ideal(°) |
|-----|-------|------|------|-------------|-------|-------------|----------|
| 57 | a | 3301 | DXT | C11-C5B-C12 | -3.86 | 115.75 | 118.80 |

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| Mol | Chain | Res | Type | Atoms | Z | Observed(°) | Ideal(°) |
|-----|-------|------|------|-------------|-------|-------------|----------|
| 57 | a | 3303 | DXT | C1-C4B-C12 | -3.82 | 105.41 | 109.88 |
| 57 | a | 3302 | DXT | C10-C6B-C6A | 3.65 | 122.83 | 118.97 |
| 57 | a | 3302 | DXT | O11-C11-C6B | -3.64 | 115.10 | 121.99 |
| 57 | a | 3301 | DXT | C5A-C5-C4A | 3.24 | 116.03 | 110.62 |
| 57 | a | 3301 | DXT | O12-C12-C4B | 3.13 | 117.90 | 113.37 |
| 57 | a | 3301 | DXT | O21-C21-N21 | -2.87 | 116.18 | 122.88 |
| 57 | a | 3303 | DXT | C5A-C5-C4A | 2.79 | 115.28 | 110.62 |
| 57 | a | 3301 | DXT | C10-C6B-C6A | 2.76 | 121.89 | 118.97 |
| 57 | a | 3302 | DXT | O12-C12-C4B | 2.72 | 117.31 | 113.37 |
| 57 | a | 3302 | DXT | O12-C12-C5B | -2.71 | 120.18 | 123.90 |
| 57 | a | 3302 | DXT | C21-C2-C1 | -2.54 | 117.97 | 120.97 |
| 57 | a | 3301 | DXT | C4B-C4A-C5 | 2.33 | 112.43 | 110.59 |
| 57 | a | 3301 | DXT | O12-C12-C5B | -2.32 | 120.72 | 123.90 |
| 57 | a | 3303 | DXT | C10-C6B-C6A | 2.31 | 121.42 | 118.97 |
| 57 | a | 3302 | DXT | O3-C3-C2 | -2.20 | 119.10 | 122.96 |
| 57 | a | 3303 | DXT | O3-C3-C2 | -2.12 | 119.23 | 122.96 |
| 57 | a | 3302 | DXT | C10-C6B-C11 | -2.11 | 118.37 | 121.47 |
| 57 | a | 3303 | DXT | C4B-C4A-C5 | 2.11 | 112.26 | 110.59 |
| 57 | a | 3301 | DXT | C10-C6B-C11 | -2.04 | 118.47 | 121.47 |
| 57 | a | 3302 | DXT | C42-N4-C4 | -2.03 | 109.32 | 114.09 |
| 57 | a | 3301 | DXT | O3-C3-C2 | -2.02 | 119.41 | 122.96 |

There are no chirality outliers.

All (22) torsion outliers are listed below:

| Mol | Chain | Res | Type | Atoms |
|-----|-------|------|------|---------------|
| 57 | a | 3301 | DXT | C1-C2-C21-O21 |
| 57 | a | 3301 | DXT | C1-C2-C21-N21 |
| 57 | a | 3301 | DXT | C3-C2-C21-O21 |
| 57 | a | 3301 | DXT | C3-C2-C21-N21 |
| 57 | a | 3301 | DXT | C4A-C4-N4-C42 |
| 57 | a | 3302 | DXT | C1-C2-C21-O21 |
| 57 | a | 3302 | DXT | C1-C2-C21-N21 |
| 57 | a | 3302 | DXT | C3-C2-C21-O21 |
| 57 | a | 3302 | DXT | C3-C2-C21-N21 |
| 57 | a | 3302 | DXT | C3-C4-N4-C41 |
| 57 | a | 3302 | DXT | C3-C4-N4-C42 |
| 57 | a | 3303 | DXT | C1-C2-C21-O21 |
| 57 | a | 3303 | DXT | C1-C2-C21-N21 |
| 57 | a | 3303 | DXT | C3-C4-N4-C42 |
| 57 | a | 3303 | DXT | C4A-C4-N4-C41 |
| 57 | a | 3301 | DXT | C3-C4-N4-C41 |

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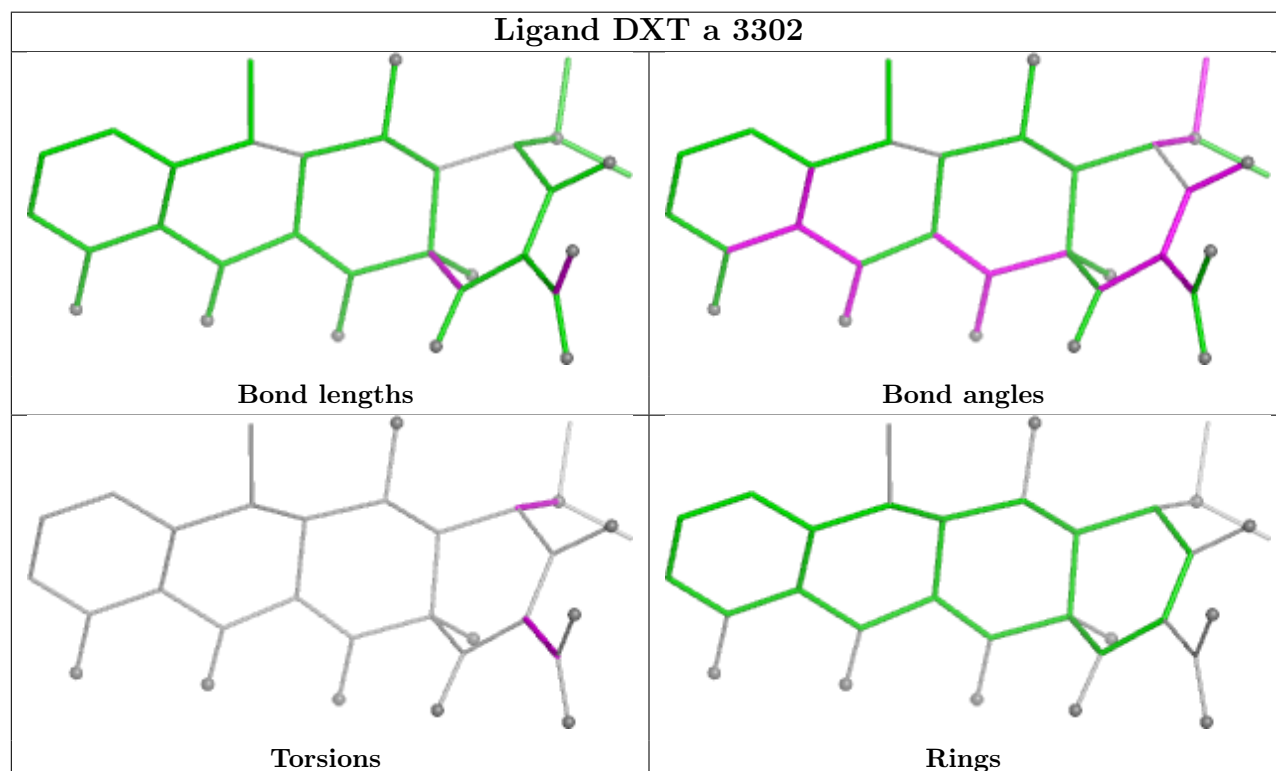
Continued from previous page...

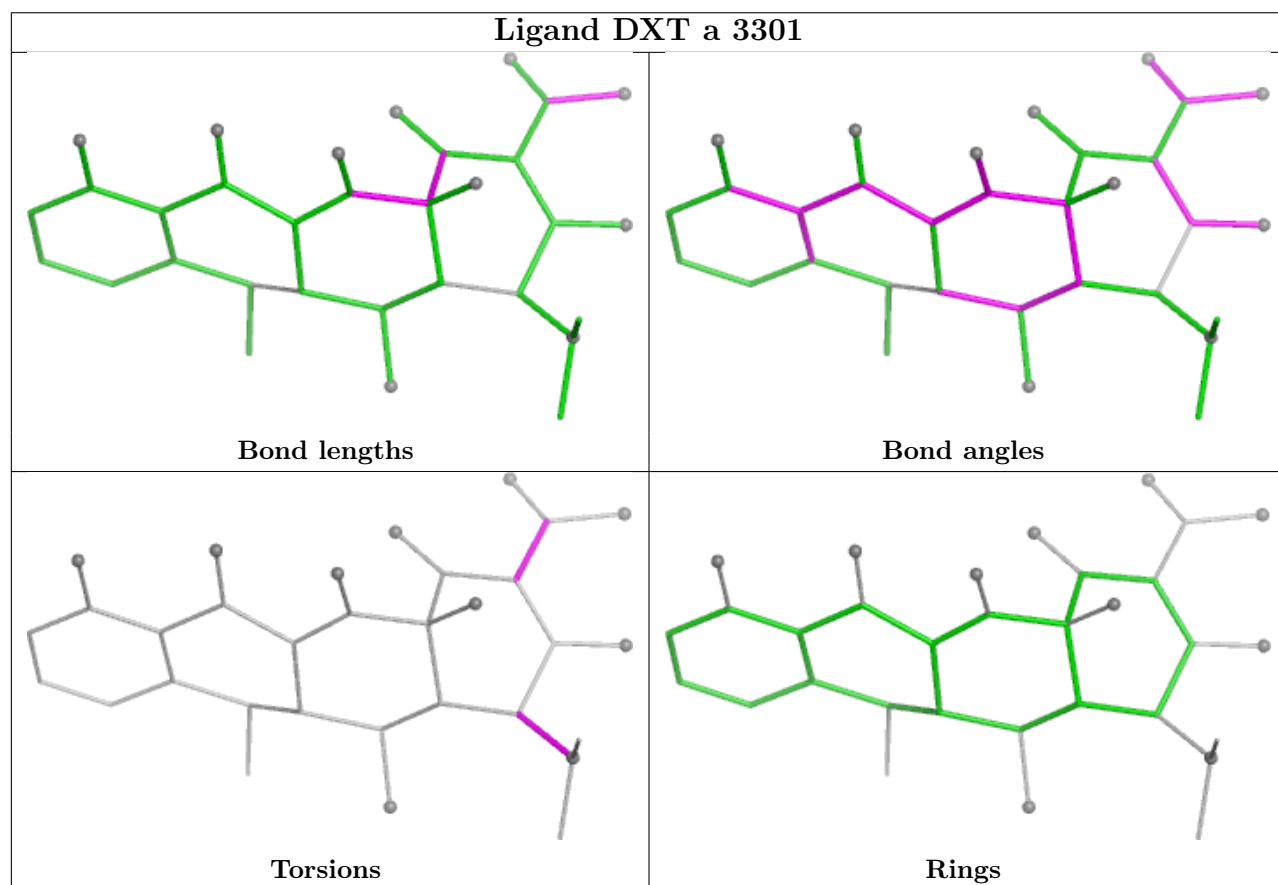
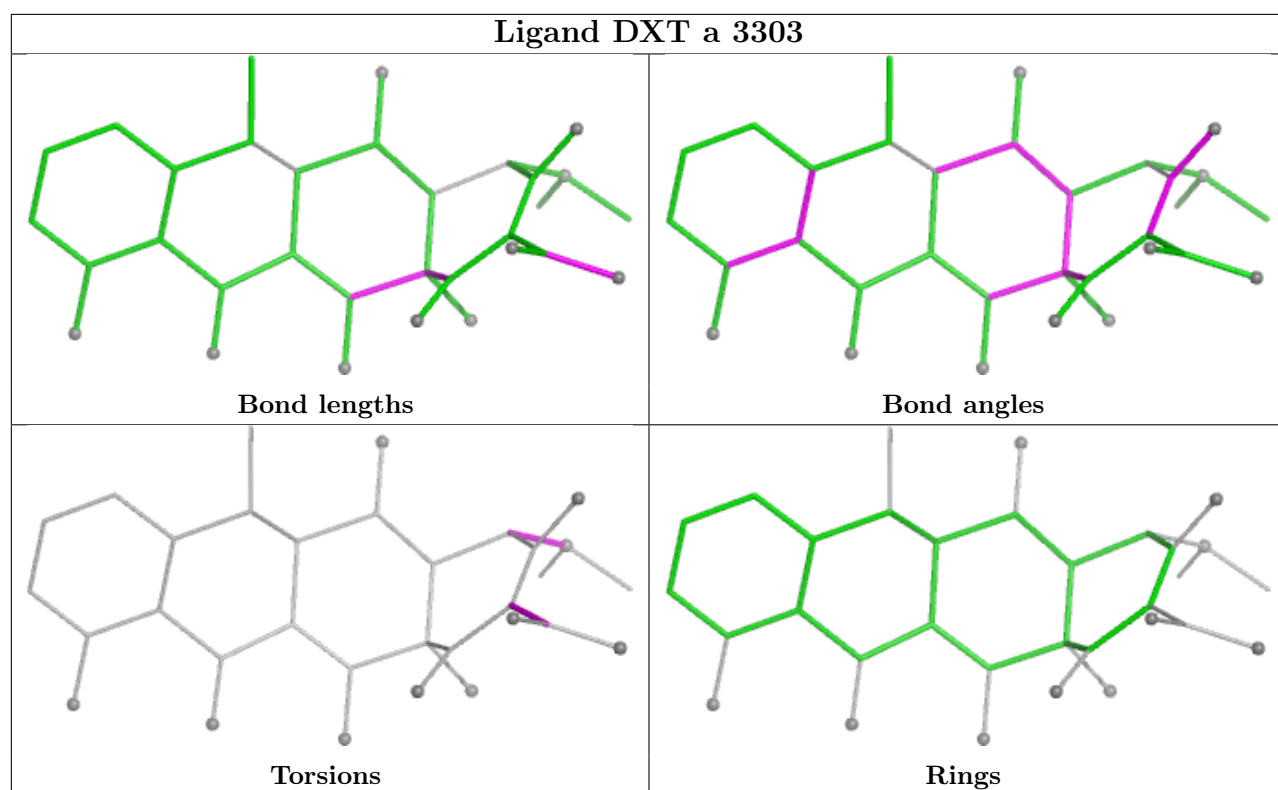
| Mol | Chain | Res | Type | Atoms |
|-----|-------|------|------|---------------|
| 57 | a | 3302 | DXT | C4A-C4-N4-C41 |
| 57 | a | 3302 | DXT | C4A-C4-N4-C42 |
| 57 | a | 3303 | DXT | C3-C4-N4-C41 |
| 57 | a | 3303 | DXT | C4A-C4-N4-C42 |
| 57 | a | 3303 | DXT | C3-C2-C21-N21 |
| 57 | a | 3303 | DXT | C3-C2-C21-O21 |

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.





4.7 Other polymers

There are no such residues in this entry.

4.8 Polymer linkage issues

There are no chain breaks in this entry.

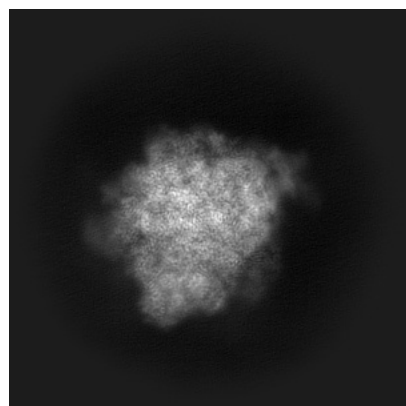
5 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-56466. These allow visual inspection of the internal detail of the map and identification of artifacts.

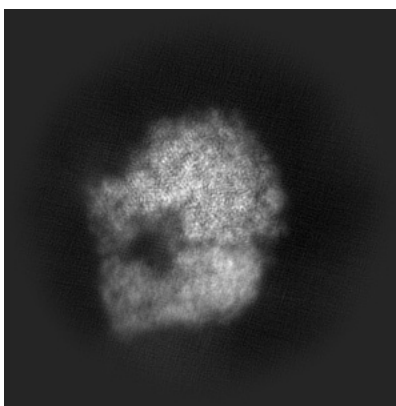
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

5.1 Orthogonal projections [i](#)

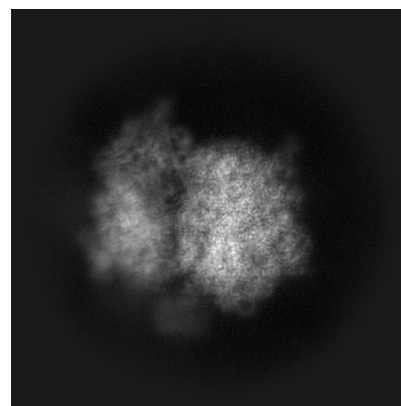
5.1.1 Primary map



X

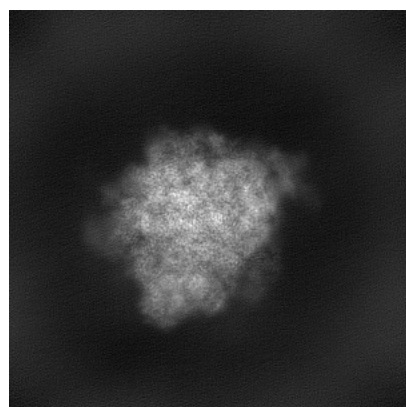


Y

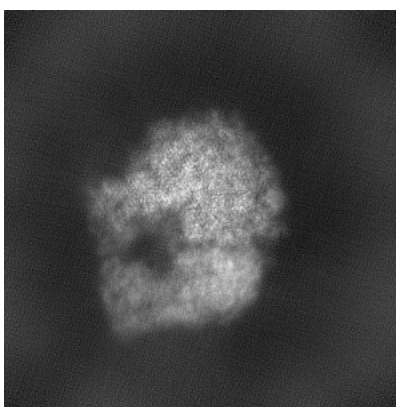


Z

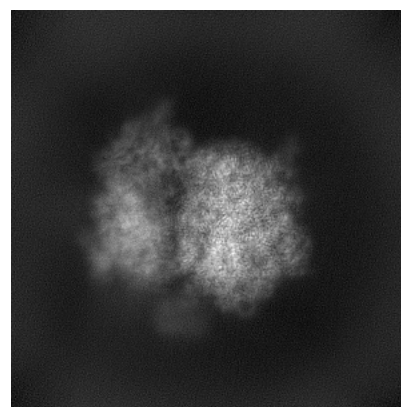
5.1.2 Raw map



X



Y

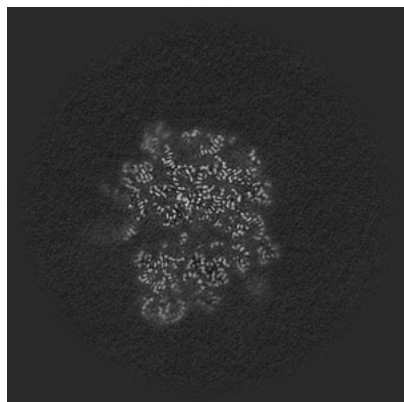


Z

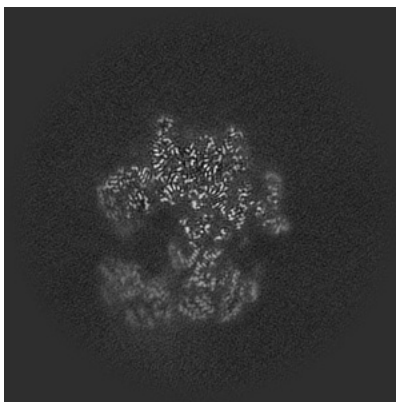
The images above show the map projected in three orthogonal directions.

5.2 Central slices [i](#)

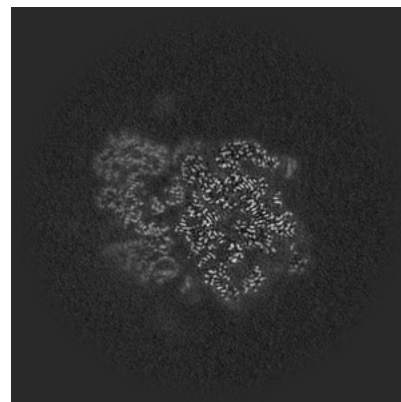
5.2.1 Primary map



X Index: 200

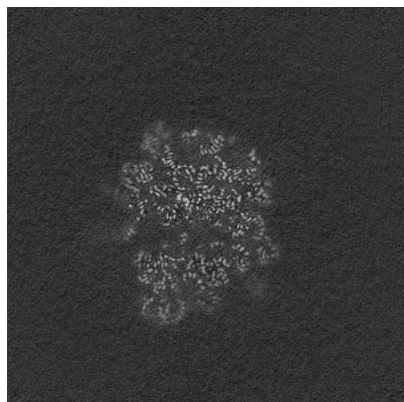


Y Index: 200

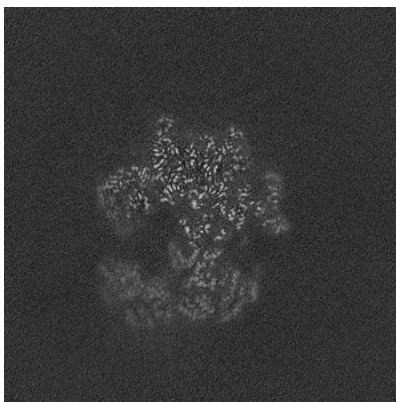


Z Index: 200

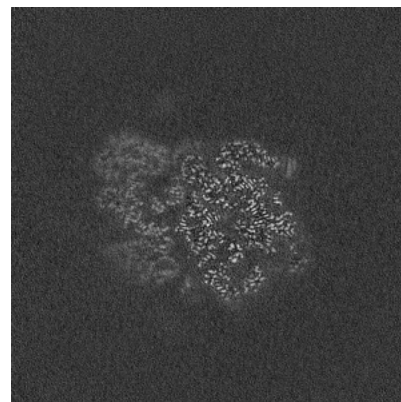
5.2.2 Raw map



X Index: 200



Y Index: 200

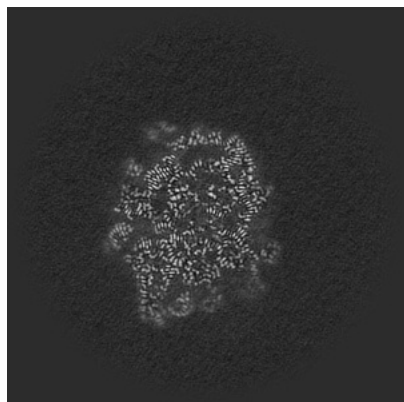


Z Index: 200

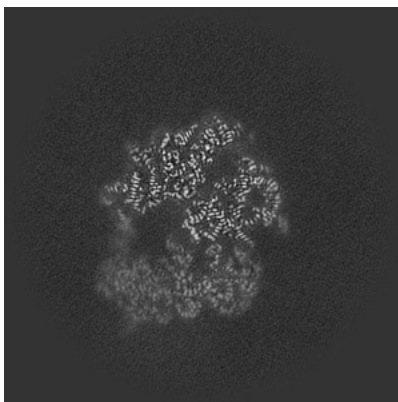
The images above show central slices of the map in three orthogonal directions.

5.3 Largest variance slices [i](#)

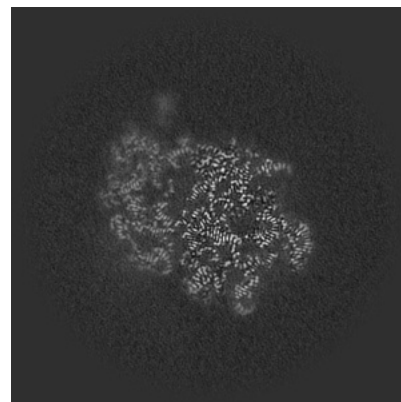
5.3.1 Primary map



X Index: 209

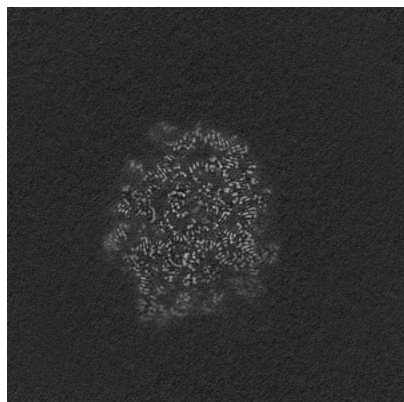


Y Index: 185

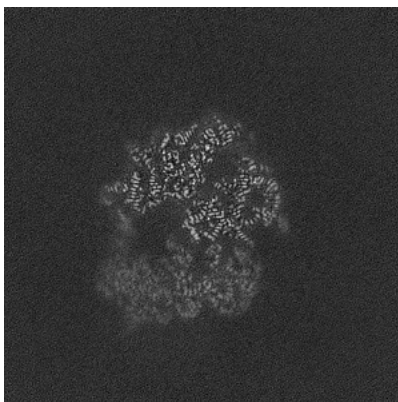


Z Index: 209

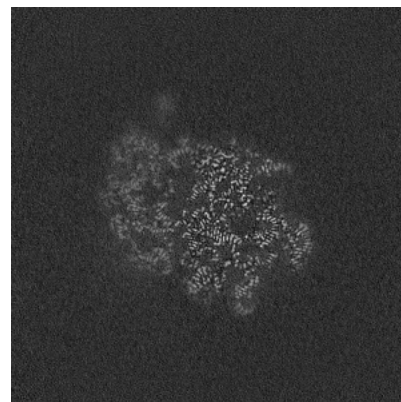
5.3.2 Raw map



X Index: 211



Y Index: 185

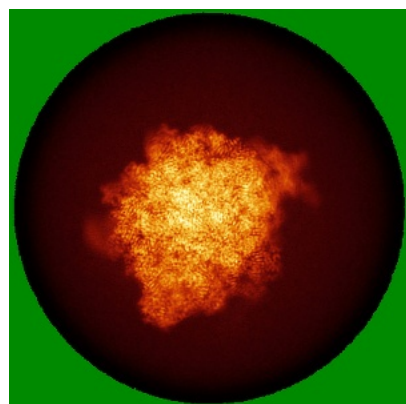


Z Index: 209

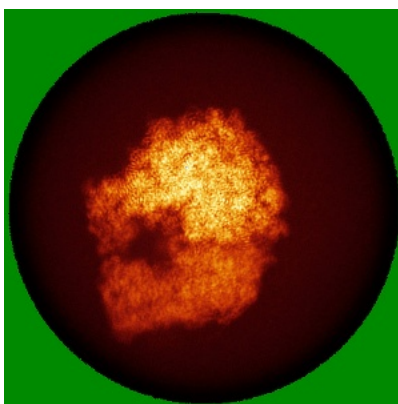
The images above show the largest variance slices of the map in three orthogonal directions.

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

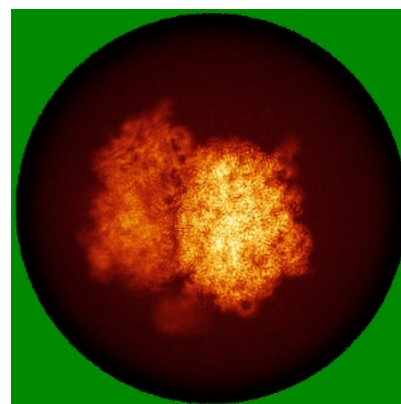
5.4.1 Primary map



X

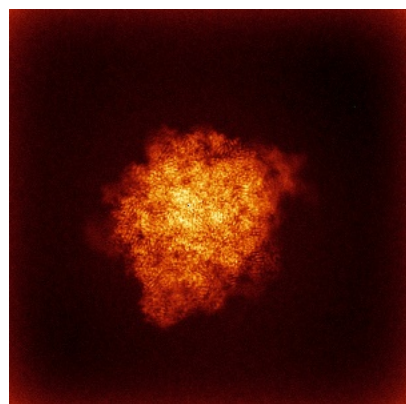


Y

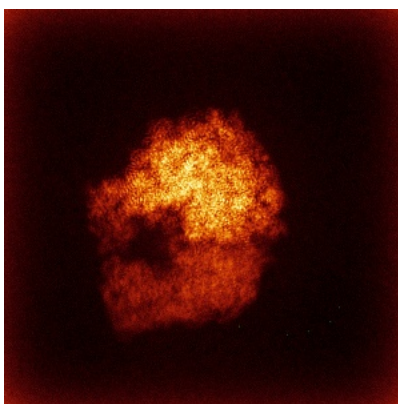


Z

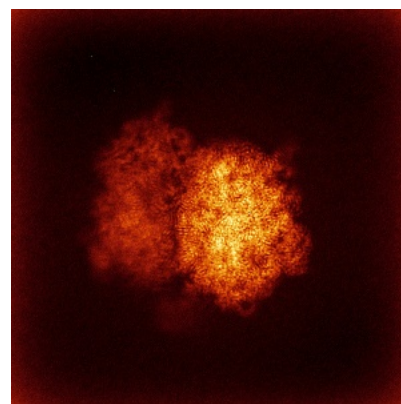
5.4.2 Raw map



X



Y

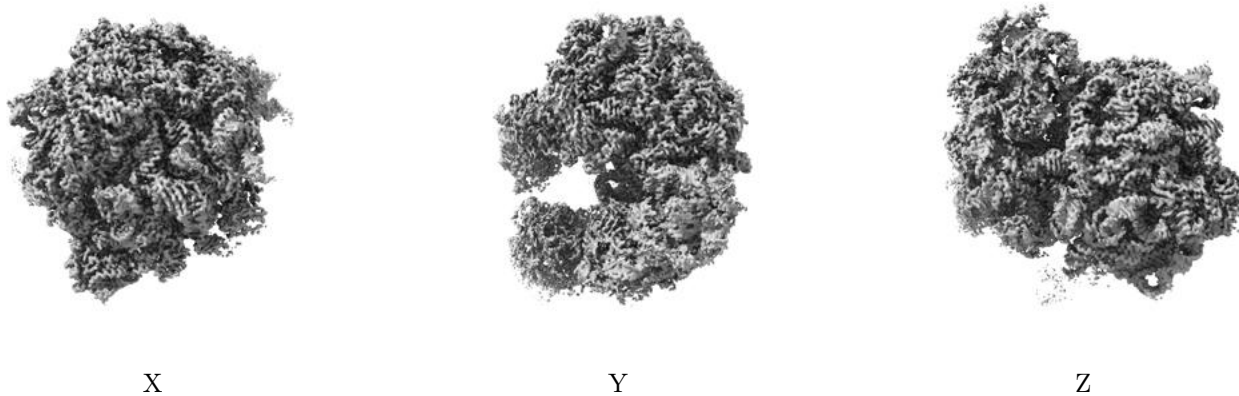


Z

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.

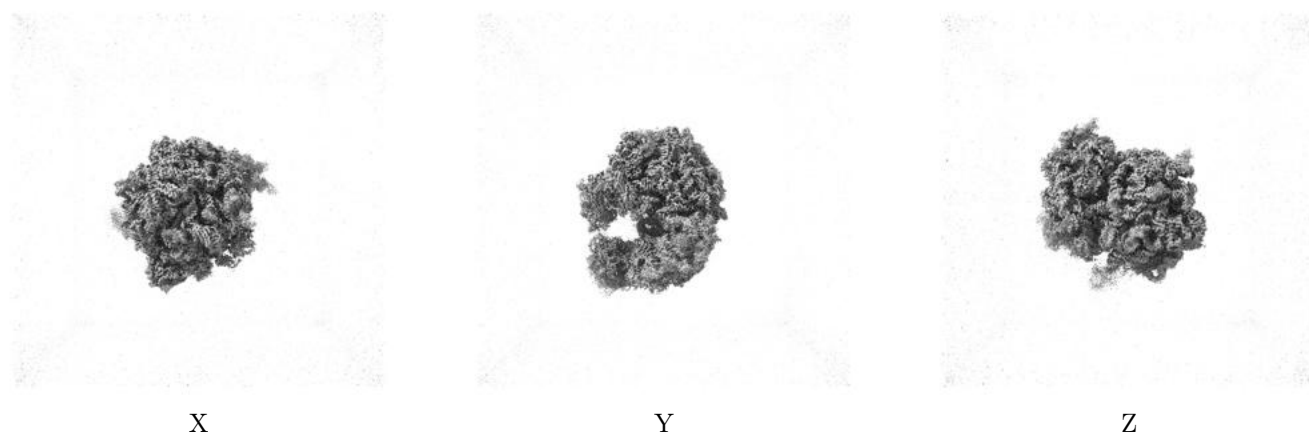
5.5 Orthogonal surface views [i](#)

5.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.078. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

5.5.2 Raw map



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.

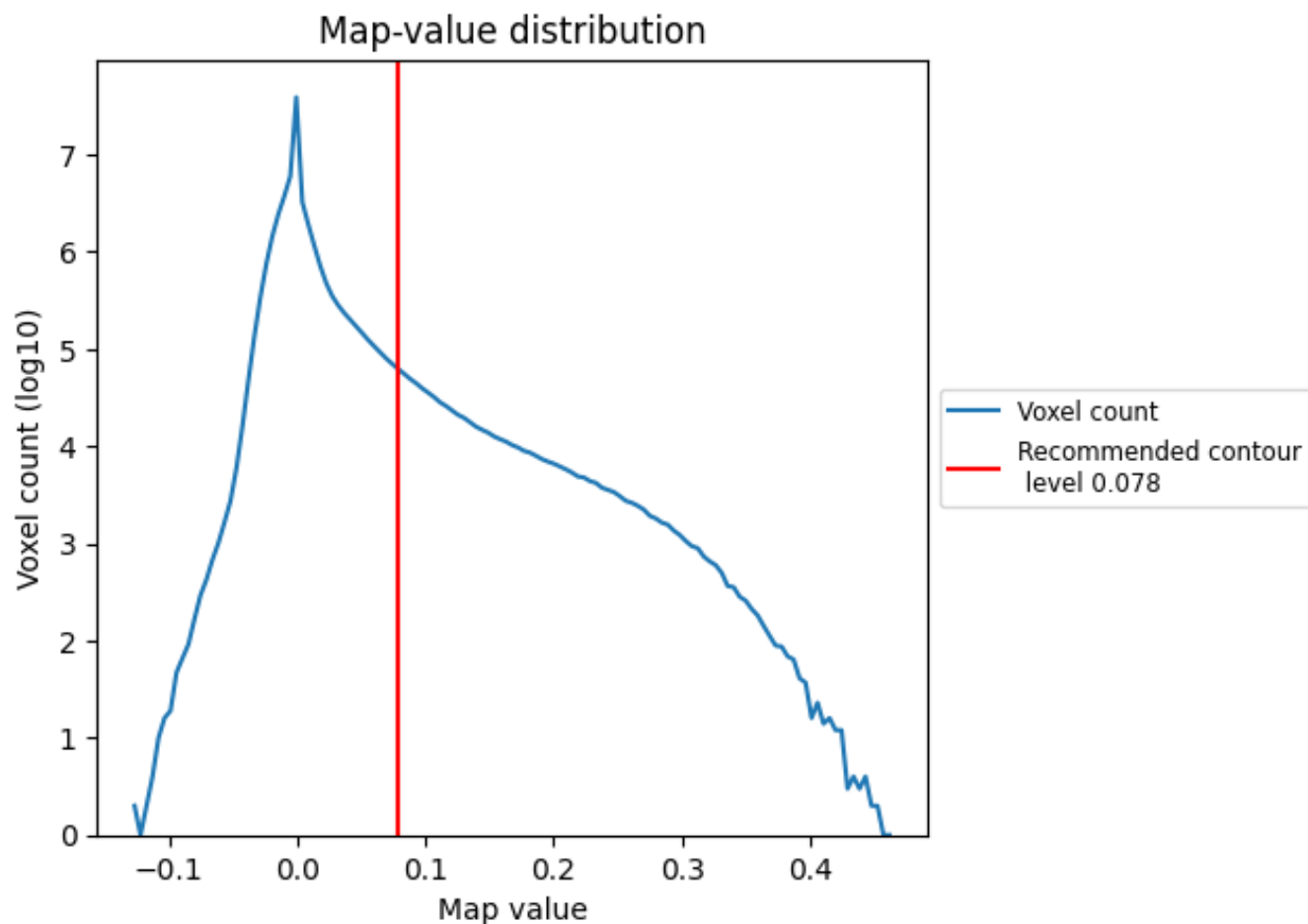
5.6 Mask visualisation [i](#)

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

6 Map analysis [i](#)

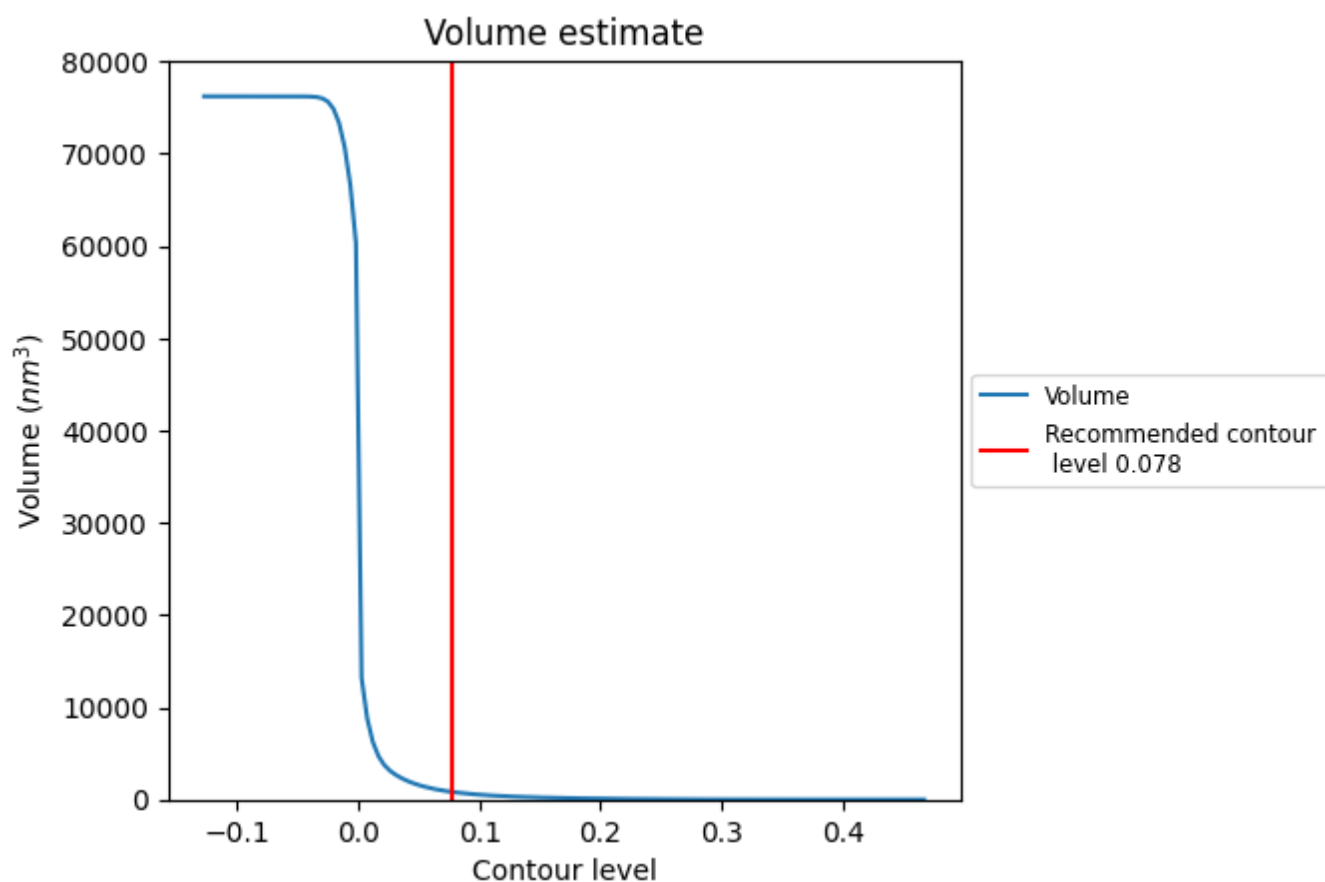
This section contains the results of statistical analysis of the map.

6.1 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.

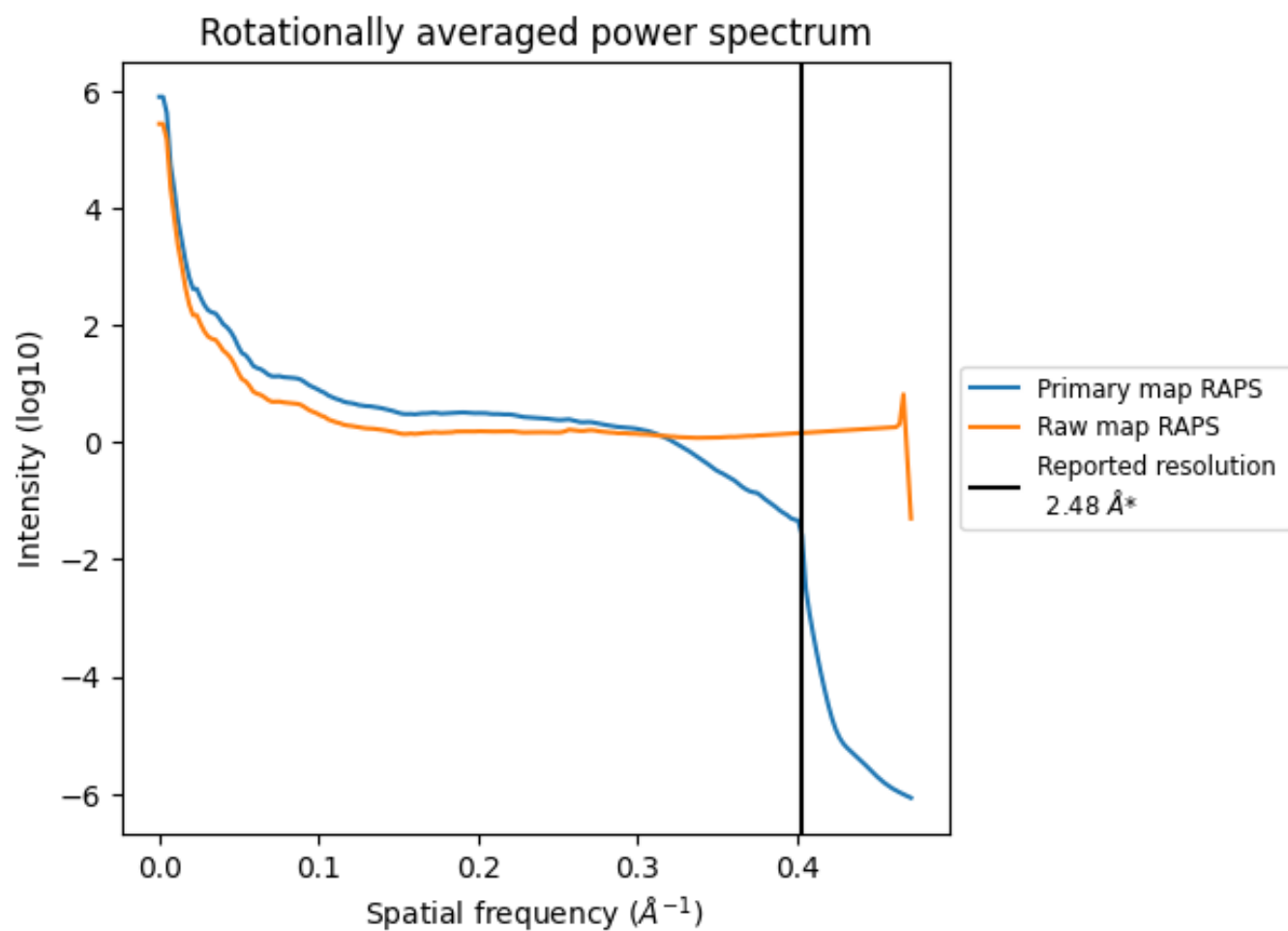
6.2 Volume estimate [i](#)



The volume at the recommended contour level is 819 nm³; this corresponds to an approximate mass of 740 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.

6.3 Rotationally averaged power spectrum ⓘ

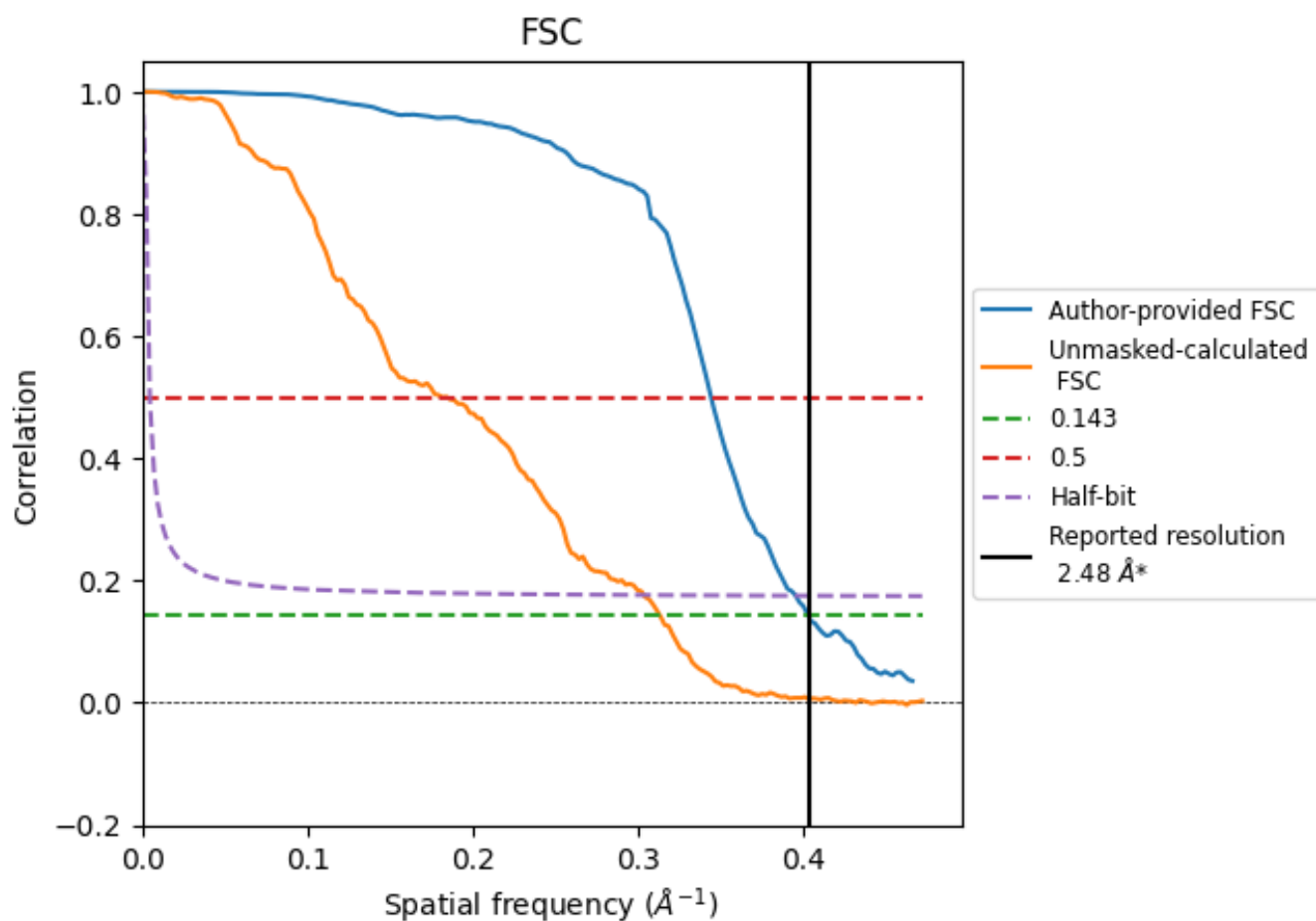


*Reported resolution corresponds to spatial frequency of 0.403 Å⁻¹

7 Fourier-Shell correlation [i](#)

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.

7.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of 0.403 \AA^{-1}

7.2 Resolution estimates

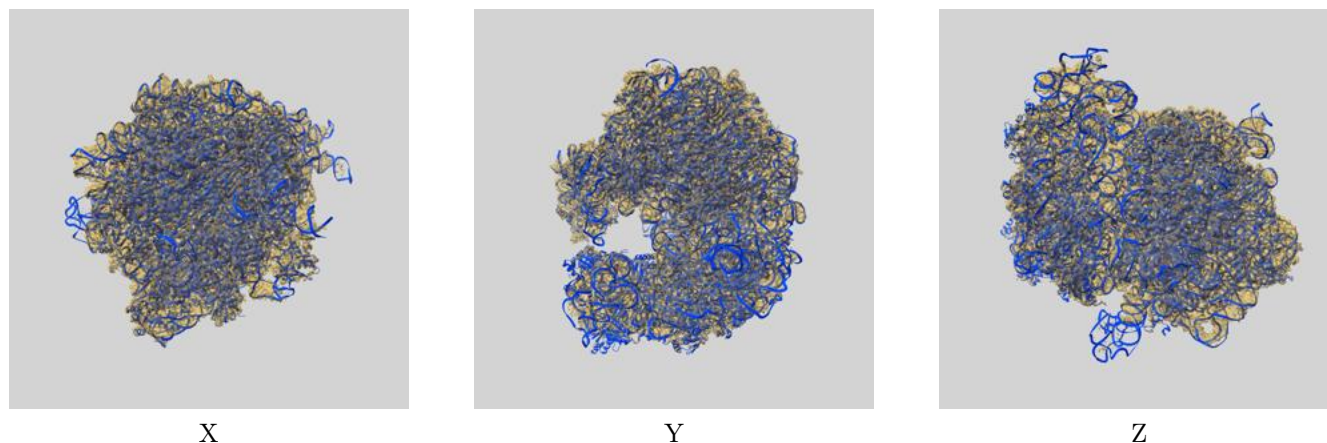
| Resolution estimate (Å) | Estimation criterion (FSC cut-off) | | |
|---------------------------|------------------------------------|------|----------|
| | 0.143 | 0.5 | Half-bit |
| Reported by author | 2.48 | - | - |
| Author-provided FSC curve | 2.48 | 2.91 | 2.53 |
| Unmasked-calculated* | 3.19 | 5.51 | 3.30 |

*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 3.19 differs from the reported value 2.48 by more than 10 %

8 Map-model fit [i](#)

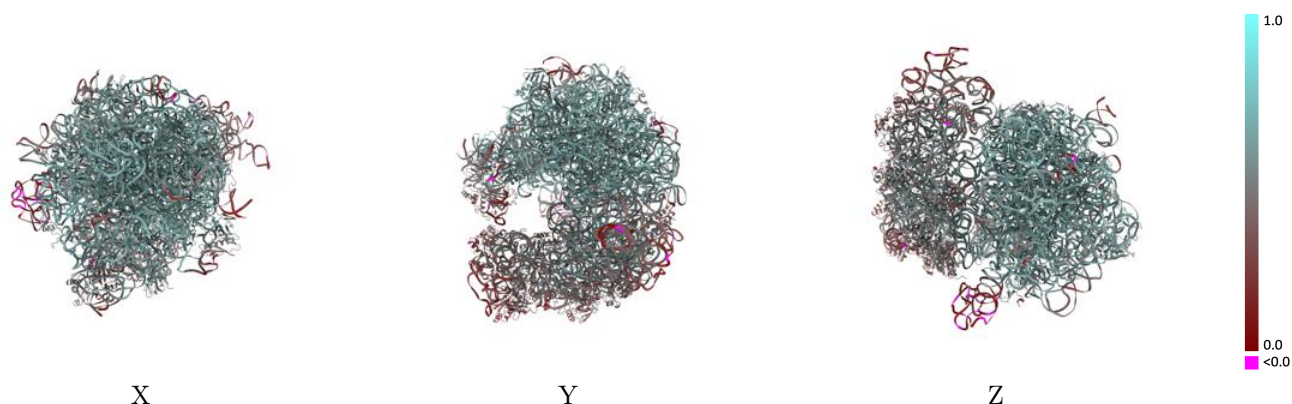
This section contains information regarding the fit between EMDB map EMD-56466 and PDB model 9TZE. Per-residue inclusion information can be found in section ?? on page ??.

8.1 Map-model overlay [i](#)



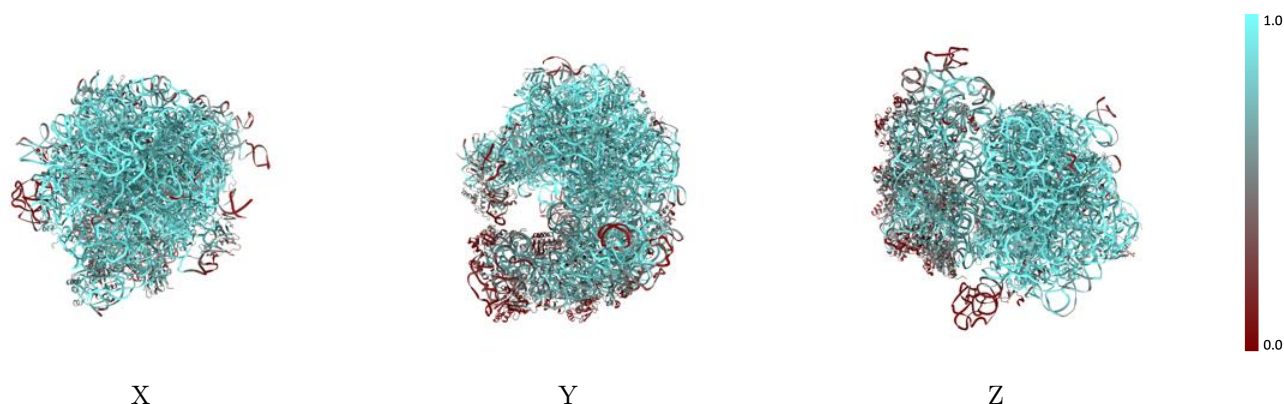
The images above show the 3D surface view of the map at the recommended contour level 0.078 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



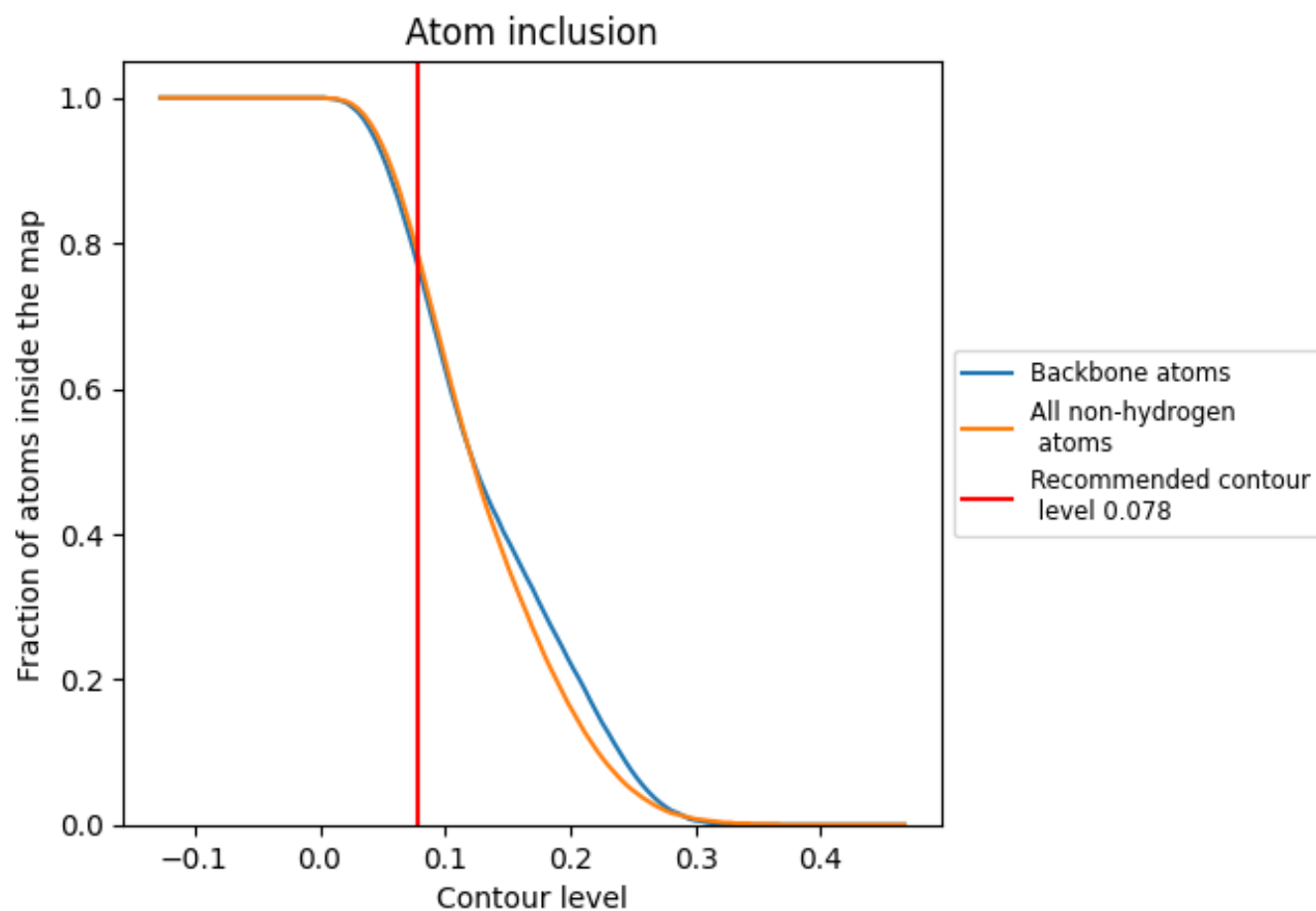
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

8.3 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 (0.078).







































































8.4 Atom inclusion ⓘ



At the recommended contour level, 77% of all backbone atoms, 79% of all non-hydrogen atoms, are inside the map.

8.5 Map-model fit summary ⓘ







































The table lists the average atom inclusion at the recommended contour level (0.078) and Q-score for the entire model and for each chain.

| Chain | Atom inclusion | Q-score |
|-------|--|--|
| All |  0.7870 |  0.5240 |
| 0 |  0.8210 |  0.5780 |
| 1 |  0.7010 |  0.5230 |
| 2 |  0.7280 |  0.5020 |
| 3 |  0.8970 |  0.5930 |
| 4 |  0.0570 |  0.1560 |
| 6 |  0.8420 |  0.5820 |
| 7 |  0.8230 |  0.5670 |
| 8 |  0.8950 |  0.5990 |
| 9 |  0.1220 |  0.3340 |
| A |  0.7710 |  0.4670 |
| C |  0.3040 |  0.3520 |
| D |  0.3920 |  0.4020 |
| E |  0.5950 |  0.4860 |
| F |  0.4220 |  0.3930 |
| G |  0.2440 |  0.3440 |
| H |  0.5750 |  0.4720 |
| I |  0.3160 |  0.3390 |
| J |  0.2170 |  0.2940 |
| K |  0.5290 |  0.4530 |
| L |  0.5330 |  0.4730 |
| M |  0.3100 |  0.3720 |
| N |  0.3600 |  0.3590 |
| O |  0.5680 |  0.4720 |
| P |  0.4730 |  0.4100 |
| Q |  0.5110 |  0.4640 |
| R |  0.5190 |  0.4300 |
| S |  0.1690 |  0.3150 |
| T |  0.5030 |  0.4190 |
| U |  0.3180 |  0.3690 |
| Z |  0.8960 |  0.6030 |
| a |  0.9150 |  0.5810 |
| b |  0.8860 |  0.5050 |
| c |  0.8250 |  0.5670 |
| d |  0.8930 |  0.6050 |



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Continued from previous page...

| Chain | Atom inclusion | Q-score |
|-------|--|--|
| e |  0.9290 |  0.6190 |
| f |  0.4120 |  0.2910 |
| g |  0.5460 |  0.4740 |
| h |  0.8320 |  0.5910 |
| i |  0.9170 |  0.6100 |
| j |  0.8760 |  0.6000 |
| k |  0.8640 |  0.5870 |
| m |  0.9260 |  0.6160 |
| o |  0.8920 |  0.6110 |
| q |  0.3390 |  0.4610 |
| r |  0.7190 |  0.5080 |
| s |  0.8450 |  0.5960 |
| t |  0.8940 |  0.5990 |
| u |  0.5550 |  0.4950 |
| v |  0.9020 |  0.6080 |
| w |  0.8220 |  0.5740 |
| x |  0.8470 |  0.5850 |
| y |  0.9520 |  0.6370 |
| z |  0.9400 |  0.6220 |