# WORLDWIDE PDB

## PROTEIN DATA BANK

# Full wwPDB EM Validation Report ⓘ

Feb 24, 2026 – 07:09 pm GMT

|  |  |  |
|---|---|---|
| PDB ID | : | 9I5X / pdb_00009i5x |
| EMDB ID | : | EMD-52641 |
| Title | : | Porphyromonas gingivalis 70S ribosome (W83 Strain) |
| Authors | : | Hiregange, D.G.; Bashan, A.; Yonath, A. |
| Deposited on | : | 2025-01-28 |
| Resolution | : | 3.00 Å(reported) |

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

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

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

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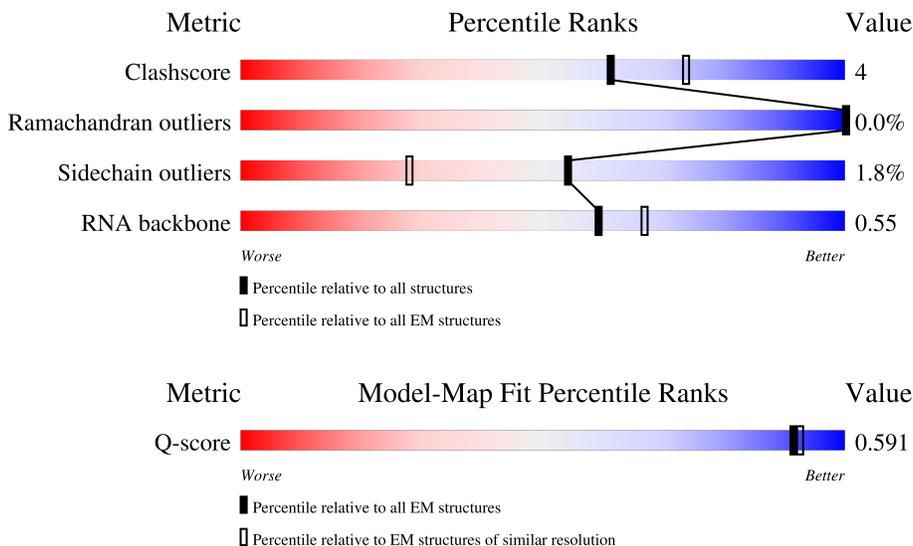The following versions of software and data (see references ⓘ) were used in the production of this report:

|  |  |  |
|---|---|---|
| EMDB validation analysis | : | 0.0.1.dev132 |
| Mogul | : | 1.8.4, CSD as541be (2020) |
| MolProbity | : | 4-5-2 with Phenix2.0 |
| Percentile statistics | : | 20231227.v01 (using entries in the PDB archive December 27th 2023) |
| 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) | : | 2.48.1 |

# 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 3.00 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.
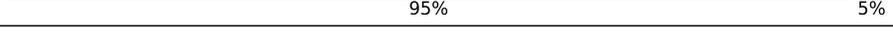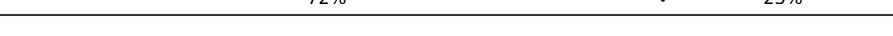
| Metric | Percentile Ranks | Value |
|---|---|---|
| Clashscore | | 4 |
| Ramachandran outliers | | 0.0% |
| Sidechain outliers | | 1.8% |
| RNA backbone | | 0.55 |

*Worse* → *Better*

▊ Percentile relative to all structures
▯ Percentile relative to all EM structures

| Metric | Model-Map Fit Percentile Ranks | Value |
|---|---|---|
| Q-score | | 0.591 |

*Worse* → *Better*

▊ Percentile relative to all EM structures
▯ Percentile relative to EM structures of similar resolution

| Metric | Whole archive (#Entries) | EM structures (#Entries) | Similar EM resolution (#Entries, resolution range(Å)) |
|---|---|---|---|
| Clashscore | 210492 | 15764 | - |
| Ramachandran outliers | 207382 | 16835 | - |
| Sidechain outliers | 206894 | 16415 | - |
| RNA backbone | 6643 | 2191 | - |
| Q-score | - | 25397 | 14081 ( 2.50 - 3.50 ) |

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

| Mol | Chain | Length | Quality of chain |
|---|---|---|---|
| 1 | p | 89 | 74% 6% 20% |
| 2 | 0 | 79 | 95% · · |
| 3 | 1 | 64 | 86% 12% · |
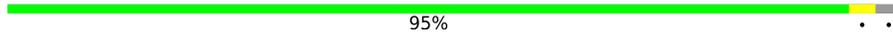
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| Mol | Chain | Length | Quality of chain |
|-----|-------|--------|------------------|
| 4 | 2 | 58 | 78% 19% |
| 5 | 4 | 61 | 84% 8% 8% |
| 6 | 5 | 62 | 55% 19% 24% |
| 7 | 6 | 50 | 92% |
| 8 | 7 | 65 | 88% 11% |
| 9 | 8 | 38 | 82% 11% 8% |
| 10 | A | 2889 | 60% 19% 19% |
| 11 | B | 109 | 61% 28% 8% |
| 12 | D | 274 | 89% 11% |
| 13 | E | 205 | 91% 7% |
| 14 | F | 209 | 95% 5% |
| 15 | K | 101 | 64% 5% 30% |
| 16 | L | 128 | 66% 8% 26% |
| 17 | M | 151 | 89% 11% |
| 18 | N | 121 | 89% 11% |
| 19 | O | 148 | 88% 7% 5% |
| 20 | P | 144 | 81% 15% |
| 21 | Q | 160 | 72% 23% |
| 22 | R | 114 | 85% 8% 6% |
| 23 | S | 121 | 87% 7% 6% |
| 24 | T | 115 | 93% 6% |
| 25 | U | 105 | 89% 10% |
| 26 | V | 134 | 83% 12% |
| 27 | W | 97 | 73% 20% 7% |
| 28 | X | 106 | 92% 5% |

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| Mol | Chain | Length | Quality of chain |
|-----|-------|--------|------------------|
| 29 | Z | 85 | 87% · 9% |
| 30 | a | 1534 | 52% 29% 5% 14% |
| 31 | b | 117 | 73% 11% 16% |
| 32 | c | 192 | 42% 9% 49% |
| 33 | d | 84 | 75% 14% · 10% |
| 34 | e | 84 | 81% 14% · · |
| 35 | f | 89 | 87% 13% |
| 36 | g | 89 | 93% 6% · |
| 37 | h | 179 | 27% · 69% |
| 38 | i | 126 | 55% 10% 35% |
| 39 | j | 134 | 81% 9% 10% |
| 40 | k | 246 | 39% · 57% |
| 41 | l | 201 | 84% 11% 5% |
| 42 | m | 158 | 58% 8% · 34% |
| 43 | n | 172 | 84% 8% · 7% |
| 44 | Y | 192 | 62% · · 33% |
| 45 | o | 131 | 89% 9% · · |
| 46 | 10 | 30 | · 73% 17% 10% |
| 47 | J | 128 | 90% 7% · |
| 48 | I | 90 | 51% 6% 43% |
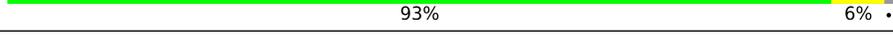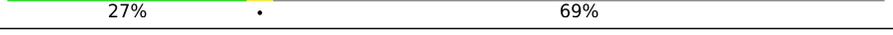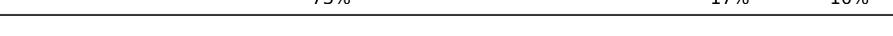
## 2 Entry composition ⓘ

There are 53 unique types of molecules in this entry. The entry contains 116574 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 Small ribosomal subunit protein uS19.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 1 | p | 71 | Total 510 | C 325 | N 95 | O 88 | S 2 | 0 | 0 |

- Molecule 2 is a protein called Large ribosomal subunit protein bL28.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|----|---|---------|-------|
| 2 | 0 | 77 | Total 608 | C 390 | N 118 | O 97 | S 3 | 0 | 0 |

- Molecule 3 is a protein called Large ribosomal subunit protein uL29.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 3 | 1 | 63 | Total 450 | C 281 | N 87 | O 79 | S 3 | 0 | 0 |

- Molecule 4 is a protein called Large ribosomal subunit protein uL30.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 4 | 2 | 56 | Total 437 | C 276 | N 89 | O 70 | S 2 | 0 | 0 |

- Molecule 5 is a protein called Large ribosomal subunit protein bL32.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 5 | 4 | 56 | Total 427 | C 265 | N 89 | O 69 | S 4 | 0 | 0 |

- Molecule 6 is a protein called Large ribosomal subunit protein bL33.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 6 | 5 | 47 | Total 342 | C 213 | N 62 | O 66 | S 1 | 0 | 0 |

- Molecule 7 is a protein called Large ribosomal subunit protein bL34.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 7 | 6 | 48 | Total | C | N | O | S | 0 | 0 |
| | | | 391 | 237 | 89 | 63 | 2 | | |

- Molecule 8 is a protein called Large ribosomal subunit protein bL35.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 8 | 7 | 64 | Total | C | N | O | S | 0 | 0 |
| | | | 456 | 289 | 91 | 75 | 1 | | |

- Molecule 9 is a protein called Large ribosomal subunit protein bL36.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 9 | 8 | 35 | Total | C | N | O | S | 0 | 0 |
| | | | 262 | 164 | 53 | 43 | 2 | | |

- Molecule 10 is a RNA chain called 23S rRNA.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 10 | A | 2344 | Total | C | N | O | P | 0 | 0 |
| | | | 50306 | 22463 | 9275 | 16224 | 2344 | | |

- Molecule 11 is a RNA chain called 5S rRNA.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 11 | B | 100 | Total | C | N | O | P | 0 | 0 |
| | | | 2142 | 955 | 391 | 696 | 100 | | |

- Molecule 12 is a protein called Large ribosomal subunit protein uL2.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 12 | D | 272 | Total | C | N | O | S | 0 | 0 |
| | | | 2058 | 1282 | 403 | 365 | 8 | | |

- Molecule 13 is a protein called Large ribosomal subunit protein uL3.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 13 | E | 204 | Total | C | N | O | S | 0 | 0 |
| | | | 1512 | 963 | 273 | 269 | 7 | | |

- Molecule 14 is a protein called Large ribosomal subunit protein uL4.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 14 | F | 209 | Total 1624 | C 1029 | N 295 | O 298 | S 2 | 0 | 0 |

- Molecule 15 is a protein called Small ribosomal subunit protein uS10.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|
| 15 | K | 71 | Total 511 | C 330 | N 91 | O 90 | 0 | 0 |

- Molecule 16 is a protein called Small ribosomal subunit protein uS11.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 16 | L | 95 | Total 550 | C 331 | N 113 | O 105 | S 1 | 0 | 0 |

- Molecule 17 is a protein called Large ribosomal subunit protein uL13.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 17 | M | 150 | Total 1178 | C 751 | N 217 | O 204 | S 6 | 0 | 0 |

- Molecule 18 is a protein called Large ribosomal subunit protein uL14.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 18 | N | 121 | Total 904 | C 565 | N 173 | O 162 | S 4 | 0 | 0 |

- Molecule 19 is a protein called Large ribosomal subunit protein uL15.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 19 | O | 141 | Total 991 | C 620 | N 189 | O 180 | S 2 | 0 | 0 |

- Molecule 20 is a protein called Large ribosomal subunit protein uL16.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 20 | P | 141 | Total 1089 | C 699 | N 201 | O 186 | S 3 | 0 | 0 |

- Molecule 21 is a protein called Large ribosomal subunit protein bL17.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|---|---|---|---|---------|-------|
| 21 | Q | 123 | Total 989 | C 630 | N 184 | O 169 | S 6 | 0 | 0 |

- Molecule 22 is a protein called Large ribosomal subunit protein uL18.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|-----|-------|----------|-------|---|---|---|---------|-------|
| 22 | R | 107 | Total 739 | C 460 | N 147 | O 132 | 0 | 0 |

- Molecule 23 is a protein called Large ribosomal subunit protein bL19.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|---|---|---|---|---------|-------|
| 23 | S | 114 | Total 945 | C 602 | N 178 | O 164 | S 1 | 0 | 0 |

- Molecule 24 is a protein called Large ribosomal subunit protein bL20.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|---|---|---|---|---------|-------|
| 24 | T | 114 | Total 919 | C 581 | N 189 | O 146 | S 3 | 0 | 0 |

- Molecule 25 is a protein called Large ribosomal subunit protein bL21.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|---|---|---|---|---------|-------|
| 25 | U | 104 | Total 824 | C 526 | N 150 | O 145 | S 3 | 0 | 0 |

- Molecule 26 is a protein called Large ribosomal subunit protein uL22.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|---|---|---|---|---------|-------|
| 26 | V | 128 | Total 1023 | C 634 | N 203 | O 181 | S 5 | 0 | 0 |

- Molecule 27 is a protein called Large ribosomal subunit protein uL23.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|---|---|---|---|---------|-------|
| 27 | W | 90 | Total 683 | C 434 | N 122 | O 124 | S 3 | 0 | 0 |

- Molecule 28 is a protein called Large ribosomal subunit protein uL24.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 28 | X | 102 | Total 732 | C 458 | N 144 | O 128 | S 2 | 0 | 0 |

- Molecule 29 is a protein called Large ribosomal subunit protein bL27.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 29 | Z | 77 | Total 570 | C 352 | N 113 | O 104 | S 1 | 0 | 0 |

- Molecule 30 is a RNA chain called 16S rRNA.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 30 | a | 1326 | Total 28463 | C 12702 | N 5226 | O 9209 | P 1326 | 0 | 0 |

- Molecule 31 is a protein called Small ribosomal subunit protein bS6.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|
| 31 | b | 98 | Total 696 | C 445 | N 128 | O 123 | 0 | 0 |

- Molecule 32 is a protein called Small ribosomal subunit protein bS16.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 32 | c | 97 | Total 712 | C 446 | N 135 | O 130 | S 1 | 0 | 0 |

- Molecule 33 is a protein called Small ribosomal subunit protein bS20.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 33 | d | 76 | Total 591 | C 367 | N 123 | O 100 | S 1 | 0 | 0 |

- Molecule 34 is a protein called Small ribosomal subunit protein uS17.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 34 | e | 81 | Total 639 | C 403 | N 124 | O 109 | S 3 | 0 | 0 |

- Molecule 35 is a protein called Small ribosomal subunit protein uS15.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 35 | f | 89 | Total 671 | C 426 | N 124 | O 119 | S 2 | 0 | 0 |

- Molecule 36 is a protein called Small ribosomal subunit protein uS14.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 36 | g | 88 | Total 659 | C 415 | N 132 | O 107 | S 5 | 0 | 0 |

- Molecule 37 is a protein called Large ribosomal subunit protein bL9.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 37 | h | 55 | Total 415 | C 263 | N 76 | O 75 | S 1 | 0 | 0 |

- Molecule 38 is a protein called Small ribosomal subunit protein uS13.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 38 | i | 82 | Total 616 | C 392 | N 114 | O 109 | S 1 | 0 | 0 |

- Molecule 39 is a protein called Small ribosomal subunit protein uS12.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 39 | j | 120 | Total 849 | C 521 | N 178 | O 148 | S 2 | 0 | 0 |

- Molecule 40 is a protein called Small ribosomal subunit protein uS3.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 40 | k | 106 | Total 691 | C 433 | N 123 | O 131 | S 4 | 0 | 0 |

- Molecule 41 is a protein called Small ribosomal subunit protein uS4.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 41 | l | 191 | Total 1383 | C 889 | N 250 | O 243 | S 1 | 0 | 0 |

- Molecule 42 is a protein called Small ribosomal subunit protein uS7.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|---|---|---|---|---------|-------|
| 42 | m | 105 | Total 714 | C 456 | N 123 | O 133 | S 2 | 0 | 0 |

- Molecule 43 is a protein called Small ribosomal subunit protein uS5.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|---|---|---|---|---------|-------|
| 43 | n | 160 | Total 1032 | C 648 | N 191 | O 191 | S 2 | 0 | 0 |

- Molecule 44 is a protein called Large ribosomal subunit protein bL25.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|---|---|---|---|---------|-------|
| 44 | Y | 128 | Total 851 | C 549 | N 152 | O 149 | S 1 | 0 | 0 |

- Molecule 45 is a protein called Small ribosomal subunit protein uS8.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|---|---|---|---|---------|-------|
| 45 | o | 129 | Total 964 | C 623 | N 167 | O 169 | S 5 | 0 | 0 |

- Molecule 46 is a protein called AURKAIP1/COX24 domain-containing protein.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|---|---|---|---|---------|-------|
| 46 | 10 | 27 | Total 219 | C 132 | N 56 | O 30 | S 1 | 0 | 0 |

- Molecule 47 is a protein called Small ribosomal subunit protein uS9.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|-----|-------|----------|-------|---|---|---|---------|-------|
| 47 | J | 124 | Total 827 | C 528 | N 162 | O 137 | 0 | 0 |

- Molecule 48 is a protein called Small ribosomal subunit protein bS18.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|-----|-------|----------|-------|---|---|---|---------|-------|
| 48 | I | 51 | Total 369 | C 239 | N 73 | O 57 | 0 | 0 |

- Molecule 49 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

| Mol | Chain | Residues | Atoms | | AltConf |
|-----|-------|----------|-------|---|---------|
| 49 | 4 | 1 | Total 1 | Mg 1 | 0 |
| 49 | A | 119 | Total 119 | Mg 119 | 0 |
| 49 | F | 1 | Total 1 | Mg 1 | 0 |
| 49 | T | 1 | Total 1 | Mg 1 | 0 |
| 49 | V | 2 | Total 2 | Mg 2 | 0 |
| 49 | a | 4 | Total 4 | Mg 4 | 0 |

- Molecule 50 is ZINC ION (CCD ID: ZN) (formula: Zn).

| Mol | Chain | Residues | Atoms | | AltConf |
|-----|-------|----------|-------|---|---------|
| 50 | 4 | 1 | Total 1 | Zn 1 | 0 |

- Molecule 51 is POTASSIUM ION (CCD ID: K) (formula: K).

| Mol | Chain | Residues | Atoms | | AltConf |
|-----|-------|----------|-------|---|---------|
| 51 | A | 31 | Total 31 | K 31 | 0 |
| 51 | B | 1 | Total 1 | K 1 | 0 |
| 51 | W | 1 | Total 1 | K 1 | 0 |
| 51 | X | 1 | Total 1 | K 1 | 0 |
| 51 | a | 9 | Total 9 | K 9 | 0 |

- Molecule 52 is SODIUM ION (CCD ID: NA) (formula: Na).

| Mol | Chain | Residues | Atoms | | AltConf |
|-----|-------|----------|-------|---|---------|
| 52 | A | 12 | Total 12 | Na 12 | 0 |
| 52 | B | 2 | Total 2 | Na 2 | 0 |

- Molecule 53 is water.

| Mol | Chain | Residues | Atoms | | AltConf |
|---|---|---|---|---|---|
| 53 | 4 | 2 | Total<br>2 | O<br>2 | 0 |
| 53 | A | 741 | Total<br>741 | O<br>741 | 0 |
| 53 | B | 6 | Total<br>6 | O<br>6 | 0 |
| 53 | D | 4 | Total<br>4 | O<br>4 | 0 |
| 53 | E | 10 | Total<br>10 | O<br>10 | 0 |
| 53 | F | 4 | Total<br>4 | O<br>4 | 0 |
| 53 | M | 2 | Total<br>2 | O<br>2 | 0 |
| 53 | O | 13 | Total<br>13 | O<br>13 | 0 |
| 53 | Q | 8 | Total<br>8 | O<br>8 | 0 |
| 53 | T | 10 | Total<br>10 | O<br>10 | 0 |
| 53 | U | 8 | Total<br>8 | O<br>8 | 0 |
| 53 | V | 6 | Total<br>6 | O<br>6 | 0 |
| 53 | Z | 1 | Total<br>1 | O<br>1 | 0 |
| 53 | a | 40 | Total<br>40 | O<br>40 | 0 |

# 3 Residue-property plots ⓘ

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

- Molecule 1: Small ribosomal subunit protein uS19

Chain p:

- Molecule 2: Large ribosomal subunit protein bL28

Chain 0:

- Molecule 3: Large ribosomal subunit protein uL29

Chain 1:

- Molecule 4: Large ribosomal subunit protein uL30

Chain 2:

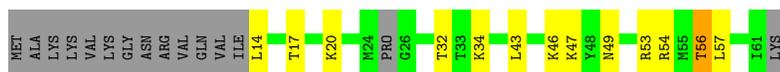- Molecule 5: Large ribosomal subunit protein bL32

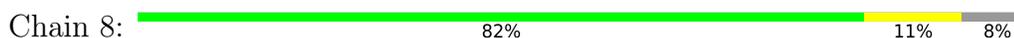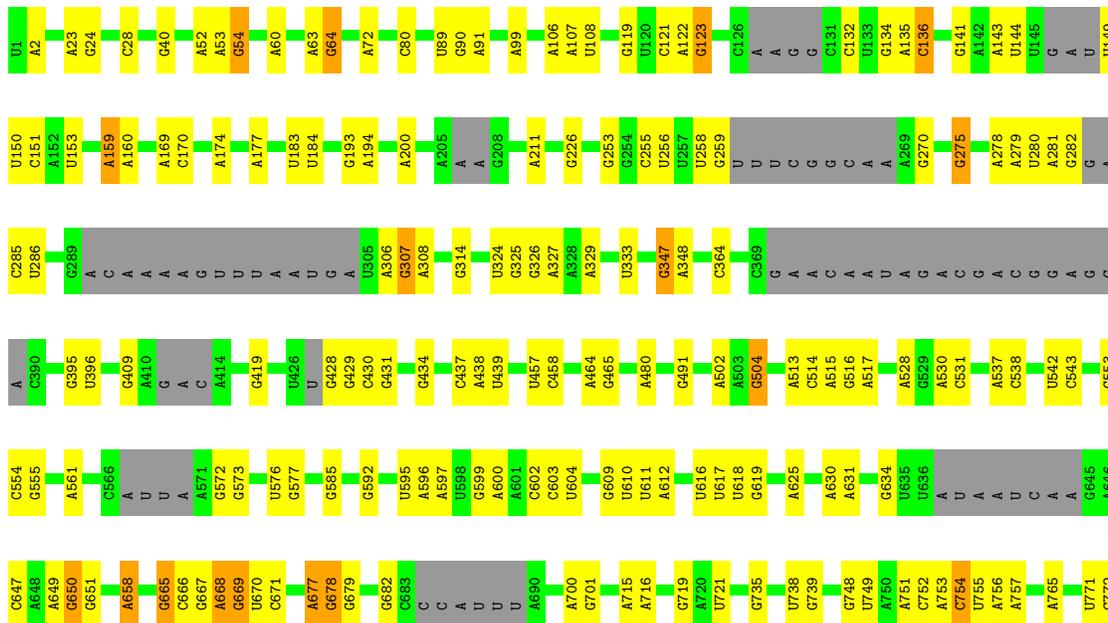Chain 4:

- Molecule 6: Large ribosomal subunit protein bL33

Chain 5:

55%    19%    •    24%

MET ALA LYS LYS VAL LYS GLY ASN ARG VAL GLN VAL ILE L14 T17 K20 M24 PRO G26 T32 T33 K34 L43 K46 K47 Y48 N49 R53 R54 M55 T56 L57 I61 LYS

• Molecule 7: Large ribosomal subunit protein bL34

Chain 6:

92%    •    •

M1 P7 R39 F48 VAL GLY

• Molecule 8: Large ribosomal subunit protein bL35

Chain 7:

88%    11%    •

MET P2 T19 K39 S48 T49 N56 K59 L64 R65

• Molecule 9: Large ribosomal subunit protein bL36

Chain 8:

82%    11%    8%

M1 K9 ARG THR PRO E13 R19 K28 P31 R36 Q37 G38

• Molecule 10: 23S rRNA

Chain A:

60%    19%    •    19%

U1 A2 A23 G24 C28 G40 A52 A53 G54 A60 A63 G64 A72 C80 U89 G90 A91 A99 A106 A107 U108 G119 U120 C121 A122 G123 C126 A A G G C131 C132 U133 G134 A135 C136 G141 A142 A143 U144 U145 G A U U149

U150 C151 A152 U153 A159 A160 A169 C170 A174 A177 U183 U184 G193 A194 A200 A205 A A G208 A211 A226 G226 G253 G254 C255 U256 U257 G258 G259 U U U C G G C A A A269 G270 G275 A278 A279 U280 A281 G282 G A

C285 U286 G289 A C A A A A G U U U A A U G A U305 A306 G307 A308 G314 G324 U325 G326 A327 A328 A329 U333 G347 A348 C364 C369 G G A A C A A U A G A C C G A C C G G A G C

A C390 G395 U396 G409 A410 G A C A414 G419 U426 U G428 G429 G430 C431 G434 C437 A438 U439 U457 C458 A464 A465 A480 G491 A502 A503 G504 A513 C514 A515 G516 A517 A528 G529 A530 C531 A537 C538 U542 C543 G553

C554 G555 A561 C566 A U U A A571 G572 G573 U576 G577 G585 G592 U595 A596 A597 U598 A600 A601 C602 C603 U604 G609 U610 U611 A612 U616 U617 U618 G619 A625 A630 A631 G634 U635 U636 G A U A A U C A A G645 A646

C647 A648 A649 G650 G651 A658 G665 C666 C667 A668 G669 U670 C671 A677 G678 G679 G682 C683 C C C A U U A690 A700 G701 A715 A716 G719 A720 U721 G735 U738 G739 G748 U749 A750 A751 C752 A753 C754 U755 A756 A757 A765 U771 C772

• Molecule 11: 5S rRNA

Chain B:





• Molecule 12: Large ribosomal subunit protein uL2

Chain D:





• Molecule 13: Large ribosomal subunit protein uL3

Chain E:


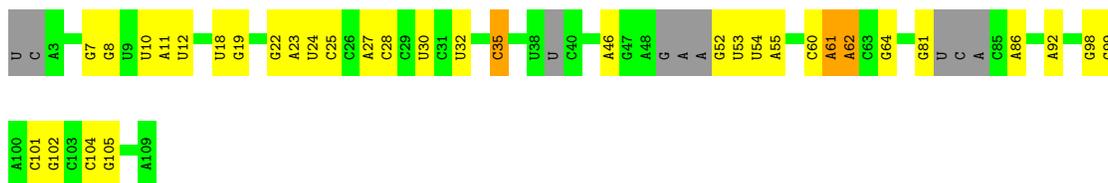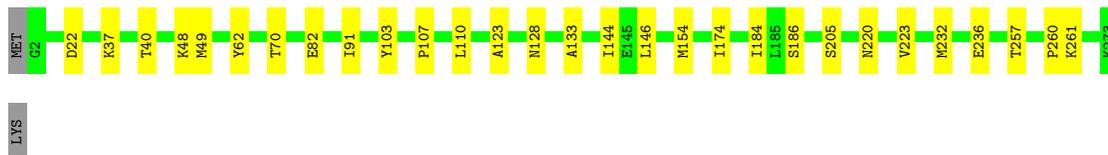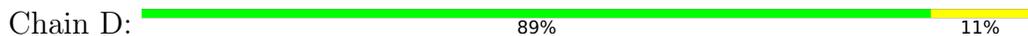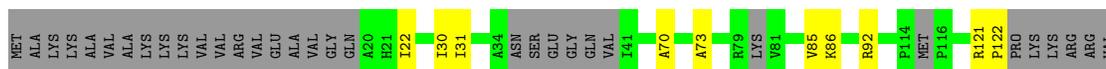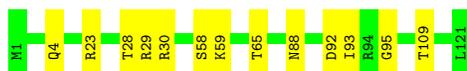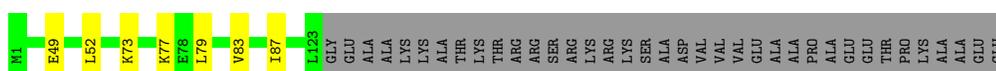
• Molecule 14: Large ribosomal subunit protein uL4

Chain F:



• Molecule 15: Small ribosomal subunit protein uS10

Chain K:

64% 5% • 30%

MET SER Q3 I7 E22 LYS ILE VAL LYS THR VAL LYS ALA ALA GLY ALA MET VAL SER GLY P38 I39 R52 V56 E62 I73 S78 THR ALA LYS THR VAL ASP ALA LEU MET LYS LEU GLU L91 K100 VAL

• Molecule 16: Small ribosomal subunit protein uS11

Chain L:

66% 8% 26%

MET ALA LYS LYS ALA VAL ALA LYS LYS LYS VAL VAL VAL ARG VAL GLU ALA VAL GLY GLN A20 H21 I22 I30 I31 A34 ASN SER GLU GLY GLN VAL I41 A70 A73 R79 LYS V81 V85 K86 R92 P114 MET P116 R121 P122 PRO LYS LYS ARG ARG VAL

• Molecule 17: Large ribosomal subunit protein uL13

Chain M:

89% 11% •

M1 D2 K7 T8 K18 D24 A25 Q28 D54 H82 F97 L105 R118 L119 I123 H135 K136 H137 L150 LYS

• Molecule 18: Large ribosomal subunit protein uL14

Chain N:

89% 11%

M1 Q4 R23 T28 R29 R30 S58 K59 T65 N88 D92 I93 R94 G95 T109 L121

• Molecule 19: Large ribosomal subunit protein uL15

Chain O:

88% 7% • 5%

M1 I57 R60 I69 V72 E73 Y74 I77 Q83 A88 ASN SER LEU THR LYS ILE S95 G103 LEU V105 K112 V119 A129 K132 L148

• Molecule 20: Large ribosomal subunit protein uL16

Chain P:

81% 15% ••

M1 K14 N25 F32 G33 I34 K35 V54 M58 V64 W65 I68 K77 G84 I103 F104 E105 V106 V109 E116 A117 L118 R119 L120 A121 F131 V132 V133 D138 N141 GLN ASN ALA

• Molecule 21: Large ribosomal subunit protein bL17

Chain Q:

72% • 23%

M1 E49 L52 K73 K77 E78 L79 V83 I87 L123 GLY GLU ALA ALA LYS LYS ALA THR LYS THR ARG ARG SER ARG LYS ARG SER ALA ASP VAL VAL VAL GLU ALA ALA PRO ALA GLU GLU THR PRO LYS ALA ALA GLU GLU

• Molecule 22: Large ribosomal subunit protein uL18

Chain R: 85% 8% • 6%

MET V2 R8 L28 T29 Q40 L41 S55 L56 LYS LEU GLU MET THR GLY S63 T86 R91 N92 L95 F114

• Molecule 23: Large ribosomal subunit protein bL19

Chain S: 87% 7% 6%

M1 D2 K5 E10 T25 R49 K56 K88 Y98 R109 R114 VAL ALA LEU SER LYS ASP

• Molecule 24: Large ribosomal subunit protein bL20

Chain T: 93% 6% •

MET P2 W61 L83 I88 E104 V110 V113 K114 N115

• Molecule 25: Large ribosomal subunit protein bL21

Chain U: 89% 10% ••

M1 I7 V14 V22 H23 H24 V34 V50 C62 L65 T96 L99 V100 V104 ALA

• Molecule 26: Large ribosomal subunit protein uL22

Chain V: 83% 12% • •

MET GLY A3 K23 T29 S30 K33 M34 I41 M44 L53 A60 F89 R92 A98 K102 R114 S119 Y125 L129 N130 ASN ASP ASN ASN
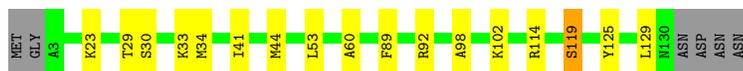
• Molecule 27: Large ribosomal subunit protein uL23

Chain W: 73% 20% 7%

MET G2 K12 M13 V16 P30 I37 K38 V41 E42 V49 M55 N63 R64 Y65 T66 K67 S68 G69 L70 K79 K80 I91 ASP PHE PHE SER ASN ILE

• Molecule 28: Large ribosomal subunit protein uL24

Chain X: 92% 5% •

MET S2 K3 A52 LYS ASN PRO Q56 V74 G79 T82 A98 K106

• Molecule 29: Large ribosomal subunit protein bL27

Chain Z:

87%     •     9%

MET ALA HIS LYS GLY VAL G8 S9 E15 S18 E84 SER

• Molecule 30: 16S rRNA

Chain a:

52%     29%     5%     14%

• Molecule 31: Small ribosomal subunit protein bS6

Chain b:

73%  11%  16%

• Molecule 32: Small ribosomal subunit protein bS16

Chain c:

42%  9%  49%

• Molecule 33: Small ribosomal subunit protein bS20

Chain d:

75%  14%  •  10%

• Molecule 34: Small ribosomal subunit protein uS17

Chain e:

81%  14%  •  •

• Molecule 35: Small ribosomal subunit protein uS15

Chain f:

87%  13%

M1 K8 T22 G23 S24 P25 E26 S27 L31 R65 L70 I71 I81 R89

• Molecule 36: Small ribosomal subunit protein uS14

Chain g: 93% 6% •

MET A2 R9 K28 C52 G56 I70 W89

• Molecule 37: Large ribosomal subunit protein bL9

Chain h: 27% • 69%

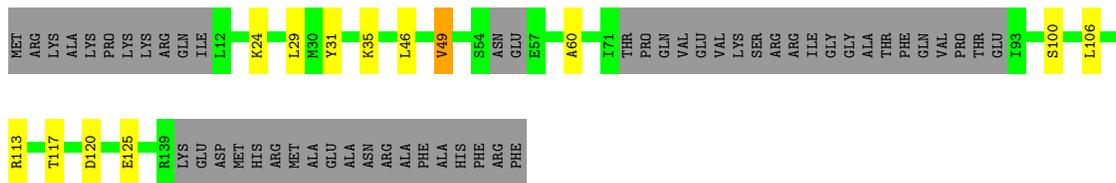M1 Q2 V3 K6 L12 V19 A36 R54 A55 HIS LYS ILE ALA GLN ILE LYS LYS GLU ALA GLU GLU LYS ALA ALA SER MET GLN GLY ILE ILE SER LEU THR ILE LYS ALA LYS THR SER SER THR GLY THR ILE PHE GLY SER VAL THR ASN ILE GLN ILE ALA GLU GLU

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

PRO VAL ALA GLU GLU PRO ALA ALA GLU GLU GLN ALA GLU VAL ALA ALA GLU

• Molecule 38: Small ribosomal subunit protein uS13

Chain i: 55% 10% 35%

MET ALA ILE R4 I5 V6 G7 V8 D9 L10 P11 Q12 N13 K14 R15 L20 W49 V67 L77 I85 GLY CYS TYR ARG GLY ILE LEU ARG HIS ARG ILE LEU PRO LEU ARG ALA GLY GLN SER THR LYS ASN ASN ALA ARG THR ARG LYS GLY LYS LYS LYS LYS THR VAL ALA ASN

LYS LYS LYS ALA THR LYS

• Molecule 39: Small ribosomal subunit protein uS12

Chain j: 81% 9% 10%

MET P2 R12 C27 C34 K43 LYS P45 R50 V55 Y66 L81 V82 R83 D89 V98 T101 K120 R121 P122 LYS PRO GLY GLN ALA PRO ALA ALA LYS GLY LYS LYS

• Molecule 40: Small ribosomal subunit protein uS3

Chain k: 39% • 57%

MET GLY GLN LYS ILE ASN PRO VAL SER ASN ARG LEU GLY ILE ILE ARG GLY W18 R37 ILE ARG GLN GLN TYR LEU ASN ALA ARG LEU ALA LYS ALA SER VAL SER ARG ILE VAL GLU ARG LEU LYS LEU VAL THR ILE THR ILE CYS THR ALA ARG PRO GLY MET ILE ILE GLY

LYS ALA GLY GLN GLU VAL ASP LYS LEU LYS GLU GLU LEU LYS LYS ARG ILE THR LYS LYS ASP VAL GLN ILE ASN ILE TYR GLU ILE ARG LYS PRO E109 L110 D111 A112 A113 Y129 ARG ARG A132 S139 A140 M143 S153 E165 P173 LEU HIS THR LEU ARG ALA ASP ILE

D182 K198 G204 GLU VAL TYR GLU LYS ARG ASP LEU ALA PRO ASN PHE ALA VAL ALA LYS ASN GLN SER ARG ARG PRO ASN ALA GLN GLY GLY ASN ASN ARG GLY GLY ASP ARG ASN ARG ARG LYS GLY ASN ARG

• Molecule 41: Small ribosomal subunit protein uS4

Chain l:　　84%　　11%　　5%

MET A2 K10 R13 A22 K29 G37 ASN ASN ARG ARG LYS T44 E53 K54 E65 A78 LYS GLY V81 L85 A104 Q112 L113 H116 T120 V125 S130 V133 I139 E143 K146 E167 L173 L194 Y199

S200 LYS

• Molecule 42: Small ribosomal subunit protein uS7

Chain m:　　58%　　8%　　34%

MET ARG LYS ALA LYS PRO LYS LYS ARG GLN ILE L12 K24 L29 M30 Y31 K35 L46 V49 S54 ASN GLU E57 A60 I71 THR PRO GLN VAL GLU VAL LYS SER ARG ARG ILE GLY GLY ALA THR PHE GLN VAL PRO THR GLU I93 S100 L106

R113 T117 D120 E125 R139 LYS GLU ASP MET HIS ARG MET ALA GLU ALA ASN ARG ALA PHE ALA HIS PHE ARG PHE

• Molecule 43: Small ribosomal subunit protein uS5

Chain n:　　84%　　8%　　7%

MET ALA ILE V4 V8 LYS SER THR ASN ASP LEU E15 L20 I23 A39 V43 D48 I51 G56 L120 V128 N137 L141 V142 I146 A159 S165 V169 PHE LYS GLY

• Molecule 44: Large ribosomal subunit protein bL25

Chain Y:　　62%　　33%

MET K2 K17 R23 Q46 L52 I53 Y54 S55 P82 I88 V107 V108 L109 THR G111 K130 VAL LYS ALA LEU TYR SER GLU ILE PRO GLU LYS LEU ASP ILE ASP VAL SER ASP LEU GLN LEU GLY LYS THR ILE GLN VAL GLY LEU GLU LEU HIS PHE GLU GLY LEU

THR LEU MET ASN ALA LYS ASN ALA VAL VAL CYS ALA VAL LYS LEU THR ARG ALA ALA ARG GLY ALA ALA VAL LYS LYS GLN

• Molecule 45: Small ribosomal subunit protein uS8

Chain o:　　89%　　9%

M1 L9 S28 K31 K41 L66 ALA HIS K69 I104 V105 S106 T107 P108 M112 T113 D114 A117 C128 Y131

• Molecule 46: AURKAIP1/COX24 domain-containing protein

Chain 10:　　73%　　17%　　10%

MET P2 R7 M12 H15 K16 K27 K28 LYS LYS

• Molecule 47: Small ribosomal subunit protein uS9

Chain J:

90%　　　　　7%　　·

MET D2 A6 R16 L53 ASP V55 L65 R66 G67 Q73 R83 K118 A119 R120 K121 S126 LYS ARG

• Molecule 48: Small ribosomal subunit protein bS18

Chain I:

51%　　　　　6%　　　　　43%

MET ALA ALA ASN ASN GLN GLY GLU ILE ARG TYR LEU THR PRO LEU SER VAL ASP THR LYS LYS LYS LYS TYR CYS ARG PHE LYS LYS SER GLY ILE ARG Y34 L63 A76 R77 L81 Y84 VAL THR ASP MET MET LYS

# 4 Experimental information ⓘ

| Property | Value | Source |
|---|---|---|
| EM reconstruction method | SINGLE PARTICLE | Depositor |
| Imposed symmetry | POINT, Not provided | |
| Number of particles used | 129576 | 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 $(e^-/\text{Å}^2)$ | 1.0 | Depositor |
| Minimum defocus (nm) | 500 | Depositor |
| Maximum defocus (nm) | 1500 | Depositor |
| Magnification | Not provided | |
| Image detector | GATAN K3 BIOQUANTUM (6k x 4k) | Depositor |
| Maximum map value | 0.182 | Depositor |
| Minimum map value | -0.077 | Depositor |
| Average map value | 0.000 | Depositor |
| Map value standard deviation | 0.004 | Depositor |
| Recommended contour level | 0.005 | Depositor |
| Map size (Å) | 370.48, 370.48, 370.48 | wwPDB |
| Map dimensions | 440, 440, 440 | wwPDB |
| Map angles (°) | 90.0, 90.0, 90.0 | wwPDB |
| Pixel spacing (Å) | 0.842, 0.842, 0.842 | Depositor |

# 5 Model quality ⓘ

## 5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: 7MG, 4OC, OMU, 2MA, MG, NA, MA6, ZN, K, 5OC, UR3, 5MU, 2MG, OMG, PSU, H2U, 5MC

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 | p | 0.13 | 0/522 | 0.30 | 0/708 |
| 2 | 0 | 0.16 | 0/617 | 0.31 | 0/825 |
| 3 | 1 | 0.14 | 0/454 | 0.26 | 0/615 |
| 4 | 2 | 0.19 | 0/440 | 0.35 | 0/591 |
| 5 | 4 | 0.19 | 0/438 | 0.34 | 0/592 |
| 6 | 5 | 0.17 | 0/344 | 0.39 | 0/464 |
| 7 | 6 | 0.18 | 0/395 | 0.35 | 0/521 |
| 8 | 7 | 0.16 | 0/461 | 0.44 | 0/617 |
| 9 | 8 | 0.10 | 0/263 | 0.25 | 0/347 |
| 10 | A | 0.23 | 0/56035 | 0.35 | 5/87314 (0.0%) |
| 11 | B | 0.15 | 0/2393 | 0.27 | 0/3723 |
| 12 | D | 0.19 | 0/2097 | 0.37 | 1/2814 (0.0%) |
| 13 | E | 0.18 | 0/1541 | 0.39 | 0/2071 |
| 14 | F | 0.18 | 0/1647 | 0.34 | 0/2219 |
| 15 | K | 0.14 | 0/518 | 0.38 | 0/703 |
| 16 | L | 0.09 | 0/553 | 0.23 | 0/750 |
| 17 | M | 0.18 | 0/1203 | 0.31 | 0/1622 |
| 18 | N | 0.17 | 0/911 | 0.34 | 0/1225 |
| 19 | O | 0.16 | 0/1001 | 0.37 | 0/1341 |
| 20 | P | 0.17 | 0/1112 | 0.39 | 0/1495 |
| 21 | Q | 0.18 | 0/1006 | 0.36 | 0/1347 |
| 22 | R | 0.13 | 0/745 | 0.30 | 0/1000 |
| 23 | S | 0.15 | 0/960 | 0.26 | 0/1275 |
| 24 | T | 0.21 | 0/936 | 0.35 | 0/1252 |
| 25 | U | 0.20 | 0/834 | 0.44 | 0/1118 |
| 26 | V | 0.18 | 0/1036 | 0.33 | 0/1385 |
| 27 | W | 0.18 | 0/690 | 0.37 | 0/924 |
| 28 | X | 0.14 | 0/738 | 0.31 | 0/988 |
| 29 | Z | 0.16 | 0/577 | 0.29 | 0/772 |
| 30 | a | 0.15 | 0/31641 | 0.30 | 0/49284 |
| 31 | b | 0.10 | 0/708 | 0.30 | 0/967 |
| 32 | c | 0.14 | 0/723 | 0.32 | 0/977 |

| Mol | Chain | Bond lengths | | Bond angles | |
|-----|-------|------|--------|------|--------|
| | | RMSZ | #\|Z\| >5 | RMSZ | #\|Z\| >5 |
| 33 | d | 0.16 | 0/597 | 0.37 | 0/799 |
| 34 | e | 0.11 | 0/650 | 0.28 | 0/872 |
| 35 | f | 0.15 | 0/680 | 0.34 | 0/914 |
| 36 | g | 0.11 | 0/670 | 0.27 | 0/897 |
| 37 | h | 0.20 | 0/417 | 0.54 | 0/559 |
| 38 | i | 0.13 | 0/622 | 0.32 | 0/839 |
| 39 | j | 0.10 | 0/860 | 0.30 | 0/1167 |
| 40 | k | 0.12 | 0/694 | 0.34 | 0/936 |
| 41 | l | 0.14 | 0/1412 | 0.38 | 0/1922 |
| 42 | m | 0.15 | 0/722 | 0.36 | 0/981 |
| 43 | n | 0.10 | 0/1043 | 0.28 | 0/1425 |
| 44 | Y | 0.15 | 0/863 | 0.38 | 0/1178 |
| 45 | o | 0.13 | 0/977 | 0.31 | 0/1317 |
| 46 | 10 | 0.10 | 0/222 | 0.23 | 0/289 |
| 47 | J | 0.12 | 0/838 | 0.30 | 0/1141 |
| 48 | I | 0.12 | 0/376 | 0.27 | 0/511 |
| All | All | 0.19 | 0/125182 | 0.33 | 6/187593 (0.0%) |

There are no bond length outliers.

All (6) bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed($^o$) | Ideal($^o$) |
|-----|-------|-----|------|-------|---|-----------|---------|
| 10 | A | 2672 | U | OP1-P-OP2 | -13.12 | 80.23 | 119.60 |
| 10 | A | 2671 | G | OP2-P-O3' | -12.05 | 71.84 | 108.00 |
| 10 | A | 2672 | U | O5'-P-OP1 | -10.34 | 76.98 | 108.00 |
| 10 | A | 2672 | U | O5'-P-OP2 | 8.86 | 134.59 | 108.00 |
| 10 | A | 2671 | G | OP1-P-O3' | 8.36 | 133.08 | 108.00 |
| 12 | D | 260 | PRO | CA-N-CD | -5.41 | 104.42 | 112.00 |

There are no chirality outliers.

There are no planarity outliers.

## 5.2　Too-close contacts ⓘ

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

| Mol | Chain | Non-H | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|-------|----------|----------|---------|--------------|
| 1 | p | 510 | 0 | 465 | 4 | 0 |

*Continued on next page...*

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| Mol | Chain | Non-H | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|-------|----------|----------|---------|--------------|
| 2 | 0 | 608 | 0 | 643 | 1 | 0 |
| 3 | 1 | 450 | 0 | 427 | 4 | 0 |
| 4 | 2 | 437 | 0 | 484 | 7 | 0 |
| 5 | 4 | 427 | 0 | 413 | 4 | 0 |
| 6 | 5 | 342 | 0 | 319 | 8 | 0 |
| 7 | 6 | 391 | 0 | 418 | 2 | 0 |
| 8 | 7 | 456 | 0 | 448 | 5 | 0 |
| 9 | 8 | 262 | 0 | 264 | 4 | 0 |
| 10 | A | 50306 | 0 | 25356 | 260 | 0 |
| 11 | B | 2142 | 0 | 1085 | 10 | 0 |
| 12 | D | 2058 | 0 | 2134 | 14 | 0 |
| 13 | E | 1512 | 0 | 1548 | 12 | 0 |
| 14 | F | 1624 | 0 | 1692 | 7 | 0 |
| 15 | K | 511 | 0 | 458 | 6 | 0 |
| 16 | L | 550 | 0 | 401 | 7 | 0 |
| 17 | M | 1178 | 0 | 1208 | 11 | 0 |
| 18 | N | 904 | 0 | 969 | 7 | 0 |
| 19 | O | 991 | 0 | 1005 | 5 | 0 |
| 20 | P | 1089 | 0 | 1108 | 15 | 0 |
| 21 | Q | 989 | 0 | 1035 | 4 | 0 |
| 22 | R | 739 | 0 | 692 | 5 | 0 |
| 23 | S | 945 | 0 | 998 | 6 | 0 |
| 24 | T | 919 | 0 | 964 | 5 | 0 |
| 25 | U | 824 | 0 | 869 | 5 | 0 |
| 26 | V | 1023 | 0 | 1065 | 9 | 0 |
| 27 | W | 683 | 0 | 709 | 12 | 0 |
| 28 | X | 732 | 0 | 756 | 3 | 0 |
| 29 | Z | 570 | 0 | 574 | 1 | 0 |
| 30 | a | 28463 | 0 | 14367 | 256 | 0 |
| 31 | b | 696 | 0 | 618 | 9 | 0 |
| 32 | c | 712 | 0 | 676 | 10 | 0 |
| 33 | d | 591 | 0 | 608 | 9 | 0 |
| 34 | e | 639 | 0 | 644 | 10 | 0 |
| 35 | f | 671 | 0 | 645 | 9 | 0 |
| 36 | g | 659 | 0 | 676 | 4 | 0 |
| 37 | h | 415 | 0 | 443 | 4 | 0 |
| 38 | i | 616 | 0 | 633 | 8 | 0 |
| 39 | j | 849 | 0 | 810 | 8 | 0 |
| 40 | k | 691 | 0 | 604 | 7 | 0 |
| 41 | l | 1383 | 0 | 1297 | 18 | 0 |
| 42 | m | 714 | 0 | 628 | 9 | 0 |
| 43 | n | 1032 | 0 | 952 | 7 | 0 |

*Continued on next page...*

*Continued from previous page...*

| Mol | Chain | Non-H | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|-------|----------|----------|---------|--------------|
| 44 | Y | 851 | 0 | 777 | 6 | 0 |
| 45 | o | 964 | 0 | 983 | 8 | 0 |
| 46 | 10 | 219 | 0 | 228 | 4 | 0 |
| 47 | J | 827 | 0 | 751 | 9 | 0 |
| 48 | I | 369 | 0 | 347 | 3 | 0 |
| 49 | 4 | 1 | 0 | 0 | 0 | 0 |
| 49 | A | 119 | 0 | 0 | 0 | 0 |
| 49 | F | 1 | 0 | 0 | 0 | 0 |
| 49 | T | 1 | 0 | 0 | 0 | 0 |
| 49 | V | 2 | 0 | 0 | 0 | 0 |
| 49 | a | 4 | 0 | 0 | 0 | 0 |
| 50 | 4 | 1 | 0 | 0 | 0 | 0 |
| 51 | A | 31 | 0 | 0 | 0 | 0 |
| 51 | B | 1 | 0 | 0 | 0 | 0 |
| 51 | W | 1 | 0 | 0 | 0 | 0 |
| 51 | X | 1 | 0 | 0 | 0 | 0 |
| 51 | a | 9 | 0 | 0 | 0 | 0 |
| 52 | A | 12 | 0 | 0 | 0 | 0 |
| 52 | B | 2 | 0 | 0 | 0 | 0 |
| 53 | 4 | 2 | 0 | 0 | 0 | 0 |
| 53 | A | 741 | 0 | 0 | 13 | 0 |
| 53 | B | 6 | 0 | 0 | 1 | 0 |
| 53 | D | 4 | 0 | 0 | 0 | 0 |
| 53 | E | 10 | 0 | 0 | 0 | 0 |
| 53 | F | 4 | 0 | 0 | 0 | 0 |
| 53 | M | 2 | 0 | 0 | 1 | 0 |
| 53 | O | 13 | 0 | 0 | 0 | 0 |
| 53 | Q | 8 | 0 | 0 | 0 | 0 |
| 53 | T | 10 | 0 | 0 | 0 | 0 |
| 53 | U | 8 | 0 | 0 | 0 | 0 |
| 53 | V | 6 | 0 | 0 | 0 | 0 |
| 53 | Z | 1 | 0 | 0 | 0 | 0 |
| 53 | a | 40 | 0 | 0 | 3 | 0 |
| All | All | 116574 | 0 | 75194 | 748 | 0 |

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 4.

All (748) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
| --- | --- | --- | --- |
| 10:A:1949:5MU:C5 | 10:A:1949:5MU:C4 | 1.79 | 1.68 |
| 30:a:1426:A:H2 | 30:a:1459:G:H1 | 1.31 | 0.79 |
| 10:A:1436:G:H1 | 10:A:1632:U:H3 | 1.29 | 0.78 |
| 30:a:1117:G:H1 | 30:a:1148:U:H3 | 1.33 | 0.77 |
| 10:A:253:G:H22 | 10:A:275:G:H1 | 1.31 | 0.76 |
| 17:M:8:THR:HG21 | 24:T:61:TRP:HE1 | 1.49 | 0.76 |
| 30:a:1009:U:H3 | 30:a:1020:G:H1 | 1.33 | 0.76 |
| 33:d:57:ARG:O | 33:d:61:LYS:HB2 | 1.90 | 0.72 |
| 10:A:1452:U:H3 | 10:A:1613:G:H1 | 1.41 | 0.69 |
| 10:A:2302:C:H42 | 10:A:2317:G:H1 | 1.39 | 0.69 |
| 30:a:1425:U:H3 | 30:a:1460:G:H22 | 1.39 | 0.68 |
| 10:A:677:A:H4' | 10:A:678:G:H5' | 1.74 | 0.68 |
| 30:a:1353:C:H2' | 30:a:1354:A:H8 | 1.59 | 0.68 |
| 19:O:83:GLN:NE2 | 19:O:119:VAL:O | 2.26 | 0.68 |
| 37:h:6:LYS:HB2 | 37:h:36:ALA:H | 1.58 | 0.68 |
| 12:D:144:ILE:HB | 12:D:154:MET:HB2 | 1.76 | 0.68 |
| 30:a:1109:C:H42 | 30:a:1186:A:H61 | 1.40 | 0.68 |
| 10:A:719:G:N7 | 53:A:3104:HOH:O | 2.28 | 0.67 |
| 10:A:811:G:N2 | 10:A:812:G:O6 | 2.28 | 0.67 |
| 30:a:201:U:O2 | 34:e:66:ARG:NH1 | 2.28 | 0.67 |
| 10:A:123:G:H22 | 10:A:134:G:H22 | 1.43 | 0.66 |
| 40:k:140:ALA:HA | 40:k:143:MET:HE3 | 1.77 | 0.66 |
| 30:a:513:C:HO2' | 30:a:516:U:H3 | 1.43 | 0.65 |
| 10:A:2524:G:H1 | 10:A:2541:C:H5 | 1.43 | 0.65 |
| 13:E:55:ALA:HB2 | 13:E:77:ARG:HG2 | 1.79 | 0.65 |
| 44:Y:52:LEU:HD12 | 44:Y:53:ILE:HG12 | 1.79 | 0.65 |
| 10:A:1943:G:H5" | 46:10:27:LYS:HA | 1.78 | 0.64 |
| 10:A:1065:C:H5 | 10:A:1160:G:H1 | 1.46 | 0.64 |
| 30:a:1243:G:H1 | 30:a:1290:U:H3 | 1.45 | 0.64 |
| 34:e:6:ARG:HB2 | 34:e:63:MET:HE2 | 1.78 | 0.64 |
| 30:a:463:C:H42 | 30:a:470:A:H61 | 1.44 | 0.64 |
| 30:a:658:U:H3 | 30:a:747:C:H41 | 1.45 | 0.64 |
| 4:2:7:GLN:HB2 | 4:2:34:ILE:HG12 | 1.80 | 0.64 |
| 5:4:40:HIS:HD1 | 10:A:2801:G:HO2' | 1.45 | 0.64 |
| 18:N:93:ILE:HG22 | 18:N:95:GLY:H | 1.63 | 0.64 |
| 30:a:501:C:H2' | 30:a:508:U:H3 | 1.63 | 0.64 |
| 34:e:69:SER:HB3 | 34:e:72:LYS:HB2 | 1.80 | 0.64 |
| 10:A:2348:C:H5 | 10:A:2371:G:H1 | 1.43 | 0.64 |
| 27:W:63:ASN:HB3 | 27:W:70:LEU:HD11 | 1.80 | 0.64 |
| 10:A:1169:A:O2' | 10:A:1172:G:OP1 | 2.16 | 0.63 |
| 10:A:1827:U:O2' | 12:D:154:MET:O | 2.16 | 0.63 |
| 30:a:1426:A:N1 | 30:a:1459:G:O6 | 2.31 | 0.63 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 30:a:1422:G:OP2 | 30:a:1422:G:N2 | 2.28 | 0.63 |
| 6:5:47:LYS:NZ | 10:A:2348:C:OP1 | 2.30 | 0.63 |
| 17:M:2:ASP:OD1 | 17:M:7:LYS:NZ | 2.31 | 0.63 |
| 30:a:462:G:H22 | 30:a:471:G:H1 | 1.47 | 0.63 |
| 10:A:1990:G:O2' | 10:A:1992:U:OP2 | 2.16 | 0.63 |
| 30:a:1009:U:H3' | 30:a:1010:G:H21 | 1.63 | 0.62 |
| 30:a:340:C:O2' | 30:a:1431:A:N3 | 2.32 | 0.62 |
| 30:a:858:C:OP2 | 30:a:868:G:N1 | 2.31 | 0.62 |
| 30:a:1353:C:H2' | 30:a:1354:A:C8 | 2.34 | 0.62 |
| 10:A:1234:G:H1 | 10:A:1269:U:H5 | 1.48 | 0.62 |
| 33:d:41:ARG:NH1 | 33:d:41:ARG:HB3 | 2.15 | 0.61 |
| 37:h:12:LEU:HD11 | 37:h:19:VAL:HG21 | 1.82 | 0.61 |
| 25:U:24:HIS:HA | 25:U:96:THR:HG23 | 1.82 | 0.61 |
| 30:a:1249:A:OP1 | 47:J:73:GLN:NE2 | 2.33 | 0.61 |
| 10:A:1964:G:N2 | 53:A:3128:HOH:O | 2.34 | 0.61 |
| 28:X:74:VAL:HG13 | 28:X:79:GLY:HA2 | 1.82 | 0.61 |
| 10:A:1596:G:H3' | 10:A:1597:G:H21 | 1.66 | 0.60 |
| 30:a:1125:C:O3' | 30:a:1142:G:N2 | 2.31 | 0.60 |
| 30:a:1355:U:OP2 | 30:a:1356:C:N4 | 2.34 | 0.60 |
| 30:a:1509:G:N7 | 46:10:15:HIS:NE2 | 2.48 | 0.60 |
| 20:P:58:MET:HE2 | 20:P:109:VAL:HG21 | 1.83 | 0.60 |
| 31:b:11:THR:HG23 | 31:b:55:LYS:HE3 | 1.83 | 0.60 |
| 30:a:1125:C:HO3' | 30:a:1142:G:H22 | 1.50 | 0.60 |
| 10:A:2438:G:N7 | 53:A:3113:HOH:O | 2.31 | 0.60 |
| 30:a:517:G:H1 | 30:a:533:A:H61 | 1.49 | 0.60 |
| 42:m:117:THR:HB | 42:m:120:ASP:HB2 | 1.83 | 0.60 |
| 43:n:20:LEU:HD11 | 43:n:23:ILE:HG23 | 1.83 | 0.60 |
| 10:A:465:G:N7 | 53:A:3111:HOH:O | 2.31 | 0.60 |
| 15:K:52:ARG:NH2 | 30:a:1187:U:OP1 | 2.35 | 0.60 |
| 41:l:167:GLU:N | 41:l:167:GLU:OE1 | 2.35 | 0.60 |
| 10:A:123:G:H1 | 10:A:134:G:H1 | 1.49 | 0.60 |
| 23:S:49:ARG:NH1 | 23:S:98:TYR:OH | 2.35 | 0.60 |
| 43:n:137:ASN:O | 43:n:141:LEU:HB2 | 2.01 | 0.60 |
| 10:A:2550:G:N7 | 53:A:3118:HOH:O | 2.32 | 0.59 |
| 30:a:678:U:H1' | 30:a:777:A:H4' | 1.84 | 0.59 |
| 10:A:2035:C:H2' | 10:A:2036:G:C8 | 2.37 | 0.59 |
| 18:N:4:GLN:OE1 | 18:N:23:ARG:NH2 | 2.34 | 0.59 |
| 26:V:102:LYS:HG2 | 26:V:114:ARG:HD3 | 1.84 | 0.59 |
| 12:D:133:ALA:HB2 | 12:D:186:SER:HB3 | 1.83 | 0.59 |
| 6:5:20:LYS:HB3 | 6:5:57:LEU:HB3 | 1.85 | 0.58 |
| 30:a:830:G:H1 | 30:a:854:U:H3 | 1.50 | 0.58 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 1:p:36:ARG:NH2 | 1:p:75:SER:O | 2.35 | 0.58 |
| 30:a:545:C:OP1 | 41:l:54:LYS:NZ | 2.35 | 0.58 |
| 30:a:1346:A:H5' | 47:J:121:LYS:HB2 | 1.85 | 0.58 |
| 31:b:5:GLU:OE1 | 31:b:93:GLN:NE2 | 2.31 | 0.58 |
| 33:d:58:LEU:HG | 33:d:63:ILE:HB | 1.85 | 0.58 |
| 3:1:49:MET:HG2 | 3:1:53:MET:HE3 | 1.84 | 0.58 |
| 30:a:412:A:H61 | 30:a:439:C:H42 | 1.50 | 0.58 |
| 30:a:1430:G:H21 | 30:a:1455:C:H5 | 1.51 | 0.58 |
| 40:k:165:GLU:N | 40:k:165:GLU:OE1 | 2.37 | 0.58 |
| 20:P:54:VAL:HB | 20:P:121:ALA:HB2 | 1.84 | 0.58 |
| 30:a:36:C:OP1 | 39:j:120:LYS:NZ | 2.35 | 0.58 |
| 30:a:1292:C:O3' | 38:i:15:ARG:NH1 | 2.37 | 0.58 |
| 10:A:848:U:H2' | 10:A:849:C:C6 | 2.39 | 0.58 |
| 30:a:945:A:H2' | 30:a:946:A:C8 | 2.39 | 0.58 |
| 41:l:133:VAL:HG11 | 41:l:139:ILE:HD11 | 1.85 | 0.58 |
| 42:m:46:LEU:HD22 | 42:m:60:ALA:HB1 | 1.85 | 0.58 |
| 10:A:1860:U:H2' | 10:A:1861:A:C8 | 2.39 | 0.57 |
| 10:A:2201:G:H2' | 10:A:2202:G:C5 | 2.39 | 0.57 |
| 20:P:35:LYS:NZ | 44:Y:82:PRO:O | 2.31 | 0.57 |
| 38:i:10:LEU:O | 38:i:12:GLN:NE2 | 2.34 | 0.57 |
| 30:a:652:U:O4 | 30:a:752:G:O2' | 2.23 | 0.57 |
| 10:A:258:U:H3 | 10:A:270:G:H22 | 1.52 | 0.57 |
| 30:a:367:G:N2 | 30:a:370:U:OP2 | 2.37 | 0.57 |
| 47:J:118:LYS:HB2 | 47:J:121:LYS:HB3 | 1.87 | 0.57 |
| 10:A:2292:U:H2' | 10:A:2293:A:C8 | 2.40 | 0.56 |
| 18:N:88:ASN:HD21 | 18:N:92:ASP:HB3 | 1.70 | 0.56 |
| 26:V:98:ALA:HB3 | 26:V:119:SER:HB2 | 1.87 | 0.56 |
| 30:a:674:G:H2' | 30:a:675:A:H8 | 1.70 | 0.56 |
| 41:l:143:GLU:N | 41:l:143:GLU:OE2 | 2.37 | 0.56 |
| 47:J:65:LEU:HD22 | 47:J:73:GLN:HG2 | 1.88 | 0.56 |
| 10:A:1694:G:N7 | 53:A:3121:HOH:O | 2.32 | 0.56 |
| 17:M:18:LYS:NZ | 17:M:54:ASP:OD1 | 2.37 | 0.56 |
| 30:a:1313:G:N2 | 30:a:1316:A:OP2 | 2.33 | 0.56 |
| 20:P:138:ASP:HB3 | 44:Y:55:SER:HB2 | 1.88 | 0.56 |
| 30:a:562:U:H1' | 39:j:12:ARG:HD2 | 1.87 | 0.56 |
| 30:a:835:U:H2' | 30:a:836:G:H8 | 1.71 | 0.56 |
| 30:a:1312:U:O2' | 30:a:1357:A:N3 | 2.32 | 0.56 |
| 6:5:47:LYS:O | 6:5:54:ARG:NE | 2.39 | 0.56 |
| 10:A:1756:C:H2' | 10:A:1757:A:H8 | 1.71 | 0.56 |
| 34:e:16:ASN:ND2 | 34:e:54:CYS:O | 2.39 | 0.56 |
| 10:A:2353:A:H2 | 10:A:2366:G:H21 | 1.54 | 0.56 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 12:D:107:PRO:HD2 | 12:D:110:LEU:HD22 | 1.87 | 0.56 |
| 10:A:1672:U:H2' | 10:A:1673:A:C8 | 2.41 | 0.55 |
| 30:a:247:C:O2' | 30:a:250:U:OP1 | 2.25 | 0.55 |
| 10:A:756:A:H2' | 10:A:757:A:C8 | 2.42 | 0.55 |
| 10:A:834:G:N7 | 53:A:3124:HOH:O | 2.33 | 0.55 |
| 10:A:1392:C:O2' | 10:A:1818:A:N3 | 2.37 | 0.55 |
| 30:a:618:C:N4 | 30:a:621:A:OP2 | 2.39 | 0.55 |
| 30:a:463:C:O2' | 30:a:464:G:O5' | 2.25 | 0.55 |
| 30:a:606:G:H22 | 30:a:631:C:H2' | 1.72 | 0.55 |
| 32:c:7:LEU:HB3 | 32:c:18:TYR:HB3 | 1.88 | 0.55 |
| 22:R:91:ARG:HH21 | 22:R:95:LEU:HA | 1.72 | 0.55 |
| 30:a:958:A:O2' | 30:a:959:U:O4' | 2.25 | 0.55 |
| 10:A:753:A:H3' | 10:A:754:C:H6 | 1.72 | 0.55 |
| 30:a:259:G:H4' | 34:e:21:THR:HG21 | 1.88 | 0.55 |
| 30:a:130:G:OP1 | 34:e:4:ASN:ND2 | 2.40 | 0.54 |
| 30:a:835:U:H2' | 30:a:836:G:C8 | 2.43 | 0.54 |
| 30:a:945:A:H2' | 30:a:946:A:H8 | 1.72 | 0.54 |
| 30:a:683:G:O6 | 30:a:707:U:O2 | 2.25 | 0.54 |
| 30:a:1431:A:H62 | 30:a:1454:A:H2 | 1.55 | 0.54 |
| 30:a:975:G:OP2 | 30:a:1355:U:O2' | 2.24 | 0.54 |
| 9:8:19:ARG:NE | 10:A:2757:U:OP2 | 2.32 | 0.54 |
| 10:A:1369:U:OP1 | 27:W:12:LYS:NZ | 2.41 | 0.54 |
| 10:A:169:A:H2' | 10:A:170:C:C6 | 2.43 | 0.54 |
| 7:6:39:ARG:NH2 | 10:A:491:G:N7 | 2.47 | 0.54 |
| 8:7:39:LYS:NZ | 10:A:2366:G:N7 | 2.54 | 0.54 |
| 10:A:2228:A:H5" | 12:D:261:LYS:HE3 | 1.89 | 0.54 |
| 43:n:120:LEU:HD13 | 43:n:128:VAL:HG11 | 1.89 | 0.54 |
| 12:D:22:ASP:N | 12:D:22:ASP:OD1 | 2.36 | 0.54 |
| 10:A:314:G:OP1 | 28:X:3:LYS:NZ | 2.41 | 0.54 |
| 10:A:2675:G:H4' | 18:N:30:ARG:HD2 | 1.90 | 0.54 |
| 30:a:513:C:O2' | 30:a:516:U:N3 | 2.35 | 0.54 |
| 30:a:1426:A:C2 | 30:a:1459:G:N1 | 2.63 | 0.54 |
| 30:a:1249:A:OP1 | 47:J:67:GLY:N | 2.41 | 0.53 |
| 41:l:65:GLU:OE2 | 41:l:199:TYR:OH | 2.25 | 0.53 |
| 25:U:7:ILE:HG21 | 25:U:22:VAL:HG11 | 1.91 | 0.53 |
| 28:X:82:THR:HG21 | 28:X:98:ALA:HB1 | 1.90 | 0.53 |
| 30:a:1142:G:H21 | 47:J:16:ARG:NH1 | 2.06 | 0.53 |
| 30:a:217:U:H2' | 30:a:218:A:C8 | 2.43 | 0.53 |
| 30:a:976:A:O2' | 30:a:980:U:O4 | 2.27 | 0.53 |
| 10:A:1703:G:O2' | 10:A:2001:U:O4 | 2.23 | 0.53 |
| 10:A:2329:A:H2' | 10:A:2330:U:C6 | 2.44 | 0.53 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 30:a:38:A:H61 | 30:a:402:A:H5" | 1.72 | 0.53 |
| 10:A:64:G:H22 | 10:A:99:A:H2 | 1.57 | 0.53 |
| 30:a:153:U:H2' | 30:a:154:A:H8 | 1.74 | 0.53 |
| 10:A:307:G:H2' | 10:A:308:A:H8 | 1.73 | 0.53 |
| 10:A:883:U:H2' | 10:A:884:U:C6 | 2.44 | 0.53 |
| 30:a:1249:A:H2' | 30:a:1250:A:C8 | 2.44 | 0.53 |
| 10:A:1276:A:N7 | 53:A:3130:HOH:O | 2.34 | 0.53 |
| 30:a:973:A:H4' | 30:a:974:G:H3' | 1.90 | 0.53 |
| 10:A:517:A:H4' | 26:V:23:LYS:HB2 | 1.91 | 0.53 |
| 10:A:1415:A:H2' | 10:A:1416:C:O4' | 2.09 | 0.53 |
| 23:S:109:ARG:NH1 | 30:a:1450:G:OP1 | 2.40 | 0.53 |
| 30:a:983:U:H3 | 30:a:1219:G:H1 | 1.56 | 0.53 |
| 12:D:37:LYS:HD2 | 12:D:62:TYR:HB2 | 1.90 | 0.52 |
| 30:a:1295:C:O2 | 30:a:1296:A:N6 | 2.42 | 0.52 |
| 39:j:81:LEU:HD22 | 39:j:101:THR:HG21 | 1.90 | 0.52 |
| 30:a:742:U:H2' | 30:a:743:A:H8 | 1.75 | 0.52 |
| 10:A:2440:A:O2' | 10:A:2588:A:OP1 | 2.24 | 0.52 |
| 30:a:552:U:H2' | 30:a:553:A:H8 | 1.74 | 0.52 |
| 30:a:1054:G:OP1 | 40:k:153:SER:OG | 2.27 | 0.52 |
| 10:A:123:G:H1 | 10:A:134:G:H22 | 1.55 | 0.52 |
| 10:A:618:U:H2' | 10:A:619:G:C8 | 2.44 | 0.52 |
| 10:A:2462:C:H2' | 10:A:2463:A:C8 | 2.44 | 0.52 |
| 11:B:35:C:N3 | 11:B:46:A:O2' | 2.40 | 0.52 |
| 34:e:71:THR:O | 34:e:71:THR:OG1 | 2.26 | 0.52 |
| 8:7:59:LYS:O | 8:7:64:LEU:N | 2.37 | 0.52 |
| 10:A:1002:U:H2' | 10:A:1003:C:C6 | 2.44 | 0.52 |
| 11:B:60:C:H2' | 11:B:61:A:H8 | 1.74 | 0.52 |
| 10:A:307:G:H2' | 10:A:308:A:C8 | 2.45 | 0.52 |
| 10:A:603:C:H2' | 10:A:604:U:C6 | 2.44 | 0.52 |
| 10:A:2292:U:OP1 | 10:A:2381:U:O2' | 2.28 | 0.52 |
| 11:B:99:G:N7 | 53:B:301:HOH:O | 2.34 | 0.52 |
| 30:a:21:G:H2' | 30:a:22:G:C8 | 2.44 | 0.52 |
| 30:a:671:G:O2' | 31:b:76:GLU:OE1 | 2.26 | 0.52 |
| 10:A:1033:A:H2' | 10:A:1034:A:C8 | 2.45 | 0.52 |
| 30:a:302:G:N2 | 30:a:305:A:OP2 | 2.37 | 0.52 |
| 30:a:448:U:H2' | 30:a:449:A:H8 | 1.75 | 0.52 |
| 34:e:19:ASP:OD1 | 34:e:19:ASP:N | 2.36 | 0.52 |
| 46:10:12:MET:HE2 | 46:10:16:LYS:HE2 | 1.91 | 0.52 |
| 4:2:48:ASN:OD1 | 4:2:51:ARG:NH2 | 2.43 | 0.52 |
| 26:V:92:ARG:HB2 | 26:V:125:TYR:HB2 | 1.92 | 0.52 |
| 30:a:478:A:O2' | 30:a:480:U:O4 | 2.27 | 0.52 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
| --- | --- | --- | --- |
| 10:A:1435:U:H2' | 10:A:1436:G:H8 | 1.75 | 0.52 |
| 10:A:1949:5MU:OP1 | 10:A:2605:U:O2' | 2.27 | 0.52 |
| 10:A:2074:C:H2' | 10:A:2075:C:C6 | 2.44 | 0.52 |
| 20:P:64:VAL:HG22 | 20:P:106:VAL:HG12 | 1.92 | 0.52 |
| 30:a:1426:A:N1 | 30:a:1459:G:C6 | 2.78 | 0.52 |
| 32:c:17:PHE:HD1 | 32:c:41:ASN:HD22 | 1.57 | 0.52 |
| 33:d:28:ALA:O | 33:d:32:VAL:HG23 | 2.10 | 0.52 |
| 10:A:327:A:N3 | 10:A:347:G:O2' | 2.41 | 0.51 |
| 10:A:1429:C:H2' | 10:A:1430:G:H8 | 1.75 | 0.51 |
| 20:P:32:PHE:HD2 | 20:P:133:VAL:HG12 | 1.76 | 0.51 |
| 30:a:498:C:H2' | 30:a:499:A:H8 | 1.75 | 0.51 |
| 10:A:749:U:O2' | 10:A:751:A:N7 | 2.42 | 0.51 |
| 10:A:898:G:N7 | 53:A:3131:HOH:O | 2.34 | 0.51 |
| 10:A:1416:C:H2' | 10:A:1417:C:C6 | 2.46 | 0.51 |
| 19:O:112:LYS:HG3 | 19:O:129:ALA:HB3 | 1.92 | 0.51 |
| 10:A:258:U:H2' | 10:A:259:G:C8 | 2.46 | 0.51 |
| 30:a:371:A:N6 | 53:a:1706:HOH:O | 2.36 | 0.51 |
| 30:a:402:A:H1' | 30:a:403:A:H2' | 1.90 | 0.51 |
| 3:1:25:TYR:HB2 | 3:1:46:GLN:HG2 | 1.93 | 0.51 |
| 14:F:159:GLU:OE2 | 14:F:198:ARG:NH1 | 2.40 | 0.51 |
| 30:a:1502:A:H2' | 30:a:1503:C:C6 | 2.46 | 0.51 |
| 20:P:65:TRP:HB2 | 20:P:105:GLU:HG2 | 1.91 | 0.51 |
| 10:A:658:A:H61 | 10:A:668:A:H5" | 1.76 | 0.51 |
| 24:T:83:LEU:HG | 24:T:88:ILE:HD11 | 1.93 | 0.51 |
| 30:a:423:U:OP1 | 30:a:510:A:O2' | 2.28 | 0.51 |
| 30:a:1518:G:N7 | 46:10:7:ARG:NH1 | 2.59 | 0.51 |
| 39:j:50:ARG:HB3 | 39:j:66:TYR:HE1 | 1.76 | 0.51 |
| 48:I:76:ALA:HB1 | 48:I:81:LEU:HB2 | 1.93 | 0.51 |
| 10:A:1811:A:H2' | 10:A:1812:A:C8 | 2.47 | 0.50 |
| 10:A:2101:U:H3 | 10:A:2229:C:H42 | 1.60 | 0.50 |
| 12:D:123:ALA:O | 12:D:128:ASN:ND2 | 2.35 | 0.50 |
| 30:a:1183:U:H2' | 30:a:1184:G:C8 | 2.46 | 0.50 |
| 43:n:48:ASP:OD1 | 43:n:48:ASP:N | 2.45 | 0.50 |
| 10:A:2295:C:OP1 | 22:R:91:ARG:NH2 | 2.38 | 0.50 |
| 10:A:890:G:H2' | 10:A:891:A:C8 | 2.46 | 0.50 |
| 10:A:602:C:H2' | 10:A:603:C:C6 | 2.45 | 0.50 |
| 10:A:1071:C:H5 | 10:A:1155:G:H1 | 1.59 | 0.50 |
| 17:M:135:HIS:CE1 | 17:M:137:HIS:HB2 | 2.46 | 0.50 |
| 10:A:2315:C:H2' | 10:A:2316:G:C8 | 2.46 | 0.50 |
| 10:A:72:A:H2 | 10:A:91:A:H2 | 1.58 | 0.50 |
| 10:A:258:U:H3 | 10:A:270:G:H1 | 1.59 | 0.50 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 25:U:14:VAL:HG21 | 25:U:100:VAL:HG21 | 1.92 | 0.50 |
| 12:D:48:LYS:NZ | 12:D:49:MET:O | 2.34 | 0.50 |
| 30:a:1320:G:H2' | 30:a:1321:A:C8 | 2.47 | 0.50 |
| 30:a:1397:C:H4' | 30:a:1398:C:H3' | 1.92 | 0.50 |
| 10:A:715:A:H2' | 10:A:716:A:C8 | 2.47 | 0.50 |
| 10:A:668:A:H8 | 10:A:682:G:H21 | 1.60 | 0.50 |
| 27:W:66:THR:OG1 | 27:W:67:LYS:N | 2.44 | 0.50 |
| 1:p:74:PHE:HE1 | 38:i:85:ILE:HG23 | 1.76 | 0.49 |
| 30:a:498:C:H1' | 30:a:549:C:H1' | 1.94 | 0.49 |
| 10:A:1052:U:OP1 | 10:A:1070:U:O2' | 2.23 | 0.49 |
| 30:a:1349:C:H2' | 30:a:1350:G:C8 | 2.48 | 0.49 |
| 42:m:125:GLU:OE1 | 42:m:125:GLU:N | 2.44 | 0.49 |
| 10:A:773:G:N7 | 53:A:3127:HOH:O | 2.34 | 0.49 |
| 10:A:1435:U:H2' | 10:A:1436:G:C8 | 2.47 | 0.49 |
| 30:a:217:U:H2' | 30:a:218:A:H8 | 1.77 | 0.49 |
| 30:a:1384:G:H2' | 30:a:1385:G:H8 | 1.77 | 0.49 |
| 39:j:50:ARG:NH1 | 39:j:89:ASP:OD2 | 2.44 | 0.49 |
| 10:A:610:U:H2' | 10:A:611:U:C6 | 2.48 | 0.49 |
| 17:M:119:LEU:O | 17:M:123:ILE:HG12 | 2.13 | 0.49 |
| 30:a:1057:U:H2' | 30:a:1058:G:H8 | 1.77 | 0.49 |
| 11:B:61:A:H2' | 11:B:62:A:C8 | 2.47 | 0.49 |
| 22:R:8:ARG:NH1 | 22:R:92:ASN:O | 2.45 | 0.49 |
| 30:a:269:C:O2' | 34:e:67:PRO:O | 2.28 | 0.49 |
| 30:a:1256:G:H2' | 30:a:1257:C:C6 | 2.48 | 0.49 |
| 39:j:83:ARG:HG2 | 39:j:98:VAL:HG22 | 1.95 | 0.49 |
| 9:8:31:PRO:HB2 | 10:A:2528:C:H5" | 1.94 | 0.49 |
| 10:A:630:A:H2' | 10:A:631:A:C8 | 2.48 | 0.49 |
| 10:A:1756:C:H2' | 10:A:1757:A:C8 | 2.47 | 0.49 |
| 21:Q:49:GLU:HA | 21:Q:52:LEU:HD12 | 1.95 | 0.49 |
| 30:a:268:A:OP1 | 33:d:71:ASN:ND2 | 2.46 | 0.49 |
| 30:a:301:U:O2 | 30:a:306:G:O6 | 2.30 | 0.49 |
| 30:a:613:G:H2' | 30:a:614:A:C8 | 2.48 | 0.49 |
| 30:a:834:U:H4' | 48:I:63:LEU:HD12 | 1.94 | 0.49 |
| 30:a:1520:A:H3' | 30:a:1521:A:H8 | 1.78 | 0.49 |
| 30:a:174:A:H2' | 30:a:175:A:C8 | 2.48 | 0.48 |
| 30:a:657:U:O2' | 35:f:22:THR:O | 2.23 | 0.48 |
| 30:a:451:G:H21 | 30:a:484:U:H5 | 1.60 | 0.48 |
| 30:a:1352:G:H2' | 30:a:1353:C:C6 | 2.47 | 0.48 |
| 8:7:19:THR:HG23 | 10:A:682:G:H5' | 1.96 | 0.48 |
| 10:A:2383:G:H3' | 10:A:2384:A:H5' | 1.94 | 0.48 |
| 15:K:62:GLU:OE1 | 15:K:62:GLU:N | 2.43 | 0.48 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 30:a:427:A:H2' | 30:a:428:A:C8 | 2.47 | 0.48 |
| 30:a:728:A:H2' | 30:a:729:A:C8 | 2.47 | 0.48 |
| 30:a:886:G:N7 | 53:a:1705:HOH:O | 2.35 | 0.48 |
| 43:n:142:VAL:O | 43:n:146:ILE:HG13 | 2.14 | 0.48 |
| 8:7:56:ASN:HA | 8:7:59:LYS:HB2 | 1.95 | 0.48 |
| 10:A:939:A:H2' | 10:A:940:G:H5" | 1.96 | 0.48 |
| 10:A:1154:U:H2' | 10:A:1155:G:C8 | 2.48 | 0.48 |
| 10:A:2547:U:OP1 | 18:N:29:ARG:NH1 | 2.39 | 0.48 |
| 30:a:259:G:H2' | 30:a:260:G:H8 | 1.79 | 0.48 |
| 30:a:907:A:H2' | 30:a:908:A:H8 | 1.79 | 0.48 |
| 30:a:976:A:H1' | 30:a:981:C:H41 | 1.78 | 0.48 |
| 30:a:1458:G:H2' | 30:a:1459:G:H8 | 1.78 | 0.48 |
| 31:b:43:TRP:HE1 | 31:b:62:LEU:HD22 | 1.78 | 0.48 |
| 30:a:581:G:OP1 | 35:f:65:ARG:NH2 | 2.34 | 0.48 |
| 30:a:1373:A:OP1 | 42:m:24:LYS:NZ | 2.41 | 0.48 |
| 30:a:1407:A:H2' | 30:a:1408:2MG:H8 | 1.78 | 0.48 |
| 32:c:19:LYS:HD3 | 32:c:36:ARG:HG3 | 1.95 | 0.48 |
| 45:o:112:MET:HE3 | 45:o:117:ALA:HA | 1.96 | 0.48 |
| 10:A:278:A:N6 | 10:A:279:A:N1 | 2.61 | 0.48 |
| 10:A:2247:G:H2' | 10:A:2248:A:C8 | 2.48 | 0.48 |
| 10:A:2671:G:H2' | 10:A:2672:U:C6 | 2.49 | 0.48 |
| 11:B:60:C:H2' | 11:B:61:A:C8 | 2.49 | 0.48 |
| 14:F:19:LEU:HA | 14:F:204:ASN:HD21 | 1.78 | 0.48 |
| 24:T:83:LEU:HD12 | 24:T:113:VAL:HG11 | 1.96 | 0.48 |
| 10:A:700:A:H2' | 10:A:701:G:C8 | 2.49 | 0.48 |
| 30:a:35:G:H2' | 30:a:36:C:C6 | 2.49 | 0.48 |
| 30:a:1043:A:H61 | 30:a:1209:U:H3 | 1.61 | 0.48 |
| 8:7:48:SER:OG | 8:7:49:THR:N | 2.47 | 0.48 |
| 30:a:1183:U:H2' | 30:a:1184:G:H8 | 1.79 | 0.48 |
| 30:a:1424:G:OP2 | 30:a:1424:G:N2 | 2.40 | 0.48 |
| 10:A:1834:U:H2' | 10:A:1835:C:C6 | 2.49 | 0.48 |
| 14:F:156:VAL:HB | 14:F:195:LEU:HD23 | 1.95 | 0.48 |
| 30:a:43:U:H5" | 32:c:12:ARG:HD3 | 1.96 | 0.48 |
| 30:a:1344:G:N2 | 30:a:1371:G:H2' | 2.29 | 0.48 |
| 30:a:1352:G:H2' | 30:a:1353:C:H6 | 1.78 | 0.48 |
| 40:k:139:SER:O | 40:k:143:MET:HG3 | 2.14 | 0.48 |
| 10:A:1429:C:H2' | 10:A:1430:G:C8 | 2.48 | 0.47 |
| 36:g:52:CYS:HB3 | 36:g:56:GLY:H | 1.79 | 0.47 |
| 41:l:120:THR:HA | 41:l:125:VAL:HA | 1.96 | 0.47 |
| 5:4:24:MET:HE1 | 26:V:44:MET:HE1 | 1.96 | 0.47 |
| 10:A:123:G:H22 | 10:A:134:G:N2 | 2.08 | 0.47 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 10:A:1176:U:H4' | 10:A:1177:A:O4' | 2.14 | 0.47 |
| 30:a:381:G:H5" | 32:c:6:ARG:HB2 | 1.95 | 0.47 |
| 30:a:1274:G:H2' | 30:a:1275:C:O4' | 2.14 | 0.47 |
| 31:b:11:THR:HG22 | 31:b:13:VAL:H | 1.79 | 0.47 |
| 10:A:1210:A:H2' | 10:A:1211:U:C6 | 2.50 | 0.47 |
| 10:A:1860:U:H2' | 10:A:1861:A:H8 | 1.79 | 0.47 |
| 30:a:970:G:OP2 | 30:a:1229:G:N2 | 2.42 | 0.47 |
| 30:a:1505:G:N1 | 30:a:1508:MA6:OP2 | 2.47 | 0.47 |
| 10:A:1976:A:N3 | 10:A:2593:G:O2' | 2.45 | 0.47 |
| 24:T:104:GLU:H | 24:T:104:GLU:CD | 2.23 | 0.47 |
| 30:a:1343:A:H61 | 30:a:1372:A:H3' | 1.79 | 0.47 |
| 10:A:457:U:H1' | 10:A:458:C:H5 | 1.79 | 0.47 |
| 10:A:1288:G:N7 | 53:A:3133:HOH:O | 2.35 | 0.47 |
| 10:A:2292:U:H2' | 10:A:2293:A:H8 | 1.79 | 0.47 |
| 16:L:22:ILE:HB | 16:L:85:VAL:HG22 | 1.95 | 0.47 |
| 30:a:9:G:H1 | 30:a:25:C:H5 | 1.63 | 0.47 |
| 30:a:139:C:O2' | 32:c:65:GLN:OE1 | 2.33 | 0.47 |
| 30:a:618:C:H5' | 30:a:619:U:H5" | 1.96 | 0.47 |
| 10:A:121:C:H42 | 10:A:136:C:N4 | 2.13 | 0.47 |
| 19:O:57:ILE:HA | 19:O:60:ARG:HG2 | 1.96 | 0.47 |
| 20:P:118:LEU:HD12 | 20:P:131:PHE:HE1 | 1.79 | 0.47 |
| 32:c:24:ASP:OD1 | 32:c:25:SER:N | 2.47 | 0.47 |
| 10:A:751:A:H2' | 10:A:752:C:O4' | 2.15 | 0.47 |
| 10:A:2315:C:H2' | 10:A:2316:G:H8 | 1.79 | 0.47 |
| 10:A:2462:C:H2' | 10:A:2463:A:H8 | 1.80 | 0.47 |
| 10:A:2702:C:O2' | 21:Q:73:LYS:NZ | 2.48 | 0.47 |
| 30:a:22:G:O2' | 30:a:912:A:N1 | 2.43 | 0.47 |
| 10:A:253:G:N2 | 10:A:275:G:H1 | 2.08 | 0.47 |
| 20:P:68:ILE:HD11 | 20:P:103:ILE:HG23 | 1.97 | 0.47 |
| 10:A:611:U:H2' | 10:A:612:A:H8 | 1.79 | 0.46 |
| 10:A:1438:U:H2' | 10:A:1439:A:C8 | 2.50 | 0.46 |
| 10:A:2670:U:O2' | 10:A:2671:G:OP1 | 2.28 | 0.46 |
| 30:a:575:G:O2' | 30:a:821:7MG:OP2 | 2.31 | 0.46 |
| 13:E:183:GLU:HG2 | 13:E:184:HIS:CD2 | 2.50 | 0.46 |
| 10:A:1067:A:N6 | 10:A:1158:A:H61 | 2.14 | 0.46 |
| 12:D:82:GLU:HB3 | 12:D:91:ILE:HG13 | 1.98 | 0.46 |
| 30:a:1284:A:H2' | 30:a:1285:A:C8 | 2.51 | 0.46 |
| 10:A:592:G:H2' | 10:A:2040:A:N7 | 2.31 | 0.46 |
| 10:A:899:C:O2 | 10:A:943:A:N6 | 2.48 | 0.46 |
| 10:A:1901:G:O2' | 10:A:2236:G:O2' | 2.33 | 0.46 |
| 10:A:906:U:H2' | 10:A:907:U:C6 | 2.50 | 0.46 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 11:B:52:G:H2' | 11:B:53:U:O4' | 2.16 | 0.46 |
| 30:a:464:G:H3' | 30:a:465:A:H8 | 1.80 | 0.46 |
| 30:a:613:G:H2' | 30:a:614:A:H8 | 1.81 | 0.46 |
| 30:a:674:G:H2' | 30:a:675:A:C8 | 2.48 | 0.46 |
| 30:a:1455:C:H2' | 30:a:1456:U:O4' | 2.16 | 0.46 |
| 10:A:2316:G:H2' | 10:A:2317:G:C8 | 2.50 | 0.46 |
| 15:K:52:ARG:HB3 | 30:a:1057:U:H5" | 1.98 | 0.46 |
| 16:L:22:ILE:HG12 | 16:L:31:ILE:HG12 | 1.97 | 0.46 |
| 26:V:30:SER:HB3 | 26:V:33:LYS:HD2 | 1.97 | 0.46 |
| 10:A:430:C:H2' | 10:A:431:G:H8 | 1.81 | 0.46 |
| 18:N:58:SER:OG | 18:N:59:LYS:N | 2.47 | 0.46 |
| 21:Q:79:LEU:HA | 21:Q:83:VAL:HB | 1.97 | 0.46 |
| 30:a:984:U:H3 | 30:a:1218:G:H1 | 1.63 | 0.46 |
| 42:m:106:LEU:HD11 | 42:m:125:GLU:HB3 | 1.96 | 0.46 |
| 43:n:39:ALA:HA | 43:n:56:GLY:O | 2.16 | 0.46 |
| 44:Y:23:ARG:HD3 | 44:Y:88:ILE:HG22 | 1.97 | 0.46 |
| 10:A:537:A:H2' | 10:A:538:C:C6 | 2.51 | 0.46 |
| 30:a:68:G:H22 | 30:a:103:A:H2 | 1.63 | 0.46 |
| 30:a:508:U:H5 | 30:a:540:G:H1 | 1.63 | 0.46 |
| 3:1:24:ALA:O | 3:1:28:MET:HG3 | 2.16 | 0.46 |
| 9:8:28:LYS:NZ | 10:A:2756:C:OP1 | 2.40 | 0.46 |
| 13:E:183:GLU:OE1 | 13:E:183:GLU:N | 2.35 | 0.46 |
| 23:S:25:THR:HB | 23:S:88:LYS:HG2 | 1.97 | 0.46 |
| 30:a:665:C:H41 | 30:a:724:U:H3 | 1.63 | 0.46 |
| 30:a:1239:G:H2' | 30:a:1241:G:H8 | 1.81 | 0.46 |
| 10:A:909:G:H21 | 10:A:937:C:N4 | 2.14 | 0.45 |
| 10:A:1417:C:H2' | 10:A:1418:G:O4' | 2.16 | 0.45 |
| 30:a:1511:U:H2' | 30:a:1512:G:H8 | 1.81 | 0.45 |
| 34:e:69:SER:OG | 34:e:70:ARG:N | 2.49 | 0.45 |
| 39:j:34:CYS:HA | 39:j:55:VAL:HG12 | 1.97 | 0.45 |
| 10:A:54:G:H5' | 27:W:64:ARG:HG3 | 1.99 | 0.45 |
| 10:A:771:U:H2' | 10:A:772:C:C6 | 2.51 | 0.45 |
| 10:A:909:G:H2' | 10:A:910:A:C5 | 2.51 | 0.45 |
| 10:A:1596:G:O5' | 10:A:1597:G:N2 | 2.48 | 0.45 |
| 10:A:2328:A:H2' | 10:A:2329:A:C8 | 2.52 | 0.45 |
| 10:A:2538:U:H2' | 10:A:2539:C:C6 | 2.51 | 0.45 |
| 30:a:965:G:H2' | 30:a:966:A:C8 | 2.52 | 0.45 |
| 44:Y:17:LYS:HE2 | 44:Y:17:LYS:HB3 | 1.77 | 0.45 |
| 30:a:743:A:H2' | 30:a:744:C:C6 | 2.52 | 0.45 |
| 30:a:1339:C:H2' | 30:a:1340:G:H8 | 1.80 | 0.45 |
| 10:A:324:U:H2' | 10:A:325:G:O4' | 2.17 | 0.45 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 10:A:958:G:H2' | 10:A:959:A:C8 | 2.52 | 0.45 |
| 10:A:964:U:H5" | 10:A:965:G:H21 | 1.80 | 0.45 |
| 10:A:1413:G:H21 | 10:A:1435:U:H1' | 1.81 | 0.45 |
| 10:A:2242:A:H2' | 10:A:2243:G:C8 | 2.51 | 0.45 |
| 10:A:2538:U:H2' | 10:A:2539:C:H6 | 1.81 | 0.45 |
| 15:K:7:ILE:HB | 15:K:73:ILE:HG13 | 1.97 | 0.45 |
| 27:W:68:SER:OG | 27:W:69:GLY:N | 2.48 | 0.45 |
| 30:a:185:C:H4' | 30:a:186:A:H5' | 1.99 | 0.45 |
| 30:a:521:G:H2' | 30:a:522:C:C6 | 2.51 | 0.45 |
| 30:a:545:C:H5' | 41:l:65:GLU:HB2 | 1.99 | 0.45 |
| 30:a:976:A:H4' | 30:a:980:U:H5 | 1.81 | 0.45 |
| 30:a:1486:G:H1' | 30:a:1507:MA6:H2 | 1.97 | 0.45 |
| 45:o:114:ASP:OD1 | 45:o:114:ASP:N | 2.47 | 0.45 |
| 10:A:1042:A:N3 | 10:A:1188:C:O2' | 2.43 | 0.45 |
| 10:A:1167:A:C6 | 17:M:82:HIS:HB2 | 2.52 | 0.45 |
| 10:A:1677:A:H2' | 10:A:1678:G:O4' | 2.17 | 0.45 |
| 44:Y:52:LEU:H | 44:Y:52:LEU:HG | 1.49 | 0.45 |
| 10:A:2629:C:H2' | 10:A:2630:A:C2 | 2.52 | 0.45 |
| 27:W:13:MET:HA | 27:W:13:MET:HE2 | 1.99 | 0.45 |
| 30:a:455:A:H4' | 30:a:456:U:H5' | 1.99 | 0.45 |
| 30:a:463:C:N4 | 30:a:470:A:H61 | 2.13 | 0.45 |
| 30:a:1247:C:H2' | 30:a:1248:A:C8 | 2.52 | 0.45 |
| 40:k:129:TYR:HA | 40:k:132:ALA:HB3 | 1.98 | 0.45 |
| 41:l:53:GLU:HG3 | 41:l:194:LEU:HD12 | 1.99 | 0.45 |
| 10:A:2619:G:C4 | 10:A:2620:H2U:H62 | 2.52 | 0.45 |
| 30:a:325:U:H2' | 30:a:326:A:O4' | 2.16 | 0.45 |
| 30:a:368:A:N6 | 39:j:27:CYS:SG | 2.90 | 0.45 |
| 30:a:411:G:H21 | 41:l:112:GLN:NE2 | 2.14 | 0.45 |
| 30:a:1020:G:H2' | 30:a:1021:U:C6 | 2.52 | 0.45 |
| 42:m:46:LEU:HD23 | 42:m:46:LEU:HA | 1.86 | 0.45 |
| 10:A:326:G:N7 | 53:A:3136:HOH:O | 2.36 | 0.45 |
| 10:A:2592:C:H2' | 10:A:2593:G:H8 | 1.81 | 0.45 |
| 12:D:174:ILE:HD12 | 12:D:184:ILE:HG13 | 1.99 | 0.45 |
| 30:a:1313:G:OP2 | 36:g:28:LYS:NZ | 2.49 | 0.45 |
| 41:l:146:LYS:HG2 | 41:l:173:LEU:HD23 | 1.99 | 0.45 |
| 10:A:735:G:O2' | 10:A:1668:A:N3 | 2.48 | 0.45 |
| 10:A:965:G:H2' | 10:A:966:A:C4 | 2.52 | 0.45 |
| 10:A:1607:A:H2' | 10:A:1608:A:C8 | 2.52 | 0.45 |
| 10:A:611:U:H2' | 10:A:612:A:C8 | 2.52 | 0.45 |
| 10:A:1860:U:O2 | 10:A:2234:U:O2' | 2.30 | 0.45 |
| 10:A:2741:A:H2' | 10:A:2742:A:C8 | 2.52 | 0.45 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 15:K:56:VAL:HA | 30:a:972:G:H5' | 1.99 | 0.45 |
| 10:A:831:U:H2' | 10:A:832:U:C6 | 2.52 | 0.44 |
| 16:L:30:ILE:HD11 | 30:a:706:A:H4' | 1.98 | 0.44 |
| 20:P:25:ASN:OD1 | 20:P:25:ASN:N | 2.42 | 0.44 |
| 27:W:30:PRO:HA | 27:W:79:LYS:HB2 | 2.00 | 0.44 |
| 27:W:55:MET:HG3 | 27:W:80:LYS:HB2 | 1.99 | 0.44 |
| 30:a:748:G:H4' | 30:a:749:A:O5' | 2.15 | 0.44 |
| 30:a:834:U:H2' | 30:a:835:U:C6 | 2.52 | 0.44 |
| 30:a:1148:U:H2' | 30:a:1149:A:C8 | 2.52 | 0.44 |
| 36:g:70:ILE:H | 36:g:70:ILE:HG13 | 1.62 | 0.44 |
| 10:A:502:A:N3 | 10:A:504:G:H5'' | 2.33 | 0.44 |
| 30:a:408:C:OP1 | 41:l:130:SER:OG | 2.31 | 0.44 |
| 30:a:833:U:H2' | 30:a:834:U:C6 | 2.52 | 0.44 |
| 10:A:255:C:H2' | 10:A:256:U:H6 | 1.83 | 0.44 |
| 10:A:437:C:H2' | 10:A:438:A:H8 | 1.80 | 0.44 |
| 10:A:1261:U:H2' | 10:A:1262:C:C6 | 2.52 | 0.44 |
| 25:U:34:VAL:HG23 | 25:U:62:CYS:HB2 | 2.00 | 0.44 |
| 30:a:1302:G:H22 | 30:a:1328:G:H2' | 1.83 | 0.44 |
| 30:a:1320:G:H2' | 30:a:1321:A:H8 | 1.82 | 0.44 |
| 10:A:428:G:H2' | 10:A:429:G:C8 | 2.52 | 0.44 |
| 10:A:602:C:H2' | 10:A:603:C:H6 | 1.83 | 0.44 |
| 10:A:2347:A:H4' | 10:A:2384:A:OP2 | 2.17 | 0.44 |
| 20:P:116:GLU:OE2 | 20:P:119:ARG:NH2 | 2.50 | 0.44 |
| 10:A:964:U:C6 | 10:A:965:G:H1' | 2.53 | 0.44 |
| 10:A:2369:C:H2' | 10:A:2370:A:H8 | 1.83 | 0.44 |
| 13:E:5:LEU:HD13 | 13:E:52:PHE:HB2 | 1.98 | 0.44 |
| 30:a:508:U:O2' | 30:a:509:A:O5' | 2.34 | 0.44 |
| 30:a:922:A:O2' | 30:a:1397:C:OP2 | 2.33 | 0.44 |
| 10:A:437:C:H2' | 10:A:438:A:C8 | 2.53 | 0.44 |
| 30:a:498:C:H2' | 30:a:499:A:C8 | 2.52 | 0.44 |
| 30:a:1216:C:H2' | 30:a:1217:G:C8 | 2.52 | 0.44 |
| 30:a:1424:G:H2' | 30:a:1425:U:H6 | 1.83 | 0.44 |
| 30:a:1458:G:H2' | 30:a:1459:G:C8 | 2.53 | 0.44 |
| 10:A:2851:U:H2' | 10:A:2852:A:N7 | 2.33 | 0.44 |
| 14:F:135:LYS:HD2 | 14:F:135:LYS:HA | 1.85 | 0.44 |
| 20:P:77:LYS:NZ | 20:P:84:GLY:O | 2.51 | 0.44 |
| 30:a:1370:U:HO2' | 30:a:1371:G:H8 | 1.65 | 0.44 |
| 1:p:5:LEU:HD11 | 30:a:1309:G:H5' | 2.00 | 0.44 |
| 10:A:1075:A:H2' | 10:A:1076:A:C8 | 2.52 | 0.44 |
| 26:V:89:PHE:HB3 | 26:V:129:LEU:HD11 | 2.00 | 0.44 |
| 30:a:34:C:H2' | 30:a:35:G:H8 | 1.81 | 0.44 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 30:a:210:A:H2' | 30:a:211:A:C8 | 2.53 | 0.44 |
| 30:a:258:U:H2' | 30:a:259:G:H8 | 1.83 | 0.44 |
| 30:a:580:C:H2' | 30:a:581:G:O4' | 2.18 | 0.44 |
| 30:a:635:C:H2' | 30:a:636:G:H8 | 1.83 | 0.44 |
| 30:a:742:U:H2' | 30:a:743:A:C8 | 2.52 | 0.44 |
| 30:a:864:A:H2' | 30:a:865:A:C8 | 2.53 | 0.44 |
| 30:a:1460:G:H2' | 30:a:1461:U:C6 | 2.52 | 0.44 |
| 10:A:618:U:H2' | 10:A:619:G:H8 | 1.81 | 0.44 |
| 10:A:989:G:N7 | 20:P:14:LYS:NZ | 2.65 | 0.44 |
| 10:A:1387:U:H5 | 10:A:1401:A:N7 | 2.16 | 0.44 |
| 27:W:37:ILE:O | 27:W:41:VAL:HG12 | 2.16 | 0.44 |
| 30:a:657:U:H1' | 35:f:23:GLY:HA2 | 2.00 | 0.44 |
| 10:A:1310:G:H2' | 10:A:1311:C:C6 | 2.53 | 0.43 |
| 10:A:1778:G:O2' | 10:A:1968:C:OP1 | 2.35 | 0.43 |
| 10:A:1956:U:H2' | 10:A:1957:C:C6 | 2.53 | 0.43 |
| 30:a:911:C:H2' | 30:a:912:A:C8 | 2.53 | 0.43 |
| 4:2:7:GLN:HA | 4:2:33:GLN:O | 2.18 | 0.43 |
| 5:4:4:PRO:HA | 10:A:2616:U:C2 | 2.53 | 0.43 |
| 10:A:169:A:H2' | 10:A:170:C:H6 | 1.81 | 0.43 |
| 10:A:1260:U:H2' | 10:A:1261:U:C6 | 2.53 | 0.43 |
| 10:A:2849:A:H2' | 10:A:2850:U:C6 | 2.54 | 0.43 |
| 35:f:71:ILE:HD13 | 35:f:71:ILE:HA | 1.79 | 0.43 |
| 40:k:111:ASP:O | 40:k:113:ALA:N | 2.52 | 0.43 |
| 10:A:1344:C:O2' | 10:A:1422:A:N3 | 2.46 | 0.43 |
| 10:A:2272:G:OP1 | 29:Z:18:SER:HB3 | 2.18 | 0.43 |
| 13:E:50:LEU:O | 13:E:79:LEU:HA | 2.18 | 0.43 |
| 20:P:34:ILE:HD11 | 20:P:104:PHE:HB2 | 1.99 | 0.43 |
| 30:a:1302:G:N2 | 30:a:1328:G:H2' | 2.33 | 0.43 |
| 30:a:1434:G:OP1 | 33:d:22:ARG:NH2 | 2.47 | 0.43 |
| 10:A:599:G:H2' | 10:A:600:A:C8 | 2.53 | 0.43 |
| 10:A:1151:U:H2' | 10:A:1152:U:O4' | 2.18 | 0.43 |
| 30:a:448:U:H2' | 30:a:449:A:C8 | 2.52 | 0.43 |
| 30:a:907:A:H2' | 30:a:908:A:C8 | 2.54 | 0.43 |
| 30:a:926:G:H1 | 30:a:1388:U:H3 | 1.65 | 0.43 |
| 30:a:1371:G:H5" | 42:m:35:LYS:HB2 | 2.00 | 0.43 |
| 31:b:89:LEU:HD12 | 31:b:89:LEU:HA | 1.87 | 0.43 |
| 2:0:58:LEU:HD13 | 10:A:395:G:H5" | 2.00 | 0.43 |
| 6:5:34:LYS:HD3 | 6:5:43:LEU:HD13 | 2.01 | 0.43 |
| 10:A:2591:A:H2' | 10:A:2592:C:H6 | 1.83 | 0.43 |
| 10:A:2592:C:H2' | 10:A:2593:G:C8 | 2.53 | 0.43 |
| 30:a:659:C:H2' | 30:a:660:A:C8 | 2.53 | 0.43 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 30:a:750:C:O2' | 30:a:751:U:H5' | 2.19 | 0.43 |
| 30:a:919:U:H2' | 30:a:920:U:C6 | 2.53 | 0.43 |
| 37:h:3:VAL:HG11 | 37:h:36:ALA:HB1 | 1.99 | 0.43 |
| 10:A:616:U:H2' | 10:A:617:U:C6 | 2.54 | 0.43 |
| 10:A:2576:C:H5' | 13:E:149:CYS:HB2 | 2.01 | 0.43 |
| 10:A:2681:C:H5' | 13:E:194:PRO:HA | 2.01 | 0.43 |
| 10:A:1227:U:H2' | 10:A:1228:U:C6 | 2.54 | 0.43 |
| 10:A:2334:A:H5' | 10:A:2336:A:H1' | 2.00 | 0.43 |
| 13:E:13:SER:O | 23:S:56:LYS:NZ | 2.42 | 0.43 |
| 30:a:428:A:H3' | 30:a:429:G:H21 | 1.84 | 0.43 |
| 30:a:444:U:O2 | 30:a:494:G:O6 | 2.37 | 0.43 |
| 30:a:1055:G:OP1 | 40:k:198:LYS:NZ | 2.49 | 0.43 |
| 31:b:22:ALA:HB2 | 31:b:84:ARG:HH12 | 1.83 | 0.43 |
| 30:a:642:A:N3 | 45:o:106:SER:OG | 2.51 | 0.43 |
| 30:a:1142:G:H21 | 47:J:16:ARG:CZ | 2.32 | 0.43 |
| 30:a:1196:A:H2' | 30:a:1197:U:C6 | 2.53 | 0.43 |
| 30:a:1262:G:H1 | 30:a:1269:C:H5 | 1.66 | 0.43 |
| 41:l:173:LEU:HD12 | 41:l:173:LEU:HA | 1.85 | 0.43 |
| 10:A:1063:A:H2' | 10:A:1064:A:C8 | 2.53 | 0.43 |
| 30:a:461:G:H2' | 30:a:462:G:C8 | 2.53 | 0.43 |
| 30:a:757:U:H2' | 30:a:758:G:O4' | 2.19 | 0.43 |
| 30:a:1501:U:H2' | 30:a:1502:A:C8 | 2.54 | 0.43 |
| 10:A:143:A:H61 | 10:A:151:C:N4 | 2.17 | 0.43 |
| 10:A:2567:A:N1 | 18:N:28:THR:OG1 | 2.48 | 0.43 |
| 17:M:24:ASP:OD1 | 17:M:25:ALA:N | 2.52 | 0.43 |
| 24:T:110:VAL:O | 24:T:114:LYS:HB2 | 2.19 | 0.43 |
| 30:a:276:5OC:O5' | 30:a:276:5OC:H6 | 2.19 | 0.43 |
| 30:a:642:A:C8 | 45:o:108:PRO:HA | 2.54 | 0.43 |
| 31:b:43:TRP:NE1 | 31:b:62:LEU:HD22 | 2.34 | 0.43 |
| 3:1:9:LEU:HG | 3:1:14:LEU:HD13 | 2.01 | 0.42 |
| 10:A:2835:U:H4' | 10:A:2836:A:H5' | 2.00 | 0.42 |
| 13:E:64:LEU:HD13 | 13:E:64:LEU:HA | 1.91 | 0.42 |
| 13:E:181:MET:HE3 | 23:S:10:GLU:HG3 | 2.01 | 0.42 |
| 30:a:628:A:C6 | 30:a:629:G:H1' | 2.54 | 0.42 |
| 35:f:24:SER:O | 35:f:27:SER:OG | 2.35 | 0.42 |
| 10:A:1382:A:H2' | 10:A:1383:A:C8 | 2.54 | 0.42 |
| 16:L:92:ARG:HE | 16:L:92:ARG:HB2 | 1.58 | 0.42 |
| 17:M:28:GLN:H | 17:M:28:GLN:HG2 | 1.69 | 0.42 |
| 17:M:118:ARG:NH2 | 53:M:201:HOH:O | 2.52 | 0.42 |
| 30:a:426:U:H1' | 30:a:427:A:C4 | 2.52 | 0.42 |
| 30:a:626:U:OP1 | 32:c:36:ARG:NH2 | 2.52 | 0.42 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 45:o:105:VAL:HG12 | 45:o:107:THR:HG23 | 2.01 | 0.42 |
| 10:A:504:G:O2' | 10:A:530:A:N1 | 2.47 | 0.42 |
| 10:A:669:G:H2' | 10:A:670:U:C6 | 2.54 | 0.42 |
| 10:A:670:U:H2' | 10:A:671:C:H6 | 1.84 | 0.42 |
| 25:U:65:LEU:HD11 | 25:U:99:LEU:HB2 | 2.01 | 0.42 |
| 30:a:380:U:OP1 | 32:c:69:THR:OG1 | 2.25 | 0.42 |
| 10:A:121:C:H2' | 10:A:122:A:H8 | 1.84 | 0.42 |
| 10:A:149:U:H2' | 10:A:150:U:C5 | 2.55 | 0.42 |
| 10:A:2591:A:H2' | 10:A:2592:C:C6 | 2.54 | 0.42 |
| 16:L:70:ALA:HA | 16:L:73:ALA:HB3 | 2.01 | 0.42 |
| 30:a:416:A:O2' | 30:a:417:A:O5' | 2.37 | 0.42 |
| 30:a:489:C:O2' | 30:a:490:G:O5' | 2.32 | 0.42 |
| 32:c:59:TRP:HA | 32:c:62:VAL:HG22 | 2.02 | 0.42 |
| 45:o:28:SER:HB3 | 45:o:31:LYS:HE2 | 2.02 | 0.42 |
| 30:a:502:A:H61 | 30:a:523:A:N6 | 2.17 | 0.42 |
| 30:a:737:U:H2' | 30:a:738:G:C8 | 2.55 | 0.42 |
| 30:a:938:G:O2' | 30:a:1373:A:N3 | 2.47 | 0.42 |
| 30:a:1407:A:H2' | 30:a:1408:2MG:C8 | 2.54 | 0.42 |
| 9:8:36:ARG:HH12 | 10:A:2540:C:H4' | 1.85 | 0.42 |
| 10:A:464:A:H2' | 10:A:465:G:C8 | 2.54 | 0.42 |
| 10:A:1152:U:H2' | 10:A:1153:U:C6 | 2.55 | 0.42 |
| 12:D:232:MET:HE2 | 12:D:232:MET:HB3 | 1.96 | 0.42 |
| 30:a:727:G:N7 | 53:a:1707:HOH:O | 2.37 | 0.42 |
| 30:a:959:U:H4' | 30:a:960:U:O5' | 2.19 | 0.42 |
| 30:a:1384:G:H2' | 30:a:1385:G:C8 | 2.54 | 0.42 |
| 6:5:14:LEU:HD23 | 6:5:14:LEU:HA | 1.84 | 0.42 |
| 10:A:255:C:H2' | 10:A:256:U:C6 | 2.55 | 0.42 |
| 10:A:1942:A:H2' | 10:A:1943:G:O4' | 2.20 | 0.42 |
| 10:A:2077:G:N7 | 53:A:3139:HOH:O | 2.37 | 0.42 |
| 10:A:2081:A:H2' | 10:A:2082:C:C6 | 2.54 | 0.42 |
| 10:A:2387:A:H2' | 10:A:2388:U:C6 | 2.55 | 0.42 |
| 11:B:61:A:H2' | 11:B:62:A:H8 | 1.82 | 0.42 |
| 14:F:124:ILE:HG12 | 14:F:194:VAL:HG22 | 2.01 | 0.42 |
| 30:a:470:A:H2' | 30:a:471:G:C8 | 2.54 | 0.42 |
| 30:a:581:G:N1 | 30:a:759:A:OP2 | 2.37 | 0.42 |
| 30:a:1043:A:N6 | 30:a:1209:U:H3 | 2.18 | 0.42 |
| 30:a:1057:U:H2' | 30:a:1058:G:C8 | 2.53 | 0.42 |
| 30:a:1250:A:N3 | 30:a:1367:C:O2' | 2.49 | 0.42 |
| 38:i:6:VAL:O | 38:i:8:VAL:N | 2.53 | 0.42 |
| 10:A:2638:U:H2' | 10:A:2639:G:O4' | 2.19 | 0.42 |
| 10:A:2845:A:H8 | 10:A:2845:A:OP2 | 2.02 | 0.42 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 41:l:54:LYS:HE2 | 41:l:54:LYS:HB3 | 1.86 | 0.42 |
| 41:l:104:ALA:HB2 | 41:l:113:LEU:HD12 | 2.01 | 0.42 |
| 10:A:2299:A:H61 | 10:A:2319:C:H41 | 1.68 | 0.42 |
| 10:A:2424:U:H2' | 10:A:2425:C:O4' | 2.20 | 0.42 |
| 10:A:2805:A:H2' | 10:A:2807:A:N7 | 2.35 | 0.42 |
| 30:a:218:A:H2' | 30:a:219:U:C6 | 2.55 | 0.42 |
| 30:a:714:G:H2' | 30:a:715:A:C8 | 2.55 | 0.42 |
| 30:a:1426:A:H2 | 30:a:1459:G:N1 | 2.08 | 0.42 |
| 38:i:14:LYS:HD3 | 38:i:14:LYS:HA | 1.79 | 0.42 |
| 10:A:650:G:H5' | 10:A:651:G:OP2 | 2.19 | 0.42 |
| 10:A:738:U:H2' | 10:A:739:G:O4' | 2.20 | 0.42 |
| 10:A:938:C:H2' | 10:A:939:A:C8 | 2.55 | 0.42 |
| 10:A:1351:A:N1 | 10:A:1362:A:O2' | 2.47 | 0.42 |
| 10:A:2440:A:N3 | 10:A:2440:A:H2' | 2.35 | 0.42 |
| 16:L:121:ARG:HA | 16:L:122:PRO:HD3 | 1.90 | 0.42 |
| 21:Q:83:VAL:O | 21:Q:87:ILE:HG13 | 2.19 | 0.42 |
| 30:a:442:C:H1' | 41:l:116:HIS:CE1 | 2.55 | 0.42 |
| 42:m:46:LEU:O | 42:m:49:VAL:HG12 | 2.20 | 0.42 |
| 42:m:113:ARG:NE | 42:m:125:GLU:OE2 | 2.52 | 0.42 |
| 47:J:6:ALA:HB1 | 47:J:83:ARG:HG3 | 2.02 | 0.42 |
| 10:A:159:A:H2' | 10:A:160:A:C8 | 2.55 | 0.41 |
| 10:A:2701:C:H2' | 10:A:2702:C:C6 | 2.55 | 0.41 |
| 11:B:7:G:H2' | 11:B:8:G:C8 | 2.54 | 0.41 |
| 17:M:97:PHE:HB3 | 17:M:105:LEU:HB2 | 2.02 | 0.41 |
| 38:i:85:ILE:HD13 | 38:i:85:ILE:HA | 1.83 | 0.41 |
| 1:p:64:GLU:OE2 | 1:p:64:GLU:N | 2.46 | 0.41 |
| 6:5:49:ASN:HB2 | 6:5:53:ARG:O | 2.20 | 0.41 |
| 10:A:253:G:H22 | 10:A:275:G:H22 | 1.69 | 0.41 |
| 10:A:1230:C:H2' | 10:A:1231:A:C8 | 2.55 | 0.41 |
| 10:A:2654:U:H3 | 10:A:2668:C:H42 | 1.68 | 0.41 |
| 30:a:70:C:H4' | 30:a:71:A:C8 | 2.55 | 0.41 |
| 30:a:258:U:H2' | 30:a:259:G:C8 | 2.54 | 0.41 |
| 30:a:865:A:C5 | 30:a:866:G:H1' | 2.55 | 0.41 |
| 37:h:54:ARG:HA | 37:h:54:ARG:HD3 | 1.82 | 0.41 |
| 4:2:14:ARG:HA | 10:A:1002:U:O3' | 2.20 | 0.41 |
| 5:4:50:ARG:NH1 | 10:A:2868:A:OP2 | 2.53 | 0.41 |
| 10:A:515:A:H2' | 10:A:516:G:O4' | 2.20 | 0.41 |
| 10:A:576:U:H2' | 10:A:577:G:O4' | 2.20 | 0.41 |
| 10:A:1806:A:O2' | 12:D:257:THR:OG1 | 2.38 | 0.41 |
| 30:a:105:C:OP2 | 33:d:9:LYS:HE3 | 2.20 | 0.41 |
| 30:a:117:G:H4' | 30:a:118:C:O5' | 2.20 | 0.41 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 38:i:4:ARG:HA | 38:i:4:ARG:HD2 | 1.79 | 0.41 |
| 10:A:123:G:N2 | 10:A:134:G:H22 | 2.13 | 0.41 |
| 10:A:2346:G:N3 | 10:A:2382:A:H2' | 2.35 | 0.41 |
| 19:O:74:TYR:HB3 | 19:O:112:LYS:HB2 | 2.01 | 0.41 |
| 26:V:34:MET:SD | 26:V:60:ALA:HB1 | 2.61 | 0.41 |
| 30:a:451:G:H1 | 30:a:482:A:H1' | 1.85 | 0.41 |
| 30:a:1345:U:H4' | 47:J:120:ARG:HG3 | 2.01 | 0.41 |
| 30:a:1414:G:H2' | 30:a:1415:G:C8 | 2.55 | 0.41 |
| 31:b:7:VAL:HG22 | 31:b:62:LEU:HB2 | 2.03 | 0.41 |
| 10:A:667:G:OP1 | 19:O:132:LYS:HG3 | 2.21 | 0.41 |
| 10:A:885:A:H2' | 10:A:886:U:C6 | 2.55 | 0.41 |
| 10:A:1211:U:H2' | 10:A:1212:A:O4' | 2.21 | 0.41 |
| 30:a:299:A:O2' | 30:a:311:A:N6 | 2.54 | 0.41 |
| 30:a:1481:A:C4 | 30:a:1482:A:H1' | 2.55 | 0.41 |
| 33:d:40:ASP:HB3 | 33:d:43:GLU:HB3 | 2.03 | 0.41 |
| 35:f:26:GLU:HB3 | 35:f:81:ILE:HD13 | 2.01 | 0.41 |
| 35:f:70:LEU:HD23 | 35:f:70:LEU:HA | 1.84 | 0.41 |
| 45:o:9:LEU:HD11 | 45:o:128:CYS:HB3 | 2.03 | 0.41 |
| 6:5:46:LYS:HA | 6:5:56:THR:HA | 2.01 | 0.41 |
| 7:6:7:PRO:HB2 | 10:A:1338:G:H4' | 2.01 | 0.41 |
| 10:A:438:A:H2' | 10:A:439:U:C6 | 2.55 | 0.41 |
| 10:A:876:H2U:H52 | 10:A:877:U:C5 | 2.55 | 0.41 |
| 10:A:1460:G:H2' | 10:A:1461:A:C8 | 2.55 | 0.41 |
| 10:A:1464:A:H2' | 10:A:1465:G:C8 | 2.55 | 0.41 |
| 10:A:2247:G:H2' | 10:A:2248:A:H8 | 1.84 | 0.41 |
| 16:L:86:LYS:HB2 | 16:L:86:LYS:HE3 | 1.76 | 0.41 |
| 23:S:2:ASP:HB3 | 23:S:5:LYS:HB3 | 2.03 | 0.41 |
| 27:W:13:MET:HA | 27:W:16:VAL:HG12 | 2.02 | 0.41 |
| 30:a:1019:C:H2' | 30:a:1020:G:C8 | 2.55 | 0.41 |
| 30:a:1502:A:H2' | 30:a:1503:C:H6 | 1.84 | 0.41 |
| 10:A:2287:A:H4' | 10:A:2288:A:O4' | 2.21 | 0.41 |
| 11:B:18:U:H2' | 11:B:19:G:C8 | 2.56 | 0.41 |
| 22:R:40:GLN:HE21 | 22:R:40:GLN:HB2 | 1.62 | 0.41 |
| 4:2:16:PRO:HB2 | 4:2:18:ASP:OD1 | 2.20 | 0.41 |
| 10:A:2839:A:H2' | 10:A:2840:U:C6 | 2.55 | 0.41 |
| 15:K:39:ILE:HD12 | 15:K:39:ILE:H | 1.85 | 0.41 |
| 30:a:267:A:H2' | 30:a:268:A:C8 | 2.56 | 0.41 |
| 4:2:46:MET:O | 4:2:50:VAL:HG22 | 2.20 | 0.41 |
| 10:A:650:G:H5" | 10:A:650:G:H8 | 1.85 | 0.41 |
| 10:A:1028:C:O2 | 17:M:8:THR:HG23 | 2.21 | 0.41 |
| 10:A:1228:U:H2' | 10:A:1229:C:C6 | 2.55 | 0.41 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 10:A:2383:G:H4' | 10:A:2384:A:OP2 | 2.21 | 0.41 |
| 10:A:2540:C:H2' | 10:A:2541:C:O2 | 2.20 | 0.41 |
| 14:F:204:ASN:O | 14:F:208:LYS:HB3 | 2.21 | 0.41 |
| 26:V:41:ILE:HG21 | 26:V:53:LEU:HD21 | 2.01 | 0.41 |
| 30:a:328:U:O3' | 33:d:17:ARG:HD2 | 2.21 | 0.41 |
| 30:a:389:G:H2' | 30:a:390:C:C6 | 2.56 | 0.41 |
| 30:a:605:U:H2' | 30:a:606:G:C8 | 2.55 | 0.41 |
| 30:a:984:U:H2' | 30:a:985:U:C6 | 2.56 | 0.41 |
| 30:a:274:C:H2' | 30:a:275:A:C8 | 2.56 | 0.41 |
| 30:a:449:A:H2' | 30:a:450:C:C6 | 2.56 | 0.41 |
| 35:f:8:LYS:HE2 | 35:f:31:LEU:HD11 | 2.03 | 0.41 |
| 10:A:135:A:H2' | 10:A:136:C:H5" | 2.03 | 0.40 |
| 10:A:141:G:H1 | 10:A:153:U:H3 | 1.69 | 0.40 |
| 10:A:665:G:H2' | 10:A:666:C:C6 | 2.57 | 0.40 |
| 10:A:944:A:H2' | 10:A:945:A:C8 | 2.56 | 0.40 |
| 10:A:2084:U:H2' | 10:A:2085:U:C6 | 2.56 | 0.40 |
| 10:A:2252:OMG:H1' | 10:A:2252:OMG:HM23 | 1.67 | 0.40 |
| 11:B:27:A:H2' | 11:B:28:C:C6 | 2.55 | 0.40 |
| 27:W:38:LYS:O | 27:W:42:GLU:HG3 | 2.21 | 0.40 |
| 38:i:20:LEU:HD21 | 38:i:49:TRP:HH2 | 1.86 | 0.40 |
| 43:n:159:ALA:HB1 | 43:n:165:SER:HA | 2.02 | 0.40 |
| 22:R:28:LEU:HG | 22:R:41:LEU:HD12 | 2.03 | 0.40 |
| 30:a:427:A:H2' | 30:a:428:A:H8 | 1.86 | 0.40 |
| 30:a:1152:G:H2' | 30:a:1153:A:H4' | 2.03 | 0.40 |
| 30:a:1215:C:P | 36:g:9:ARG:HH21 | 2.44 | 0.40 |
| 30:a:1496:A:H2' | 30:a:1497:G:C8 | 2.57 | 0.40 |
| 10:A:542:U:H2' | 10:A:543:C:C6 | 2.55 | 0.40 |
| 10:A:553:G:H1' | 10:A:2045:G:H4' | 2.03 | 0.40 |
| 10:A:1716:U:H2' | 10:A:1717:G:O4' | 2.21 | 0.40 |
| 27:W:38:LYS:HD3 | 27:W:49:VAL:HB | 2.03 | 0.40 |
| 30:a:497:A:N6 | 30:a:545:C:H42 | 2.18 | 0.40 |
| 30:a:1370:U:O2' | 30:a:1371:G:H8 | 2.03 | 0.40 |
| 10:A:819:G:H5' | 10:A:820:G:OP1 | 2.21 | 0.40 |
| 10:A:2003:U:H4' | 13:E:133:THR:OG1 | 2.21 | 0.40 |
| 12:D:82:GLU:OE2 | 12:D:103:TYR:OH | 2.30 | 0.40 |
| 14:F:1:MET:HG3 | 14:F:19:LEU:HD13 | 2.01 | 0.40 |
| 20:P:118:LEU:HD12 | 20:P:131:PHE:CE1 | 2.56 | 0.40 |
| 30:a:432:U:H5" | 41:l:10:LYS:HD2 | 2.04 | 0.40 |
| 30:a:953:G:H2' | 30:a:954:U:C6 | 2.57 | 0.40 |
| 30:a:1335:G:H2' | 30:a:1336:A:C8 | 2.57 | 0.40 |
| 35:f:25:PRO:C | 35:f:27:SER:H | 2.29 | 0.40 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 45:o:41:LYS:HD3 | 45:o:41:LYS:HA | 1.77 | 0.40 |
| 48:I:77:ARG:HB3 | 48:I:84:TYR:CZ | 2.57 | 0.40 |
| 4:2:31:LEU:HD23 | 4:2:31:LEU:HA | 1.81 | 0.40 |
| 6:5:47:LYS:HE2 | 6:5:47:LYS:HB3 | 1.83 | 0.40 |
| 10:A:1711:C:O2 | 13:E:133:THR:HB | 2.21 | 0.40 |
| 30:a:251:A:C2 | 30:a:287:A:C5 | 3.09 | 0.40 |
| 30:a:274:C:H2' | 30:a:275:A:H8 | 1.87 | 0.40 |
| 41:l:13:ARG:HD2 | 41:l:29:LYS:O | 2.22 | 0.40 |
| 41:l:81:VAL:O | 41:l:85:LEU:HD23 | 2.22 | 0.40 |

There are no symmetry-related clashes.

## 5.3 Torsion angles ⓘ

### 5.3.1 Protein backbone ⓘ

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 | p | 67/89 (75%) | 65 (97%) | 2 (3%) | 0 | 100 | 100 |
| 2 | 0 | 75/79 (95%) | 75 (100%) | 0 | 0 | 100 | 100 |
| 3 | 1 | 61/64 (95%) | 60 (98%) | 1 (2%) | 0 | 100 | 100 |
| 4 | 2 | 54/58 (93%) | 53 (98%) | 1 (2%) | 0 | 100 | 100 |
| 5 | 4 | 54/61 (88%) | 53 (98%) | 1 (2%) | 0 | 100 | 100 |
| 6 | 5 | 43/62 (69%) | 33 (77%) | 10 (23%) | 0 | 100 | 100 |
| 7 | 6 | 46/50 (92%) | 46 (100%) | 0 | 0 | 100 | 100 |
| 8 | 7 | 62/65 (95%) | 57 (92%) | 5 (8%) | 0 | 100 | 100 |
| 9 | 8 | 31/38 (82%) | 29 (94%) | 2 (6%) | 0 | 100 | 100 |
| 12 | D | 270/274 (98%) | 264 (98%) | 6 (2%) | 0 | 100 | 100 |
| 13 | E | 202/205 (98%) | 193 (96%) | 9 (4%) | 0 | 100 | 100 |
| 14 | F | 207/209 (99%) | 196 (95%) | 11 (5%) | 0 | 100 | 100 |
| 15 | K | 65/101 (64%) | 63 (97%) | 2 (3%) | 0 | 100 | 100 |

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| Mol | Chain | Analysed | Favoured | Allowed | Outliers | Percentiles | |
|---|---|---|---|---|---|---|---|
| 16 | L | 87/128 (68%) | 77 (88%) | 10 (12%) | 0 | 100 | 100 |
| 17 | M | 148/151 (98%) | 145 (98%) | 3 (2%) | 0 | 100 | 100 |
| 18 | N | 119/121 (98%) | 113 (95%) | 6 (5%) | 0 | 100 | 100 |
| 19 | O | 135/148 (91%) | 127 (94%) | 8 (6%) | 0 | 100 | 100 |
| 20 | P | 139/144 (96%) | 133 (96%) | 6 (4%) | 0 | 100 | 100 |
| 21 | Q | 121/160 (76%) | 118 (98%) | 3 (2%) | 0 | 100 | 100 |
| 22 | R | 103/114 (90%) | 95 (92%) | 8 (8%) | 0 | 100 | 100 |
| 23 | S | 112/121 (93%) | 108 (96%) | 4 (4%) | 0 | 100 | 100 |
| 24 | T | 112/115 (97%) | 109 (97%) | 3 (3%) | 0 | 100 | 100 |
| 25 | U | 102/105 (97%) | 96 (94%) | 6 (6%) | 0 | 100 | 100 |
| 26 | V | 126/134 (94%) | 124 (98%) | 2 (2%) | 0 | 100 | 100 |
| 27 | W | 88/97 (91%) | 86 (98%) | 2 (2%) | 0 | 100 | 100 |
| 28 | X | 98/106 (92%) | 91 (93%) | 7 (7%) | 0 | 100 | 100 |
| 29 | Z | 75/85 (88%) | 72 (96%) | 3 (4%) | 0 | 100 | 100 |
| 31 | b | 96/117 (82%) | 95 (99%) | 1 (1%) | 0 | 100 | 100 |
| 32 | c | 93/192 (48%) | 85 (91%) | 8 (9%) | 0 | 100 | 100 |
| 33 | d | 74/84 (88%) | 73 (99%) | 1 (1%) | 0 | 100 | 100 |
| 34 | e | 79/84 (94%) | 73 (92%) | 6 (8%) | 0 | 100 | 100 |
| 35 | f | 87/89 (98%) | 81 (93%) | 6 (7%) | 0 | 100 | 100 |
| 36 | g | 86/89 (97%) | 83 (96%) | 3 (4%) | 0 | 100 | 100 |
| 37 | h | 53/179 (30%) | 48 (91%) | 5 (9%) | 0 | 100 | 100 |
| 38 | i | 80/126 (64%) | 75 (94%) | 4 (5%) | 1 (1%) | 10 | 39 |
| 39 | j | 116/134 (87%) | 110 (95%) | 6 (5%) | 0 | 100 | 100 |
| 40 | k | 98/246 (40%) | 91 (93%) | 7 (7%) | 0 | 100 | 100 |
| 41 | l | 185/201 (92%) | 172 (93%) | 13 (7%) | 0 | 100 | 100 |
| 42 | m | 99/158 (63%) | 94 (95%) | 5 (5%) | 0 | 100 | 100 |
| 43 | n | 156/172 (91%) | 151 (97%) | 5 (3%) | 0 | 100 | 100 |
| 44 | Y | 124/192 (65%) | 110 (89%) | 14 (11%) | 0 | 100 | 100 |
| 45 | o | 125/131 (95%) | 122 (98%) | 3 (2%) | 0 | 100 | 100 |
| 46 | 10 | 25/30 (83%) | 24 (96%) | 1 (4%) | 0 | 100 | 100 |
| 47 | J | 120/128 (94%) | 116 (97%) | 4 (3%) | 0 | 100 | 100 |

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| Mol | Chain | Analysed | Favoured | Allowed | Outliers | Percentiles | |
|-----|-------|----------|----------|---------|----------|-----|-----|
| 48 | I | 49/90 (54%) | 47 (96%) | 2 (4%) | 0 | 100 | 100 |
| All | All | 4547/5526 (82%) | 4331 (95%) | 215 (5%) | 1 (0%) | 100 | 100 |

All (1) Ramachandran outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 38 | i | 7 | GLY |

### 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 | p | 46/75 (61%) | 46 (100%) | 0 | 100 | 100 |
| 2 | 0 | 62/66 (94%) | 61 (98%) | 1 (2%) | 58 | 82 |
| 3 | 1 | 38/56 (68%) | 38 (100%) | 0 | 100 | 100 |
| 4 | 2 | 48/53 (91%) | 48 (100%) | 0 | 100 | 100 |
| 5 | 4 | 40/50 (80%) | 39 (98%) | 1 (2%) | 42 | 73 |
| 6 | 5 | 33/58 (57%) | 30 (91%) | 3 (9%) | 7 | 30 |
| 7 | 6 | 39/40 (98%) | 39 (100%) | 0 | 100 | 100 |
| 8 | 7 | 40/58 (69%) | 40 (100%) | 0 | 100 | 100 |
| 9 | 8 | 24/35 (69%) | 24 (100%) | 0 | 100 | 100 |
| 12 | D | 213/218 (98%) | 206 (97%) | 7 (3%) | 33 | 67 |
| 13 | E | 157/163 (96%) | 152 (97%) | 5 (3%) | 34 | 67 |
| 14 | F | 174/177 (98%) | 174 (100%) | 0 | 100 | 100 |
| 15 | K | 45/92 (49%) | 44 (98%) | 1 (2%) | 47 | 76 |
| 16 | L | 28/102 (28%) | 28 (100%) | 0 | 100 | 100 |
| 17 | M | 124/128 (97%) | 124 (100%) | 0 | 100 | 100 |
| 18 | N | 97/100 (97%) | 95 (98%) | 2 (2%) | 48 | 77 |
| 19 | O | 95/117 (81%) | 91 (96%) | 4 (4%) | 25 | 59 |

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| Mol | Chain | Analysed | Rotameric | Outliers | Percentiles | |
|-----|-------|----------|-----------|----------|-------------|---|
| 20 | P | 107/118 (91%) | 105 (98%) | 2 (2%) | 52 | 79 |
| 21 | Q | 102/129 (79%) | 101 (99%) | 1 (1%) | 73 | 88 |
| 22 | R | 57/90 (63%) | 53 (93%) | 4 (7%) | 12 | 41 |
| 23 | S | 101/107 (94%) | 101 (100%) | 0 | 100 | 100 |
| 24 | T | 89/93 (96%) | 89 (100%) | 0 | 100 | 100 |
| 25 | U | 91/92 (99%) | 89 (98%) | 2 (2%) | 47 | 76 |
| 26 | V | 107/113 (95%) | 105 (98%) | 2 (2%) | 52 | 79 |
| 27 | W | 70/85 (82%) | 70 (100%) | 0 | 100 | 100 |
| 28 | X | 72/89 (81%) | 72 (100%) | 0 | 100 | 100 |
| 29 | Z | 58/69 (84%) | 56 (97%) | 2 (3%) | 32 | 66 |
| 31 | b | 55/101 (54%) | 54 (98%) | 1 (2%) | 54 | 80 |
| 32 | c | 63/137 (46%) | 60 (95%) | 3 (5%) | 21 | 55 |
| 33 | d | 55/69 (80%) | 54 (98%) | 1 (2%) | 54 | 80 |
| 34 | e | 65/77 (84%) | 64 (98%) | 1 (2%) | 60 | 83 |
| 35 | f | 61/79 (77%) | 61 (100%) | 0 | 100 | 100 |
| 36 | g | 60/69 (87%) | 60 (100%) | 0 | 100 | 100 |
| 37 | h | 43/146 (30%) | 43 (100%) | 0 | 100 | 100 |
| 38 | i | 60/102 (59%) | 58 (97%) | 2 (3%) | 33 | 67 |
| 39 | j | 76/111 (68%) | 76 (100%) | 0 | 100 | 100 |
| 40 | k | 48/197 (24%) | 48 (100%) | 0 | 100 | 100 |
| 41 | l | 125/174 (72%) | 124 (99%) | 1 (1%) | 79 | 90 |
| 42 | m | 56/132 (42%) | 52 (93%) | 4 (7%) | 12 | 40 |
| 43 | n | 81/130 (62%) | 78 (96%) | 3 (4%) | 29 | 63 |
| 44 | Y | 68/159 (43%) | 65 (96%) | 3 (4%) | 24 | 58 |
| 45 | o | 95/112 (85%) | 93 (98%) | 2 (2%) | 48 | 77 |
| 46 | 10 | 20/28 (71%) | 20 (100%) | 0 | 100 | 100 |
| 47 | J | 58/106 (55%) | 58 (100%) | 0 | 100 | 100 |
| 48 | I | 29/80 (36%) | 29 (100%) | 0 | 100 | 100 |
| All | All | 3275/4582 (72%) | 3217 (98%) | 58 (2%) | 54 | 80 |

All (58) residues with a non-rotameric sidechain are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 2 | 0 | 26 | LYS |
| 5 | 4 | 30 | CYS |
| 6 | 5 | 17 | THR |
| 6 | 5 | 32 | THR |
| 6 | 5 | 56 | THR |
| 12 | D | 40 | THR |
| 12 | D | 70 | THR |
| 12 | D | 146 | LEU |
| 12 | D | 205 | SER |
| 12 | D | 220 | ASN |
| 12 | D | 223 | VAL |
| 12 | D | 236 | GLU |
| 13 | E | 13 | SER |
| 13 | E | 24 | CYS |
| 13 | E | 64 | LEU |
| 13 | E | 150 | SER |
| 13 | E | 151 | TYR |
| 15 | K | 56 | VAL |
| 18 | N | 65 | THR |
| 18 | N | 109 | THR |
| 19 | O | 69 | ILE |
| 19 | O | 72 | VAL |
| 19 | O | 77 | ILE |
| 19 | O | 119 | VAL |
| 20 | P | 25 | ASN |
| 20 | P | 34 | ILE |
| 21 | Q | 77 | LYS |
| 22 | R | 29 | THR |
| 22 | R | 41 | LEU |
| 22 | R | 55 | SER |
| 22 | R | 86 | THR |
| 25 | U | 34 | VAL |
| 25 | U | 50 | VAL |
| 26 | V | 29 | THR |
| 26 | V | 119 | SER |
| 29 | Z | 9 | SER |
| 29 | Z | 15 | GLU |
| 31 | b | 63 | VAL |
| 32 | c | 8 | GLN |
| 32 | c | 39 | SER |
| 32 | c | 48 | THR |
| 33 | d | 61 | LYS |
| 34 | e | 21 | THR |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 38 | i | 67 | VAL |
| 38 | i | 77 | LEU |
| 41 | l | 125 | VAL |
| 42 | m | 29 | LEU |
| 42 | m | 31 | TYR |
| 42 | m | 49 | VAL |
| 42 | m | 100 | SER |
| 43 | n | 43 | VAL |
| 43 | n | 51 | ILE |
| 43 | n | 141 | LEU |
| 44 | Y | 46 | GLN |
| 44 | Y | 52 | LEU |
| 44 | Y | 107 | VAL |
| 45 | o | 41 | LYS |
| 45 | o | 104 | ILE |

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (33) such sidechains are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1 | p | 12 | ASN |
| 2 | 0 | 17 | ASN |
| 3 | 1 | 46 | GLN |
| 3 | 1 | 59 | GLN |
| 12 | D | 143 | ASN |
| 14 | F | 67 | GLN |
| 14 | F | 173 | ASN |
| 15 | K | 63 | GLN |
| 16 | L | 117 | HIS |
| 17 | M | 52 | HIS |
| 17 | M | 89 | GLN |
| 20 | P | 135 | HIS |
| 21 | Q | 31 | HIS |
| 21 | Q | 71 | GLN |
| 23 | S | 83 | ASN |
| 24 | T | 101 | ASN |
| 25 | U | 8 | GLN |
| 26 | V | 47 | ASN |
| 27 | W | 53 | ASN |
| 32 | c | 8 | GLN |
| 32 | c | 43 | ASN |
| 32 | c | 45 | ASN |
| 32 | c | 52 | ASN |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 33 | d | 13 | GLN |
| 36 | g | 37 | GLN |
| 36 | g | 42 | ASN |
| 41 | l | 35 | GLN |
| 41 | l | 50 | GLN |
| 41 | l | 73 | HIS |
| 41 | l | 137 | GLN |
| 44 | Y | 41 | ASN |
| 46 | 10 | 3 | ASN |
| 48 | I | 71 | GLN |

### 5.3.3   RNA ⓘ

| Mol | Chain | Analysed | Backbone Outliers | Pucker Outliers |
|-----|-------|----------|-------------------|-----------------|
| 10 | A | 2306/2889 (79%) | 292 (12%) | 10 (0%) |
| 11 | B | 96/109 (88%) | 22 (22%) | 1 (1%) |
| 30 | a | 1297/1534 (84%) | 270 (20%) | 0 |
| All | All | 3699/4532 (81%) | 584 (15%) | 11 (0%) |

All (584) RNA backbone outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 10 | A | 2 | A |
| 10 | A | 23 | A |
| 10 | A | 24 | G |
| 10 | A | 28 | C |
| 10 | A | 40 | G |
| 10 | A | 52 | A |
| 10 | A | 53 | A |
| 10 | A | 54 | G |
| 10 | A | 60 | A |
| 10 | A | 63 | A |
| 10 | A | 64 | G |
| 10 | A | 80 | C |
| 10 | A | 89 | U |
| 10 | A | 90 | G |
| 10 | A | 106 | A |
| 10 | A | 107 | A |
| 10 | A | 108 | U |
| 10 | A | 119 | G |
| 10 | A | 123 | G |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 10 | A | 132 | C |
| 10 | A | 136 | C |
| 10 | A | 144 | U |
| 10 | A | 159 | A |
| 10 | A | 174 | A |
| 10 | A | 177 | A |
| 10 | A | 183 | U |
| 10 | A | 184 | U |
| 10 | A | 193 | G |
| 10 | A | 194 | A |
| 10 | A | 200 | A |
| 10 | A | 211 | A |
| 10 | A | 226 | G |
| 10 | A | 275 | G |
| 10 | A | 280 | U |
| 10 | A | 281 | A |
| 10 | A | 282 | G |
| 10 | A | 286 | U |
| 10 | A | 306 | A |
| 10 | A | 307 | G |
| 10 | A | 329 | A |
| 10 | A | 333 | U |
| 10 | A | 347 | G |
| 10 | A | 348 | A |
| 10 | A | 364 | C |
| 10 | A | 396 | U |
| 10 | A | 409 | G |
| 10 | A | 419 | G |
| 10 | A | 434 | G |
| 10 | A | 480 | A |
| 10 | A | 504 | G |
| 10 | A | 513 | A |
| 10 | A | 514 | C |
| 10 | A | 528 | A |
| 10 | A | 531 | C |
| 10 | A | 554 | C |
| 10 | A | 555 | G |
| 10 | A | 561 | A |
| 10 | A | 572 | G |
| 10 | A | 573 | G |
| 10 | A | 585 | G |
| 10 | A | 595 | U |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 10 | A | 596 | A |
| 10 | A | 597 | A |
| 10 | A | 609 | G |
| 10 | A | 625 | A |
| 10 | A | 634 | G |
| 10 | A | 647 | C |
| 10 | A | 649 | A |
| 10 | A | 650 | G |
| 10 | A | 658 | A |
| 10 | A | 665 | G |
| 10 | A | 668 | A |
| 10 | A | 669 | G |
| 10 | A | 677 | A |
| 10 | A | 678 | G |
| 10 | A | 679 | G |
| 10 | A | 721 | U |
| 10 | A | 754 | C |
| 10 | A | 755 | U |
| 10 | A | 765 | A |
| 10 | A | 782 | U |
| 10 | A | 783 | G |
| 10 | A | 799 | A |
| 10 | A | 810 | G |
| 10 | A | 817 | A |
| 10 | A | 819 | G |
| 10 | A | 820 | G |
| 10 | A | 827 | A |
| 10 | A | 840 | G |
| 10 | A | 847 | C |
| 10 | A | 862 | U |
| 10 | A | 880 | A |
| 10 | A | 882 | G |
| 10 | A | 893 | G |
| 10 | A | 900 | G |
| 10 | A | 901 | A |
| 10 | A | 908 | G |
| 10 | A | 910 | A |
| 10 | A | 940 | G |
| 10 | A | 944 | A |
| 10 | A | 946 | C |
| 10 | A | 965 | G |
| 10 | A | 966 | A |

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| Mol | Chain | Res | Type |
|-----|-------|------|------|
| 10 | A | 967 | C |
| 10 | A | 974 | A |
| 10 | A | 978 | A |
| 10 | A | 979 | G |
| 10 | A | 994 | G |
| 10 | A | 1007 | G |
| 10 | A | 1013 | A |
| 10 | A | 1029 | G |
| 10 | A | 1045 | U |
| 10 | A | 1046 | A |
| 10 | A | 1050 | G |
| 10 | A | 1054 | A |
| 10 | A | 1064 | A |
| 10 | A | 1066 | G |
| 10 | A | 1067 | A |
| 10 | A | 1068 | A |
| 10 | A | 1069 | G |
| 10 | A | 1074 | G |
| 10 | A | 1076 | A |
| 10 | A | 1155 | G |
| 10 | A | 1163 | U |
| 10 | A | 1164 | A |
| 10 | A | 1168 | C |
| 10 | A | 1170 | C |
| 10 | A | 1174 | C |
| 10 | A | 1177 | A |
| 10 | A | 1203 | U |
| 10 | A | 1235 | A |
| 10 | A | 1239 | A |
| 10 | A | 1252 | G |
| 10 | A | 1253 | C |
| 10 | A | 1267 | G |
| 10 | A | 1285 | G |
| 10 | A | 1300 | G |
| 10 | A | 1301 | A |
| 10 | A | 1305 | A |
| 10 | A | 1329 | A |
| 10 | A | 1330 | A |
| 10 | A | 1381 | U |
| 10 | A | 1394 | A |
| 10 | A | 1408 | U |
| 10 | A | 1412 | A |

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| Mol | Chain | Res | Type |
|-----|-------|------|------|
| 10 | A | 1413 | G |
| 10 | A | 1414 | A |
| 10 | A | 1418 | G |
| 10 | A | 1433 | A |
| 10 | A | 1458 | C |
| 10 | A | 1603 | A |
| 10 | A | 1606 | A |
| 10 | A | 1632 | U |
| 10 | A | 1643 | U |
| 10 | A | 1644 | A |
| 10 | A | 1645 | A |
| 10 | A | 1654 | A |
| 10 | A | 1668 | A |
| 10 | A | 1683 | U |
| 10 | A | 1684 | C |
| 10 | A | 1710 | G |
| 10 | A | 1765 | G |
| 10 | A | 1767 | A |
| 10 | A | 1773 | G |
| 10 | A | 1782 | A |
| 10 | A | 1791 | C |
| 10 | A | 1795 | A |
| 10 | A | 1809 | C |
| 10 | A | 1810 | A |
| 10 | A | 1811 | A |
| 10 | A | 1815 | A |
| 10 | A | 1826 | G |
| 10 | A | 1838 | A |
| 10 | A | 1901 | G |
| 10 | A | 1939 | G |
| 10 | A | 1940 | G |
| 10 | A | 1947 | A |
| 10 | A | 1951 | C |
| 10 | A | 1965 | U |
| 10 | A | 1973 | U |
| 10 | A | 1977 | C |
| 10 | A | 1980 | A |
| 10 | A | 1981 | U |
| 10 | A | 1982 | G |
| 10 | A | 1992 | U |
| 10 | A | 2001 | U |
| 10 | A | 2002 | G |

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| Mol | Chain | Res | Type |
|-----|-------|------|------|
| 10 | A | 2003 | U |
| 10 | A | 2041 | A |
| 10 | A | 2042 | G |
| 10 | A | 2043 | A |
| 10 | A | 2053 | C |
| 10 | A | 2065 | C |
| 10 | A | 2066 | G |
| 10 | A | 2070 | A |
| 10 | A | 2071 | G |
| 10 | A | 2072 | A |
| 10 | A | 2079 | G |
| 10 | A | 2103 | G |
| 10 | A | 2107 | U |
| 10 | A | 2202 | G |
| 10 | A | 2208 | A |
| 10 | A | 2222 | G |
| 10 | A | 2226 | A |
| 10 | A | 2239 | G |
| 10 | A | 2240 | G |
| 10 | A | 2280 | G |
| 10 | A | 2284 | U |
| 10 | A | 2288 | A |
| 10 | A | 2289 | A |
| 10 | A | 2316 | G |
| 10 | A | 2317 | G |
| 10 | A | 2318 | U |
| 10 | A | 2323 | A |
| 10 | A | 2324 | G |
| 10 | A | 2326 | G |
| 10 | A | 2334 | A |
| 10 | A | 2336 | A |
| 10 | A | 2341 | U |
| 10 | A | 2346 | G |
| 10 | A | 2348 | C |
| 10 | A | 2351 | G |
| 10 | A | 2383 | G |
| 10 | A | 2384 | A |
| 10 | A | 2386 | C |
| 10 | A | 2392 | G |
| 10 | A | 2423 | C |
| 10 | A | 2426 | A |
| 10 | A | 2430 | G |

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| Mol | Chain | Res | Type |
|-----|-------|------|------|
| 10 | A | 2431 | A |
| 10 | A | 2435 | A |
| 10 | A | 2440 | A |
| 10 | A | 2442 | U |
| 10 | A | 2449 | A |
| 10 | A | 2483 | A |
| 10 | A | 2492 | U |
| 10 | A | 2506 | G |
| 10 | A | 2519 | A |
| 10 | A | 2530 | G |
| 10 | A | 2535 | A |
| 10 | A | 2548 | U |
| 10 | A | 2552 | C |
| 10 | A | 2567 | A |
| 10 | A | 2568 | G |
| 10 | A | 2574 | C |
| 10 | A | 2586 | U |
| 10 | A | 2603 | A |
| 10 | A | 2604 | G |
| 10 | A | 2610 | U |
| 10 | A | 2614 | U |
| 10 | A | 2631 | G |
| 10 | A | 2671 | G |
| 10 | A | 2672 | U |
| 10 | A | 2674 | G |
| 10 | A | 2690 | U |
| 10 | A | 2703 | G |
| 10 | A | 2715 | G |
| 10 | A | 2727 | C |
| 10 | A | 2734 | U |
| 10 | A | 2735 | A |
| 10 | A | 2736 | A |
| 10 | A | 2737 | G |
| 10 | A | 2745 | G |
| 10 | A | 2749 | A |
| 10 | A | 2753 | C |
| 10 | A | 2759 | A |
| 10 | A | 2763 | C |
| 10 | A | 2765 | A |
| 10 | A | 2766 | A |
| 10 | A | 2767 | G |
| 10 | A | 2779 | A |

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| Mol | Chain | Res | Type |
|-----|-------|------|------|
| 10 | A | 2780 | U |
| 10 | A | 2781 | A |
| 10 | A | 2790 | A |
| 10 | A | 2791 | U |
| 10 | A | 2798 | G |
| 10 | A | 2806 | A |
| 10 | A | 2807 | A |
| 10 | A | 2809 | A |
| 10 | A | 2821 | A |
| 10 | A | 2829 | C |
| 10 | A | 2840 | U |
| 10 | A | 2842 | G |
| 10 | A | 2845 | A |
| 10 | A | 2852 | A |
| 10 | A | 2853 | A |
| 10 | A | 2858 | A |
| 10 | A | 2865 | C |
| 10 | A | 2868 | A |
| 10 | A | 2869 | U |
| 10 | A | 2870 | A |
| 10 | A | 2871 | G |
| 11 | B | 10 | U |
| 11 | B | 11 | A |
| 11 | B | 12 | U |
| 11 | B | 22 | G |
| 11 | B | 23 | A |
| 11 | B | 24 | U |
| 11 | B | 25 | C |
| 11 | B | 30 | U |
| 11 | B | 32 | U |
| 11 | B | 35 | C |
| 11 | B | 54 | U |
| 11 | B | 55 | A |
| 11 | B | 62 | A |
| 11 | B | 64 | G |
| 11 | B | 81 | G |
| 11 | B | 86 | A |
| 11 | B | 92 | A |
| 11 | B | 98 | G |
| 11 | B | 101 | C |
| 11 | B | 102 | G |
| 11 | B | 104 | C |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 11 | B | 105 | G |
| 30 | a | 8 | A |
| 30 | a | 9 | G |
| 30 | a | 31 | G |
| 30 | a | 32 | A |
| 30 | a | 38 | A |
| 30 | a | 39 | G |
| 30 | a | 47 | C |
| 30 | a | 48 | U |
| 30 | a | 50 | A |
| 30 | a | 51 | A |
| 30 | a | 52 | C |
| 30 | a | 61 | G |
| 30 | a | 65 | A |
| 30 | a | 66 | G |
| 30 | a | 71 | A |
| 30 | a | 72 | G |
| 30 | a | 73 | C |
| 30 | a | 111 | A |
| 30 | a | 118 | C |
| 30 | a | 123 | C |
| 30 | a | 132 | A |
| 30 | a | 146 | A |
| 30 | a | 147 | G |
| 30 | a | 152 | A |
| 30 | a | 159 | G |
| 30 | a | 169 | G |
| 30 | a | 176 | A |
| 30 | a | 185 | C |
| 30 | a | 187 | C |
| 30 | a | 192 | A |
| 30 | a | 199 | C |
| 30 | a | 202 | G |
| 30 | a | 205 | A |
| 30 | a | 206 | U |
| 30 | a | 207 | U |
| 30 | a | 209 | C |
| 30 | a | 216 | A |
| 30 | a | 249 | U |
| 30 | a | 250 | U |
| 30 | a | 252 | G |
| 30 | a | 256 | G |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 30 | a | 271 | G |
| 30 | a | 272 | C |
| 30 | a | 275 | A |
| 30 | a | 280 | G |
| 30 | a | 286 | G |
| 30 | a | 293 | A |
| 30 | a | 294 | G |
| 30 | a | 298 | A |
| 30 | a | 306 | G |
| 30 | a | 310 | U |
| 30 | a | 330 | A |
| 30 | a | 331 | G |
| 30 | a | 333 | C |
| 30 | a | 334 | A |
| 30 | a | 337 | G |
| 30 | a | 343 | A |
| 30 | a | 349 | A |
| 30 | a | 350 | C |
| 30 | a | 351 | G |
| 30 | a | 352 | G |
| 30 | a | 353 | G |
| 30 | a | 356 | G |
| 30 | a | 358 | A |
| 30 | a | 372 | U |
| 30 | a | 377 | C |
| 30 | a | 378 | A |
| 30 | a | 389 | G |
| 30 | a | 396 | C |
| 30 | a | 397 | C |
| 30 | a | 402 | A |
| 30 | a | 403 | A |
| 30 | a | 411 | G |
| 30 | a | 415 | G |
| 30 | a | 416 | A |
| 30 | a | 417 | A |
| 30 | a | 418 | G |
| 30 | a | 422 | G |
| 30 | a | 430 | G |
| 30 | a | 433 | U |
| 30 | a | 437 | A |
| 30 | a | 442 | C |
| 30 | a | 457 | A |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 30 | a | 463 | C |
| 30 | a | 464 | G |
| 30 | a | 466 | U |
| 30 | a | 467 | A |
| 30 | a | 468 | C |
| 30 | a | 476 | G |
| 30 | a | 479 | U |
| 30 | a | 481 | G |
| 30 | a | 482 | A |
| 30 | a | 483 | A |
| 30 | a | 490 | G |
| 30 | a | 492 | A |
| 30 | a | 494 | G |
| 30 | a | 501 | C |
| 30 | a | 502 | A |
| 30 | a | 505 | G |
| 30 | a | 506 | G |
| 30 | a | 507 | C |
| 30 | a | 508 | U |
| 30 | a | 509 | A |
| 30 | a | 512 | U |
| 30 | a | 518 | C |
| 30 | a | 521 | G |
| 30 | a | 524 | G |
| 30 | a | 535 | A |
| 30 | a | 544 | G |
| 30 | a | 547 | A |
| 30 | a | 556 | C |
| 30 | a | 559 | A |
| 30 | a | 560 | U |
| 30 | a | 562 | U |
| 30 | a | 564 | U |
| 30 | a | 572 | A |
| 30 | a | 573 | A |
| 30 | a | 576 | G |
| 30 | a | 577 | G |
| 30 | a | 592 | G |
| 30 | a | 618 | C |
| 30 | a | 621 | A |
| 30 | a | 630 | C |
| 30 | a | 631 | C |
| 30 | a | 632 | U |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 30 | a | 633 | G |
| 30 | a | 639 | G |
| 30 | a | 653 | U |
| 30 | a | 665 | C |
| 30 | a | 673 | G |
| 30 | a | 682 | G |
| 30 | a | 686 | U |
| 30 | a | 687 | A |
| 30 | a | 688 | G |
| 30 | a | 702 | A |
| 30 | a | 703 | G |
| 30 | a | 704 | A |
| 30 | a | 709 | A |
| 30 | a | 713 | G |
| 30 | a | 721 | G |
| 30 | a | 722 | A |
| 30 | a | 746 | G |
| 30 | a | 748 | G |
| 30 | a | 749 | A |
| 30 | a | 751 | U |
| 30 | a | 755 | A |
| 30 | a | 761 | G |
| 30 | a | 777 | A |
| 30 | a | 789 | U |
| 30 | a | 790 | A |
| 30 | a | 793 | U |
| 30 | a | 794 | A |
| 30 | a | 817 | C |
| 30 | a | 828 | A |
| 30 | a | 837 | C |
| 30 | a | 850 | A |
| 30 | a | 851 | G |
| 30 | a | 853 | U |
| 30 | a | 854 | U |
| 30 | a | 855 | C |
| 30 | a | 901 | C |
| 30 | a | 913 | A |
| 30 | a | 925 | G |
| 30 | a | 926 | G |
| 30 | a | 930 | C |
| 30 | a | 959 | U |
| 30 | a | 960 | U |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 30 | a | 965 | G |
| 30 | a | 966 | A |
| 30 | a | 968 | A |
| 30 | a | 970 | G |
| 30 | a | 971 | C |
| 30 | a | 972 | G |
| 30 | a | 975 | G |
| 30 | a | 990 | U |
| 30 | a | 1050 | G |
| 30 | a | 1051 | C |
| 30 | a | 1052 | A |
| 30 | a | 1059 | U |
| 30 | a | 1064 | A |
| 30 | a | 1065 | G |
| 30 | a | 1066 | C |
| 30 | a | 1076 | G |
| 30 | a | 1117 | G |
| 30 | a | 1118 | G |
| 30 | a | 1120 | A |
| 30 | a | 1141 | A |
| 30 | a | 1147 | C |
| 30 | a | 1152 | G |
| 30 | a | 1153 | A |
| 30 | a | 1154 | G |
| 30 | a | 1189 | A |
| 30 | a | 1190 | C |
| 30 | a | 1191 | G |
| 30 | a | 1194 | A |
| 30 | a | 1195 | A |
| 30 | a | 1198 | C |
| 30 | a | 1209 | U |
| 30 | a | 1211 | A |
| 30 | a | 1212 | C |
| 30 | a | 1234 | A |
| 30 | a | 1236 | A |
| 30 | a | 1241 | G |
| 30 | a | 1247 | C |
| 30 | a | 1248 | A |
| 30 | a | 1249 | A |
| 30 | a | 1250 | A |
| 30 | a | 1255 | A |
| 30 | a | 1256 | G |

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| Mol | Chain | Res | Type |
|-----|-------|------|------|
| 30 | a | 1261 | C |
| 30 | a | 1262 | G |
| 30 | a | 1263 | G |
| 30 | a | 1264 | G |
| 30 | a | 1267 | A |
| 30 | a | 1268 | C |
| 30 | a | 1269 | C |
| 30 | a | 1270 | G |
| 30 | a | 1277 | A |
| 30 | a | 1278 | A |
| 30 | a | 1281 | U |
| 30 | a | 1282 | C |
| 30 | a | 1283 | U |
| 30 | a | 1287 | C |
| 30 | a | 1288 | C |
| 30 | a | 1297 | G |
| 30 | a | 1299 | U |
| 30 | a | 1302 | G |
| 30 | a | 1307 | G |
| 30 | a | 1309 | G |
| 30 | a | 1310 | U |
| 30 | a | 1319 | C |
| 30 | a | 1325 | C |
| 30 | a | 1328 | G |
| 30 | a | 1341 | C |
| 30 | a | 1344 | G |
| 30 | a | 1345 | U |
| 30 | a | 1346 | A |
| 30 | a | 1350 | G |
| 30 | a | 1356 | C |
| 30 | a | 1360 | C |
| 30 | a | 1361 | A |
| 30 | a | 1362 | U |
| 30 | a | 1366 | G |
| 30 | a | 1368 | G |
| 30 | a | 1369 | G |
| 30 | a | 1370 | U |
| 30 | a | 1371 | G |
| 30 | a | 1373 | A |
| 30 | a | 1375 | A |
| 30 | a | 1387 | C |
| 30 | a | 1396 | A |

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| Mol | Chain | Res | Type |
|-----|-------|------|------|
| 30 | a | 1415 | G |
| 30 | a | 1417 | G |
| 30 | a | 1436 | C |
| 30 | a | 1455 | C |
| 30 | a | 1457 | A |
| 30 | a | 1468 | G |
| 30 | a | 1481 | A |
| 30 | a | 1482 | A |
| 30 | a | 1486 | G |
| 30 | a | 1488 | A |
| 30 | a | 1493 | G |
| 30 | a | 1495 | U |
| 30 | a | 1496 | A |
| 30 | a | 1506 | G |
| 30 | a | 1518 | G |
| 30 | a | 1519 | G |
| 30 | a | 1520 | A |
| 30 | a | 1521 | A |
| 30 | a | 1522 | C |

All (11) RNA pucker outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|------|------|
| 10 | A | 285 | C |
| 10 | A | 677 | A |
| 10 | A | 748 | G |
| 10 | A | 862 | U |
| 10 | A | 1255 | A |
| 10 | A | 1309 | G |
| 10 | A | 2221 | C |
| 10 | A | 2670 | U |
| 10 | A | 2671 | G |
| 10 | A | 2852 | A |
| 11 | B | 61 | A |

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

20 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 | $\#|Z| > 2$ |
| 10 | 5MU | A | 1949 | 10 | 19,22,23 | 7.25 | 8 (42%) | 28,32,35 | 3.41 | 10 (35%) |
| 30 | 4OC | a | 1400 | 30 | 20,23,24 | 3.14 | 8 (40%) | 26,32,35 | 0.90 | 1 (3%) |
| 10 | H2U | A | 2620 | 10 | 18,21,22 | 0.43 | 0 | 21,30,33 | 0.37 | 0 |
| 10 | H2U | A | 876 | 10 | 18,21,22 | 0.40 | 0 | 21,30,33 | 0.39 | 0 |
| 10 | OMG | A | 2252 | 10 | 18,26,27 | 2.51 | 8 (44%) | 19,38,41 | 1.49 | 4 (21%) |
| 10 | PSU | A | 2581 | 10 | 18,21,22 | 1.10 | 2 (11%) | 22,30,33 | 1.88 | 5 (22%) |
| 10 | 5OC | A | 2502 | 10,51 | 18,21,22 | 4.26 | 13 (72%) | 25,30,33 | 1.17 | 3 (12%) |
| 10 | OMU | A | 2450 | 10 | 19,22,23 | 2.98 | 8 (42%) | 26,31,34 | 1.74 | 5 (19%) |
| 30 | 7MG | a | 821 | 30 | 22,26,27 | 3.70 | 10 (45%) | 29,39,42 | 2.04 | 9 (31%) |
| 30 | 5OC | a | 276 | 30 | 18,21,22 | 4.40 | 13 (72%) | 25,30,33 | 1.18 | 1 (4%) |
| 30 | MA6 | a | 1507 | 30 | 18,26,27 | 1.02 | 2 (11%) | 19,38,41 | 4.21 | 3 (15%) |
| 30 | 2MG | a | 1408 | 30 | 18,26,27 | 2.50 | 7 (38%) | 16,38,41 | 1.36 | 3 (18%) |
| 10 | PSU | A | 2606 | 10 | 18,21,22 | 1.01 | 1 (5%) | 22,30,33 | 1.73 | 4 (18%) |
| 30 | 5MC | a | 1402 | 30 | 18,22,23 | 3.72 | 7 (38%) | 26,32,35 | 0.98 | 1 (3%) |
| 30 | MA6 | a | 1508 | 30 | 18,26,27 | 1.04 | 2 (11%) | 19,38,41 | 4.07 | 2 (10%) |
| 10 | H2U | A | 781 | 10 | 18,21,22 | 0.31 | 0 | 21,30,33 | 0.50 | 0 |
| 10 | 2MA | A | 2504 | 10,49,51 | 19,25,26 | 3.59 | 6 (31%) | 21,37,40 | 2.51 | 4 (19%) |
| 10 | 2MG | A | 2446 | 10 | 18,26,27 | 2.42 | 7 (38%) | 16,38,41 | 1.35 | 3 (18%) |
| 30 | UR3 | a | 1487 | 30 | 19,22,23 | 3.21 | 8 (42%) | 26,32,35 | 1.30 | 2 (7%) |
| 10 | 5MC | A | 1972 | 10 | 18,22,23 | 3.67 | 7 (38%) | 26,32,35 | 1.00 | 2 (7%) |

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 |
|-----|------|-------|-----|------|---------|----------|-------|
| 10 | 5MU | A | 1949 | 10 | - | 0/7/25/26 | 0/2/2/2 |
| 30 | 4OC | a | 1400 | 30 | - | 0/9/29/30 | 0/2/2/2 |
| 10 | H2U | A | 2620 | 10 | - | 0/7/38/39 | 0/2/2/2 |
| 10 | H2U | A | 876 | 10 | - | 0/7/38/39 | 0/2/2/2 |
| 10 | OMG | A | 2252 | 10 | - | 1/5/27/28 | 0/3/3/3 |
| 10 | PSU | A | 2581 | 10 | - | 0/7/25/26 | 0/2/2/2 |
| 10 | 5OC | A | 2502 | 10,51 | - | 5/7/21/22 | 0/2/2/2 |

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| Mol | Type | Chain | Res | Link | Chirals | Torsions | Rings |
|-----|------|-------|-----|------|---------|----------|-------|
| 10 | OMU | A | 2450 | 10 | - | 0/9/27/28 | 0/2/2/2 |
| 30 | 7MG | a | 821 | 30 | - | 0/7/37/38 | 0/3/3/3 |
| 30 | 5OC | a | 276 | 30 | - | 1/7/21/22 | 0/2/2/2 |
| 30 | MA6 | a | 1507 | 30 | - | 3/7/29/30 | 0/3/3/3 |
| 30 | 2MG | a | 1408 | 30 | - | 0/5/27/28 | 0/3/3/3 |
| 10 | PSU | A | 2606 | 10 | - | 0/7/25/26 | 0/2/2/2 |
| 30 | 5MC | a | 1402 | 30 | - | 0/7/25/26 | 0/2/2/2 |
| 30 | MA6 | a | 1508 | 30 | - | 5/7/29/30 | 0/3/3/3 |
| 10 | H2U | A | 781 | 10 | - | 0/7/38/39 | 0/2/2/2 |
| 10 | 2MA | A | 2504 | 10,49,51 | - | 1/3/25/26 | 0/3/3/3 |
| 10 | 2MG | A | 2446 | 10 | - | 2/5/27/28 | 0/3/3/3 |
| 30 | UR3 | a | 1487 | 30 | - | 0/7/25/26 | 0/2/2/2 |
| 10 | 5MC | A | 1972 | 10 | - | 0/7/25/26 | 0/2/2/2 |

All (117) bond length outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed(Å) | Ideal(Å) |
|-----|-------|-----|------|-------|---|-------------|----------|
| 10 | A | 1949 | 5MU | C4-C5 | 21.01 | 1.79 | 1.44 |
| 10 | A | 1949 | 5MU | C6-N1 | 15.49 | 1.64 | 1.38 |
| 10 | A | 1949 | 5MU | C6-C5 | -11.72 | 1.15 | 1.34 |
| 10 | A | 1949 | 5MU | C4-N3 | -11.71 | 1.17 | 1.38 |
| 30 | a | 1402 | 5MC | C6-C5 | 9.37 | 1.50 | 1.34 |
| 10 | A | 1972 | 5MC | C6-C5 | 9.36 | 1.50 | 1.34 |
| 10 | A | 2504 | 2MA | C4-N3 | 9.35 | 1.50 | 1.35 |
| 30 | a | 821 | 7MG | C8-N9 | 8.75 | 1.50 | 1.46 |
| 30 | a | 1487 | UR3 | C2-N1 | 8.73 | 1.51 | 1.38 |
| 30 | a | 276 | 5OC | C2'-C3' | -8.55 | 1.30 | 1.52 |
| 10 | A | 2502 | 5OC | C2'-C3' | -8.43 | 1.30 | 1.52 |
| 30 | a | 821 | 7MG | C5-N7 | 8.17 | 1.45 | 1.35 |
| 10 | A | 2504 | 2MA | C2-N3 | 7.81 | 1.47 | 1.34 |
| 30 | a | 1400 | 4OC | C4-N3 | 6.94 | 1.44 | 1.32 |
| 10 | A | 2450 | OMU | C2-N1 | 6.88 | 1.49 | 1.38 |
| 30 | a | 1487 | UR3 | C6-C5 | 6.71 | 1.50 | 1.35 |
| 30 | a | 1402 | 5MC | C4-N3 | 6.66 | 1.45 | 1.34 |
| 10 | A | 1972 | 5MC | C4-N3 | 6.62 | 1.45 | 1.34 |
| 10 | A | 2450 | OMU | C2-N3 | 6.54 | 1.49 | 1.38 |
| 30 | a | 1402 | 5MC | C2-N3 | 6.33 | 1.49 | 1.36 |
| 10 | A | 1972 | 5MC | C2-N3 | 6.21 | 1.49 | 1.36 |
| 30 | a | 276 | 5OC | C2-N3 | 6.15 | 1.48 | 1.36 |
| 30 | a | 276 | 5OC | C4-N3 | 5.96 | 1.44 | 1.34 |
| 30 | a | 1400 | 4OC | C4-N4 | 5.88 | 1.48 | 1.35 |
| 30 | a | 1487 | UR3 | C2-N3 | 5.88 | 1.50 | 1.39 |

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| Mol | Chain | Res | Type | Atoms | Z | Observed(Å) | Ideal(Å) |
|-----|-------|-----|------|-------|-----|-------------|----------|
| 10 | A | 2502 | 5OC | C2-N3 | 5.85 | 1.48 | 1.36 |
| 10 | A | 2502 | 5OC | O4'-C1' | -5.84 | 1.29 | 1.42 |
| 30 | a | 1400 | 4OC | C6-C5 | 5.79 | 1.48 | 1.35 |
| 10 | A | 2504 | 2MA | C6-N1 | 5.73 | 1.44 | 1.33 |
| 30 | a | 276 | 5OC | C5-C4 | 5.70 | 1.49 | 1.42 |
| 30 | a | 821 | 7MG | C2-N3 | 5.65 | 1.46 | 1.33 |
| 30 | a | 276 | 5OC | O4'-C1' | -5.64 | 1.29 | 1.42 |
| 10 | A | 2504 | 2MA | C2-N1 | 5.63 | 1.44 | 1.34 |
| 10 | A | 2450 | OMU | C6-C5 | 5.62 | 1.48 | 1.35 |
| 30 | a | 1400 | 4OC | C2-N3 | 5.51 | 1.47 | 1.36 |
| 30 | a | 1408 | 2MG | C2-N2 | 5.48 | 1.45 | 1.33 |
| 30 | a | 821 | 7MG | C4-N3 | 5.46 | 1.47 | 1.34 |
| 10 | A | 2252 | OMG | C2-N3 | 5.44 | 1.46 | 1.33 |
| 10 | A | 2502 | 5OC | C5-C4 | 5.44 | 1.49 | 1.42 |
| 10 | A | 2502 | 5OC | C4-N3 | 5.36 | 1.43 | 1.34 |
| 30 | a | 821 | 7MG | C4-N9 | 5.31 | 1.43 | 1.37 |
| 10 | A | 2446 | 2MG | C2-N2 | 5.23 | 1.45 | 1.33 |
| 30 | a | 1408 | 2MG | C4-N3 | 5.06 | 1.49 | 1.37 |
| 30 | a | 1402 | 5MC | C6-N1 | 5.04 | 1.46 | 1.38 |
| 30 | a | 276 | 5OC | O4'-C4' | 5.01 | 1.56 | 1.45 |
| 10 | A | 2446 | 2MG | C4-N3 | 4.93 | 1.49 | 1.37 |
| 30 | a | 276 | 5OC | C4-N4 | 4.87 | 1.46 | 1.34 |
| 10 | A | 1972 | 5MC | C6-N1 | 4.87 | 1.46 | 1.38 |
| 10 | A | 2252 | OMG | C4-N3 | 4.85 | 1.49 | 1.37 |
| 10 | A | 2502 | 5OC | C4-N4 | 4.70 | 1.46 | 1.34 |
| 30 | a | 1408 | 2MG | C2-N1 | 4.69 | 1.44 | 1.36 |
| 10 | A | 2502 | 5OC | O4'-C4' | 4.68 | 1.55 | 1.45 |
| 30 | a | 821 | 7MG | C2-N2 | 4.63 | 1.45 | 1.34 |
| 30 | a | 1402 | 5MC | C4-N4 | 4.58 | 1.46 | 1.34 |
| 10 | A | 2252 | OMG | C2-N2 | 4.53 | 1.45 | 1.34 |
| 30 | a | 276 | 5OC | C2-N1 | 4.47 | 1.49 | 1.40 |
| 10 | A | 2446 | 2MG | C2-N1 | 4.45 | 1.43 | 1.36 |
| 10 | A | 1972 | 5MC | C4-N4 | 4.44 | 1.45 | 1.34 |
| 30 | a | 1400 | 4OC | C2-N1 | 4.44 | 1.49 | 1.40 |
| 30 | a | 1402 | 5MC | C2-N1 | 4.39 | 1.49 | 1.40 |
| 30 | a | 276 | 5OC | C6-N1 | 4.29 | 1.45 | 1.38 |
| 10 | A | 1972 | 5MC | C2-N1 | 4.24 | 1.49 | 1.40 |
| 30 | a | 276 | 5OC | C2'-C1' | 4.18 | 1.64 | 1.52 |
| 10 | A | 2502 | 5OC | C2-N1 | 4.15 | 1.49 | 1.40 |
| 10 | A | 2502 | 5OC | C6-N1 | 4.13 | 1.45 | 1.38 |
| 10 | A | 2502 | 5OC | C2'-C1' | 4.11 | 1.63 | 1.52 |
| 30 | a | 1487 | UR3 | C6-N1 | 3.92 | 1.47 | 1.38 |

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| Mol | Chain | Res | Type | Atoms | Z | Observed(Å) | Ideal(Å) |
|-----|-------|-----|------|-------|-----|-------------|----------|
| 10 | A | 2450 | OMU | C4-N3 | 3.86 | 1.45 | 1.38 |
| 10 | A | 1949 | 5MU | C2-N3 | 3.83 | 1.44 | 1.38 |
| 30 | a | 1400 | 4OC | C5-C4 | 3.68 | 1.48 | 1.40 |
| 10 | A | 2502 | 5OC | C5'-C4' | -3.65 | 1.40 | 1.51 |
| 30 | a | 821 | 7MG | C2-N1 | 3.63 | 1.46 | 1.37 |
| 10 | A | 1949 | 5MU | C2-N1 | 3.61 | 1.44 | 1.38 |
| 30 | a | 276 | 5OC | C5'-C4' | -3.59 | 1.40 | 1.51 |
| 30 | a | 821 | 7MG | C5-C6 | 3.55 | 1.52 | 1.43 |
| 30 | a | 1408 | 2MG | C6-N1 | 3.49 | 1.43 | 1.37 |
| 10 | A | 2504 | 2MA | CM2-C2 | 3.43 | 1.59 | 1.49 |
| 10 | A | 2252 | OMG | C6-N1 | 3.35 | 1.42 | 1.37 |
| 10 | A | 2450 | OMU | O4-C4 | -3.29 | 1.18 | 1.24 |
| 30 | a | 1400 | 4OC | C6-N1 | 3.17 | 1.45 | 1.38 |
| 10 | A | 2581 | PSU | C6-C5 | 3.17 | 1.39 | 1.35 |
| 10 | A | 2502 | 5OC | O3'-C3' | 3.10 | 1.49 | 1.43 |
| 10 | A | 2606 | PSU | C6-C5 | 3.09 | 1.38 | 1.35 |
| 30 | a | 821 | 7MG | C6-N1 | 3.08 | 1.44 | 1.38 |
| 30 | a | 1408 | 2MG | C5-C6 | 3.02 | 1.53 | 1.47 |
| 30 | a | 276 | 5OC | O3'-C3' | 3.02 | 1.49 | 1.43 |
| 10 | A | 2446 | 2MG | C6-N1 | 3.00 | 1.42 | 1.37 |
| 10 | A | 2504 | 2MA | C6-C5 | 2.93 | 1.54 | 1.43 |
| 10 | A | 2252 | OMG | C5-C6 | 2.87 | 1.53 | 1.47 |
| 10 | A | 2446 | 2MG | C5-C4 | -2.81 | 1.35 | 1.43 |
| 10 | A | 2446 | 2MG | C5-C6 | 2.75 | 1.53 | 1.47 |
| 10 | A | 2450 | OMU | C6-N1 | 2.73 | 1.44 | 1.38 |
| 10 | A | 1972 | 5MC | O2-C2 | -2.73 | 1.18 | 1.23 |
| 30 | a | 1487 | UR3 | C5-C4 | 2.72 | 1.50 | 1.43 |
| 10 | A | 2450 | OMU | O2-C2 | -2.68 | 1.18 | 1.23 |
| 30 | a | 821 | 7MG | O6-C6 | -2.65 | 1.18 | 1.23 |
| 30 | a | 1487 | UR3 | C4-N3 | 2.62 | 1.46 | 1.40 |
| 10 | A | 1949 | 5MU | O4-C4 | -2.62 | 1.18 | 1.23 |
| 10 | A | 2252 | OMG | C5-C4 | -2.61 | 1.36 | 1.43 |
| 10 | A | 2446 | 2MG | O6-C6 | -2.60 | 1.18 | 1.23 |
| 30 | a | 1507 | MA6 | C5-C4 | -2.60 | 1.34 | 1.40 |
| 30 | a | 1402 | 5MC | O2-C2 | -2.58 | 1.18 | 1.23 |
| 30 | a | 1408 | 2MG | C5-C4 | -2.51 | 1.36 | 1.43 |
| 30 | a | 1508 | MA6 | C5-C4 | -2.50 | 1.34 | 1.40 |
| 10 | A | 1949 | 5MU | O2-C2 | -2.47 | 1.18 | 1.23 |
| 10 | A | 2252 | OMG | O6-C6 | -2.46 | 1.18 | 1.23 |
| 30 | a | 1508 | MA6 | C2-N3 | 2.43 | 1.36 | 1.32 |
| 10 | A | 2252 | OMG | C2-N1 | 2.43 | 1.43 | 1.37 |
| 30 | a | 276 | 5OC | O5-C5 | 2.40 | 1.40 | 1.34 |

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| Mol | Chain | Res | Type | Atoms | Z | Observed(Å) | Ideal(Å) |
|-----|-------|-----|------|-------|---|-------------|----------|
| 30 | a | 1507 | MA6 | C2-N3 | 2.32 | 1.35 | 1.32 |
| 30 | a | 1408 | 2MG | O6-C6 | -2.31 | 1.18 | 1.23 |
| 10 | A | 2450 | OMU | C5-C4 | 2.29 | 1.48 | 1.43 |
| 10 | A | 2581 | PSU | O4'-C1' | -2.21 | 1.40 | 1.43 |
| 10 | A | 2502 | 5OC | O5-C5 | 2.09 | 1.39 | 1.34 |
| 30 | a | 1487 | UR3 | O4-C4 | -2.08 | 1.19 | 1.23 |
| 30 | a | 1487 | UR3 | O2-C2 | -2.07 | 1.18 | 1.22 |
| 30 | a | 1400 | 4OC | O2-C2 | -2.07 | 1.19 | 1.23 |

All (62) bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed($^o$) | Ideal($^o$) |
|-----|-------|-----|------|-------|---|----------------|-------------|
| 30 | a | 1507 | MA6 | N1-C6-N6 | -17.14 | 99.02 | 117.06 |
| 30 | a | 1508 | MA6 | N1-C6-N6 | -16.56 | 99.63 | 117.06 |
| 10 | A | 1949 | 5MU | C5-C4-N3 | 10.60 | 124.36 | 115.31 |
| 10 | A | 1949 | 5MU | C5-C6-N1 | -8.70 | 114.39 | 123.34 |
| 10 | A | 2504 | 2MA | C2-N3-C4 | 7.76 | 121.83 | 115.52 |
| 10 | A | 1949 | 5MU | C4-N3-C2 | -7.07 | 118.20 | 127.35 |
| 10 | A | 2504 | 2MA | C1'-N9-C4 | -6.91 | 114.50 | 126.64 |
| 30 | a | 1507 | MA6 | N3-C2-N1 | -5.71 | 119.75 | 128.68 |
| 30 | a | 1508 | MA6 | N3-C2-N1 | -5.58 | 119.95 | 128.68 |
| 10 | A | 2450 | OMU | C4-N3-C2 | -5.42 | 119.42 | 126.58 |
| 30 | a | 821 | 7MG | C5-C6-N1 | 5.06 | 119.91 | 110.99 |
| 30 | a | 1487 | UR3 | C4-N3-C2 | -4.78 | 120.06 | 124.56 |
| 10 | A | 2581 | PSU | N1-C2-N3 | 4.74 | 120.50 | 115.13 |
| 10 | A | 1949 | 5MU | N3-C2-N1 | 4.60 | 121.00 | 114.89 |
| 10 | A | 2606 | PSU | C4-N3-C2 | -4.53 | 119.81 | 126.34 |
| 30 | a | 821 | 7MG | C2-N3-C4 | 4.48 | 120.29 | 112.30 |
| 10 | A | 2606 | PSU | N1-C2-N3 | 4.46 | 120.18 | 115.13 |
| 10 | A | 2581 | PSU | C4-N3-C2 | -4.44 | 119.94 | 126.34 |
| 10 | A | 1949 | 5MU | C5M-C5-C6 | -4.06 | 117.42 | 122.85 |
| 30 | a | 821 | 7MG | C5-C4-N3 | -3.98 | 120.55 | 128.13 |
| 10 | A | 2450 | OMU | N3-C2-N1 | 3.94 | 120.12 | 114.89 |
| 10 | A | 1949 | 5MU | O4-C4-C5 | -3.89 | 120.39 | 124.90 |
| 30 | a | 276 | 5OC | O5-C5-C4 | 3.81 | 120.17 | 114.43 |
| 10 | A | 2252 | OMG | C5-C6-N1 | 3.60 | 120.30 | 113.95 |
| 10 | A | 2446 | 2MG | C5-C6-N1 | 3.53 | 120.18 | 113.95 |
| 10 | A | 2502 | 5OC | O5-C5-C4 | 3.49 | 119.69 | 114.43 |
| 30 | a | 1408 | 2MG | C5-C6-N1 | 3.44 | 120.02 | 113.95 |
| 10 | A | 2450 | OMU | C5-C4-N3 | 3.39 | 119.92 | 114.84 |
| 10 | A | 1972 | 5MC | C5-C6-N1 | -3.30 | 119.94 | 123.34 |
| 10 | A | 2252 | OMG | C2-N1-C6 | -3.29 | 119.04 | 125.10 |

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| Mol | Chain | Res | Type | Atoms | Z | Observed($^o$) | Ideal($^o$) |
|-----|-------|------|------|-----------|-------|--------|--------|
| 10 | A | 1949 | 5MU | C6-C5-C4 | 3.26 | 120.75 | 118.03 |
| 10 | A | 2504 | 2MA | N3-C2-N1 | -3.17 | 119.94 | 125.73 |
| 30 | a | 821 | 7MG | C5-C4-N9 | 3.13 | 110.41 | 106.35 |
| 30 | a | 1402 | 5MC | C5-C6-N1 | -3.09 | 120.16 | 123.34 |
| 30 | a | 821 | 7MG | C4-C5-N7 | 3.06 | 109.78 | 105.53 |
| 10 | A | 2450 | OMU | O4-C4-C5 | -2.88 | 120.09 | 125.16 |
| 10 | A | 1949 | 5MU | C5M-C5-C4 | 2.78 | 121.83 | 118.77 |
| 30 | a | 821 | 7MG | C2-N1-C6 | -2.73 | 120.12 | 125.10 |
| 30 | a | 821 | 7MG | O6-C6-C5 | -2.66 | 121.01 | 127.54 |
| 10 | A | 2446 | 2MG | C8-N7-C5 | 2.66 | 108.05 | 102.99 |
| 30 | a | 821 | 7MG | N9-C8-N7 | 2.63 | 107.14 | 103.38 |
| 10 | A | 2581 | PSU | O4'-C1'-C2' | 2.61 | 108.83 | 105.14 |
| 10 | A | 2252 | OMG | C8-N7-C5 | 2.61 | 107.96 | 102.99 |
| 10 | A | 2581 | PSU | O2-C2-N1 | -2.60 | 119.93 | 122.79 |
| 10 | A | 2581 | PSU | C6-N1-C2 | -2.55 | 120.08 | 122.68 |
| 10 | A | 1949 | 5MU | O4-C4-N3 | -2.54 | 115.25 | 120.12 |
| 30 | a | 1408 | 2MG | C8-N7-C5 | 2.53 | 107.82 | 102.99 |
| 30 | a | 1400 | 4OC | C6-C5-C4 | 2.41 | 119.91 | 116.96 |
| 30 | a | 821 | 7MG | N9-C4-N3 | 2.39 | 129.04 | 125.47 |
| 10 | A | 2446 | 2MG | O6-C6-C5 | -2.37 | 119.74 | 124.37 |
| 30 | a | 1408 | 2MG | O6-C6-C5 | -2.28 | 119.92 | 124.37 |
| 30 | a | 1487 | UR3 | C6-N1-C2 | -2.25 | 119.78 | 121.79 |
| 10 | A | 2606 | PSU | O2-C2-N1 | -2.20 | 120.36 | 122.79 |
| 10 | A | 2252 | OMG | O6-C6-C5 | -2.17 | 120.13 | 124.37 |
| 10 | A | 1972 | 5MC | CM5-C5-C6 | -2.17 | 119.95 | 122.85 |
| 10 | A | 1949 | 5MU | O2-C2-N1 | -2.15 | 119.93 | 122.79 |
| 10 | A | 2504 | 2MA | CM2-C2-N3 | 2.12 | 120.46 | 117.16 |
| 10 | A | 2450 | OMU | O2-C2-N1 | -2.11 | 119.98 | 122.79 |
| 10 | A | 2502 | 5OC | C3'-C2'-C1' | 2.07 | 107.72 | 102.54 |
| 30 | a | 1507 | MA6 | C1'-N9-C4 | -2.06 | 123.01 | 126.64 |
| 10 | A | 2502 | 5OC | C2'-C3'-C4' | 2.06 | 107.04 | 102.76 |
| 10 | A | 2606 | PSU | C6-N1-C2 | -2.04 | 120.60 | 122.68 |

There are no chirality outliers.

All (18) torsion outliers are listed below:

| Mol | Chain | Res | Type | Atoms |
|-----|-------|------|------|----------------|
| 10 | A | 2252 | OMG | C1'-C2'-O2'-CM2 |
| 30 | a | 1507 | MA6 | C5-C6-N6-C9 |
| 30 | a | 1507 | MA6 | C5-C6-N6-C10 |
| 30 | a | 1508 | MA6 | C5-C6-N6-C10 |
| 30 | a | 1508 | MA6 | O4'-C4'-C5'-O5' |

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| Mol | Chain | Res | Type | Atoms |
|-----|-------|-----|------|-------|
| 30 | a | 1507 | MA6 | N1-C6-N6-C10 |
| 30 | a | 1508 | MA6 | N1-C6-N6-C10 |
| 10 | A | 2502 | 5OC | C2'-C1'-N1-C6 |
| 10 | A | 2502 | 5OC | C2'-C1'-N1-C2 |
| 30 | a | 1508 | MA6 | C5-C6-N6-C9 |
| 10 | A | 2446 | 2MG | C3'-C4'-C5'-O5' |
| 10 | A | 2502 | 5OC | O4'-C1'-N1-C6 |
| 10 | A | 2502 | 5OC | O4'-C1'-N1-C2 |
| 30 | a | 1508 | MA6 | C3'-C4'-C5'-O5' |
| 30 | a | 276 | 5OC | C3'-C4'-C5'-O5' |
| 10 | A | 2502 | 5OC | O4'-C4'-C5'-O5' |
| 10 | A | 2504 | 2MA | O4'-C4'-C5'-O5' |
| 10 | A | 2446 | 2MG | O4'-C4'-C5'-O5' |

There are no ring outliers.

9 monomers are involved in 11 short contacts:

| Mol | Chain | Res | Type | Clashes | Symm-Clashes |
|-----|-------|-----|------|---------|--------------|
| 10 | A | 1949 | 5MU | 2 | 0 |
| 10 | A | 2620 | H2U | 1 | 0 |
| 10 | A | 876 | H2U | 1 | 0 |
| 10 | A | 2252 | OMG | 1 | 0 |
| 30 | a | 821 | 7MG | 1 | 0 |
| 30 | a | 276 | 5OC | 1 | 0 |
| 30 | a | 1507 | MA6 | 1 | 0 |
| 30 | a | 1408 | 2MG | 2 | 0 |
| 30 | a | 1508 | MA6 | 1 | 0 |

## 5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

## 5.6 Ligand geometry ⓘ

Of 186 ligands modelled in this entry, 186 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

## 5.7 Other polymers ⓘ

There are no such residues in this entry.

## 5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

# 6 Map visualisation ⓘ

This section contains visualisations of the EMDB entry EMD-52641. These allow visual inspection of the internal detail of the map and identification of artifacts.

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

## 6.1 Orthogonal projections ⓘ

### 6.1.1 Primary map



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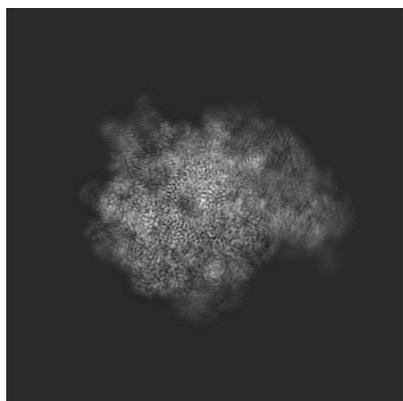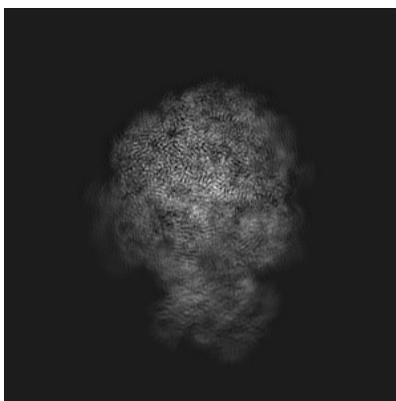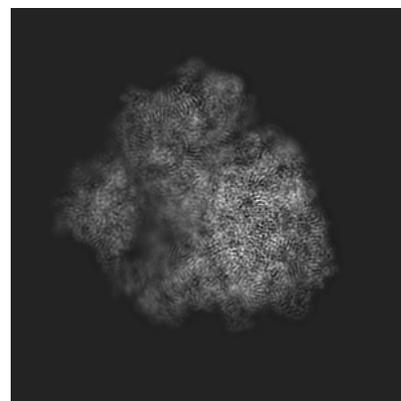
The images above show the map projected in three orthogonal directions.

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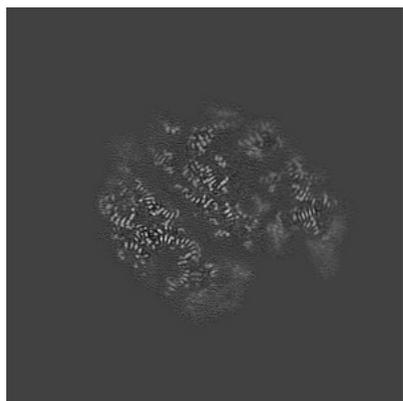
### 6.2.1 Primary map
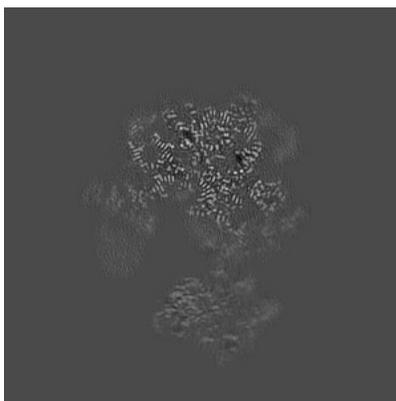


| X Index: 220 | Y Index: 220 | Z Index: 220 |
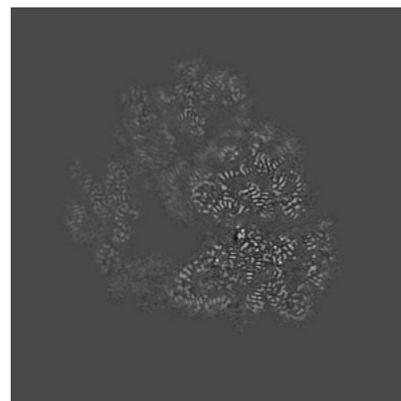
The images above show central slices of the map in three orthogonal directions.

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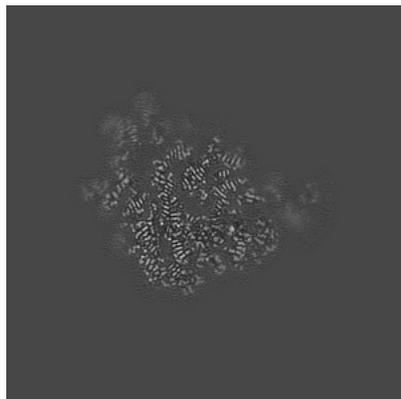
### 6.3.1 Primary map
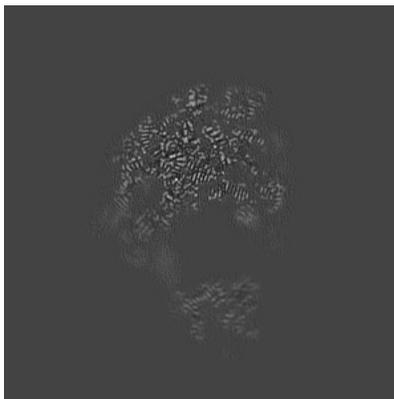


| X Index: 262 | Y Index: 184 | Z Index: 201 |
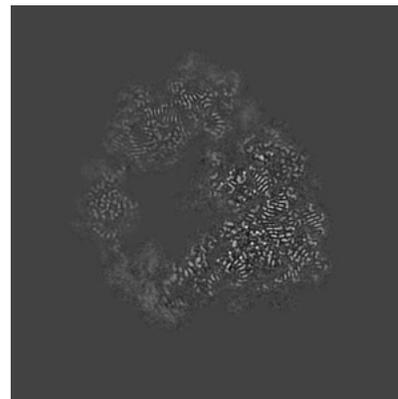
The images above show the largest variance slices of the map in three orthogonal directions.

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

### 6.4.1 Primary map



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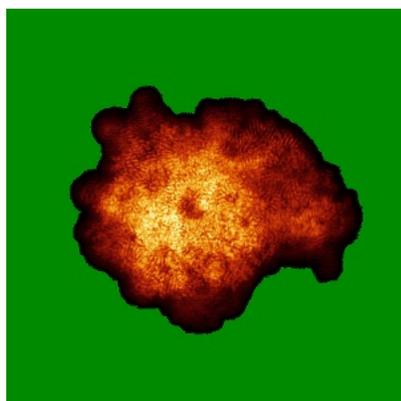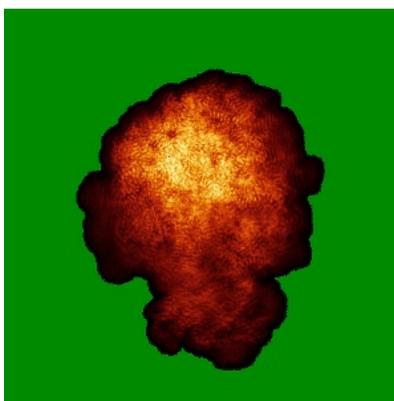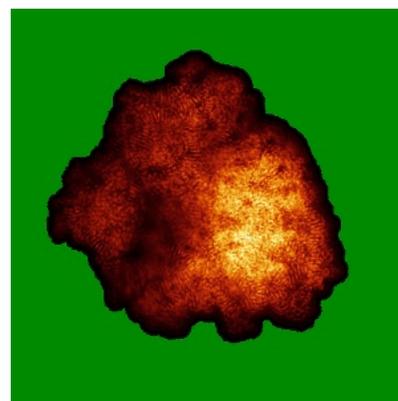
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

## 6.5 Orthogonal surface views ⓘ

### 6.5.1 Primary map



| X | Y | Z |
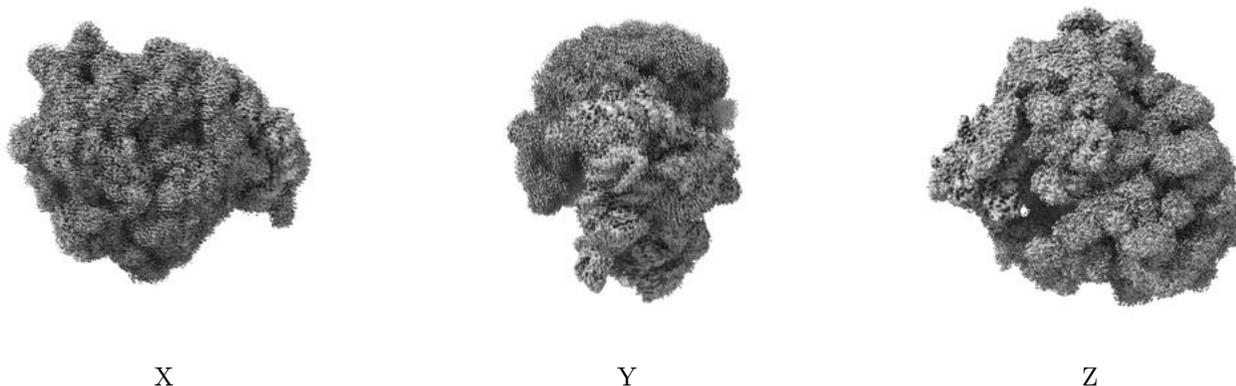
The images above show the 3D surface view of the map at the recommended contour level 0.005. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

## 6.6 Mask visualisation ⓘ

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

# 7  Map analysis ⓘ

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

## 7.1  Map-value distribution ⓘ
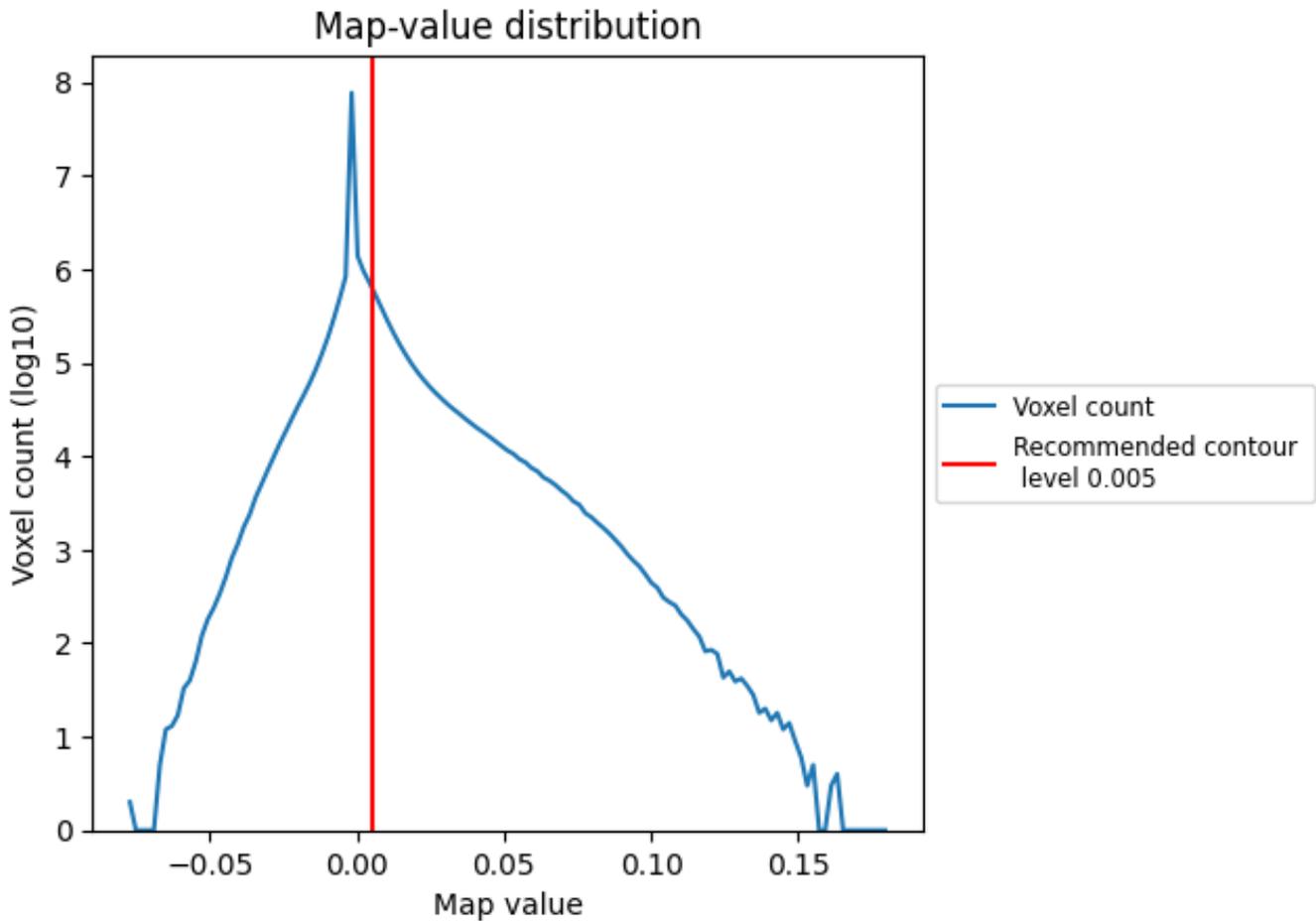


The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

## 7.2　Volume estimate ⓘ
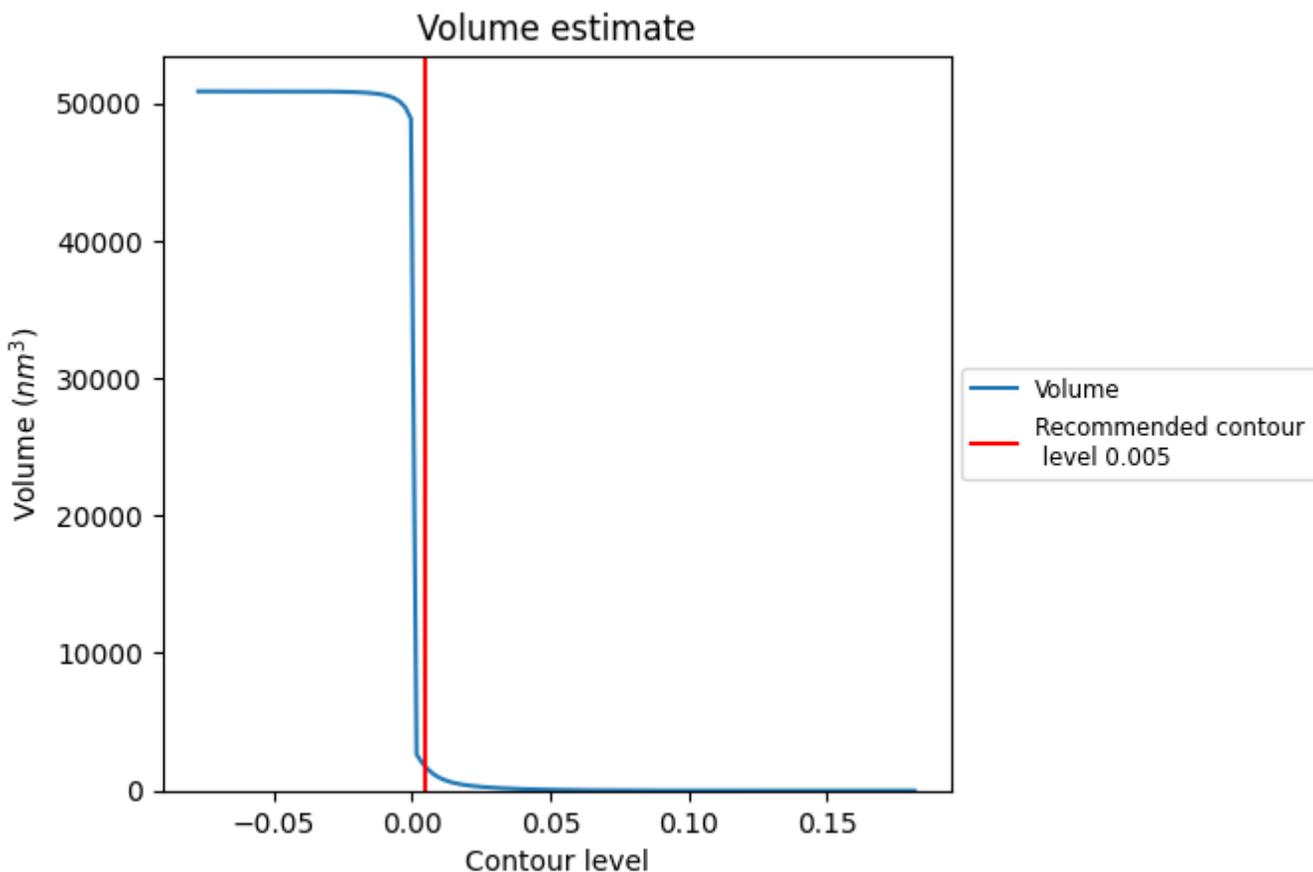


The volume at the recommended contour level is 1735 $nm^3$; this corresponds to an approximate mass of 1567 kDa.

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 ⓘ
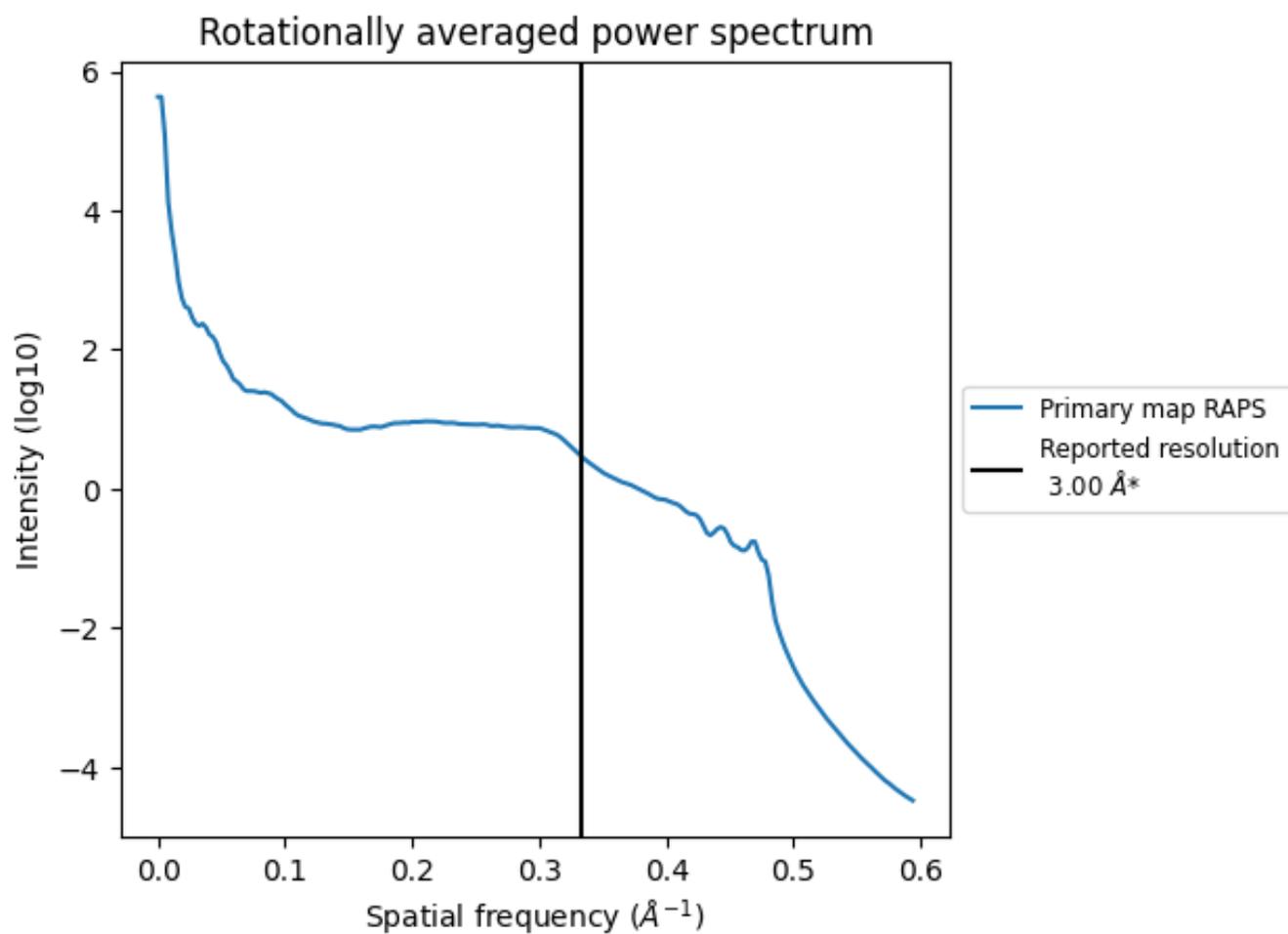


*Reported resolution corresponds to spatial frequency of 0.333 Å$^{-1}$

# 8 Fourier-Shell correlation ⓘ

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

# 9 Map-model fit ⓘ

This section contains information regarding the fit between EMDB map EMD-52641 and PDB model 9I5X. Per-residue inclusion information can be found in section 3 on page 14.

## 9.1 Map-model overlay ⓘ



X        Y        Z
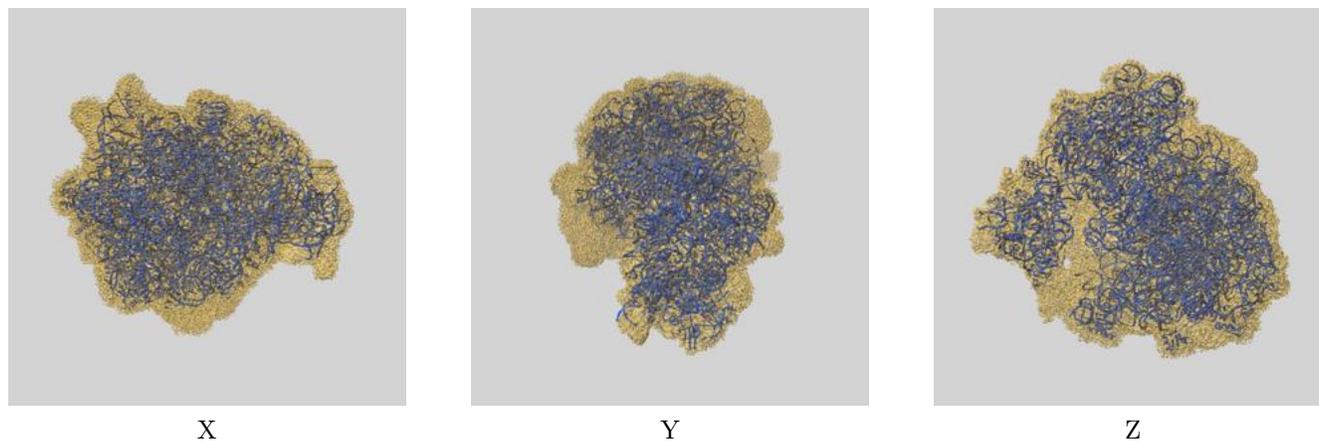
The images above show the 3D surface view of the map at the recommended contour level 0.005 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

## 9.2 Q-score mapped to coordinate model ⓘ



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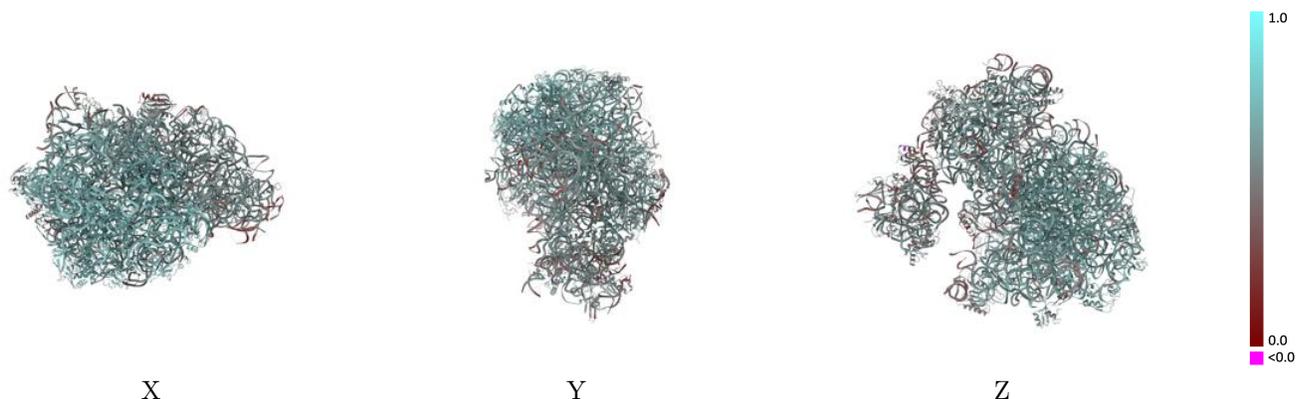
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

## 9.3 Atom inclusion mapped to coordinate model ⓘ



X            Y            Z
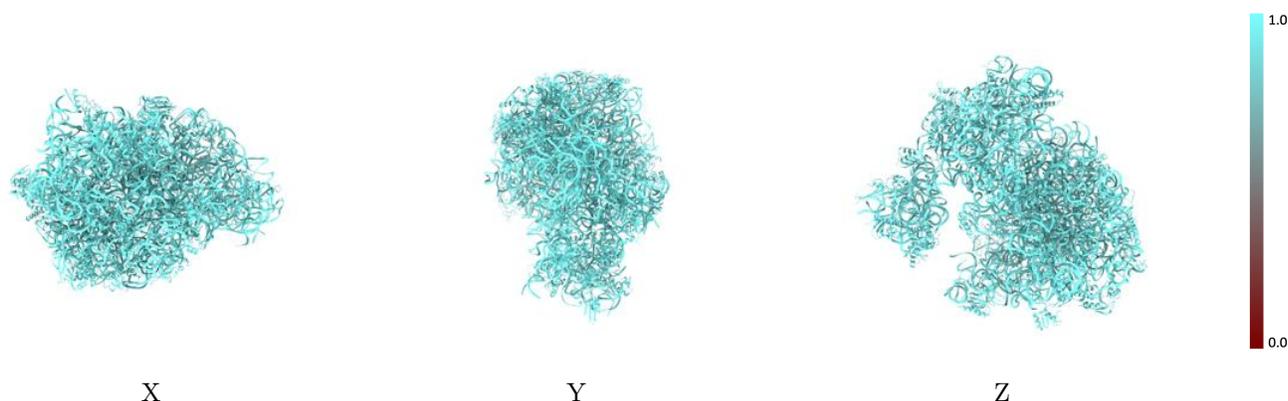
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.005).

## 9.4　Atom inclusion ⓘ
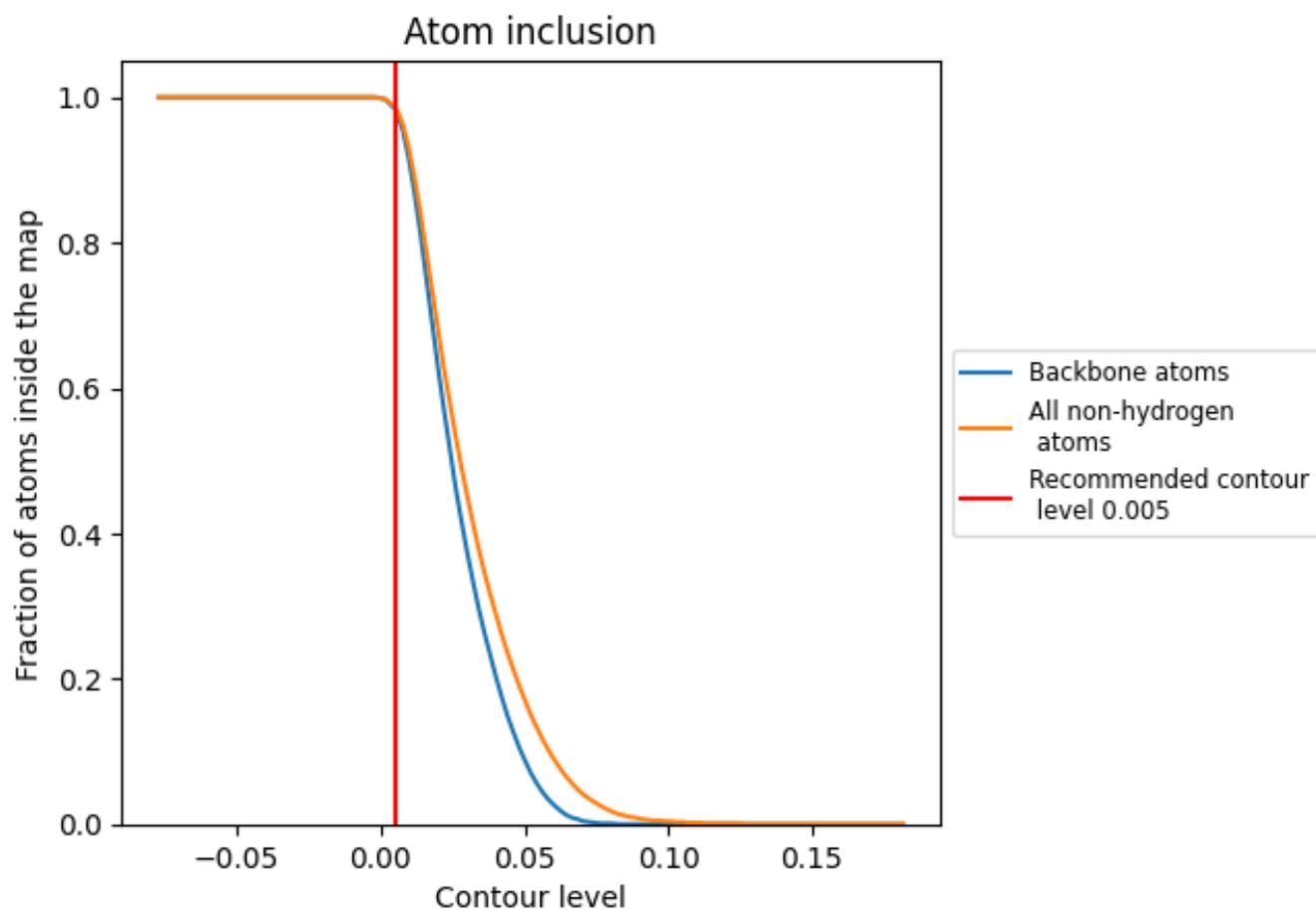


At the recommended contour level, 98% of all backbone atoms, 99% of all non-hydrogen atoms, are inside the map.

## 9.5　Map-model fit summary ⓘ

The table lists the average atom inclusion at the recommended contour level (0.005) and Q-score for the entire model and for each chain.

| Chain | Atom inclusion | Q-score |
|:---:|:---:|:---:|
| All | 0.9870 | 0.5910 |
| 0 | 0.9950 | 0.6430 |
| 1 | 0.9770 | 0.5490 |
| 10 | 0.9330 | 0.5720 |
| 2 | 0.9950 | 0.6480 |
| 4 | 0.9950 | 0.6550 |
| 5 | 0.9760 | 0.5690 |
| 6 | 0.9920 | 0.6860 |
| 7 | 0.9780 | 0.6130 |
| 8 | 0.9760 | 0.5920 |
| A | 0.9960 | 0.6320 |
| B | 0.9850 | 0.4980 |
| D | 0.9910 | 0.6550 |
| E | 0.9950 | 0.6600 |
| F | 0.9910 | 0.6510 |
| I | 0.9780 | 0.5250 |
| J | 0.9760 | 0.5370 |
| K | 0.9580 | 0.5220 |
| L | 0.9470 | 0.4580 |
| M | 0.9890 | 0.6480 |
| N | 0.9870 | 0.6350 |
| O | 0.9900 | 0.6110 |
| P | 0.9810 | 0.6040 |
| Q | 0.9960 | 0.6640 |
| R | 0.9750 | 0.5130 |
| S | 0.9900 | 0.6260 |
| T | 0.9970 | 0.6810 |
| U | 0.9890 | 0.6440 |
| V | 0.9950 | 0.6680 |
| W | 0.9840 | 0.5970 |
| X | 0.9900 | 0.6140 |
| Y | 0.9910 | 0.5550 |
| Z | 0.9960 | 0.6660 |
| a | 0.9820 | 0.5240 |
| b | 0.9570 | 0.4690 |

1.0

0.0
<0.0

*Continued on next page...*

*Continued from previous page...*

| Chain | Atom inclusion | Q-score |
|:---:|:---:|:---:|
| c | 0.9740 | 0.5530 |
| d | 0.9720 | 0.5450 |
| e | 0.9840 | 0.5630 |
| f | 0.9660 | 0.5330 |
| g | 0.9690 | 0.5530 |
| h | 0.9490 | 0.5170 |
| i | 0.9770 | 0.5210 |
| j | 0.9530 | 0.5570 |
| k | 0.9430 | 0.4990 |
| l | 0.9680 | 0.5060 |
| m | 0.9530 | 0.4960 |
| n | 0.9650 | 0.5290 |
| o | 0.9840 | 0.5680 |
| p | 0.9860 | 0.5570 |