# wwPDB EM Validation Summary Report (i)

Nov 8, 2022 – 10:03 AM JST

| | | |
|---|---|---|
| PDB ID | : | 5ZEP |
| EMDB ID | : | EMD-6921 |
| Title | : | M. smegmatis hibernating state 70S ribosome structure |
| Authors | : | Mishra, S.; Ahmed, T.; Tyagi, A.; Shi, J.; Bhushan, S. |
| Deposited on | : | 2018-02-27 |
| Resolution | : | 3.40 Å(reported) |

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

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

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

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

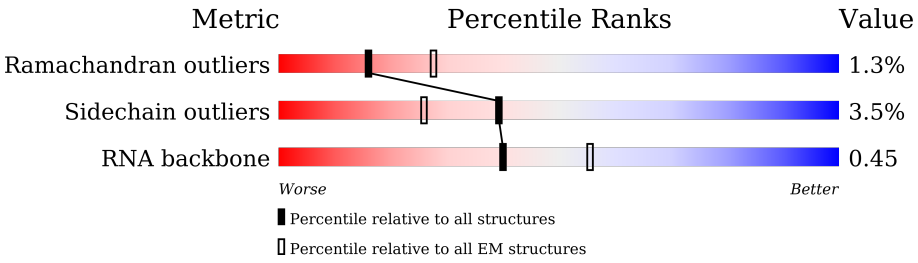
| | | |
|---|---|---|
| EMDB validation analysis | : | 0.0.1.dev43 |
| MolProbity | : | 4.02b-467 |
| Percentile statistics | : | 20191225.v01 (using entries in the PDB archive December 25th 2019) |
| MapQ | : | 1.9.9 |
| Ideal geometry (proteins) | : | Engh & Huber (2001) |
| Ideal geometry (DNA, RNA) | : | Parkinson et al. (1996) |
| Validation Pipeline (wwPDB-VP) | : | 2.31.2 |

# 1 Overall quality at a glance (i)

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

The reported resolution of this entry is 3.40 Å.

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




| Metric | Whole archive (#Entries) | EM structures (#Entries) |
|---|---|---|
| Ramachandran outliers | 154571 | 4023 |
| Sidechain outliers | 154315 | 3826 |
| RNA backbone | 4643 | 859 |

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

| Mol | Chain | Length | Quality of chain |
|---|---|---|---|
| 1 | a | 1528 | 67% 27% |
| 2 | c | 275 | 71% 24% |
| 3 | e | 214 | 5% 88% 7% |
| 4 | g | 156 | 95% |
| 5 | h | 132 | 93% 5% |
| 6 | i | 150 | 77% 6% 16% |
| 7 | j | 101 | 92% |
| 8 | k | 138 | 78% 7% 15% |

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| Mol | Chain | Length | Quality of chain |
|---|---|---|---|
| 9 | l | 124 | 92% 6% |
| 10 | o | 89 | 97% |
| 11 | q | 98 | 92% 6% |
| 12 | r | 84 | 75% 24% |
| 13 | s | 93 | 80% 16% |
| 14 | t | 86 | 94% |
| 15 | n | 61 | 97% |
| 16 | b | 277 | 81% 18% |
| 17 | d | 201 | 99% |
| 18 | f | 96 | 98% |
| 19 | m | 124 | 94% 6% |
| 20 | p | 156 | 72% 28% |
| 21 | u | 33 | 76% 21% |
| 22 | w | 77 | 17% 39% 53% 8% |
| 23 | x | 230 | 35% 30% 11% 57% |
| 24 | 0 | 479 | 32% 53% 45% |
| 25 | C | 278 | 90% 8% |
| 26 | D | 217 | 93% 5% |
| 27 | E | 215 | 87% 8% |
| 28 | F | 187 | 88% 9% |
| 29 | G | 179 | 98% |
| 30 | H | 151 | 99% |
| 31 | I | 175 | 6% 72% 28% |
| 32 | J | 142 | 5% 94% 6% |
| 33 | K | 147 | 91% 9% |

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| Mol | Chain | Length | Quality of chain |
|---|---|---|---|
| 34 | L | 122 | 91% 8% |
| 35 | M | 147 | 98% |
| 36 | N | 138 | 92% |
| 37 | O | 199 | 51% 7% 41% |
| 38 | P | 127 | 99% |
| 39 | Q | 113 | 98% |
| 40 | R | 129 | 95% |
| 41 | S | 103 | 97% |
| 42 | T | 153 | 69% 5% 25% |
| 43 | U | 100 | 79% 12% 6% |
| 44 | V | 105 | 84% 9% 8% |
| 45 | W | 215 | 79% 7% 13% |
| 46 | X | 88 | 5% 86% 6% 7% |
| 47 | Y | 64 | 98% |
| 48 | Z | 77 | 74% 8% 18% |
| 49 | v | 61 | 95% |
| 50 | y | 75 | 7% 83% 12% |
| 51 | z | 57 | 95% 5% |
| 52 | 1 | 55 | 5% 69% 16% 5% 9% |
| 53 | 2 | 47 | 89% 6% |
| 54 | 3 | 64 | 95% |
| 55 | 4 | 37 | 95% 5% |
| 56 | 5 | 24 | 8% 96% |
| 57 | B | 118 | 64% 33% |
| 58 | A | 3120 | 67% 30% |

# 2 Entry composition (i)

There are 58 unique types of molecules in this entry. The entry contains 152451 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a RNA chain called 16S rRNA.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| | | | Total | C | N | O | P | | |
| 1 | a | 1506 | 32341 | 14404 | 5921 | 10510 | 1506 | 0 | 0 |

- Molecule 2 is a protein called 30S ribosomal protein S3.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| | | | Total | C | N | O | S | | |
| 2 | c | 210 | 1672 | 1043 | 324 | 300 | 5 | 0 | 0 |

- Molecule 3 is a protein called 30S ribosomal protein S5.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| | | | Total | C | N | O | S | | |
| 3 | e | 198 | 1433 | 885 | 282 | 262 | 4 | 0 | 0 |

- Molecule 4 is a protein called 30S ribosomal protein S7.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| | | | Total | C | N | O | S | | |
| 4 | g | 156 | 1240 | 773 | 242 | 222 | 3 | 0 | 0 |

- Molecule 5 is a protein called 30S ribosomal protein S8.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| | | | Total | C | N | O | S | | |
| 5 | h | 130 | 1003 | 629 | 188 | 185 | 1 | 0 | 0 |

- Molecule 6 is a protein called 30S ribosomal protein S9.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|
| | | | Total | C | N | O | | |
| 6 | i | 126 | 994 | 630 | 194 | 170 | 0 | 0 |

- Molecule 7 is a protein called 30S ribosomal protein S10.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 7 | j | 97 | Total | C | N | O | S | 0 | 0 |
| | | | 775 | 488 | 143 | 141 | 3 | | |

- Molecule 8 is a protein called 30S ribosomal protein S11.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 8 | k | 117 | Total | C | N | O | S | 0 | 0 |
| | | | 871 | 539 | 173 | 158 | 1 | | |

- Molecule 9 is a protein called 30S ribosomal protein S12.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 9 | l | 122 | Total | C | N | O | S | 0 | 0 |
| | | | 958 | 594 | 197 | 165 | 2 | | |

- Molecule 10 is a protein called 30S ribosomal protein S15.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|
| 10 | o | 87 | Total | C | N | O | 0 | 0 |
| | | | 709 | 443 | 143 | 123 | | |

- Molecule 11 is a protein called 30S ribosomal protein S17.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 11 | q | 92 | Total | C | N | O | S | 0 | 0 |
| | | | 730 | 458 | 138 | 132 | 2 | | |

- Molecule 12 is a protein called 30S ribosomal protein S18 2.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 12 | r | 64 | Total | C | N | O | S | 0 | 0 |
| | | | 512 | 319 | 102 | 88 | 3 | | |

- Molecule 13 is a protein called 30S ribosomal protein S19.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 13 | s | 78 | Total | C | N | O | S | 0 | 0 |
| | | | 630 | 405 | 117 | 107 | 1 | | |

- Molecule 14 is a protein called 30S ribosomal protein S20.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|
| 14 | t | 84 | Total<br>655 | C<br>399 | N<br>138 | O<br>118 | 0 | 0 |

- Molecule 15 is a protein called 30S ribosomal protein S14 type Z.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 15 | n | 60 | Total<br>477 | C<br>302 | N<br>97 | O<br>73 | S<br>5 | 0 | 0 |

- Molecule 16 is a protein called 30S ribosomal protein S2.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 16 | b | 228 | Total<br>1793 | C<br>1132 | N<br>322 | O<br>330 | S<br>9 | 0 | 0 |

- Molecule 17 is a protein called 30S ribosomal protein S4.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 17 | d | 200 | Total<br>1641 | C<br>1028 | N<br>316 | O<br>295 | S<br>2 | 0 | 0 |

- Molecule 18 is a protein called 30S ribosomal protein S6.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 18 | f | 96 | Total<br>771 | C<br>486 | N<br>138 | O<br>145 | S<br>2 | 0 | 0 |

- Molecule 19 is a protein called 30S ribosomal protein S13.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 19 | m | 116 | Total<br>935 | C<br>572 | N<br>191 | O<br>169 | S<br>3 | 0 | 0 |

- Molecule 20 is a protein called 30S ribosomal protein S16.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|
| 20 | p | 113 | Total<br>891 | C<br>570 | N<br>162 | O<br>159 | 0 | 0 |

- Molecule 21 is a protein called Conserved domain protein.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 21 | u | 32 | Total | C | N | O | S | 0 | 0 |
| | | | 280 | 172 | 71 | 36 | 1 | | |

- Molecule 22 is a RNA chain called E-tRNAfMet.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 22 | w | 77 | Total | C | N | O | P | 0 | 0 |
| | | | 1643 | 732 | 297 | 537 | 77 | | |

- Molecule 23 is a protein called Ribosome hibernation promoting factor.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 23 | x | 100 | Total | C | N | O | S | 0 | 0 |
| | | | 831 | 513 | 167 | 149 | 2 | | |

- Molecule 24 is a protein called bS1.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|
| 24 | 0 | 262 | Total | C | N | O | 0 | 0 |
| | | | 1310 | 786 | 262 | 262 | | |

- Molecule 25 is a protein called 50S ribosomal protein L2.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 25 | C | 273 | Total | C | N | O | S | 0 | 0 |
| | | | 2097 | 1290 | 435 | 368 | 4 | | |

- Molecule 26 is a protein called 50S ribosomal protein L3.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 26 | D | 214 | Total | C | N | O | S | 0 | 0 |
| | | | 1587 | 982 | 310 | 290 | 5 | | |

- Molecule 27 is a protein called 50S ribosomal protein L4.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 27 | E | 207 | Total | C | N | O | S | 0 | 0 |
| | | | 1553 | 959 | 292 | 300 | 2 | | |

- Molecule 28 is a protein called 50S ribosomal protein L5.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 28 | F | 181 | Total | C | N | O | S | 0 | 0 |
| | | | 1437 | 903 | 269 | 259 | 6 | | |

- Molecule 29 is a protein called 50S ribosomal protein L6.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 29 | G | 176 | Total | C | N | O | S | 0 | 0 |
| | | | 1348 | 845 | 249 | 253 | 1 | | |

- Molecule 30 is a protein called 50S ribosomal protein L9.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 30 | H | 151 | Total | C | N | O | S | 0 | 0 |
| | | | 1018 | 635 | 188 | 194 | 1 | | |

- Molecule 31 is a protein called 50S ribosomal protein L10.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 31 | I | 126 | Total | C | N | O | S | 0 | 0 |
| | | | 918 | 580 | 156 | 180 | 2 | | |

- Molecule 32 is a protein called 50S ribosomal protein L11.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 32 | J | 133 | Total | C | N | O | S | 0 | 0 |
| | | | 990 | 625 | 175 | 187 | 3 | | |

- Molecule 33 is a protein called 50S ribosomal protein L13.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 33 | K | 147 | Total | C | N | O | S | 0 | 0 |
| | | | 1138 | 727 | 208 | 201 | 2 | | |

- Molecule 34 is a protein called 50S ribosomal protein L14.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 34 | L | 121 | Total | C | N | O | S | 0 | 0 |
| | | | 930 | 580 | 178 | 169 | 3 | | |

- Molecule 35 is a protein called 50S ribosomal protein L15.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 35 | M | 145 | Total | C | N | O | S | 0 | 0 |
| | | | 1078 | 676 | 205 | 194 | 3 | | |

- Molecule 36 is a protein called 50S ribosomal protein L16.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 36 | N | 134 | Total | C | N | O | S | 0 | 0 |
| | | | 1074 | 680 | 211 | 181 | 2 | | |

- Molecule 37 is a protein called 50S ribosomal protein L17.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 37 | O | 117 | Total | C | N | O | S | 0 | 0 |
| | | | 919 | 577 | 178 | 162 | 2 | | |

- Molecule 38 is a protein called 50S ribosomal protein L18.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|
| 38 | P | 126 | Total | C | N | O | 0 | 0 |
| | | | 956 | 586 | 199 | 171 | | |

- Molecule 39 is a protein called 50S ribosomal protein L19.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 39 | Q | 113 | Total | C | N | O | S | 0 | 0 |
| | | | 907 | 570 | 171 | 165 | 1 | | |

- Molecule 40 is a protein called 50S ribosomal protein L20.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|
| 40 | R | 124 | Total | C | N | O | 0 | 0 |
| | | | 988 | 613 | 203 | 172 | | |

- Molecule 41 is a protein called 50S ribosomal protein L21.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|
| 41 | S | 102 | Total | C | N | O | 0 | 0 |
| | | | 768 | 487 | 140 | 141 | | |

- Molecule 42 is a protein called 50S ribosomal protein L22.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|
| 42 | T | 114 | Total<br>873 | C<br>543 | N<br>171 | O<br>159 | 0 | 0 |

- Molecule 43 is a protein called 50S ribosomal protein L23.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|
| 43 | U | 94 | Total<br>739 | C<br>469 | N<br>135 | O<br>135 | 0 | 0 |

- Molecule 44 is a protein called 50S ribosomal protein L24.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 44 | V | 97 | Total<br>731 | C<br>456 | N<br>137 | O<br>136 | S<br>2 | 0 | 0 |

- Molecule 45 is a protein called 50S ribosomal protein L25.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|
| 45 | W | 186 | Total<br>1389 | C<br>859 | N<br>249 | O<br>281 | 0 | 0 |

- Molecule 46 is a protein called 50S ribosomal protein L27.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|
| 46 | X | 82 | Total<br>604 | C<br>372 | N<br>127 | O<br>105 | 0 | 0 |

- Molecule 47 is a protein called 50S ribosomal protein L28.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 47 | Y | 63 | Total<br>470 | C<br>283 | N<br>103 | O<br>80 | S<br>4 | 0 | 0 |

- Molecule 48 is a protein called 50S ribosomal protein L29.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 48 | Z | 63 | Total<br>527 | C<br>322 | N<br>102 | O<br>102 | S<br>1 | 0 | 0 |

- Molecule 49 is a protein called 50S ribosomal protein L30.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|
| 49 | v | 60 | Total<br>483 | C<br>298 | N<br>97 | O<br>88 | 0 | 0 |

- Molecule 50 is a protein called 50S ribosomal protein L31.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 50 | y | 66 | Total<br>510 | C<br>316 | N<br>93 | O<br>96 | S<br>5 | 0 | 0 |

- Molecule 51 is a protein called 50S ribosomal protein L32.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 51 | z | 54 | Total<br>423 | C<br>260 | N<br>93 | O<br>69 | S<br>1 | 0 | 0 |

- Molecule 52 is a protein called 50S ribosomal protein L33 1.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 52 | 1 | 50 | Total<br>416 | C<br>254 | N<br>86 | O<br>72 | S<br>4 | 0 | 0 |

- Molecule 53 is a protein called 50S ribosomal protein L34.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 53 | 2 | 45 | Total<br>372 | C<br>222 | N<br>96 | O<br>53 | S<br>1 | 0 | 0 |

- Molecule 54 is a protein called 50S ribosomal protein L35.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|
| 54 | 3 | 63 | Total<br>502 | C<br>302 | N<br>115 | O<br>85 | 0 | 0 |

- Molecule 55 is a protein called 50S ribosomal protein L36.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 55 | 4 | 37 | Total<br>298 | C<br>181 | N<br>66 | O<br>46 | S<br>5 | 0 | 0 |

- Molecule 56 is a protein called Uncharacterized protein.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|
| 56 | 5 | 23 | Total<br>189 | C<br>111 | N<br>50 | O<br>28 | 0 | 0 |

- Molecule 57 is a RNA chain called 5S rRNA.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 57 | B | 117 | Total<br>2501 | C<br>1116 | N<br>462 | O<br>806 | P<br>117 | 0 | 0 |

- Molecule 58 is a RNA chain called 23S rRNA.

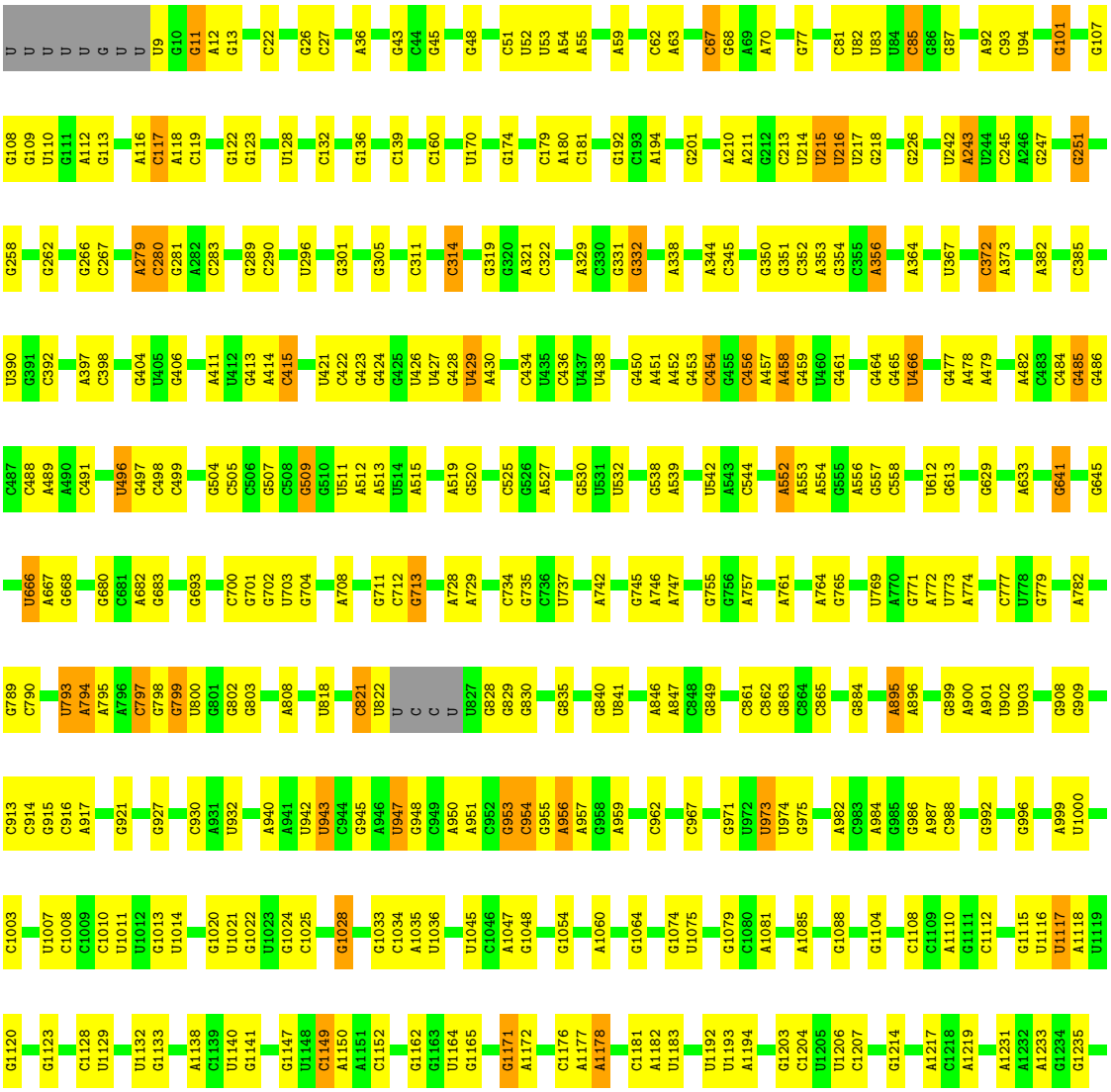
| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 58 | A | 3102 | Total<br>66623 | C<br>29694 | N<br>12253 | O<br>21574 | P<br>3102 | 0 | 0 |

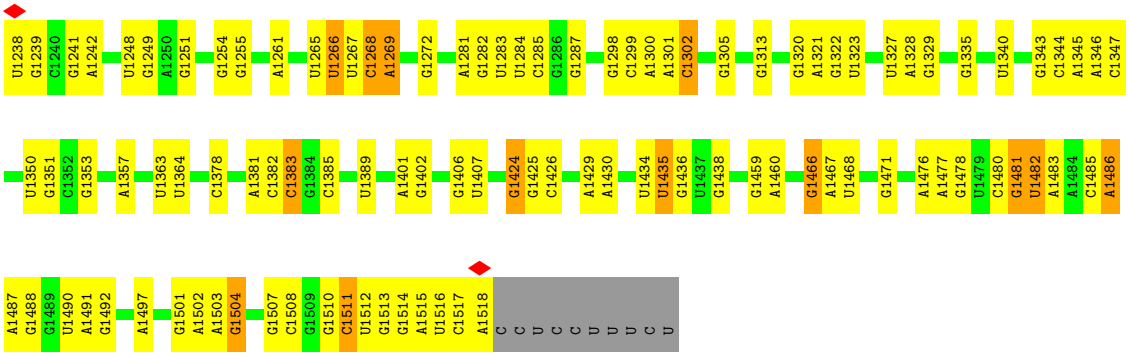
# 3 Residue-property plots (i)

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

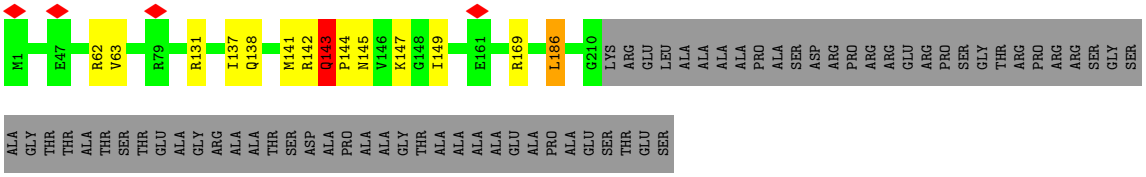
- Molecule 1: 16S rRNA

Chain a:

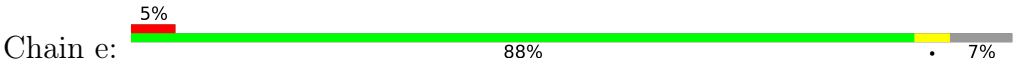



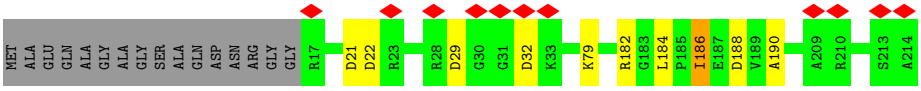



• Molecule 2: 30S ribosomal protein S3

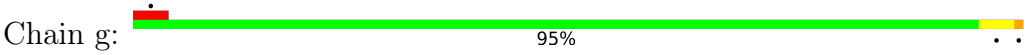



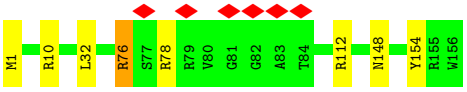

• Molecule 3: 30S ribosomal protein S5



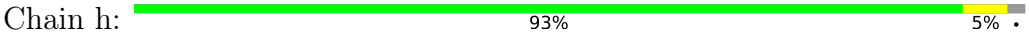



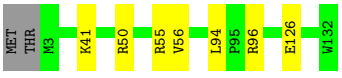

• Molecule 4: 30S ribosomal protein S7



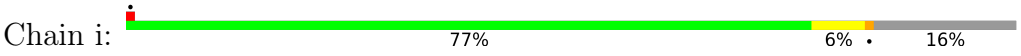



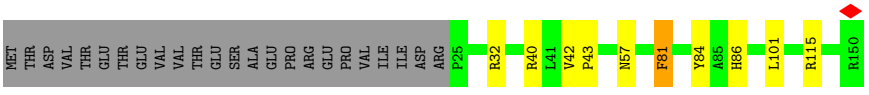

• Molecule 5: 30S ribosomal protein S8



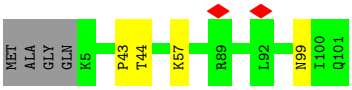

• Molecule 6: 30S ribosomal protein S9



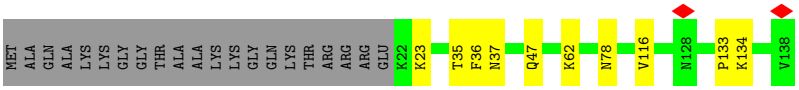
• Molecule 7: 30S ribosomal protein S10

Chain j:

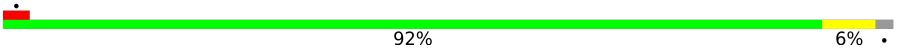

• Molecule 8: 30S ribosomal protein S11

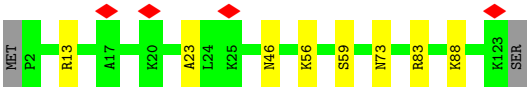
Chain k:


• Molecule 9: 30S ribosomal protein S12

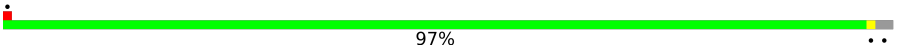
Chain l:

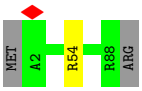



• Molecule 10: 30S ribosomal protein S15

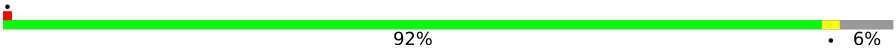
Chain o:

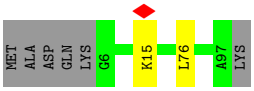



• Molecule 11: 30S ribosomal protein S17

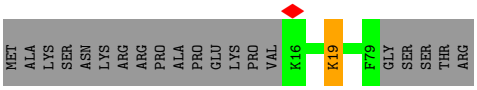
Chain q:



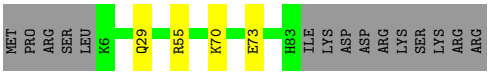

• Molecule 12: 30S ribosomal protein S18 2

Chain r:

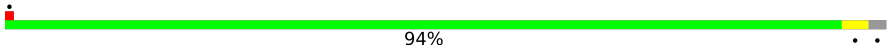

• Molecule 13: 30S ribosomal protein S19

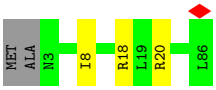
Chain s:




• Molecule 14: 30S ribosomal protein S20

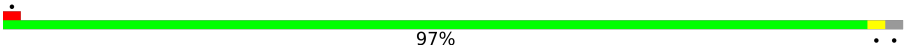
Chain t:

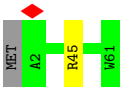



• Molecule 15: 30S ribosomal protein S14 type Z

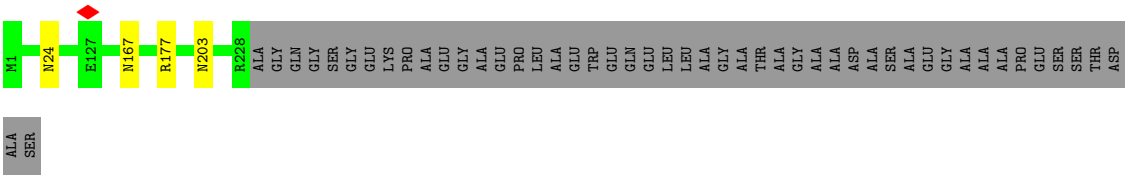
Chain n:



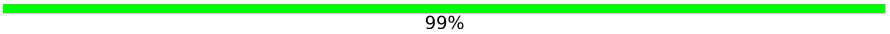

• Molecule 16: 30S ribosomal protein S2

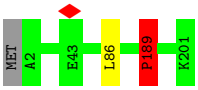
Chain b:


• Molecule 17: 30S ribosomal protein S4

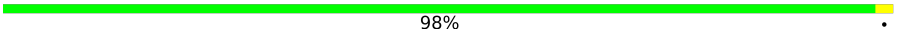
Chain d:




• Molecule 18: 30S ribosomal protein S6

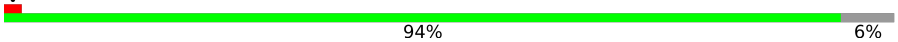
Chain f:

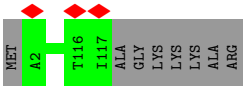




• Molecule 19: 30S ribosomal protein S13

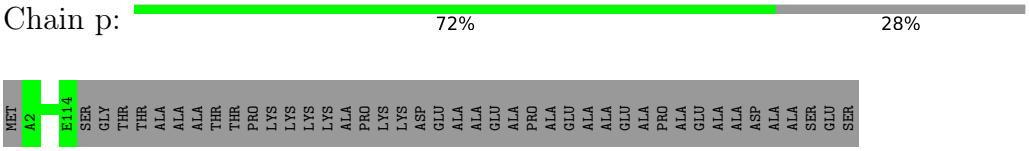
Chain m:



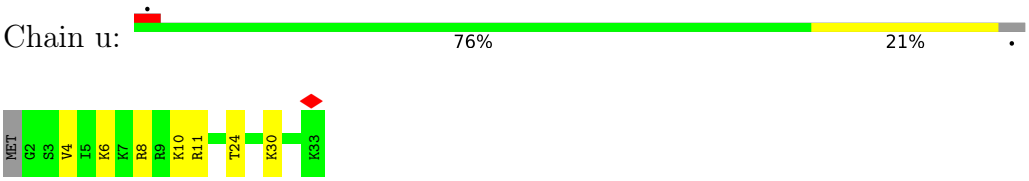
• Molecule 20: 30S ribosomal protein S16

Chain p:



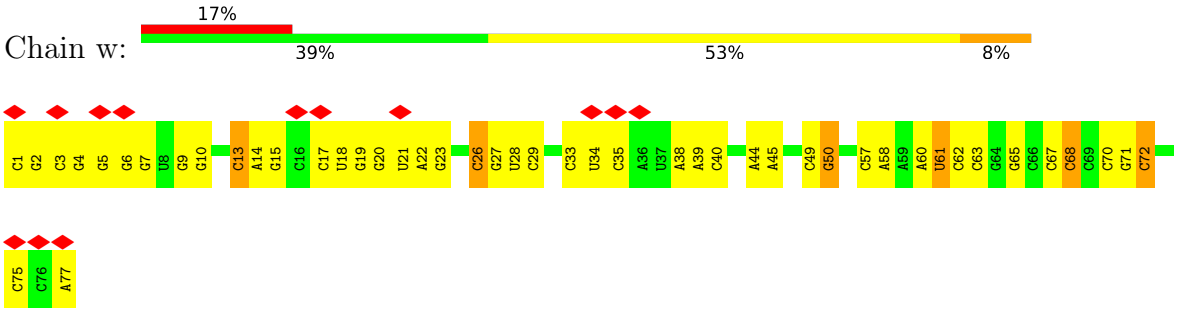

• Molecule 21: Conserved domain protein

Chain u:



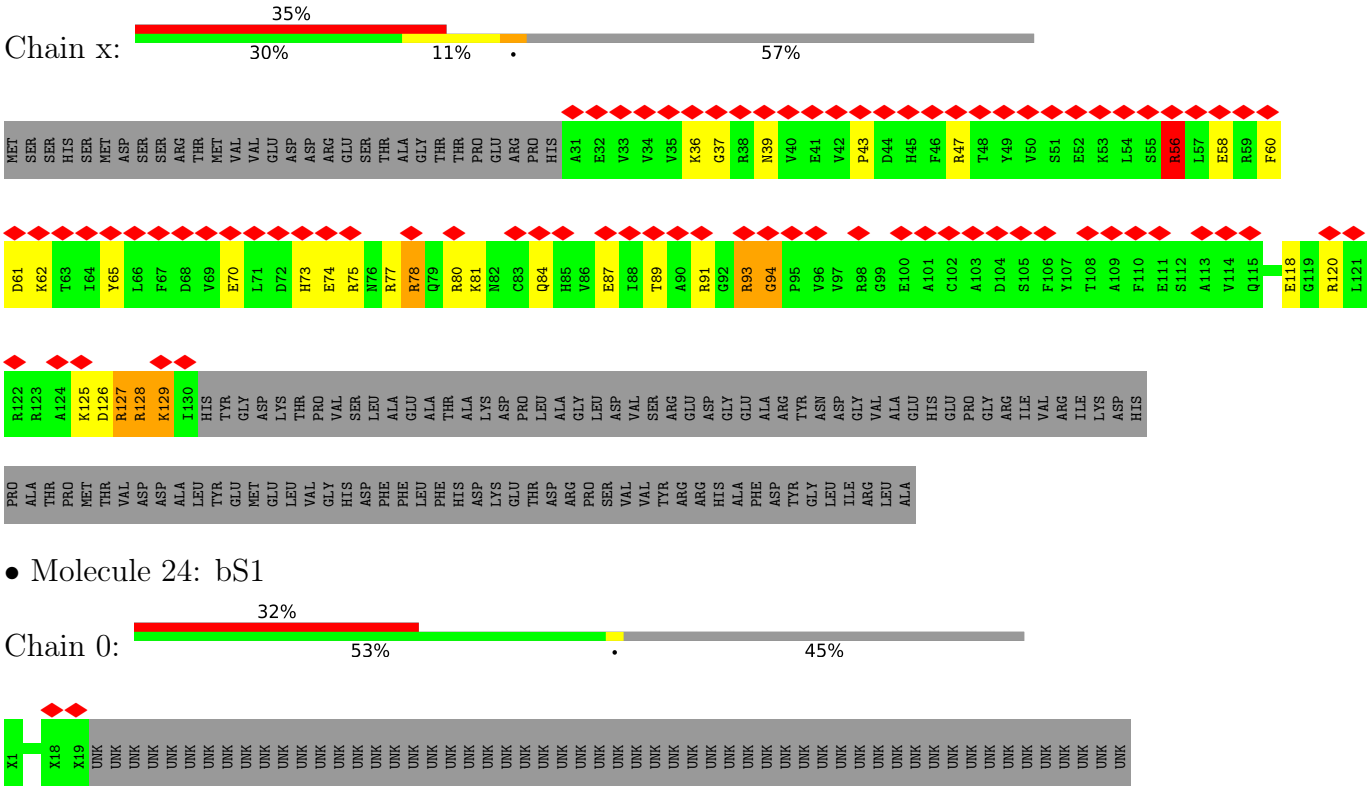

• Molecule 22: E-tRNAfMet

Chain w:



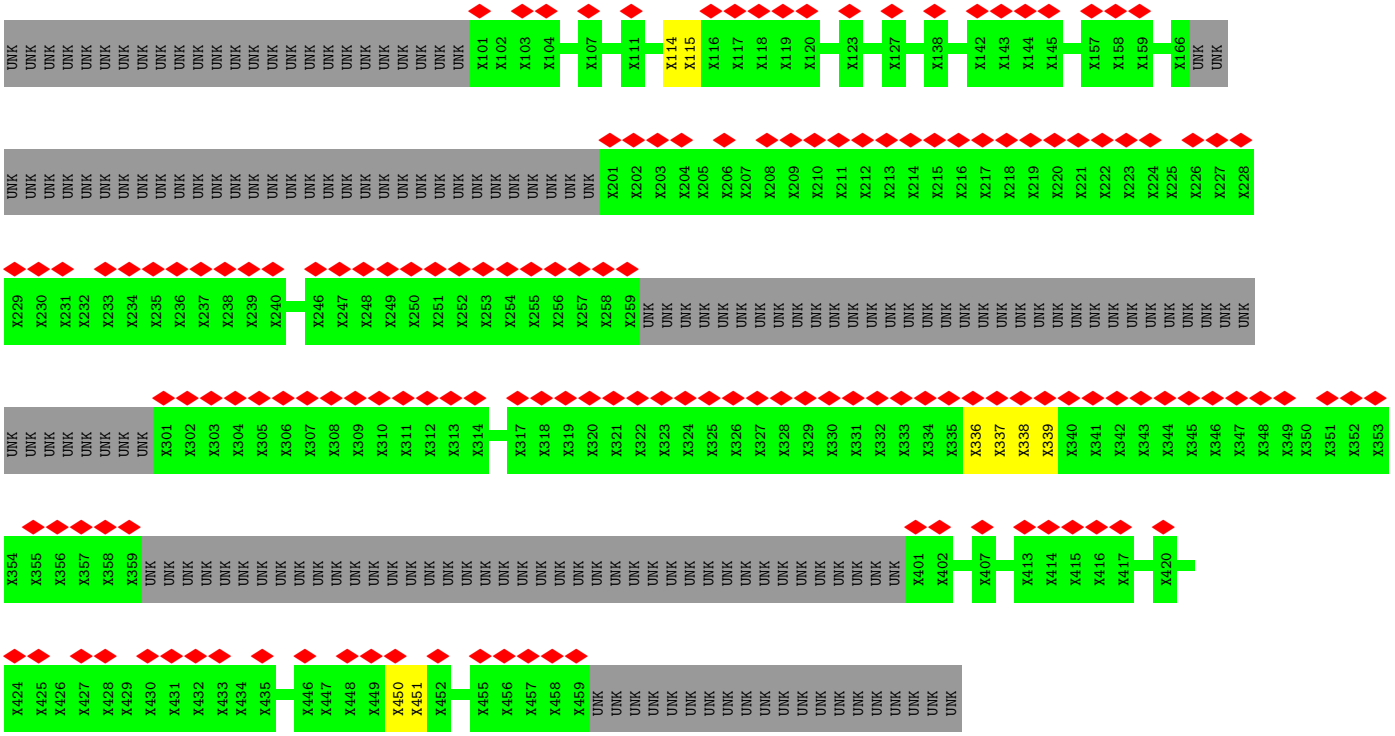

• Molecule 23: Ribosome hibernation promoting factor

Chain x:



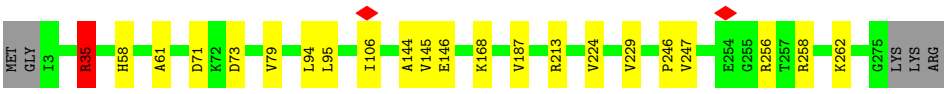

• Molecule 24: bS1

Chain 0:



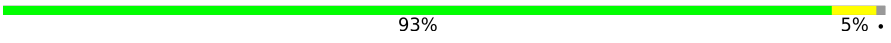
• Molecule 25: 50S ribosomal protein L2

Chain C:

• Molecule 26: 50S ribosomal protein L3

Chain D:

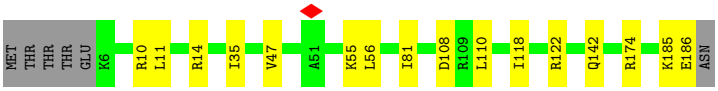



• Molecule 27: 50S ribosomal protein L4

Chain E:

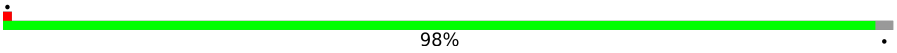

• Molecule 28: 50S ribosomal protein L5

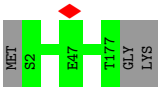
Chain F:




• Molecule 29: 50S ribosomal protein L6

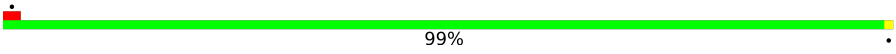
Chain G:

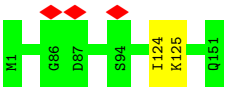



• Molecule 30: 50S ribosomal protein L9

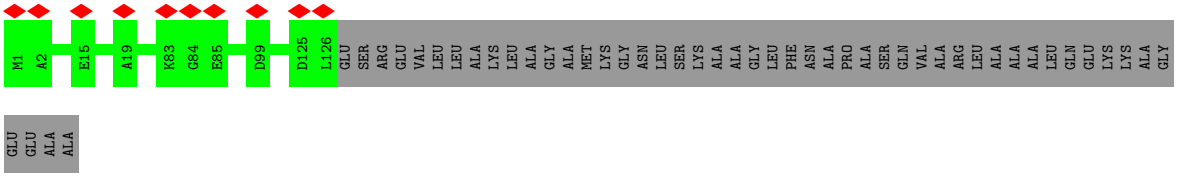
Chain H:



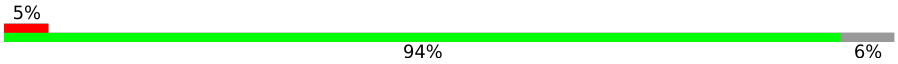

• Molecule 31: 50S ribosomal protein L10

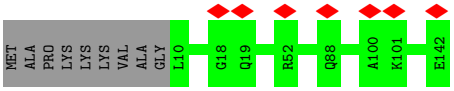
Chain I:


• Molecule 32: 50S ribosomal protein L11

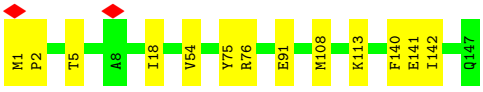
Chain J:



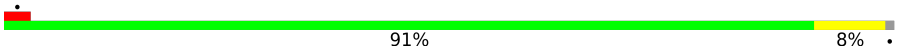

• Molecule 33: 50S ribosomal protein L13

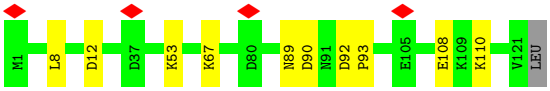
Chain K:


• Molecule 34: 50S ribosomal protein L14

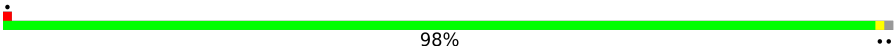
Chain L:

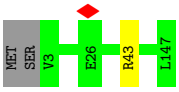





• Molecule 35: 50S ribosomal protein L15

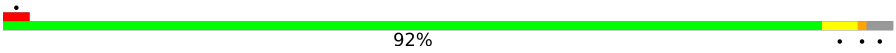
Chain M:

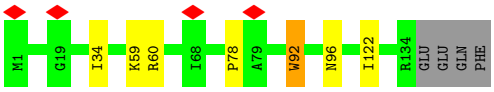



• Molecule 36: 50S ribosomal protein L16

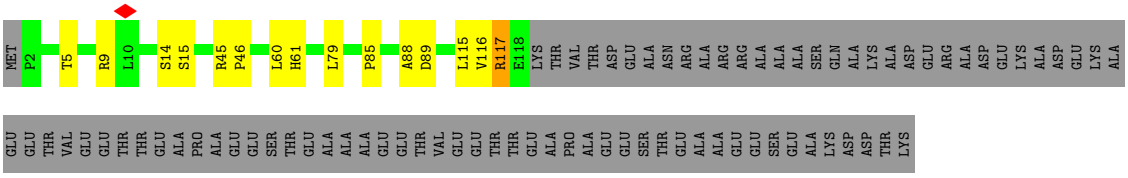
Chain N:



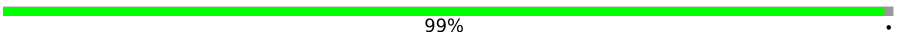

• Molecule 37: 50S ribosomal protein L17

Chain O:


• Molecule 38: 50S ribosomal protein L18

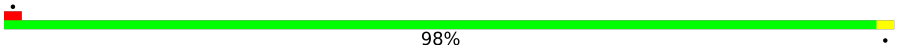
Chain P:

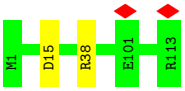




• Molecule 39: 50S ribosomal protein L19

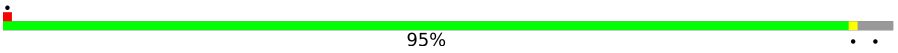
Chain Q:

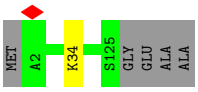



• Molecule 40: 50S ribosomal protein L20

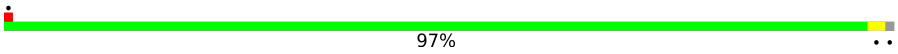
Chain R:

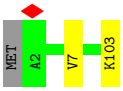


• Molecule 41: 50S ribosomal protein L21

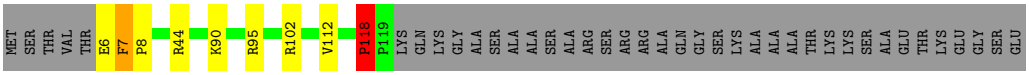
Chain S:



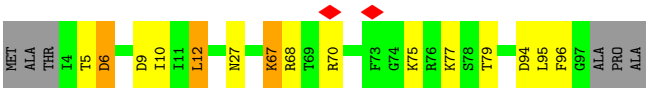

• Molecule 42: 50S ribosomal protein L22

Chain T:

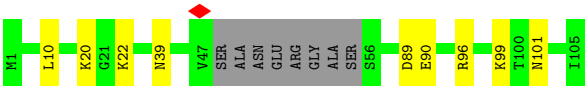

• Molecule 43: 50S ribosomal protein L23

Chain U:

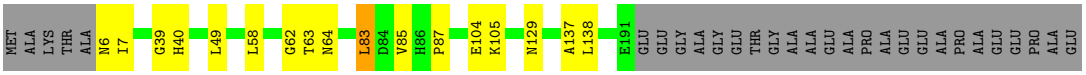

• Molecule 44: 50S ribosomal protein L24

Chain V:

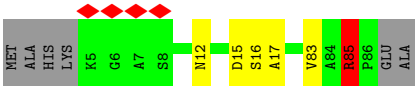

• Molecule 45: 50S ribosomal protein L25

Chain W:

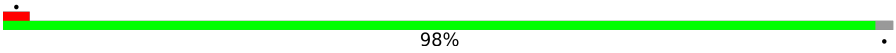

• Molecule 46: 50S ribosomal protein L27

Chain X:

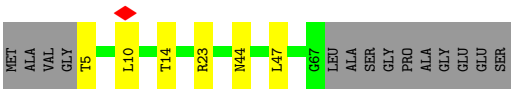

• Molecule 47: 50S ribosomal protein L28

Chain Y:



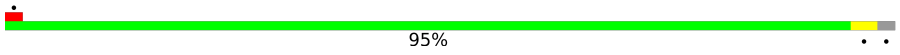

• Molecule 48: 50S ribosomal protein L29

Chain Z:


• Molecule 49: 50S ribosomal protein L30

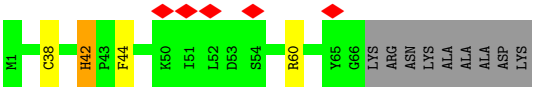
Chain v:





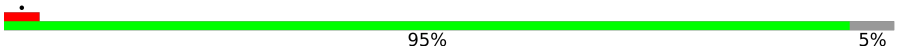
• Molecule 50: 50S ribosomal protein L31

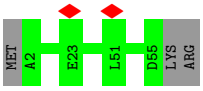
Chain y:


• Molecule 51: 50S ribosomal protein L32

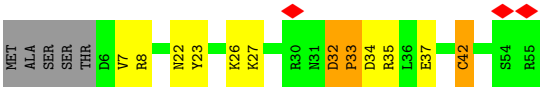
Chain z:



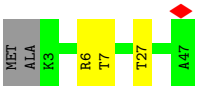

• Molecule 52: 50S ribosomal protein L33 1

Chain 1:

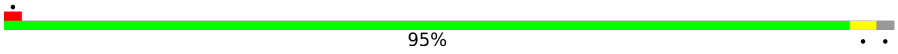

• Molecule 53: 50S ribosomal protein L34

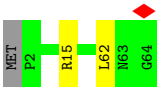
Chain 2:


• Molecule 54: 50S ribosomal protein L35

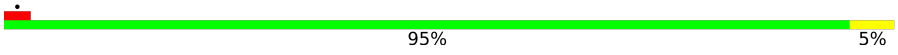
Chain 3:

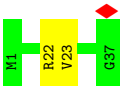



• Molecule 55: 50S ribosomal protein L36

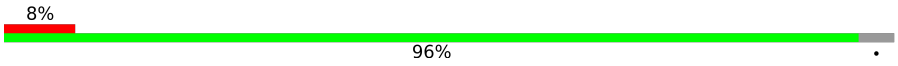
Chain 4:




• Molecule 56: Uncharacterized protein

Chain 5:





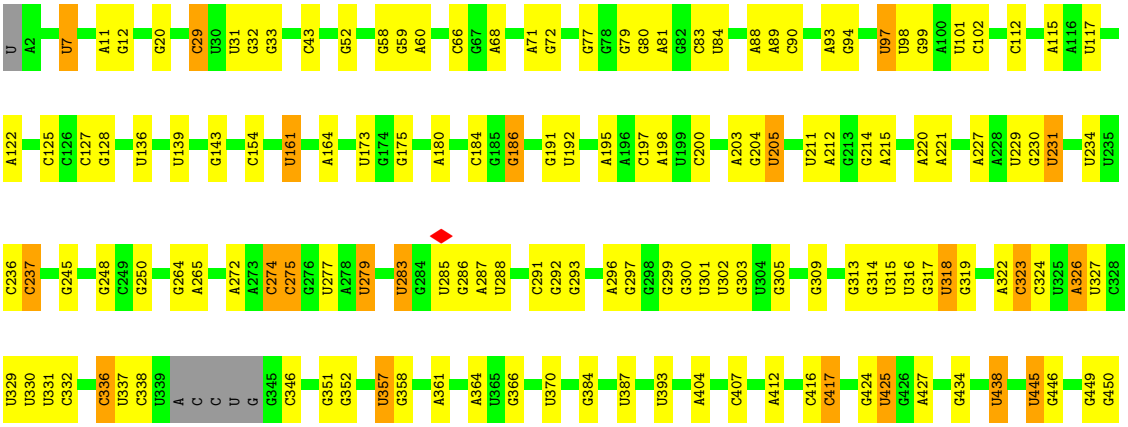
• Molecule 57: 5S rRNA

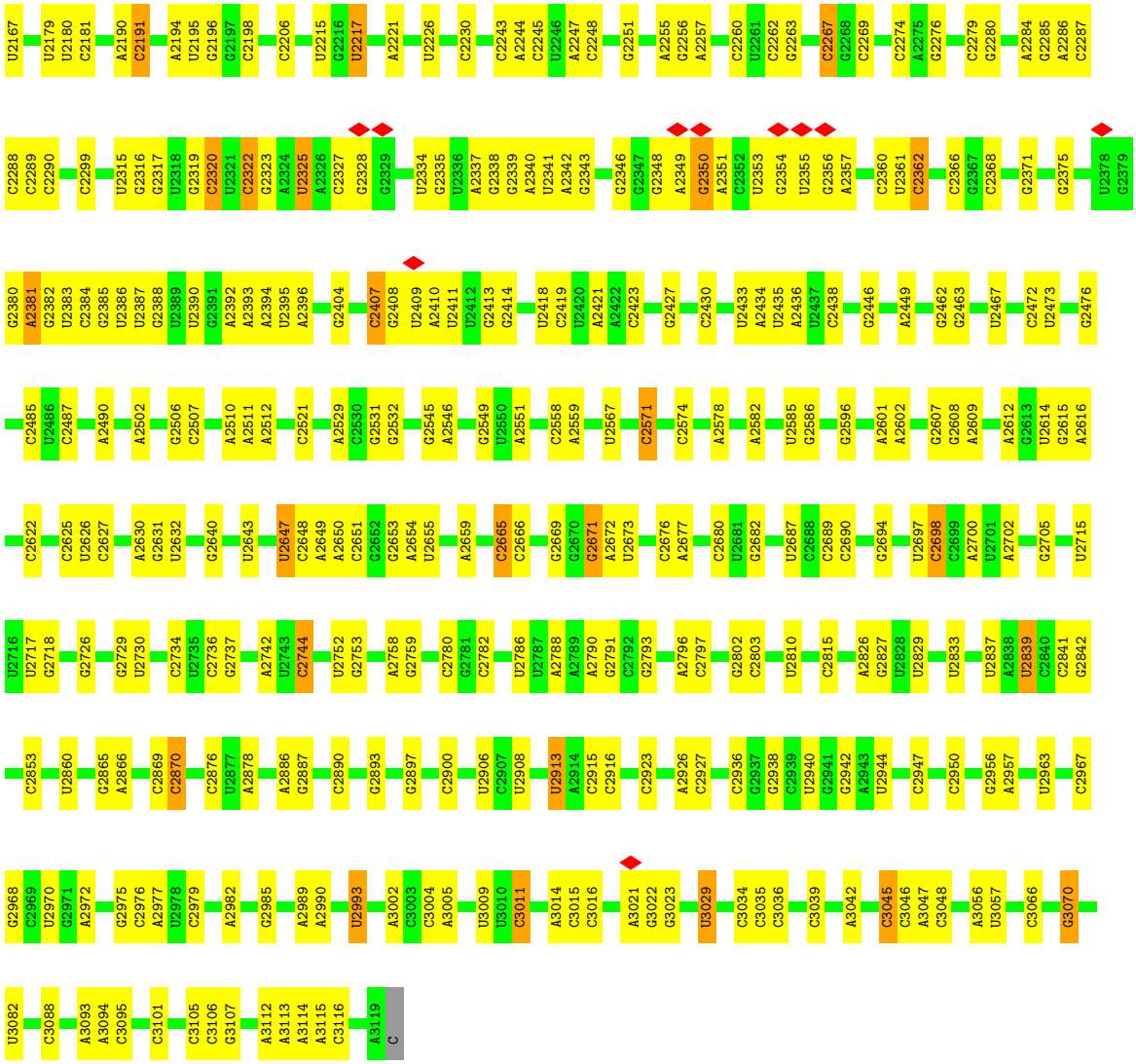
Chain B:



• Molecule 58: 23S rRNA

Chain A:


U2167 U2179 U2180 C2181 A2190 C2191 A2194 U2195 G2196 G2197 C2198 C2206 U2215 G2216 U2217 A2221 U2226 C2230 C2243 A2244 C2245 U2246 A2247 C2248 G2251 A2255 G2256 A2257 C2260 U2261 C2262 G2263 C2267 G2268 C2269 C2274 A2275 G2276 C2279 G2280 A2284 G2285 A2286 C2287
C2288 C2289 C2290 C2299 U2315 G2316 G2317 U2318 G2319 C2320 U2321 C2322 G2323 A2324 U2325 A2326 C2327 G2328 G2329 U2334 G2335 U2336 A2337 G2338 G2339 A2340 U2341 A2342 G2343 G2346 G2347 G2348 A2349 G2350 A2351 C2352 U2353 G2354 U2355 G2356 A2357 C2360 U2361 C2362 C2366 G2367 C2368 G2371 G2375 U2378 G2379
G2380 A2381 G2382 U2383 C2384 G2385 U2386 U2387 G2388 U2389 U2390 G2391 A2392 A2393 A2394 U2395 A2396 G2404 C2407 G2408 U2409 A2410 U2411 U2412 G2413 G2414 U2418 C2419 U2420 A2421 A2422 C2423 G2427 C2430 U2433 A2434 U2435 A2436 U2437 C2438 G2446 A2449 G2462 G2463 U2467 C2472 U2473 G2476
C2485 U2486 C2487 A2490 A2502 G2506 C2507 A2510 A2511 A2512 C2521 A2529 C2530 G2531 G2532 G2545 A2546 G2549 U2550 A2551 C2558 A2559 U2567 C2571 C2574 A2578 A2582 U2585 G2586 G2596 A2601 A2602 G2607 G2608 A2609 A2612 G2613 U2614 G2615 A2616
C2622 C2625 U2626 C2627 A2630 G2631 U2632 G2640 U2643 U2647 C2648 A2649 A2650 C2651 G2652 G2653 A2654 U2655 A2659 C2665 C2666 G2669 G2670 G2671 A2672 U2673 C2676 A2677 C2680 U2681 G2682 U2687 C2688 C2689 C2690 G2694 U2697 C2698 C2699 A2700 U2701 A2702 G2705 U2715
U2716 U2717 G2718 G2726 G2729 U2730 C2734 U2735 C2736 G2737 A2742 U2743 C2744 U2752 G2753 A2758 G2759 C2780 G2781 C2782 U2786 U2787 A2788 A2789 A2790 G2791 C2792 G2793 A2796 C2797 G2802 C2803 U2810 C2815 A2826 G2827 U2828 U2829 U2833 U2837 A2838 U2839 C2840 C2841 G2842
C2853 U2860 G2865 A2866 C2869 C2870 C2876 U2877 A2878 A2886 G2887 C2890 G2893 G2897 C2900 U2906 C2907 U2908 U2913 A2914 C2915 C2916 C2923 A2926 C2927 C2936 G2937 G2938 C2939 U2940 G2941 G2942 A2943 U2944 C2947 C2950 G2956 A2957 U2963 C2967
G2968 C2969 U2970 G2971 A2972 G2975 C2976 A2977 U2978 C2979 A2982 G2985 A2989 A2990 U2993 A3002 C3003 C3004 A3005 U3009 U3010 C3011 A3014 C3015 C3016 A3021 G3022 G3023 U3029 C3034 C3035 C3036 C3039 A3042 C3045 C3046 A3047 C3048 A3056 U3057 C3066 G3070
U3082 C3088 A3093 A3094 C3095 C3101 C3105 C3106 G3107 A3112 A3113 A3114 A3115 C3116 A3119 C

# 4 Experimental information (i)

| Property | Value | Source |
|---|---|---|
| EM reconstruction method | SINGLE PARTICLE | Depositor |
| Imposed symmetry | POINT, Not provided | |
| Number of particles used | 391837 | Depositor |
| Resolution determination method | FSC 0.143 CUT-OFF | Depositor |
| CTF correction method | PHASE FLIPPING ONLY | Depositor |
| Microscope | FEI TITAN KRIOS | Depositor |
| Voltage (kV) | 300 | Depositor |
| Electron dose ($e^-/Å^2$) | 1.5 | Depositor |
| Minimum defocus (nm) | Not provided | |
| Maximum defocus (nm) | Not provided | |
| Magnification | Not provided | |
| Image detector | FEI FALCON II (4k x 4k) | Depositor |
| Maximum map value | 0.253 | Depositor |
| Minimum map value | -0.087 | Depositor |
| Average map value | -0.001 | Depositor |
| Map value standard deviation | 0.017 | Depositor |
| Recommended contour level | 0.03 | Depositor |
| Map size (Å) | 419.84, 419.84, 419.84 | wwPDB |
| Map dimensions | 328, 328, 328 | wwPDB |
| Map angles (°) | 90.0, 90.0, 90.0 | wwPDB |
| Pixel spacing (Å) | 1.28, 1.28, 1.28 | Depositor |

# 5 Model quality

## 5.1 Standard geometry

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

| Mol | Chain | Bond lengths | | Bond angles | |
|---|---|---|---|---|---|
| | | RMSZ | #$\|Z\|$ >5 | RMSZ | #$\|Z\|$ >5 |
| 1 | a | 0.81 | 24/36201 (0.1%) | 1.27 | 213/56488 (0.4%) |
| 2 | c | 0.36 | 0/1696 | 0.62 | 2/2276 (0.1%) |
| 3 | e | 0.39 | 0/1449 | 0.67 | 5/1949 (0.3%) |
| 4 | g | 0.35 | 0/1260 | 0.58 | 0/1701 |
| 5 | h | 0.42 | 0/1018 | 0.71 | 2/1375 (0.1%) |
| 6 | i | 0.36 | 0/1012 | 0.74 | 2/1362 (0.1%) |
| 7 | j | 0.36 | 0/789 | 0.60 | 0/1069 |
| 8 | k | 0.31 | 0/889 | 0.57 | 0/1201 |
| 9 | l | 0.38 | 0/969 | 0.75 | 0/1294 |
| 10 | o | 0.34 | 0/718 | 0.58 | 0/963 |
| 11 | q | 0.39 | 0/741 | 0.67 | 1/993 (0.1%) |
| 12 | r | 0.34 | 0/517 | 0.56 | 0/691 |
| 13 | s | 0.34 | 0/647 | 0.64 | 0/871 |
| 14 | t | 0.33 | 0/658 | 0.52 | 0/875 |
| 15 | n | 0.53 | 0/488 | 0.57 | 0/650 |
| 16 | b | 0.31 | 0/1822 | 0.54 | 0/2457 |
| 17 | d | 0.38 | 0/1672 | 0.61 | 1/2251 (0.0%) |
| 18 | f | 0.38 | 0/782 | 0.62 | 1/1059 (0.1%) |
| 19 | m | 0.36 | 0/942 | 0.62 | 0/1260 |
| 20 | p | 0.41 | 0/908 | 0.60 | 0/1226 |
| 21 | u | 0.49 | 0/280 | 0.67 | 0/359 |
| 22 | w | 0.78 | 1/1835 (0.1%) | 1.23 | 20/2857 (0.7%) |
| 23 | x | 0.56 | 0/843 | 0.93 | 6/1127 (0.5%) |
| 25 | C | 1.00 | 5/2140 (0.2%) | 0.93 | 5/2879 (0.2%) |
| 26 | D | 0.54 | 0/1609 | 0.65 | 2/2165 (0.1%) |
| 27 | E | 0.84 | 1/1576 (0.1%) | 0.87 | 4/2132 (0.2%) |
| 28 | F | 0.58 | 0/1459 | 0.79 | 1/1962 (0.1%) |
| 29 | G | 0.36 | 0/1369 | 0.57 | 0/1848 |
| 30 | H | 0.33 | 0/1027 | 0.61 | 1/1398 (0.1%) |
| 31 | I | 0.29 | 0/925 | 0.52 | 0/1246 |
| 32 | J | 0.29 | 0/1006 | 0.60 | 0/1364 |
| 33 | K | 0.76 | 1/1165 (0.1%) | 0.88 | 4/1578 (0.3%) |
| 34 | L | 0.92 | 0/938 | 0.96 | 5/1257 (0.4%) |
| 35 | M | 0.53 | 0/1091 | 0.65 | 0/1457 |

| Mol | Chain | Bond lengths | | Bond angles | |
|---|---|---|---|---|---|
| | | RMSZ | #\|Z\| >5 | RMSZ | #\|Z\| >5 |
| 36 | N | 0.91 | 1/1100 (0.1%) | 0.86 | 1/1482 (0.1%) |
| 37 | O | 0.74 | 0/936 | 0.95 | 5/1256 (0.4%) |
| 38 | P | 0.43 | 0/966 | 0.57 | 0/1298 |
| 39 | Q | 0.51 | 0/921 | 0.60 | 1/1236 (0.1%) |
| 40 | R | 0.55 | 0/1000 | 0.58 | 0/1341 |
| 41 | S | 0.47 | 0/778 | 0.57 | 0/1048 |
| 42 | T | 0.96 | 1/887 (0.1%) | 0.93 | 3/1204 (0.2%) |
| 43 | U | 0.75 | 0/749 | 0.87 | 2/1006 (0.2%) |
| 44 | V | 0.65 | 0/737 | 0.78 | 1/987 (0.1%) |
| 45 | W | 0.52 | 0/1404 | 0.81 | 5/1917 (0.3%) |
| 46 | X | 0.96 | 0/613 | 0.87 | 1/821 (0.1%) |
| 47 | Y | 0.55 | 0/478 | 0.71 | 0/641 |
| 48 | Z | 0.68 | 0/530 | 0.75 | 0/708 |
| 49 | v | 0.80 | 0/486 | 0.88 | 0/651 |
| 50 | y | 0.37 | 0/520 | 0.60 | 1/698 (0.1%) |
| 51 | z | 0.55 | 0/427 | 0.61 | 0/572 |
| 52 | 1 | 0.73 | 1/424 (0.2%) | 0.78 | 2/567 (0.4%) |
| 53 | 2 | 0.84 | 0/375 | 1.00 | 1/493 (0.2%) |
| 54 | 3 | 0.92 | 0/507 | 0.94 | 2/672 (0.3%) |
| 55 | 4 | 0.82 | 0/302 | 0.77 | 0/401 |
| 56 | 5 | 0.44 | 0/191 | 0.60 | 0/247 |
| 57 | B | 0.55 | 1/2797 (0.0%) | 1.15 | 19/4357 (0.4%) |
| 58 | A | 1.00 | 1/74597 (0.0%) | 1.24 | 627/116386 (0.5%) |
| All | All | 0.84 | 37/164166 (0.0%) | 1.13 | 946/245629 (0.4%) |

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

| Mol | Chain | #Chirality outliers | #Planarity outliers |
|---|---|---|---|
| 2 | c | 0 | 1 |
| 3 | e | 0 | 1 |
| 4 | g | 0 | 3 |
| 5 | h | 0 | 2 |
| 7 | j | 0 | 1 |
| 8 | k | 0 | 2 |
| 9 | l | 0 | 2 |
| 11 | q | 0 | 1 |
| 12 | r | 0 | 1 |
| 13 | s | 0 | 2 |
| 17 | d | 0 | 1 |

*Continued on next page...*

*Continued from previous page...*

| Mol | Chain | #Chirality outliers | #Planarity outliers |
|---|---|---|---|
| 23 | x | 0 | 11 |
| 24 | 0 | 0 | 8 |
| 25 | C | 0 | 5 |
| 26 | D | 0 | 2 |
| 27 | E | 0 | 5 |
| 28 | F | 0 | 1 |
| 33 | K | 0 | 1 |
| 36 | N | 0 | 2 |
| 37 | O | 0 | 2 |
| 42 | T | 0 | 1 |
| 43 | U | 0 | 1 |
| 45 | W | 0 | 2 |
| 52 | 1 | 0 | 2 |
| All | All | 0 | 60 |

The worst 5 of 37 bond length outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed(Å) | Ideal(Å) |
|---|---|---|---|---|---|---|---|
| 22 | w | 1 | C | OP3-P | -11.11 | 1.47 | 1.61 |
| 57 | B | 1 | G | OP3-P | -10.43 | 1.48 | 1.61 |
| 1 | a | 861 | C | N1-C6 | -7.36 | 1.32 | 1.37 |
| 1 | a | 552 | A | N9-C4 | -7.21 | 1.33 | 1.37 |
| 25 | C | 79 | VAL | CB-CG2 | -6.93 | 1.38 | 1.52 |

The worst 5 of 946 bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed($^o$) | Ideal($^o$) |
|---|---|---|---|---|---|---|---|
| 58 | A | 323 | C | N1-C2-O2 | 11.58 | 125.85 | 118.90 |
| 58 | A | 1130 | C | N1-C2-O2 | 11.12 | 125.57 | 118.90 |
| 58 | A | 2245 | C | N1-C2-O2 | 11.04 | 125.52 | 118.90 |
| 58 | A | 2245 | C | C2-N1-C1' | 10.65 | 130.51 | 118.80 |
| 58 | A | 323 | C | C2-N1-C1' | 10.46 | 130.31 | 118.80 |

There are no chirality outliers.

5 of 60 planarity outliers are listed below:

| Mol | Chain | Res | Type | Group |
|---|---|---|---|---|
| 2 | c | 62 | ARG | Peptide |
| 3 | e | 186 | ILE | Peptide |
| 4 | g | 1 | MET | Peptide |
| 4 | g | 32 | LEU | Peptide |

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| Mol | Chain | Res | Type | Group |
|---|---|---|---|---|
| 4 | g | 76 | ARG | Peptide |

## 5.2 Too-close contacts (i)

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

## 5.3 Torsion angles (i)

### 5.3.1 Protein backbone (i)

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

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

| Mol | Chain | Analysed | Favoured | Allowed | Outliers | Percentiles |
|---|---|---|---|---|---|---|
| 2 | c | 208/275 (76%) | 184 (88%) | 17 (8%) | 7 (3%) | 3 21 |
| 3 | e | 196/214 (92%) | 176 (90%) | 19 (10%) | 1 (0%) | 29 61 |
| 4 | g | 154/156 (99%) | 144 (94%) | 9 (6%) | 1 (1%) | 25 57 |
| 5 | h | 128/132 (97%) | 119 (93%) | 8 (6%) | 1 (1%) | 19 51 |
| 6 | i | 124/150 (83%) | 108 (87%) | 13 (10%) | 3 (2%) | 6 28 |
| 7 | j | 95/101 (94%) | 84 (88%) | 10 (10%) | 1 (1%) | 14 44 |
| 8 | k | 115/138 (83%) | 103 (90%) | 10 (9%) | 2 (2%) | 9 34 |
| 9 | l | 120/124 (97%) | 93 (78%) | 26 (22%) | 1 (1%) | 19 51 |
| 10 | o | 85/89 (96%) | 81 (95%) | 4 (5%) | 0 | 100 100 |
| 11 | q | 90/98 (92%) | 79 (88%) | 11 (12%) | 0 | 100 100 |
| 12 | r | 62/84 (74%) | 54 (87%) | 8 (13%) | 0 | 100 100 |
| 13 | s | 76/93 (82%) | 68 (90%) | 8 (10%) | 0 | 100 100 |
| 14 | t | 82/86 (95%) | 77 (94%) | 5 (6%) | 0 | 100 100 |
| 15 | n | 58/61 (95%) | 53 (91%) | 5 (9%) | 0 | 100 100 |
| 16 | b | 226/277 (82%) | 211 (93%) | 15 (7%) | 0 | 100 100 |
| 17 | d | 198/201 (98%) | 185 (93%) | 12 (6%) | 1 (0%) | 29 61 |
| 18 | f | 94/96 (98%) | 90 (96%) | 4 (4%) | 0 | 100 100 |

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| Mol | Chain | Analysed | Favoured | Allowed | Outliers | Percentiles | |
|---|---|---|---|---|---|---|---|
| 19 | m | 114/124 (92%) | 102 (90%) | 12 (10%) | 0 | 100 | 100 |
| 20 | p | 111/156 (71%) | 104 (94%) | 7 (6%) | 0 | 100 | 100 |
| 21 | u | 30/33 (91%) | 28 (93%) | 2 (7%) | 0 | 100 | 100 |
| 23 | x | 98/230 (43%) | 80 (82%) | 15 (15%) | 3 (3%) | 4 | 23 |
| 25 | C | 271/278 (98%) | 234 (86%) | 33 (12%) | 4 (2%) | 10 | 36 |
| 26 | D | 212/217 (98%) | 197 (93%) | 10 (5%) | 5 (2%) | 6 | 28 |
| 27 | E | 205/215 (95%) | 179 (87%) | 20 (10%) | 6 (3%) | 4 | 24 |
| 28 | F | 179/187 (96%) | 163 (91%) | 14 (8%) | 2 (1%) | 14 | 44 |
| 29 | G | 174/179 (97%) | 166 (95%) | 8 (5%) | 0 | 100 | 100 |
| 30 | H | 149/151 (99%) | 139 (93%) | 9 (6%) | 1 (1%) | 22 | 55 |
| 31 | I | 124/175 (71%) | 118 (95%) | 6 (5%) | 0 | 100 | 100 |
| 32 | J | 131/142 (92%) | 118 (90%) | 13 (10%) | 0 | 100 | 100 |
| 33 | K | 145/147 (99%) | 132 (91%) | 10 (7%) | 3 (2%) | 7 | 30 |
| 34 | L | 119/122 (98%) | 106 (89%) | 10 (8%) | 3 (2%) | 5 | 26 |
| 35 | M | 143/147 (97%) | 128 (90%) | 15 (10%) | 0 | 100 | 100 |
| 36 | N | 132/138 (96%) | 111 (84%) | 20 (15%) | 1 (1%) | 19 | 51 |
| 37 | O | 115/199 (58%) | 101 (88%) | 11 (10%) | 3 (3%) | 5 | 26 |
| 38 | P | 124/127 (98%) | 119 (96%) | 5 (4%) | 0 | 100 | 100 |
| 39 | Q | 111/113 (98%) | 102 (92%) | 9 (8%) | 0 | 100 | 100 |
| 40 | R | 122/129 (95%) | 120 (98%) | 2 (2%) | 0 | 100 | 100 |
| 41 | S | 100/103 (97%) | 94 (94%) | 5 (5%) | 1 (1%) | 15 | 46 |
| 42 | T | 112/153 (73%) | 103 (92%) | 6 (5%) | 3 (3%) | 5 | 26 |
| 43 | U | 92/100 (92%) | 76 (83%) | 11 (12%) | 5 (5%) | 2 | 13 |
| 44 | V | 93/105 (89%) | 83 (89%) | 8 (9%) | 2 (2%) | 6 | 29 |
| 45 | W | 184/215 (86%) | 156 (85%) | 22 (12%) | 6 (3%) | 4 | 22 |
| 46 | X | 80/88 (91%) | 61 (76%) | 14 (18%) | 5 (6%) | 1 | 9 |
| 47 | Y | 61/64 (95%) | 57 (93%) | 4 (7%) | 0 | 100 | 100 |
| 48 | Z | 61/77 (79%) | 59 (97%) | 1 (2%) | 1 (2%) | 9 | 34 |
| 49 | v | 58/61 (95%) | 53 (91%) | 5 (9%) | 0 | 100 | 100 |
| 50 | y | 64/75 (85%) | 60 (94%) | 3 (5%) | 1 (2%) | 9 | 34 |
| 51 | z | 52/57 (91%) | 51 (98%) | 1 (2%) | 0 | 100 | 100 |

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| Mol | Chain | Analysed | Favoured | Allowed | Outliers | Percentiles |
|---|---|---|---|---|---|---|
| 52 | 1 | 48/55 (87%) | 40 (83%) | 5 (10%) | 3 (6%) | 1 9 |
| 53 | 2 | 43/47 (92%) | 41 (95%) | 2 (5%) | 0 | 100 100 |
| 54 | 3 | 61/64 (95%) | 54 (88%) | 7 (12%) | 0 | 100 100 |
| 55 | 4 | 35/37 (95%) | 29 (83%) | 5 (14%) | 1 (3%) | 4 24 |
| 56 | 5 | 21/24 (88%) | 20 (95%) | 1 (5%) | 0 | 100 100 |
| All | All | 6085/6909 (88%) | 5493 (90%) | 515 (8%) | 77 (1%) | 16 39 |

5 of 77 Ramachandran outliers are listed below:

| Mol | Chain | Res | Type |
|---|---|---|---|
| 2 | c | 138 | GLN |
| 2 | c | 143 | GLN |
| 2 | c | 144 | PRO |
| 4 | g | 154 | TYR |
| 8 | k | 116 | VAL |

### 5.3.2 Protein sidechains (i)

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

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

| Mol | Chain | Analysed | Rotameric | Outliers | Percentiles |
|---|---|---|---|---|---|
| 2 | c | 171/212 (81%) | 164 (96%) | 7 (4%) | 30 59 |
| 3 | e | 139/147 (95%) | 135 (97%) | 4 (3%) | 42 69 |
| 4 | g | 132/132 (100%) | 127 (96%) | 5 (4%) | 33 61 |
| 5 | h | 106/108 (98%) | 103 (97%) | 3 (3%) | 43 70 |
| 6 | i | 102/125 (82%) | 96 (94%) | 6 (6%) | 19 49 |
| 7 | j | 88/90 (98%) | 86 (98%) | 2 (2%) | 50 74 |
| 8 | k | 91/105 (87%) | 85 (93%) | 6 (7%) | 16 46 |
| 9 | l | 103/105 (98%) | 98 (95%) | 5 (5%) | 25 55 |
| 10 | o | 75/77 (97%) | 74 (99%) | 1 (1%) | 69 84 |
| 11 | q | 78/83 (94%) | 78 (100%) | 0 | 100 100 |
| 12 | r | 55/72 (76%) | 54 (98%) | 1 (2%) | 59 79 |

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| Mol | Chain | Analysed | Rotameric | Outliers | Percentiles |
|---|---|---|---|---|---|
| 13 | s | 69/84 (82%) | 67 (97%) | 2 (3%) | 42 69 |
| 14 | t | 69/70 (99%) | 66 (96%) | 3 (4%) | 29 59 |
| 15 | n | 49/50 (98%) | 48 (98%) | 1 (2%) | 55 77 |
| 16 | b | 191/218 (88%) | 187 (98%) | 4 (2%) | 53 76 |
| 17 | d | 175/176 (99%) | 174 (99%) | 1 (1%) | 86 94 |
| 18 | f | 85/85 (100%) | 84 (99%) | 1 (1%) | 71 85 |
| 19 | m | 99/104 (95%) | 99 (100%) | 0 | 100 100 |
| 20 | p | 92/118 (78%) | 92 (100%) | 0 | 100 100 |
| 21 | u | 30/31 (97%) | 23 (77%) | 7 (23%) | 1 2 |
| 23 | x | 88/199 (44%) | 66 (75%) | 22 (25%) | 0 2 |
| 25 | C | 214/218 (98%) | 208 (97%) | 6 (3%) | 43 70 |
| 26 | D | 160/163 (98%) | 156 (98%) | 4 (2%) | 47 72 |
| 27 | E | 167/173 (96%) | 159 (95%) | 8 (5%) | 25 56 |
| 28 | F | 150/156 (96%) | 138 (92%) | 12 (8%) | 12 38 |
| 29 | G | 148/150 (99%) | 148 (100%) | 0 | 100 100 |
| 30 | H | 90/116 (78%) | 90 (100%) | 0 | 100 100 |
| 31 | I | 89/120 (74%) | 89 (100%) | 0 | 100 100 |
| 32 | J | 102/108 (94%) | 102 (100%) | 0 | 100 100 |
| 33 | K | 120/120 (100%) | 116 (97%) | 4 (3%) | 38 66 |
| 34 | L | 99/100 (99%) | 97 (98%) | 2 (2%) | 55 77 |
| 35 | M | 112/114 (98%) | 111 (99%) | 1 (1%) | 78 90 |
| 36 | N | 112/116 (97%) | 109 (97%) | 3 (3%) | 44 70 |
| 37 | O | 96/158 (61%) | 90 (94%) | 6 (6%) | 18 47 |
| 38 | P | 93/94 (99%) | 93 (100%) | 0 | 100 100 |
| 39 | Q | 100/100 (100%) | 99 (99%) | 1 (1%) | 76 88 |
| 40 | R | 97/99 (98%) | 96 (99%) | 1 (1%) | 76 88 |
| 41 | S | 82/83 (99%) | 81 (99%) | 1 (1%) | 71 85 |
| 42 | T | 90/117 (77%) | 86 (96%) | 4 (4%) | 28 58 |
| 43 | U | 82/85 (96%) | 72 (88%) | 10 (12%) | 5 18 |
| 44 | V | 81/86 (94%) | 75 (93%) | 6 (7%) | 13 42 |
| 45 | W | 152/168 (90%) | 146 (96%) | 6 (4%) | 32 61 |

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| Mol | Chain | Analysed | Rotameric | Outliers | Percentiles |
|---|---|---|---|---|---|
| 46 | X | 59/63 (94%) | 57 (97%) | 2 (3%) | 37 65 |
| 47 | Y | 50/51 (98%) | 50 (100%) | 0 | 100 100 |
| 48 | Z | 58/66 (88%) | 53 (91%) | 5 (9%) | 10 35 |
| 49 | v | 53/54 (98%) | 51 (96%) | 2 (4%) | 33 61 |
| 50 | y | 57/63 (90%) | 54 (95%) | 3 (5%) | 22 52 |
| 51 | z | 43/46 (94%) | 43 (100%) | 0 | 100 100 |
| 52 | 1 | 48/52 (92%) | 41 (85%) | 7 (15%) | 3 12 |
| 53 | 2 | 35/36 (97%) | 33 (94%) | 2 (6%) | 20 50 |
| 54 | 3 | 53/54 (98%) | 53 (100%) | 0 | 100 100 |
| 55 | 4 | 35/35 (100%) | 34 (97%) | 1 (3%) | 42 69 |
| 56 | 5 | 18/19 (95%) | 18 (100%) | 0 | 100 100 |
| All | All | 5032/5574 (90%) | 4854 (96%) | 178 (4%) | 39 65 |

5 of 178 residues with a non-rotameric sidechain are listed below:

| Mol | Chain | Res | Type |
|---|---|---|---|
| 34 | L | 8 | LEU |
| 43 | U | 96 | PHE |
| 36 | N | 92 | TRP |
| 42 | T | 6 | GLU |
| 45 | W | 6 | ASN |

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 102 such sidechains are listed below:

| Mol | Chain | Res | Type |
|---|---|---|---|
| 32 | J | 119 | ASN |
| 40 | R | 38 | GLN |
| 54 | 3 | 28 | ASN |
| 33 | K | 132 | HIS |
| 35 | M | 127 | ASN |

### 5.3.3 RNA (i)

| Mol | Chain | Analysed | Backbone Outliers | Pucker Outliers |
|---|---|---|---|---|
| 1 | a | 1504/1528 (98%) | 397 (26%) | 0 |
| 22 | w | 76/77 (98%) | 41 (53%) | 0 |

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| Mol | Chain | Analysed | Backbone Outliers | Pucker Outliers |
|---|---|---|---|---|
| 57 | B | 116/118 (98%) | 33 (28%) | 1 (0%) |
| 58 | A | 3096/3120 (99%) | 785 (25%) | 28 (0%) |
| All | All | 4792/4843 (98%) | 1256 (26%) | 29 (0%) |

5 of 1256 RNA backbone outliers are listed below:

| Mol | Chain | Res | Type |
|---|---|---|---|
| 1 | a | 11 | G |
| 1 | a | 12 | A |
| 1 | a | 13 | G |
| 1 | a | 26 | G |
| 1 | a | 36 | A |

5 of 29 RNA pucker outliers are listed below:

| Mol | Chain | Res | Type |
|---|---|---|---|
| 58 | A | 1010 | U |
| 58 | A | 2350 | G |
| 58 | A | 1186 | G |
| 58 | A | 2085 | C |
| 58 | A | 1117 | U |

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

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

## 5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

## 5.6 Ligand geometry (i)

There are no ligands in this entry.

## 5.7 Other polymers (i)

There are no such residues in this entry.

## 5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

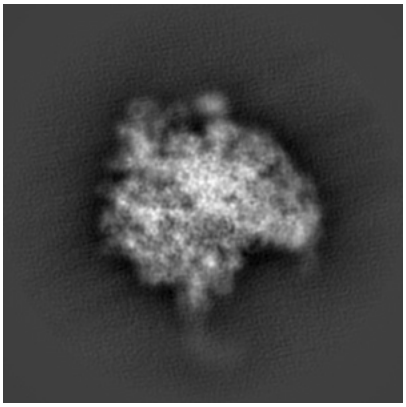
# 6 Map visualisation

This section contains visualisations of the EMDB entry EMD-6921. These allow visual inspection of the internal detail of the map and identification of artifacts.

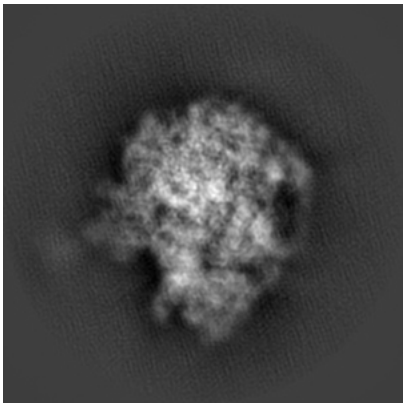
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

## 6.1 Orthogonal projections

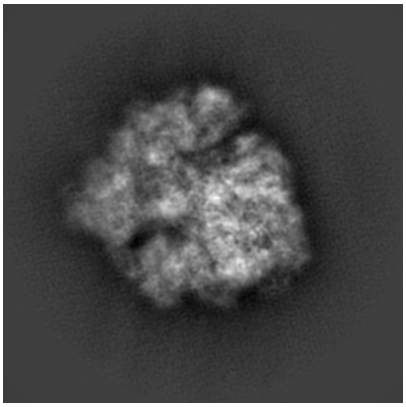
### 6.1.1 Primary map



X



Y

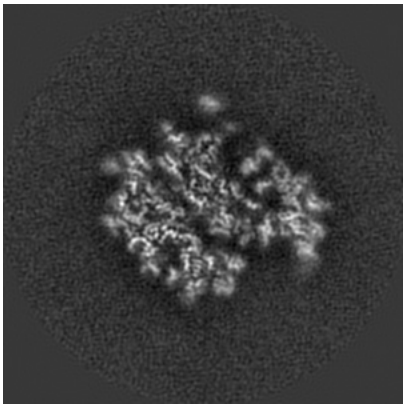


Z

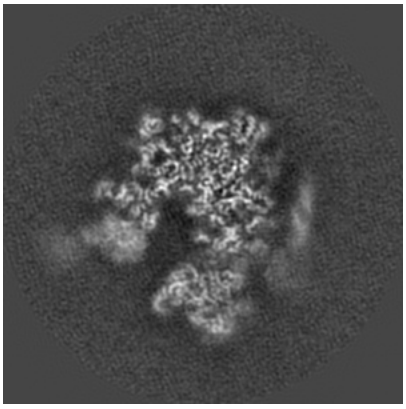
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices

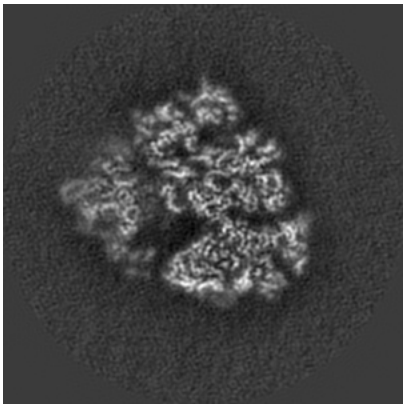
### 6.2.1 Primary map



X Index: 164



Y Index: 164

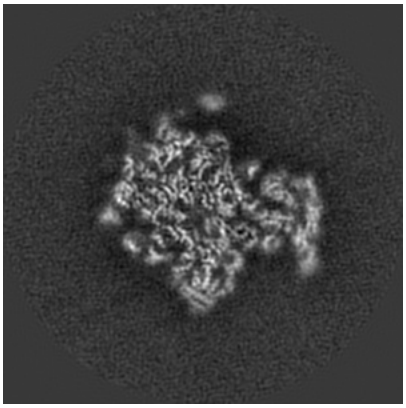


Z Index: 164

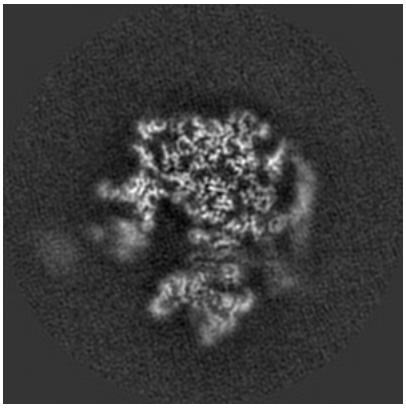
The images above show central slices of the map in three orthogonal directions.

## 6.3 Largest variance slices (i)

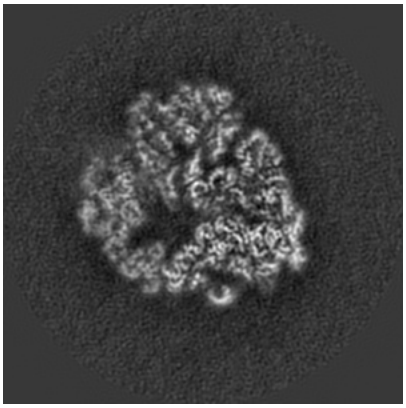
### 6.3.1 Primary map



X Index: 171



Y Index: 169



Z Index: 157

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

## 6.4 Orthogonal surface views (i)

### 6.4.1 Primary map

X

Y

Z

The images above show the 3D surface view of the map at the recommended contour level 0.03. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

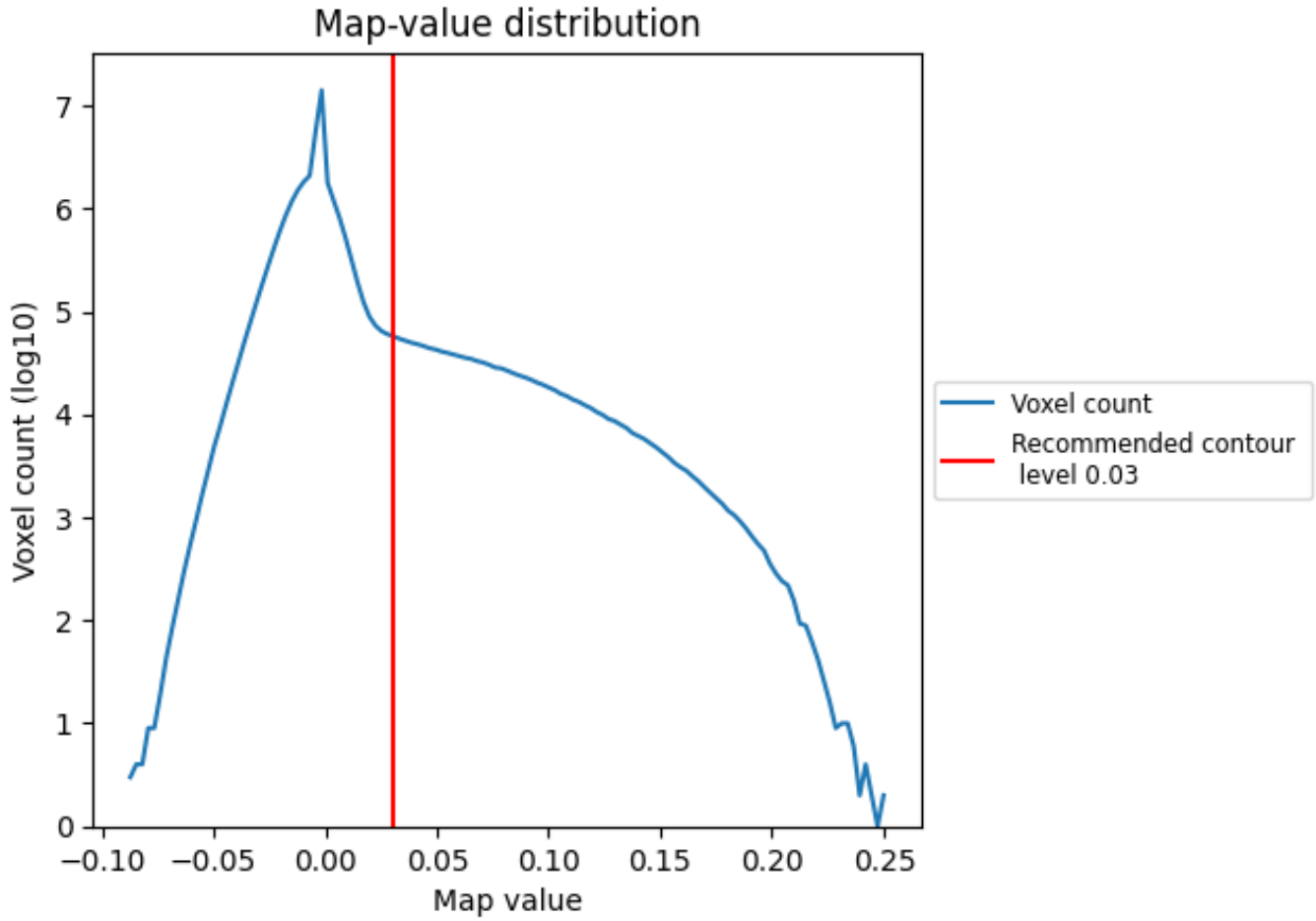
## 6.5 Mask visualisation (i)

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

# 7 Map analysis

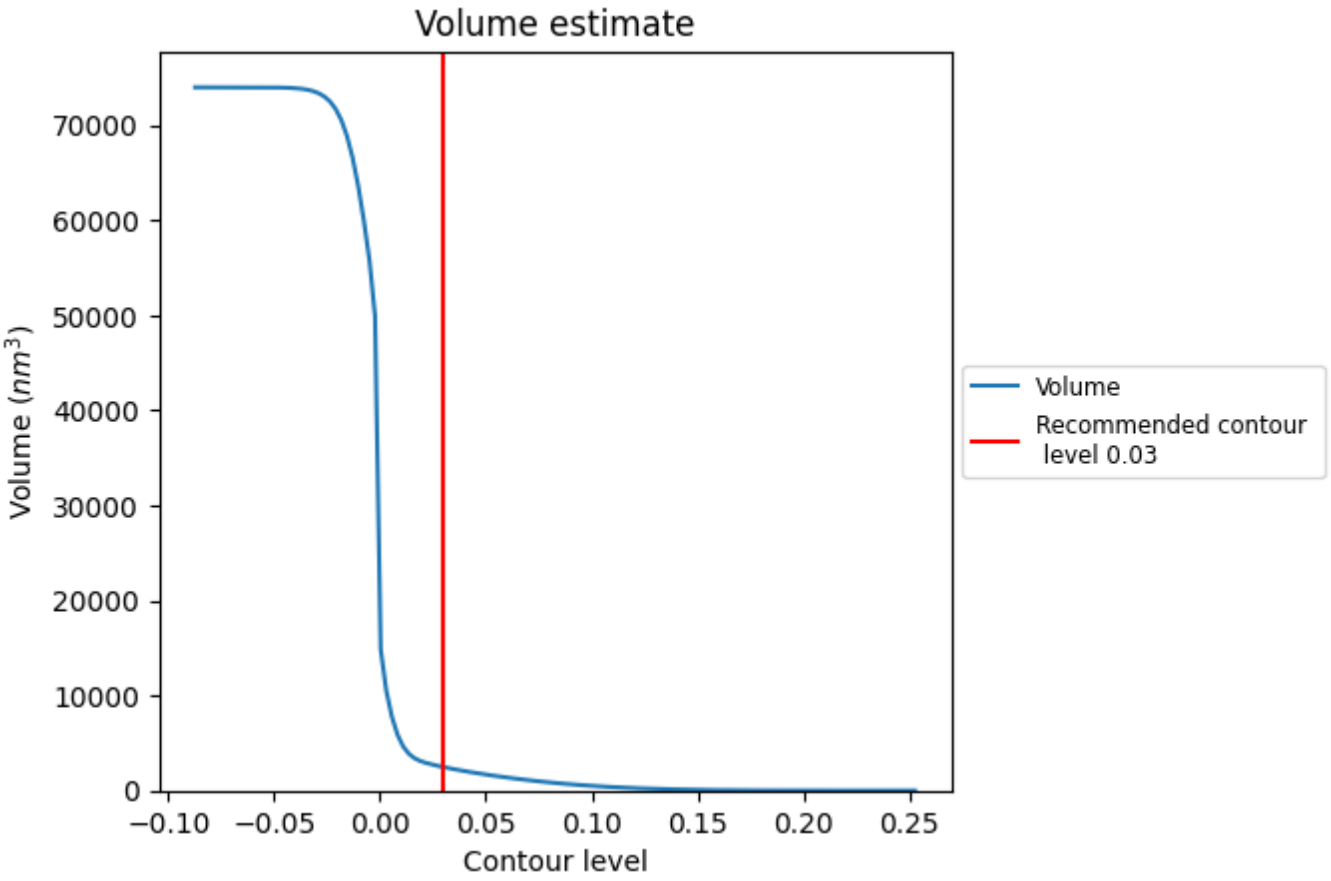
This section contains the results of statistical analysis of the map.

## 7.1 Map-value distribution




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

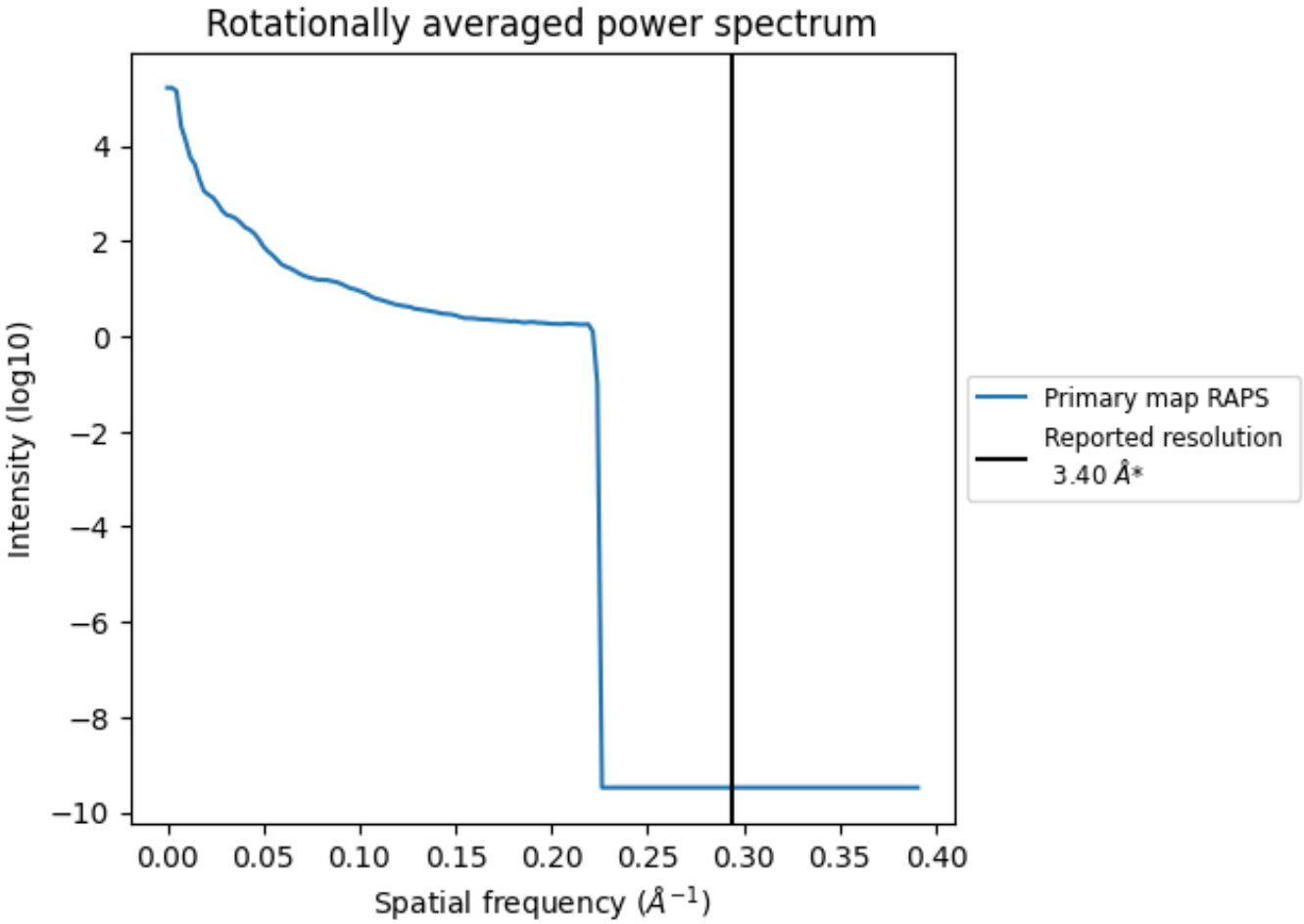
## 7.2 Volume estimate (i)




The volume at the recommended contour level is 2473 $nm^3$; this corresponds to an approximate mass of 2234 kDa.

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

## 7.3 Rotationally averaged power spectrum (i)




*Reported resolution corresponds to spatial frequency of 0.294 Å$^{-1}$

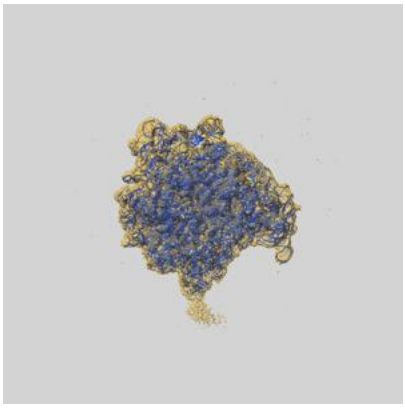
# 8 Fourier-Shell correlation (i)

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

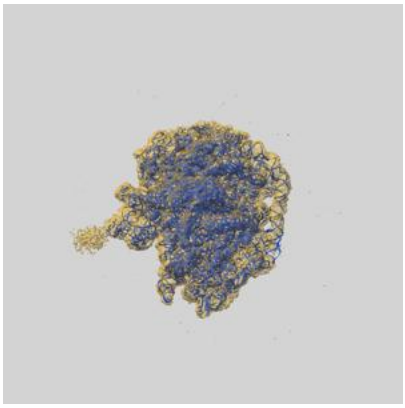
# 9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-6921 and PDB model 5ZEP. Per-residue inclusion information can be found in section 3 on page 14.

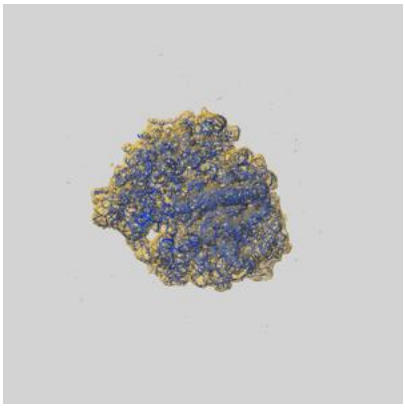
## 9.1 Map-model overlay



X



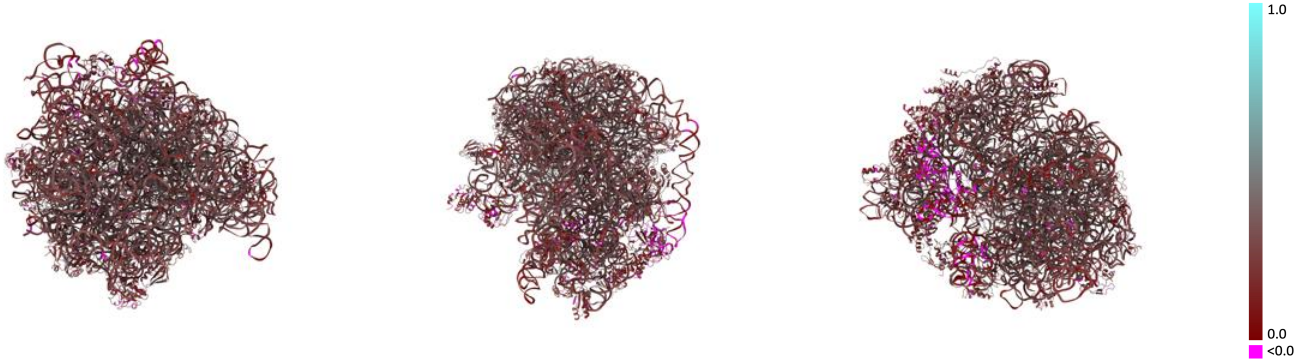
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.03 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.

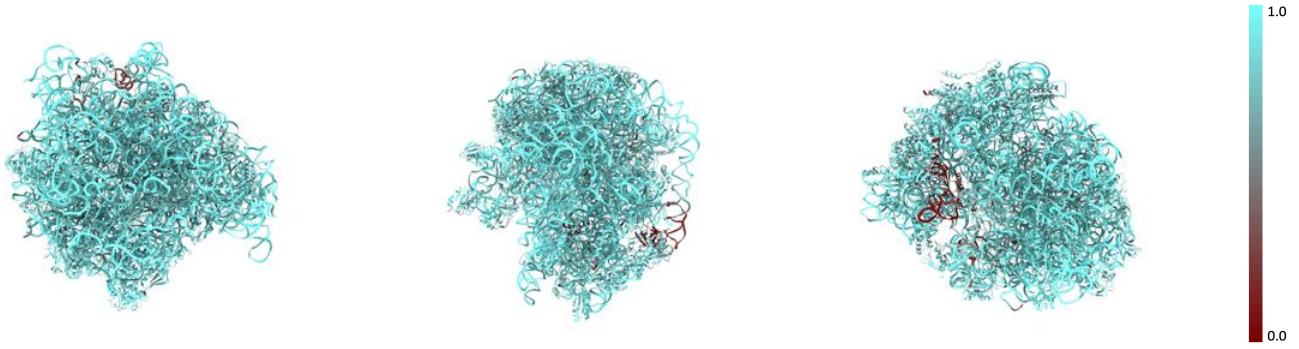
## 9.2 Q-score mapped to coordinate model




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.

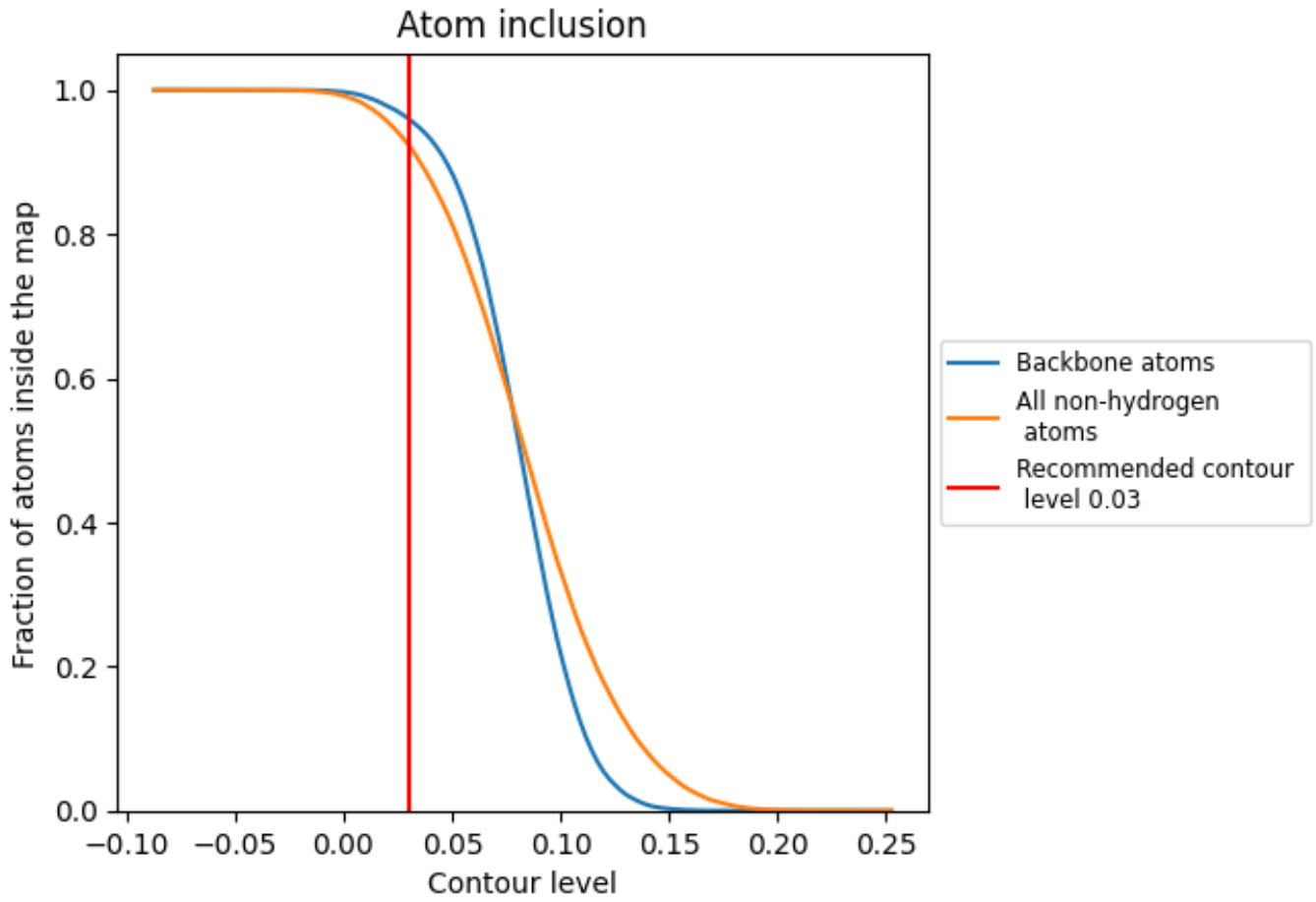
## 9.3 Atom inclusion mapped to coordinate model




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 (0.03).

## 9.4 Atom inclusion (i)




At the recommended contour level, 96% of all backbone atoms, 92% 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 (0.03) and Q-score for the entire model and for each chain.

| Chain | Atom inclusion | Q-score |
|---|---|---|
| All | 0.9239 | 0.2750 |
| 0 | 0.4168 | 0.0310 |
| 1 | 0.8561 | 0.2240 |
| 2 | 0.8372 | 0.3070 |
| 3 | 0.8208 | 0.2930 |
| 4 | 0.8846 | 0.2810 |
| 5 | 0.8268 | 0.2680 |
| A | 0.9680 | 0.2950 |
| B | 0.9764 | 0.2680 |
| C | 0.8200 | 0.2850 |
| D | 0.8544 | 0.2870 |
| E | 0.8665 | 0.2690 |
| F | 0.8780 | 0.2420 |
| G | 0.9109 | 0.2520 |
| H | 0.8720 | 0.2260 |
| I | 0.8401 | 0.1300 |
| J | 0.8631 | 0.1190 |
| K | 0.8557 | 0.2760 |
| L | 0.7561 | 0.2780 |
| M | 0.8451 | 0.2700 |
| N | 0.8327 | 0.2880 |
| O | 0.8121 | 0.2510 |
| P | 0.9100 | 0.2480 |
| Q | 0.8045 | 0.2540 |
| R | 0.8552 | 0.2450 |
| S | 0.8682 | 0.3080 |
| T | 0.8290 | 0.2830 |
| U | 0.8340 | 0.2990 |
| V | 0.8776 | 0.2290 |
| W | 0.8889 | 0.2550 |
| X | 0.8065 | 0.2590 |
| Y | 0.8455 | 0.3030 |
| Z | 0.8419 | 0.2110 |
| a | 0.9862 | 0.3000 |
| b | 0.8330 | 0.1980 |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| Chain | Atom inclusion | Q-score |
|---|---|---|
| c | 0.8418 | 0.2040 |
| d | 0.8525 | 0.1940 |
| e | 0.8138 | 0.2510 |
| f | 0.8652 | 0.2630 |
| g | 0.8395 | 0.2020 |
| h | 0.8763 | 0.2830 |
| i | 0.9168 | 0.2300 |
| j | 0.8767 | 0.2300 |
| k | 0.8595 | 0.2540 |
| l | 0.8095 | 0.2680 |
| m | 0.8555 | 0.2020 |
| n | 0.8420 | 0.2520 |
| o | 0.8436 | 0.2410 |
| p | 0.8675 | 0.2440 |
| q | 0.8136 | 0.2600 |
| r | 0.8846 | 0.2500 |
| s | 0.8470 | 0.2270 |
| t | 0.8299 | 0.1930 |
| u | 0.6832 | 0.2460 |
| v | 0.8312 | 0.2500 |
| w | 0.6689 | 0.1340 |
| x | 0.2425 | -0.0160 |
| y | 0.8457 | 0.2190 |
| z | 0.8209 | 0.2820 |