



wwPDB EM Validation Summary Report ⓘ

Mar 19, 2022 – 08:43 am GMT

PDB ID : 7QGH
EMDB ID : EMD-13955
Title : Structure of the E. coli disome - collided 70S ribosome
Authors : Kratzat, H.; Buschauer, R.; Berninghausen, O.; Beckmann, R.
Deposited on : 2021-12-08
Resolution : 4.48 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 ⓘ symbol.

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

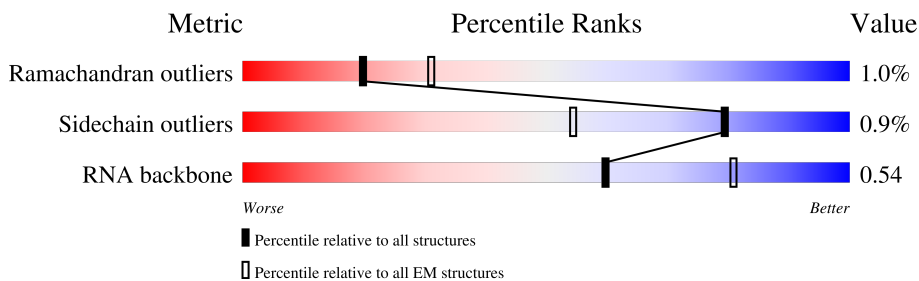
EMDB validation analysis : 0.0.0.dev97
MolProbity : 4.02b-467
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.27

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 4.48 Å.

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



| Metric | 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 $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion $< 40\%$). The numeric value is given above the bar.

| Mol | Chain | Length | Quality of chain |
|-----|-------|--------|------------------|
| 1 | O | 120 | |
| 2 | P | 275 | |
| 3 | Q | 209 | |
| 4 | R | 201 | |
| 5 | S | 179 | |
| 6 | T | 177 | |
| 7 | V | 142 | |
| 8 | W | 142 | |

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| Mol | Chain | Length | Quality of chain |
|-----|-------|--------|------------------|
| 9 | X | 123 | |
| 10 | Y | 144 | |
| 11 | Z | 137 | |
| 12 | a | 127 | |
| 13 | b | 117 | |
| 14 | c | 115 | |
| 15 | d | 118 | |
| 16 | e | 103 | |
| 17 | f | 110 | |
| 18 | g | 100 | |
| 19 | h | 104 | |
| 20 | i | 94 | |
| 21 | j | 85 | |
| 22 | k | 78 | |
| 23 | l | 63 | |
| 24 | m | 59 | |
| 25 | n | 57 | |
| 26 | o | 55 | |
| 27 | p | 47 | |
| 28 | q | 67 | |
| 29 | r | 55 | |
| 30 | N | 2903 | |
| 31 | L | 70 | |
| 32 | C | 223 | |
| 33 | U | 149 | |

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| Mol | Chain | Length | Quality of chain |
|-----|-------|--------|------------------|
| 34 | M | 75 | |
| 35 | x | 692 | |
| 36 | 0 | 1539 | |
| 37 | 1 | 244 | |
| 38 | 2 | 237 | |
| 39 | 3 | 206 | |
| 40 | 4 | 162 | |
| 41 | 5 | 131 | |
| 42 | 6 | 152 | |
| 43 | 7 | 130 | |
| 44 | 8 | 130 | |
| 45 | 9 | 110 | |
| 46 | A | 129 | |
| 47 | B | 124 | |
| 48 | D | 118 | |
| 49 | E | 101 | |
| 50 | F | 89 | |
| 51 | G | 100 | |
| 52 | H | 84 | |
| 53 | I | 75 | |
| 54 | J | 92 | |
| 55 | K | 87 | |
| 56 | s | 88 | |
| 57 | t | 557 | |
| 58 | u | 73 | |

2 Entry composition [i](#)

There are 61 unique types of molecules in this entry. The entry contains 147973 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 5S rRNA.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|-----|---------|-------|
| | | | Total | C | N | O | P | | |
| 1 | O | 118 | 2529 | 1126 | 464 | 821 | 118 | 0 | 0 |

- Molecule 2 is a protein called 50S ribosomal protein L2.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 2 | P | 271 | 2082 | 1288 | 423 | 364 | 7 | 0 | 0 |

- Molecule 3 is a protein called 50S ribosomal protein L3.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 3 | Q | 209 | 1564 | 979 | 288 | 293 | 4 | 0 | 0 |

- Molecule 4 is a protein called 50S ribosomal protein L4.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 4 | R | 201 | 1552 | 974 | 283 | 290 | 5 | 0 | 0 |

- Molecule 5 is a protein called 50S ribosomal protein L5.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 5 | S | 177 | 1410 | 899 | 249 | 256 | 6 | 0 | 0 |

- Molecule 6 is a protein called 50S ribosomal protein L6.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 6 | T | 176 | 1322 | 832 | 243 | 245 | 2 | 0 | 0 |

- Molecule 7 is a protein called 50S ribosomal protein L11.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 7 | V | 141 | 1031 | 651 | 179 | 195 | 6 | 0 | 0 |

- Molecule 8 is a protein called 50S ribosomal protein L13.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 8 | W | 142 | 1128 | 714 | 212 | 198 | 4 | 0 | 0 |

- Molecule 9 is a protein called 50S ribosomal protein L14.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 9 | X | 122 | 938 | 587 | 180 | 165 | 6 | 0 | 0 |

- Molecule 10 is a protein called 50S ribosomal protein L15.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 10 | Y | 143 | 1044 | 649 | 206 | 188 | 1 | 0 | 0 |

- Molecule 11 is a protein called 50S ribosomal protein L16.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 11 | Z | 136 | 1073 | 686 | 205 | 176 | 6 | 0 | 0 |

- Molecule 12 is a protein called 50S ribosomal protein L17.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 12 | a | 120 | 960 | 593 | 196 | 166 | 5 | 0 | 0 |

There is a discrepancy between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
|-------|---------|----------|--------|----------|------------|
| a | 123 | ALA | GLU | conflict | UNP P0AG44 |

- Molecule 13 is a protein called 50S ribosomal protein L18.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---------|-------|
| | | | Total | C | N | O | | |
| 13 | b | 116 | 891 | 552 | 178 | 161 | 0 | 0 |

- Molecule 14 is a protein called 50S ribosomal protein L19.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 14 | c | 114 | 915 | 573 | 179 | 162 | 1 | 0 | 0 |

- Molecule 15 is a protein called 50S ribosomal protein L20.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---------|-------|
| | | | Total | C | N | O | | |
| 15 | d | 117 | 946 | 604 | 192 | 150 | 0 | 0 |

- Molecule 16 is a protein called 50S ribosomal protein L21.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 16 | e | 103 | 815 | 516 | 153 | 144 | 2 | 0 | 0 |

- Molecule 17 is a protein called 50S ribosomal protein L22.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 17 | f | 110 | 857 | 532 | 166 | 156 | 3 | 0 | 0 |

- Molecule 18 is a protein called 50S ribosomal protein L23.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 18 | g | 93 | 738 | 466 | 139 | 131 | 2 | 0 | 0 |

There is a discrepancy between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
|-------|---------|----------|--------|----------|------------|
| g | 98 | SER | GLY | conflict | UNP P0ADZ0 |

- Molecule 19 is a protein called 50S ribosomal protein L24.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---------|-------|
| | | | Total | C | N | O | | |
| 19 | h | 102 | 779 | 492 | 146 | 141 | 0 | 0 |

- Molecule 20 is a protein called 50S ribosomal protein L25.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 20 | i | 94 | 752 | 479 | 137 | 133 | 3 | 0 | 0 |

- Molecule 21 is a protein called 50S ribosomal protein L27.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 21 | j | 75 | 568 | 353 | 113 | 101 | 1 | 0 | 0 |

There is a discrepancy between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
|-------|---------|----------|--------|----------|------------|
| j | 3 | UNK | HIS | conflict | UNP P0A7L8 |

- Molecule 22 is a protein called 50S ribosomal protein L28.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 22 | k | 77 | 624 | 388 | 129 | 105 | 2 | 0 | 0 |

- Molecule 23 is a protein called 50S ribosomal protein L29.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 23 | l | 63 | 508 | 313 | 99 | 94 | 2 | 0 | 0 |

- Molecule 24 is a protein called 50S ribosomal protein L30.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 24 | m | 58 | 448 | 281 | 87 | 78 | 2 | 0 | 0 |

- Molecule 25 is a protein called 50S ribosomal protein L32.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 25 | n | 56 | Total | C | N | O | S | 0 | 0 |
| | | | 443 | 269 | 94 | 79 | 1 | | |

- Molecule 26 is a protein called 50S ribosomal protein L33.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 26 | o | 50 | Total | C | N | O | S | 0 | 0 |
| | | | 409 | 263 | 75 | 71 | | | |

- Molecule 27 is a protein called 50S ribosomal protein L34.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 27 | p | 46 | Total | C | N | O | S | 0 | 0 |
| | | | 376 | 228 | 90 | 56 | 2 | | |

- Molecule 28 is a protein called 50S ribosomal protein L35.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|----|---|---------|-------|
| 28 | q | 64 | Total | C | N | O | S | 0 | 0 |
| | | | 503 | 323 | 105 | 73 | 2 | | |

- Molecule 29 is a protein called 50S ribosomal protein L36.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 29 | r | 38 | Total | C | N | O | S | 0 | 0 |
| | | | 301 | 185 | 65 | 47 | 4 | | |

- Molecule 30 is a RNA chain called 23S rRNA.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-------|-------|-------|------|---------|-------|
| 30 | N | 2897 | Total | C | N | O | P | 1 | 0 |
| | | | 62215 | 27754 | 11448 | 20115 | 2898 | | |

- Molecule 31 is a protein called 50S ribosomal protein L31.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 31 | L | 52 | Total | C | N | O | S | 0 | 0 |
| | | | 404 | 250 | 73 | 75 | 6 | | |

There is a discrepancy between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
|-------|---------|----------|--------|----------|------------|
| L | 68 | SER | GLY | conflict | UNP P0A7M9 |

- Molecule 32 is a protein called 50S ribosomal protein L1.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 32 | C | 134 | 1027 | 645 | 186 | 194 | 2 | 0 | 0 |

- Molecule 33 is a protein called 50S ribosomal protein L9.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 33 | U | 149 | 1111 | 699 | 197 | 214 | 1 | 0 | 0 |

- Molecule 34 is a RNA chain called P-site tRNA.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|----|---------|-------|
| | | | Total | C | N | O | P | | |
| 34 | M | 75 | 1594 | 711 | 281 | 527 | 75 | 0 | 0 |

- Molecule 35 is a RNA chain called mRNA.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|----|---------|-------|
| | | | Total | C | N | O | P | | |
| 35 | x | 14 | 294 | 132 | 51 | 97 | 14 | 0 | 0 |

- Molecule 36 is a RNA chain called 16S rRNA.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-------|------|-------|------|---------|-------|
| | | | Total | C | N | O | P | | |
| 36 | 0 | 1539 | 33015 | 14725 | 6052 | 10699 | 1539 | 0 | 0 |

- Molecule 37 is a protein called 30S ribosomal protein S2.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 37 | 1 | 218 | 1704 | 1081 | 305 | 311 | 7 | 0 | 0 |

- Molecule 38 is a protein called 30S ribosomal protein S3.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 38 | 2 | 206 | 1624 | 1028 | 305 | 288 | 3 | 0 | 0 |

- Molecule 39 is a protein called 30S ribosomal protein S4.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 39 | 3 | 205 | 1642 | 1026 | 315 | 297 | 4 | 0 | 0 |

- Molecule 40 is a protein called 30S ribosomal protein S5.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 40 | 4 | 150 | 1105 | 687 | 211 | 201 | 6 | 0 | 0 |

There is a discrepancy between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
|-------|---------|----------|--------|----------|------------|
| 4 | 4 | MET | ILE | conflict | UNP P0A7W1 |

- Molecule 41 is a protein called 30S ribosomal protein S6, non-modified isoform.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 41 | 5 | 100 | 817 | 515 | 148 | 148 | 6 | 0 | 0 |

There is a discrepancy between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
|-------|---------|----------|--------|----------|------------|
| 5 | 101 | SER | PRO | conflict | UNP P02358 |

- Molecule 42 is a protein called 30S ribosomal protein S7.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 42 | 6 | 151 | 1181 | 735 | 227 | 215 | 4 | 0 | 0 |

- Molecule 43 is a protein called 30S ribosomal protein S8.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 43 | 7 | 129 | 978 | 616 | 173 | 183 | 6 | 0 | 0 |

- Molecule 44 is a protein called 30S ribosomal protein S9.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 44 | 8 | 127 | 1021 | 634 | 206 | 178 | 3 | 0 | 0 |

There is a discrepancy between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
|-------|---------|----------|--------|----------|------------|
| 8 | 3 | ASP | GLU | conflict | UNP P0A7X3 |

- Molecule 45 is a protein called 30S ribosomal protein S10.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 45 | 9 | 98 | 786 | 493 | 150 | 142 | 1 | 0 | 0 |

- Molecule 46 is a protein called 30S ribosomal protein S11.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 46 | A | 117 | 876 | 540 | 174 | 159 | 3 | 0 | 0 |

There is a discrepancy between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
|-------|---------|----------|--------|----------|------------|
| A | 5 | ALA | PRO | conflict | UNP P0A7R9 |

- Molecule 47 is a protein called 30S ribosomal protein S12.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 47 | B | 123 | 954 | 590 | 196 | 164 | 4 | 0 | 0 |

- Molecule 48 is a protein called 30S ribosomal protein S13.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 48 | D | 114 | 883 | 546 | 178 | 156 | 3 | 0 | 0 |

There is a discrepancy between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
|-------|---------|----------|--------|----------|------------|
| D | 1 | VAL | MET | conflict | UNP P0A7S9 |

- Molecule 49 is a protein called 30S ribosomal protein S14.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 49 | E | 96 | 773 | 483 | 160 | 127 | 3 | 0 | 0 |

There is a discrepancy between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
|-------|---------|----------|--------|----------|------------|
| E | 40 | ALA | ASP | conflict | UNP P0AG59 |

- Molecule 50 is a protein called 30S ribosomal protein S15.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 50 | F | 88 | 709 | 437 | 143 | 128 | 1 | 0 | 0 |

- Molecule 51 is a protein called 30S ribosomal protein S16.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 51 | G | 82 | 648 | 406 | 128 | 113 | 1 | 0 | 0 |

- Molecule 52 is a protein called 30S ribosomal protein S17.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 52 | H | 80 | 648 | 411 | 121 | 113 | 3 | 0 | 0 |

There is a discrepancy between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
|-------|---------|----------|--------|----------|------------|
| H | 2 | ALA | THR | conflict | UNP P0AG63 |

- Molecule 53 is a protein called 30S ribosomal protein S18.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---------|-------|
| | | | Total | C | N | O | | |
| 53 | I | 55 | 455 | 288 | 86 | 81 | 0 | 0 |

There are 2 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
|-------|---------|----------|--------|----------|------------|
| I | 15 | THR | ALA | conflict | UNP P0A7T7 |
| I | 19 | VAL | GLN | conflict | UNP P0A7T7 |

- Molecule 54 is a protein called 30S ribosomal protein S19.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 54 | J | 79 | Total | C | N | O | S | 0 | 0 |
| | | | 637 | 408 | 120 | 107 | 2 | | |

- Molecule 55 is a protein called 30S ribosomal protein S20.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 55 | K | 85 | Total | C | N | O | S | 0 | 0 |
| | | | 664 | 411 | 137 | 113 | 3 | | |

There is a discrepancy between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
|-------|---------|----------|--------|----------|------------|
| K | 1 | LEU | MET | conflict | UNP P0A7U7 |

- Molecule 56 is a protein called 30S ribosomal protein S21.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 56 | s | 51 | Total | C | N | O | S | 0 | 0 |
| | | | 425 | 265 | 86 | 73 | 1 | | |

- Molecule 57 is a protein called 30S ribosomal protein S1.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---------|-------|
| 57 | t | 143 | Total | C | N | O | 0 | 0 |
| | | | 704 | 418 | 143 | 143 | | |

There is a discrepancy between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
|-------|---------|----------|--------|----------|------------|
| t | 241 | VAL | ILE | conflict | UNP P0AG67 |

- Molecule 58 is a RNA chain called A-site tRNA.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|----|---------|-------|
| | | | Total | C | N | O | P | | |
| 58 | u | 73 | 1561 | 695 | 279 | 514 | 73 | 0 | 0 |

There are 2 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
|-------|---------|----------|--------|----------|---------------|
| u | 3 | G | C | conflict | GB 1851743410 |
| u | 70 | C | G | conflict | GB 1851743410 |

- Molecule 59 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

| Mol | Chain | Residues | Atoms | | AltConf |
|-----|-------|----------|-------|----|---------|
| 59 | u | 2 | Total | Mg | 0 |
| | | | 2 | 2 | |

- Molecule 60 is POTASSIUM ION (three-letter code: K) (formula: K).

| Mol | Chain | Residues | Atoms | | AltConf |
|-----|-------|----------|-------|---|---------|
| 60 | u | 1 | Total | K | 0 |
| | | | 1 | 1 | |


- Molecule 61 is water.

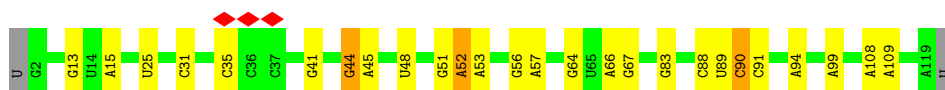
| Mol | Chain | Residues | Atoms | | AltConf |
|-----|-------|----------|-------|---|---------|
| 61 | u | 9 | Total | O | 0 |
| | | | 9 | 9 | |

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.

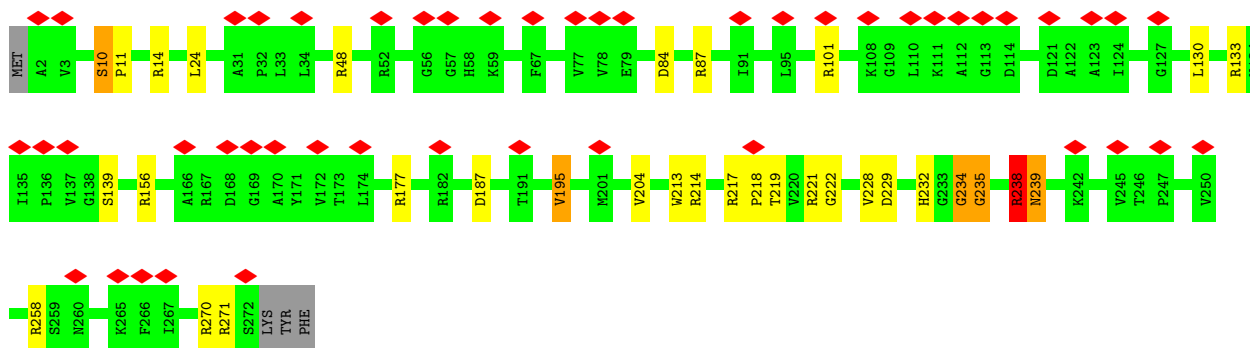
- Molecule 1: 5S rRNA

Chain O:  77% 19% ..

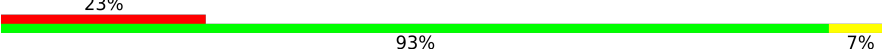


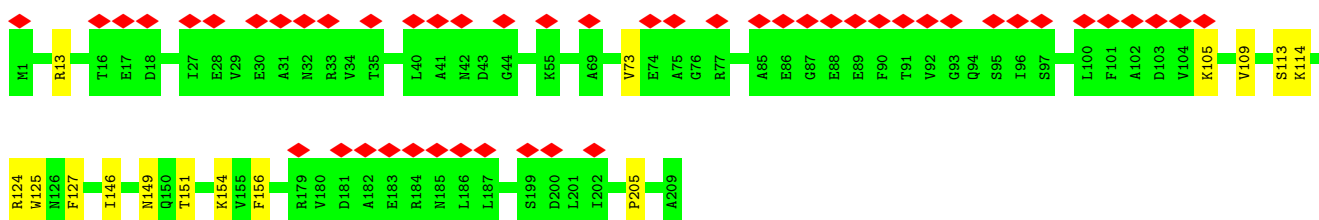
- Molecule 2: 50S ribosomal protein L2

Chain P:  17% 87% 10% ..



- Molecule 3: 50S ribosomal protein L3

Chain Q:  23% 93% 7%

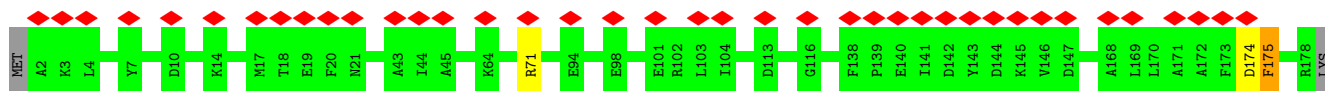


- Molecule 4: 50S ribosomal protein L4

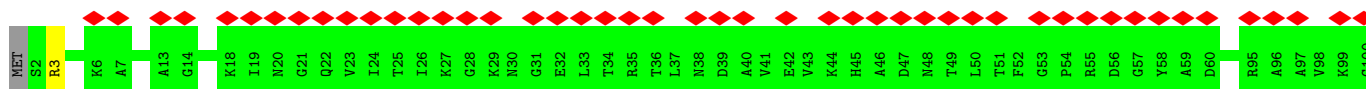
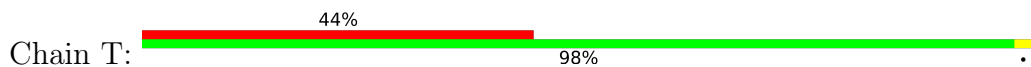
Chain R:  95%



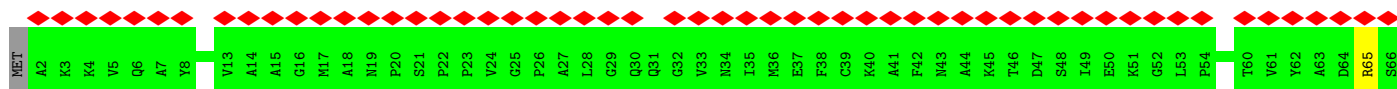
- Molecule 5: 50S ribosomal protein L5



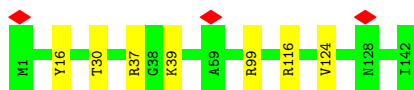
- Molecule 6: 50S ribosomal protein L6



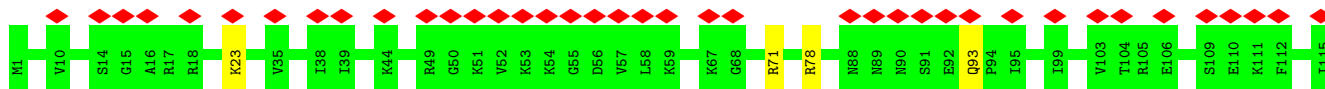
- Molecule 7: 50S ribosomal protein L11



- Molecule 8: 50S ribosomal protein L13

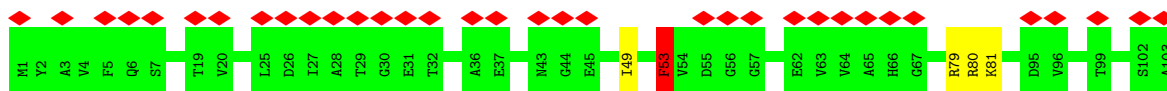
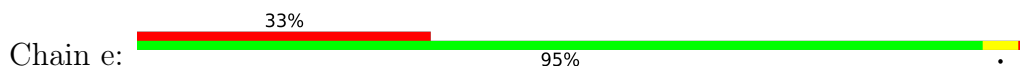


- Molecule 9: 50S ribosomal protein L14





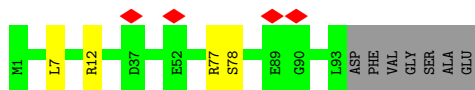
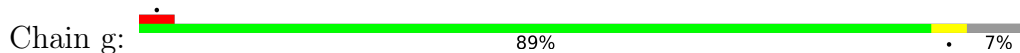
- Molecule 16: 50S ribosomal protein L21



- Molecule 17: 50S ribosomal protein L22



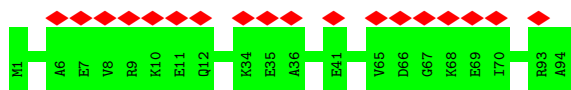
- Molecule 18: 50S ribosomal protein L23



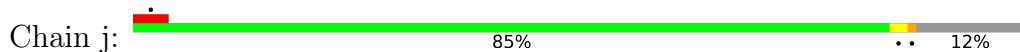
- Molecule 19: 50S ribosomal protein L24




- Molecule 20: 50S ribosomal protein L25

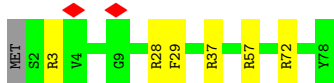


- Molecule 21: 50S ribosomal protein L27

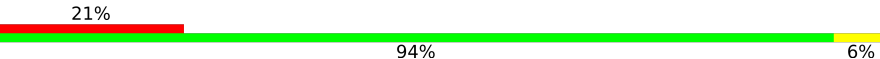


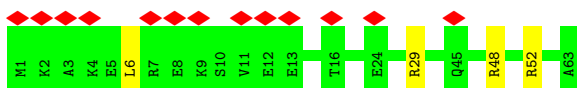
- Molecule 22: 50S ribosomal protein L28

Chain k:  91% 8%



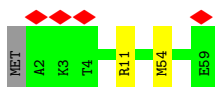
- Molecule 23: 50S ribosomal protein L29

Chain l:  21% 94% 6%




- Molecule 24: 50S ribosomal protein L30

Chain m:  7% 95%




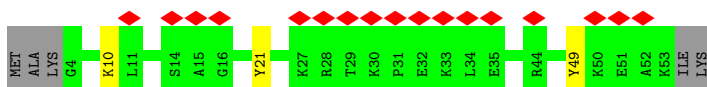
- Molecule 25: 50S ribosomal protein L32

Chain n:  7% 82% 16%




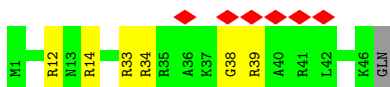
- Molecule 26: 50S ribosomal protein L33

Chain o:  31% 85% 5% 9%




- Molecule 27: 50S ribosomal protein L34

Chain p:  13% 85% 13%

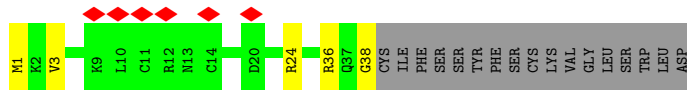


- Molecule 28: 50S ribosomal protein L35

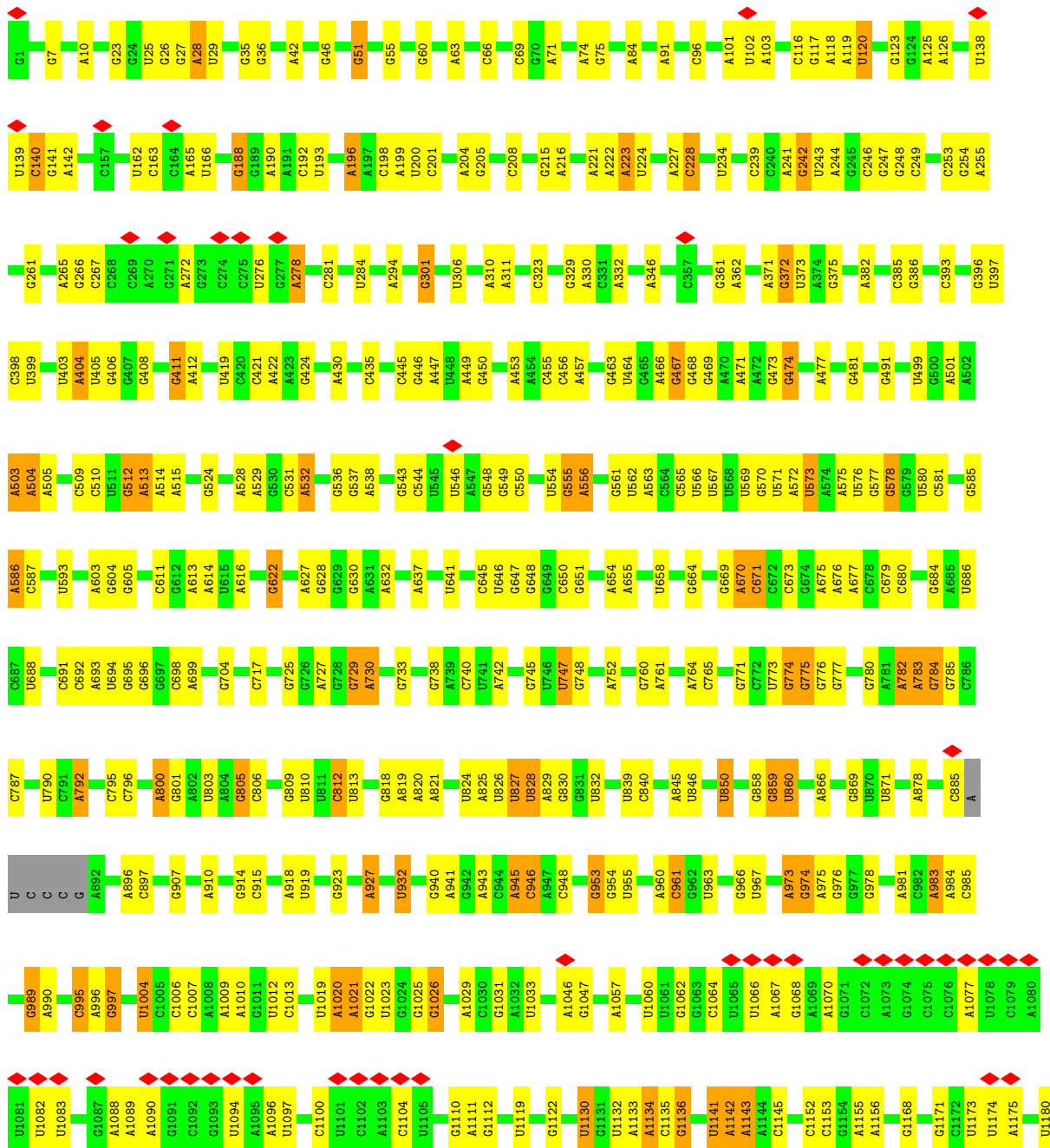
Chain q:  85% 9%

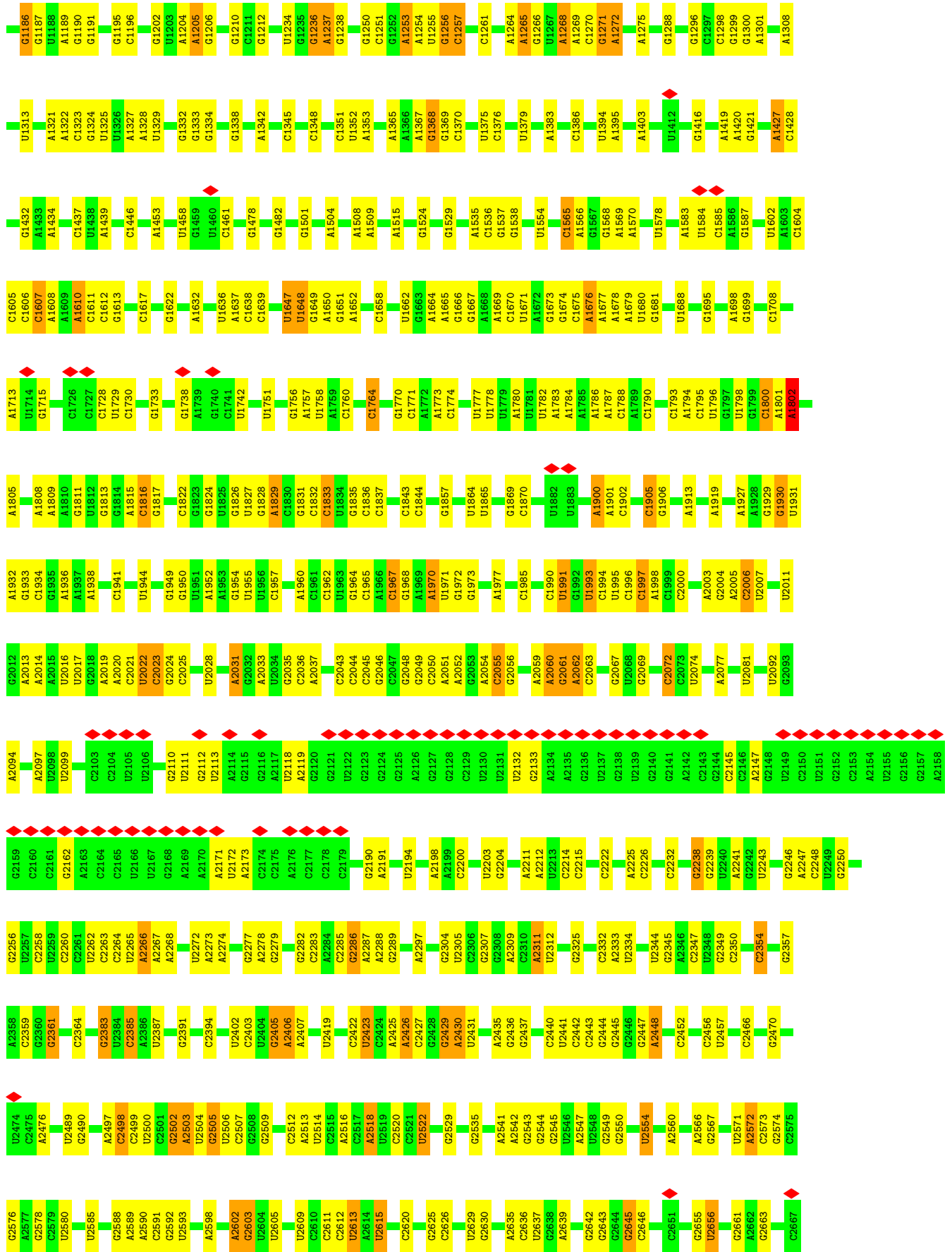


• Molecule 29: 50S ribosomal protein L36



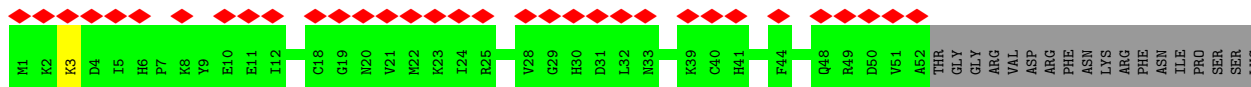
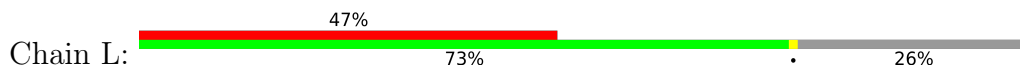
• Molecule 30: 23S rRNA



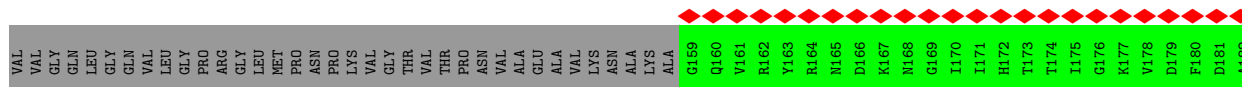
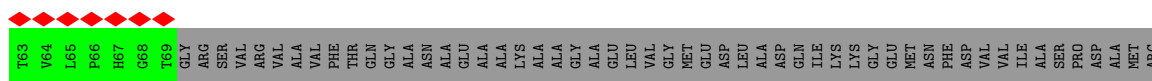
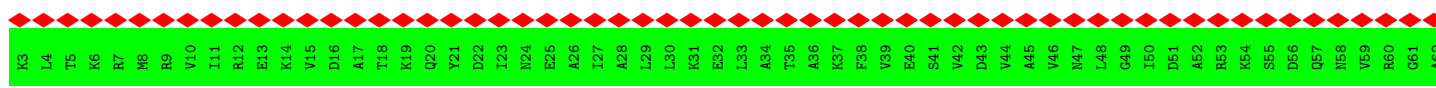




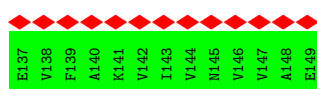
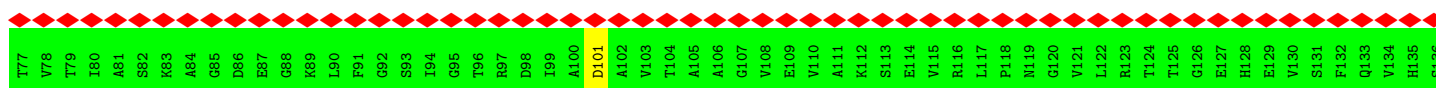
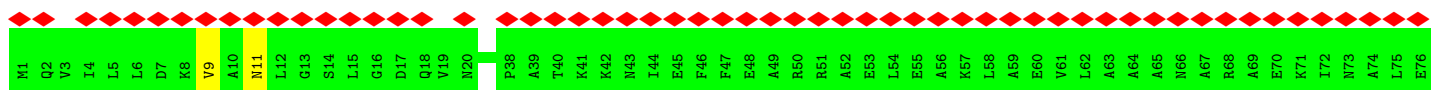
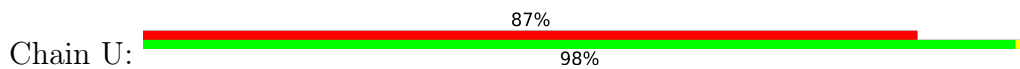
• Molecule 31: 50S ribosomal protein L31



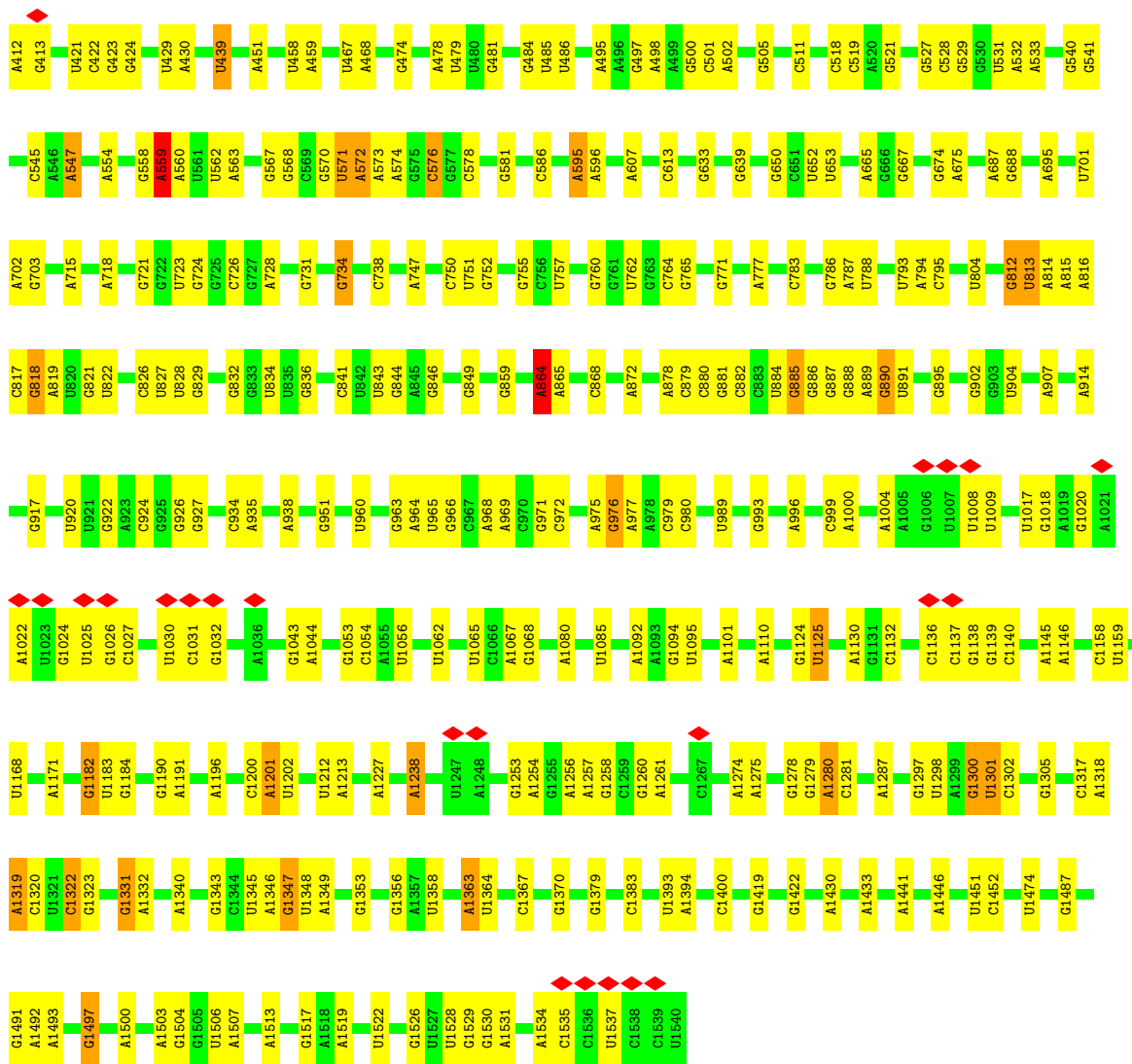
• Molecule 32: 50S ribosomal protein L1



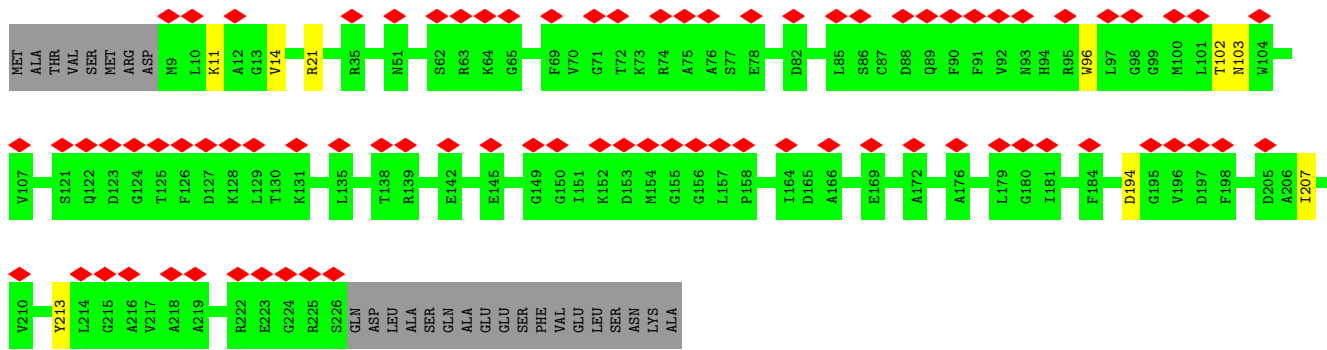
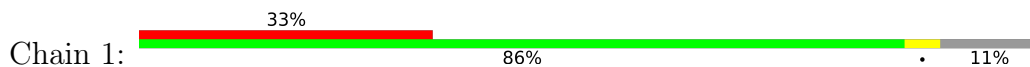
• Molecule 33: 50S ribosomal protein L9



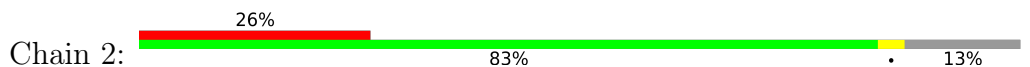
• Molecule 34: P-site tRNA

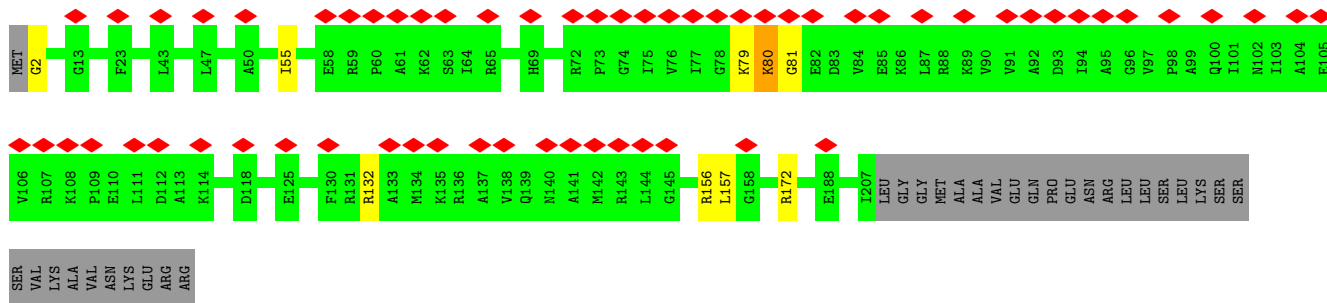


• Molecule 37: 30S ribosomal protein S2

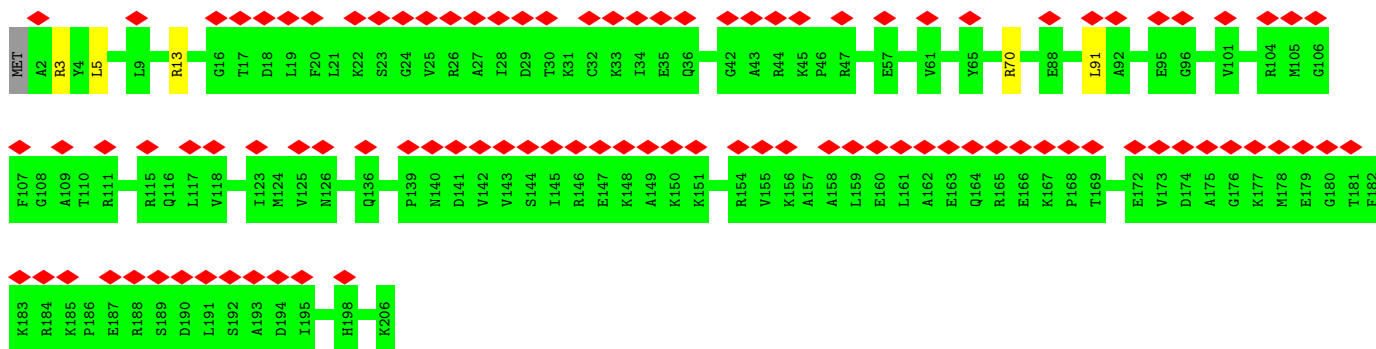


• Molecule 38: 30S ribosomal protein S3

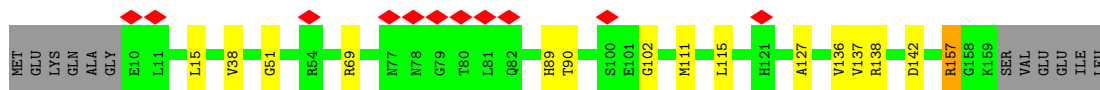
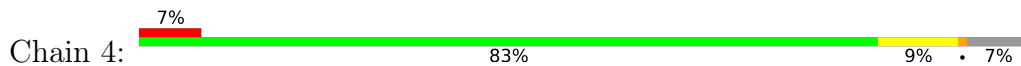




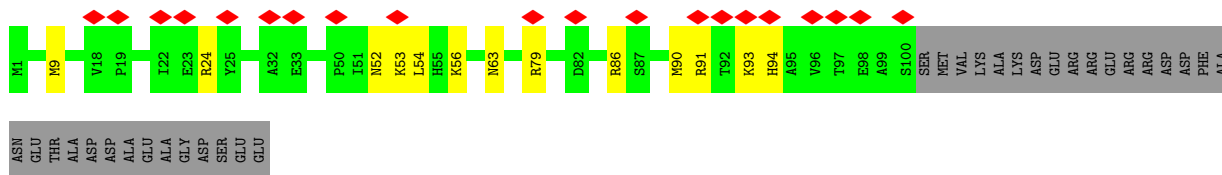
• Molecule 39: 30S ribosomal protein S4



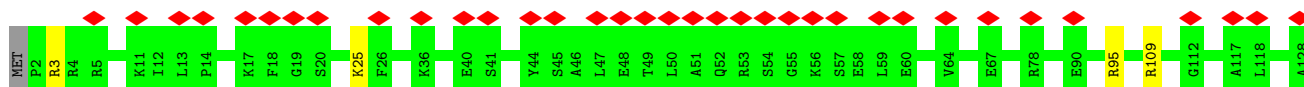
• Molecule 40: 30S ribosomal protein S5

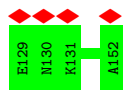


• Molecule 41: 30S ribosomal protein S6, non-modified isoform

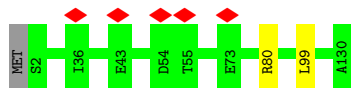


• Molecule 42: 30S ribosomal protein S7

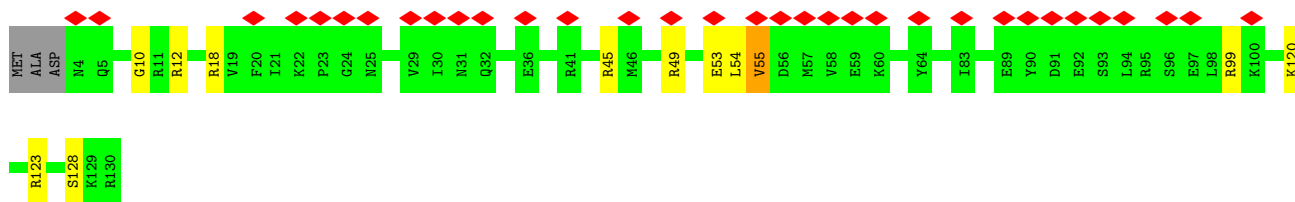
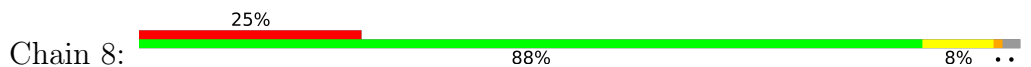




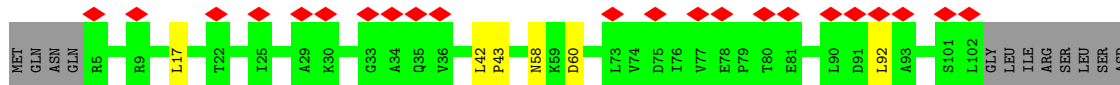
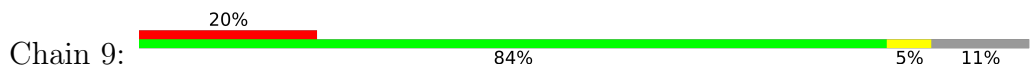
- Molecule 43: 30S ribosomal protein S8



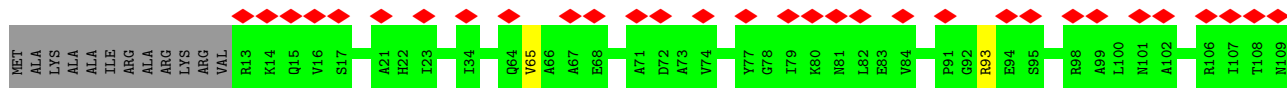
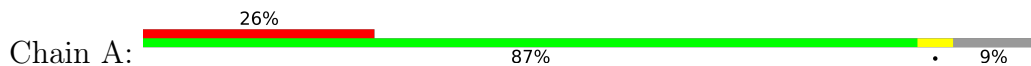
- Molecule 44: 30S ribosomal protein S9



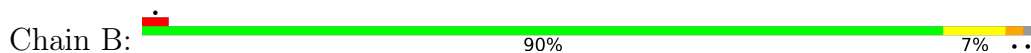
- Molecule 45: 30S ribosomal protein S10



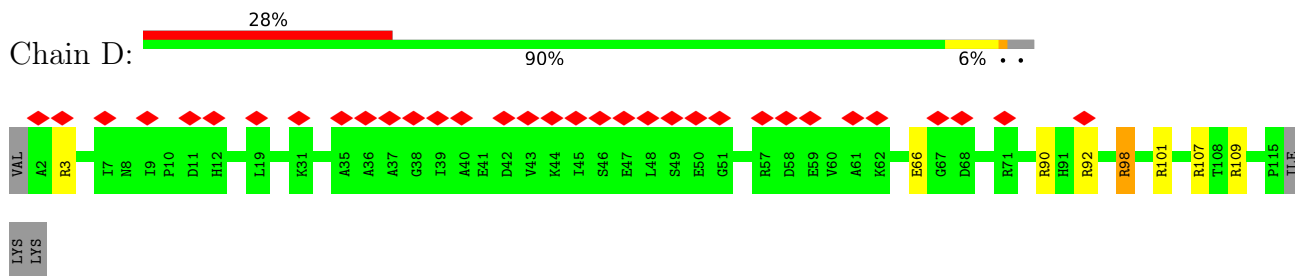
- Molecule 46: 30S ribosomal protein S11



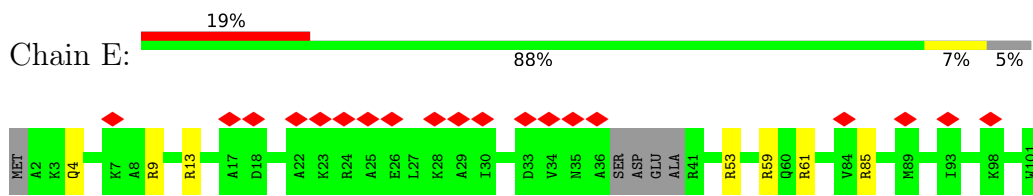
- Molecule 47: 30S ribosomal protein S12



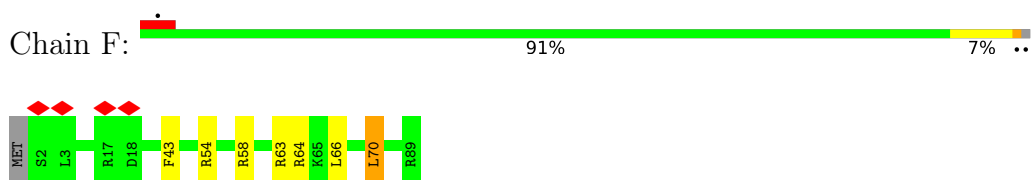
- Molecule 48: 30S ribosomal protein S13



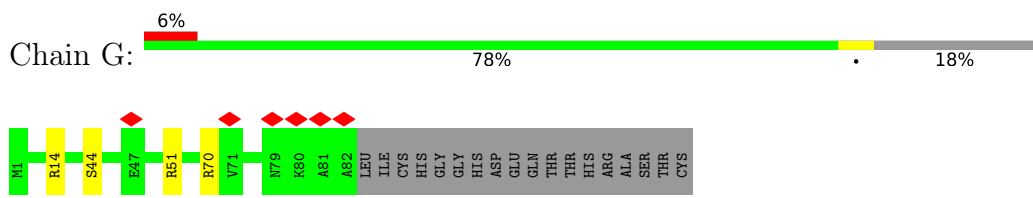
• Molecule 49: 30S ribosomal protein S14



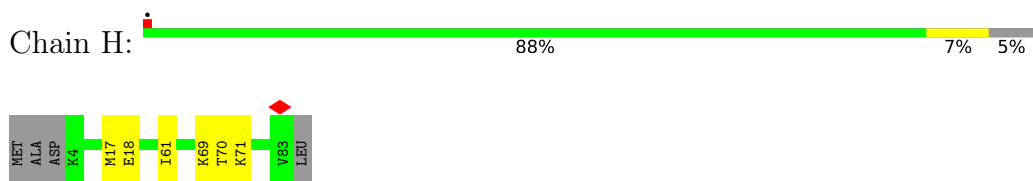
• Molecule 50: 30S ribosomal protein S15



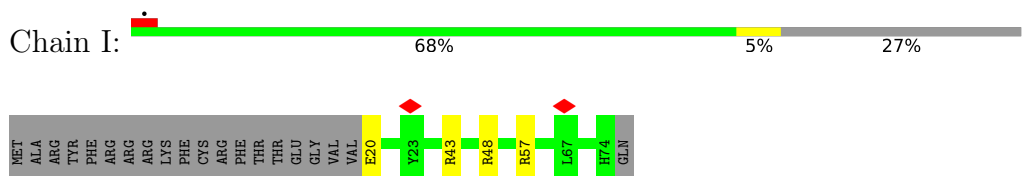
• Molecule 51: 30S ribosomal protein S16



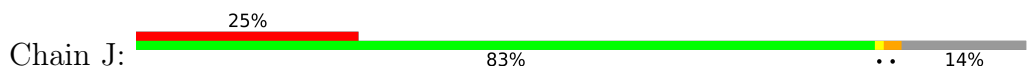
• Molecule 52: 30S ribosomal protein S17

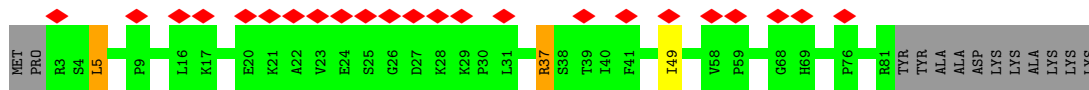


• Molecule 53: 30S ribosomal protein S18

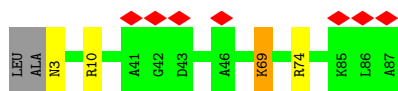


• Molecule 54: 30S ribosomal protein S19





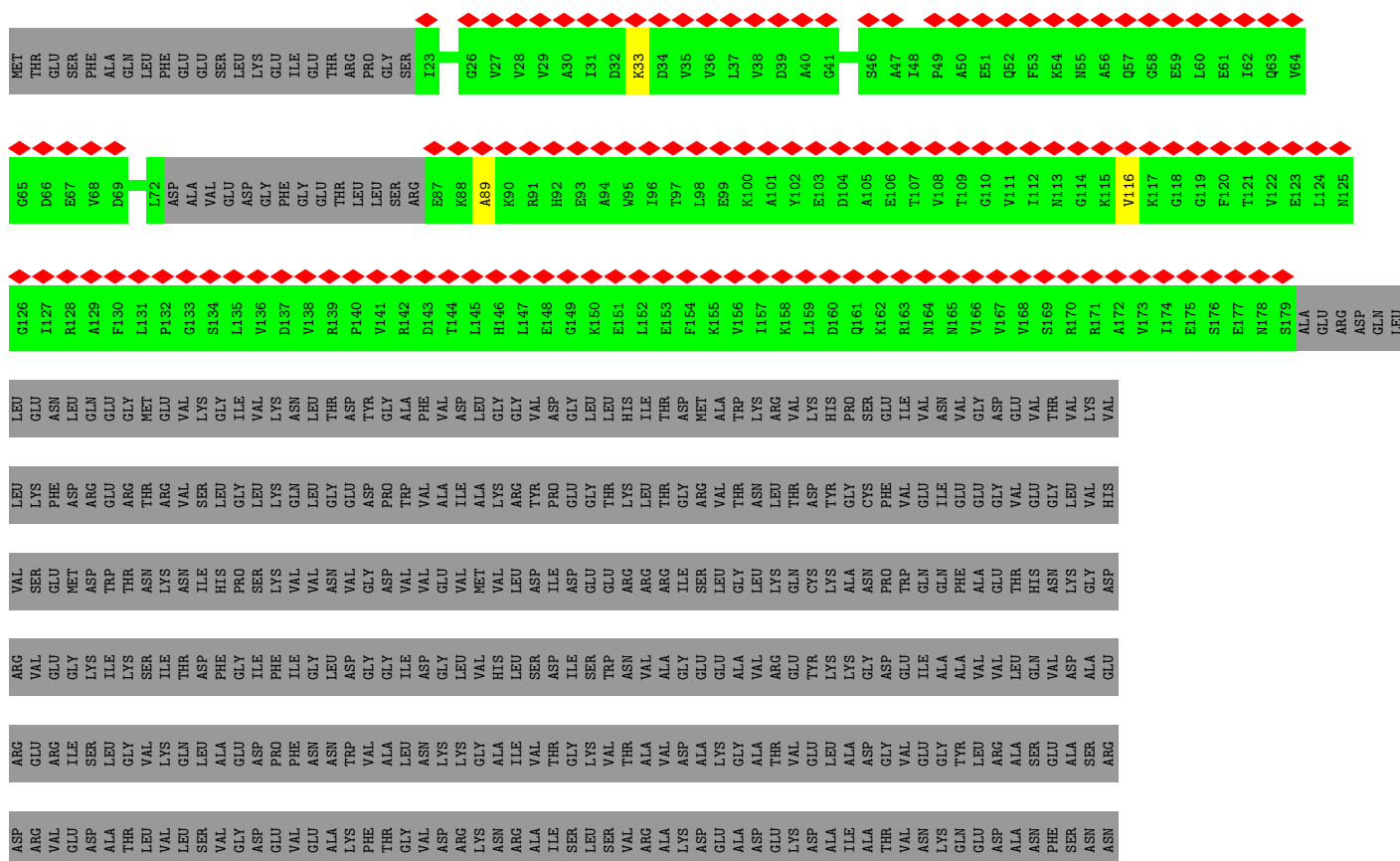
• Molecule 55: 30S ribosomal protein S20



• Molecule 56: 30S ribosomal protein S21

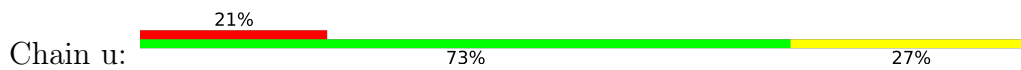


• Molecule 57: 30S ribosomal protein S1



ALA
MET
ALA
GLU
ALA
PHE
LYS
ALA
ALA
LYS
GLY
GLU

• Molecule 58: A-site tRNA



4 Experimental information

| Property | Value | Source |
|--------------------------------------|---|-----------|
| EM reconstruction method | SINGLE PARTICLE | Depositor |
| Imposed symmetry | POINT, Not provided | |
| Number of particles used | 75081 | Depositor |
| Resolution determination method | FSC 0.143 CUT-OFF | Depositor |
| CTF correction method | PHASE FLIPPING AND AMPLITUDE CORRECTION | Depositor |
| Microscope | FEI TITAN KRIOS | Depositor |
| Voltage (kV) | 300 | Depositor |
| Electron dose ($e^-/\text{\AA}^2$) | 40 | 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 | 2.366 | Depositor |
| Minimum map value | -0.728 | Depositor |
| Average map value | -0.008 | Depositor |
| Map value standard deviation | 0.144 | Depositor |
| Recommended contour level | 0.45 | Depositor |
| Map size (Å) | 654.0, 654.0, 654.0 | wwPDB |
| Map dimensions | 600, 600, 600 | wwPDB |
| Map angles (°) | 90.0, 90.0, 90.0 | wwPDB |
| Pixel spacing (Å) | 1.09, 1.09, 1.09 | Depositor |

5 Model quality i

5.1 Standard geometry i

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

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

| Mol | Chain | Bond lengths | | Bond angles | |
|-----|-------|--------------|------------------|-------------|-------------------|
| | | RMSZ | # Z >5 | RMSZ | # Z >5 |
| 1 | O | 0.80 | 1/2828 (0.0%) | 0.88 | 6/4410 (0.1%) |
| 2 | P | 1.41 | 21/2121 (1.0%) | 1.32 | 27/2852 (0.9%) |
| 3 | Q | 1.18 | 3/1585 (0.2%) | 1.14 | 8/2134 (0.4%) |
| 4 | R | 0.97 | 4/1571 (0.3%) | 1.02 | 9/2113 (0.4%) |
| 5 | S | 0.67 | 0/1434 | 0.85 | 1/1926 (0.1%) |
| 6 | T | 0.67 | 0/1342 | 0.83 | 4/1816 (0.2%) |
| 7 | V | 0.53 | 0/1045 | 0.65 | 0/1410 |
| 8 | W | 1.10 | 3/1151 (0.3%) | 1.10 | 7/1551 (0.5%) |
| 9 | X | 1.15 | 0/947 | 1.19 | 5/1268 (0.4%) |
| 10 | Y | 1.30 | 4/1053 (0.4%) | 1.38 | 11/1403 (0.8%) |
| 11 | Z | 1.13 | 2/1092 (0.2%) | 1.19 | 7/1460 (0.5%) |
| 12 | a | 1.28 | 3/973 (0.3%) | 1.30 | 8/1301 (0.6%) |
| 13 | b | 0.84 | 2/901 (0.2%) | 1.08 | 8/1209 (0.7%) |
| 14 | c | 1.09 | 3/927 (0.3%) | 1.19 | 8/1240 (0.6%) |
| 15 | d | 1.32 | 4/959 (0.4%) | 1.37 | 15/1278 (1.2%) |
| 16 | e | 1.08 | 2/828 (0.2%) | 1.08 | 3/1107 (0.3%) |
| 17 | f | 1.02 | 1/864 (0.1%) | 1.09 | 1/1156 (0.1%) |
| 18 | g | 0.91 | 0/744 | 1.01 | 2/994 (0.2%) |
| 19 | h | 0.82 | 1/787 (0.1%) | 0.89 | 0/1051 |
| 20 | i | 0.78 | 0/765 | 0.87 | 0/1025 |
| 21 | j | 1.20 | 2/575 (0.3%) | 1.29 | 5/762 (0.7%) |
| 22 | k | 1.09 | 1/634 (0.2%) | 1.15 | 6/848 (0.7%) |
| 23 | l | 0.71 | 0/509 | 1.04 | 4/677 (0.6%) |
| 24 | m | 0.86 | 0/452 | 1.08 | 2/605 (0.3%) |
| 25 | n | 1.16 | 2/449 (0.4%) | 1.42 | 7/599 (1.2%) |
| 26 | o | 1.31 | 7/416 (1.7%) | 0.97 | 1/554 (0.2%) |
| 27 | p | 1.38 | 3/379 (0.8%) | 1.75 | 7/498 (1.4%) |
| 28 | q | 1.15 | 1/512 (0.2%) | 1.26 | 6/676 (0.9%) |
| 29 | r | 1.16 | 1/302 (0.3%) | 1.35 | 5/397 (1.3%) |
| 30 | N | 1.24 | 516/69681 (0.7%) | 1.04 | 347/108706 (0.3%) |
| 31 | L | 0.58 | 0/411 | 0.77 | 0/550 |
| 32 | C | 0.28 | 0/1034 | 0.51 | 0/1387 |

| Mol | Chain | Bond lengths | | Bond angles | |
|-----|-------|--------------|-------------------|-------------|-------------------|
| | | RMSZ | # Z >5 | RMSZ | # Z >5 |
| 33 | U | 0.29 | 0/1122 | 0.58 | 0/1515 |
| 34 | M | 0.63 | 3/1779 (0.2%) | 0.83 | 2/2768 (0.1%) |
| 35 | x | 0.31 | 0/327 | 0.71 | 0/506 |
| 36 | 0 | 0.97 | 131/36966 (0.4%) | 0.93 | 109/57666 (0.2%) |
| 37 | 1 | 0.81 | 2/1735 (0.1%) | 0.93 | 3/2338 (0.1%) |
| 38 | 2 | 0.85 | 1/1651 (0.1%) | 0.94 | 4/2225 (0.2%) |
| 39 | 3 | 0.76 | 0/1664 | 0.98 | 6/2227 (0.3%) |
| 40 | 4 | 1.11 | 1/1118 (0.1%) | 1.22 | 7/1504 (0.5%) |
| 41 | 5 | 0.90 | 1/835 (0.1%) | 1.04 | 4/1128 (0.4%) |
| 42 | 6 | 0.66 | 0/1195 | 0.96 | 5/1602 (0.3%) |
| 43 | 7 | 0.88 | 0/988 | 0.99 | 2/1326 (0.2%) |
| 44 | 8 | 0.85 | 0/1033 | 1.13 | 6/1375 (0.4%) |
| 45 | 9 | 0.74 | 0/796 | 1.01 | 2/1077 (0.2%) |
| 46 | A | 0.86 | 1/892 (0.1%) | 1.03 | 3/1205 (0.2%) |
| 47 | B | 1.09 | 3/968 (0.3%) | 1.22 | 7/1300 (0.5%) |
| 48 | D | 0.85 | 1/892 (0.1%) | 1.12 | 9/1193 (0.8%) |
| 49 | E | 0.86 | 0/784 | 1.14 | 7/1043 (0.7%) |
| 50 | F | 0.94 | 0/717 | 1.14 | 8/959 (0.8%) |
| 51 | G | 0.94 | 0/658 | 1.16 | 4/884 (0.5%) |
| 52 | H | 0.82 | 0/657 | 1.02 | 0/881 |
| 53 | I | 0.98 | 1/462 (0.2%) | 1.10 | 2/621 (0.3%) |
| 54 | J | 0.82 | 0/652 | 1.05 | 3/877 (0.3%) |
| 55 | K | 0.89 | 0/670 | 1.06 | 3/888 (0.3%) |
| 56 | s | 1.07 | 1/430 (0.2%) | 1.25 | 4/570 (0.7%) |
| 57 | t | 0.34 | 0/702 | 0.44 | 0/973 |
| 58 | u | 0.67 | 1/1744 (0.1%) | 0.86 | 0/2716 |
| All | All | 1.09 | 734/160708 (0.5%) | 1.02 | 720/240330 (0.3%) |

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 | P | 0 | 3 |
| 3 | Q | 0 | 1 |
| 5 | S | 0 | 2 |
| 10 | Y | 0 | 2 |
| 11 | Z | 0 | 2 |
| 19 | h | 0 | 1 |
| 28 | q | 0 | 1 |
| 30 | N | 0 | 6 |

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| Mol | Chain | #Chirality outliers | #Planarity outliers |
|-----|-------|---------------------|---------------------|
| 36 | 0 | 0 | 5 |
| 37 | 1 | 0 | 2 |
| 38 | 2 | 0 | 2 |
| 40 | 4 | 0 | 5 |
| 41 | 5 | 0 | 2 |
| 44 | 8 | 0 | 4 |
| 46 | A | 0 | 1 |
| 47 | B | 0 | 2 |
| 52 | H | 0 | 2 |
| 54 | J | 0 | 1 |
| 55 | K | 0 | 1 |
| 56 | s | 0 | 1 |
| All | All | 0 | 46 |

The worst 5 of 734 bond length outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed(Å) | Ideal(Å) |
|-----|-------|------|------|-------|--------|-------------|----------|
| 30 | N | 2873 | A | C6-N1 | -20.29 | 1.21 | 1.35 |
| 30 | N | 2765 | A | C6-N1 | -18.77 | 1.22 | 1.35 |
| 30 | N | 2502 | G | P-OP2 | 16.62 | 1.77 | 1.49 |
| 30 | N | 503 | A | C6-N1 | -15.22 | 1.24 | 1.35 |
| 30 | N | 1156 | A | P-OP2 | 15.18 | 1.74 | 1.49 |

The worst 5 of 720 bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed(°) | Ideal(°) |
|-----|-------|---------|------|-----------|--------|-------------|----------|
| 30 | N | 2506[A] | U | OP1-P-O3' | 17.12 | 142.87 | 105.20 |
| 30 | N | 2506[B] | U | OP1-P-O3' | 17.12 | 142.87 | 105.20 |
| 27 | p | 39 | ARG | NE-CZ-NH1 | 16.04 | 128.32 | 120.30 |
| 27 | p | 39 | ARG | NE-CZ-NH2 | -14.81 | 112.89 | 120.30 |
| 34 | M | 73 | C | O3'-P-O5' | 14.38 | 131.33 | 104.00 |

There are no chirality outliers.

5 of 46 planarity outliers are listed below:

| Mol | Chain | Res | Type | Group |
|-----|-------|-----|------|---------|
| 2 | P | 195 | VAL | Peptide |
| 2 | P | 234 | GLY | Peptide |
| 2 | P | 238 | ARG | Peptide |
| 3 | Q | 151 | THR | Peptide |
| 5 | S | 174 | ASP | 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 | P | 269/275 (98%) | 247 (92%) | 18 (7%) | 4 (2%) | 10 | 46 |
| 3 | Q | 207/209 (99%) | 195 (94%) | 11 (5%) | 1 (0%) | 29 | 68 |
| 4 | R | 199/201 (99%) | 191 (96%) | 8 (4%) | 0 | 100 | 100 |
| 5 | S | 175/179 (98%) | 163 (93%) | 11 (6%) | 1 (1%) | 25 | 65 |
| 6 | T | 174/177 (98%) | 164 (94%) | 10 (6%) | 0 | 100 | 100 |
| 7 | V | 139/142 (98%) | 112 (81%) | 27 (19%) | 0 | 100 | 100 |
| 8 | W | 140/142 (99%) | 136 (97%) | 4 (3%) | 0 | 100 | 100 |
| 9 | X | 120/123 (98%) | 109 (91%) | 9 (8%) | 2 (2%) | 9 | 43 |
| 10 | Y | 141/144 (98%) | 121 (86%) | 16 (11%) | 4 (3%) | 5 | 33 |
| 11 | Z | 134/137 (98%) | 118 (88%) | 11 (8%) | 5 (4%) | 3 | 28 |
| 12 | a | 118/127 (93%) | 103 (87%) | 13 (11%) | 2 (2%) | 9 | 43 |
| 13 | b | 114/117 (97%) | 108 (95%) | 6 (5%) | 0 | 100 | 100 |
| 14 | c | 112/115 (97%) | 104 (93%) | 8 (7%) | 0 | 100 | 100 |
| 15 | d | 115/118 (98%) | 115 (100%) | 0 | 0 | 100 | 100 |
| 16 | e | 101/103 (98%) | 92 (91%) | 8 (8%) | 1 (1%) | 15 | 54 |
| 17 | f | 108/110 (98%) | 100 (93%) | 7 (6%) | 1 (1%) | 17 | 56 |
| 18 | g | 91/100 (91%) | 80 (88%) | 9 (10%) | 2 (2%) | 6 | 38 |
| 19 | h | 100/104 (96%) | 84 (84%) | 14 (14%) | 2 (2%) | 7 | 40 |
| 20 | i | 92/94 (98%) | 89 (97%) | 3 (3%) | 0 | 100 | 100 |
| 21 | j | 73/85 (86%) | 71 (97%) | 2 (3%) | 0 | 100 | 100 |
| 22 | k | 75/78 (96%) | 71 (95%) | 3 (4%) | 1 (1%) | 12 | 48 |

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| Mol | Chain | Analysed | Favoured | Allowed | Outliers | Percentiles | |
|-----|-------|---------------|-----------|----------|----------|-------------|-----|
| 23 | l | 61/63 (97%) | 56 (92%) | 5 (8%) | 0 | 100 | 100 |
| 24 | m | 56/59 (95%) | 52 (93%) | 4 (7%) | 0 | 100 | 100 |
| 25 | n | 54/57 (95%) | 48 (89%) | 5 (9%) | 1 (2%) | 8 | 41 |
| 26 | o | 48/55 (87%) | 45 (94%) | 3 (6%) | 0 | 100 | 100 |
| 27 | p | 44/47 (94%) | 40 (91%) | 4 (9%) | 0 | 100 | 100 |
| 28 | q | 62/67 (92%) | 56 (90%) | 5 (8%) | 1 (2%) | 9 | 45 |
| 29 | r | 36/55 (66%) | 35 (97%) | 1 (3%) | 0 | 100 | 100 |
| 31 | L | 50/70 (71%) | 44 (88%) | 5 (10%) | 1 (2%) | 7 | 40 |
| 32 | C | 130/223 (58%) | 123 (95%) | 7 (5%) | 0 | 100 | 100 |
| 33 | U | 147/149 (99%) | 124 (84%) | 21 (14%) | 2 (1%) | 11 | 47 |
| 37 | 1 | 216/244 (88%) | 188 (87%) | 27 (12%) | 1 (0%) | 29 | 68 |
| 38 | 2 | 204/237 (86%) | 186 (91%) | 16 (8%) | 2 (1%) | 15 | 54 |
| 39 | 3 | 203/206 (98%) | 182 (90%) | 21 (10%) | 0 | 100 | 100 |
| 40 | 4 | 148/162 (91%) | 116 (78%) | 30 (20%) | 2 (1%) | 11 | 47 |
| 41 | 5 | 98/131 (75%) | 81 (83%) | 11 (11%) | 6 (6%) | 1 | 19 |
| 42 | 6 | 149/152 (98%) | 139 (93%) | 10 (7%) | 0 | 100 | 100 |
| 43 | 7 | 127/130 (98%) | 121 (95%) | 6 (5%) | 0 | 100 | 100 |
| 44 | 8 | 125/130 (96%) | 103 (82%) | 20 (16%) | 2 (2%) | 9 | 45 |
| 45 | 9 | 96/110 (87%) | 84 (88%) | 9 (9%) | 3 (3%) | 4 | 31 |
| 46 | A | 115/129 (89%) | 102 (89%) | 13 (11%) | 0 | 100 | 100 |
| 47 | B | 121/124 (98%) | 104 (86%) | 15 (12%) | 2 (2%) | 9 | 43 |
| 48 | D | 112/118 (95%) | 103 (92%) | 8 (7%) | 1 (1%) | 17 | 56 |
| 49 | E | 92/101 (91%) | 78 (85%) | 13 (14%) | 1 (1%) | 14 | 52 |
| 50 | F | 86/89 (97%) | 81 (94%) | 5 (6%) | 0 | 100 | 100 |
| 51 | G | 80/100 (80%) | 69 (86%) | 10 (12%) | 1 (1%) | 12 | 48 |
| 52 | H | 78/84 (93%) | 66 (85%) | 9 (12%) | 3 (4%) | 3 | 27 |
| 53 | I | 53/75 (71%) | 49 (92%) | 3 (6%) | 1 (2%) | 8 | 41 |
| 54 | J | 77/92 (84%) | 73 (95%) | 4 (5%) | 0 | 100 | 100 |
| 55 | K | 83/87 (95%) | 78 (94%) | 4 (5%) | 1 (1%) | 13 | 50 |
| 56 | s | 49/88 (56%) | 40 (82%) | 9 (18%) | 0 | 100 | 100 |
| 57 | t | 139/557 (25%) | 115 (83%) | 21 (15%) | 3 (2%) | 6 | 38 |

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| Mol | Chain | Analysed | Favoured | Allowed | Outliers | Percentiles | |
|-----|-------|-----------------|------------|----------|----------|-------------|----|
| All | All | 5936/6871 (86%) | 5354 (90%) | 522 (9%) | 60 (1%) | 20 | 54 |

5 of 60 Ramachandran outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 2 | P | 239 | ASN |
| 10 | Y | 36 | LYS |
| 11 | Z | 58 | LYS |
| 16 | e | 53 | PHE |
| 25 | n | 55 | ILE |

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 | P | 216/220 (98%) | 215 (100%) | 1 (0%) | 88 | 93 |
| 3 | Q | 164/164 (100%) | 161 (98%) | 3 (2%) | 59 | 77 |
| 4 | R | 165/165 (100%) | 161 (98%) | 4 (2%) | 49 | 69 |
| 5 | S | 148/150 (99%) | 148 (100%) | 0 | 100 | 100 |
| 6 | T | 137/138 (99%) | 137 (100%) | 0 | 100 | 100 |
| 7 | V | 109/110 (99%) | 108 (99%) | 1 (1%) | 78 | 87 |
| 8 | W | 116/116 (100%) | 116 (100%) | 0 | 100 | 100 |
| 9 | X | 103/104 (99%) | 103 (100%) | 0 | 100 | 100 |
| 10 | Y | 102/103 (99%) | 102 (100%) | 0 | 100 | 100 |
| 11 | Z | 109/110 (99%) | 108 (99%) | 1 (1%) | 78 | 87 |
| 12 | a | 100/102 (98%) | 97 (97%) | 3 (3%) | 41 | 63 |
| 13 | b | 86/87 (99%) | 86 (100%) | 0 | 100 | 100 |
| 14 | c | 98/100 (98%) | 95 (97%) | 3 (3%) | 40 | 63 |
| 15 | d | 89/90 (99%) | 88 (99%) | 1 (1%) | 73 | 85 |
| 16 | e | 84/84 (100%) | 82 (98%) | 2 (2%) | 49 | 69 |
| 17 | f | 93/93 (100%) | 93 (100%) | 0 | 100 | 100 |

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| Mol | Chain | Analysed | Rotameric | Outliers | Percentiles | |
|-----|-------|----------------|------------|----------|-------------|-----|
| 18 | g | 80/85 (94%) | 80 (100%) | 0 | 100 | 100 |
| 19 | h | 83/85 (98%) | 82 (99%) | 1 (1%) | 71 | 84 |
| 20 | i | 78/78 (100%) | 78 (100%) | 0 | 100 | 100 |
| 21 | j | 56/62 (90%) | 55 (98%) | 1 (2%) | 59 | 77 |
| 22 | k | 67/68 (98%) | 67 (100%) | 0 | 100 | 100 |
| 23 | l | 55/55 (100%) | 55 (100%) | 0 | 100 | 100 |
| 24 | m | 48/49 (98%) | 48 (100%) | 0 | 100 | 100 |
| 25 | n | 47/48 (98%) | 46 (98%) | 1 (2%) | 53 | 72 |
| 26 | o | 45/49 (92%) | 45 (100%) | 0 | 100 | 100 |
| 27 | p | 38/39 (97%) | 38 (100%) | 0 | 100 | 100 |
| 28 | q | 51/54 (94%) | 49 (96%) | 2 (4%) | 32 | 57 |
| 29 | r | 34/50 (68%) | 34 (100%) | 0 | 100 | 100 |
| 31 | L | 47/63 (75%) | 47 (100%) | 0 | 100 | 100 |
| 32 | C | 110/174 (63%) | 110 (100%) | 0 | 100 | 100 |
| 33 | U | 114/114 (100%) | 113 (99%) | 1 (1%) | 78 | 87 |
| 37 | 1 | 180/202 (89%) | 178 (99%) | 2 (1%) | 73 | 85 |
| 38 | 2 | 170/196 (87%) | 169 (99%) | 1 (1%) | 86 | 92 |
| 39 | 3 | 172/173 (99%) | 172 (100%) | 0 | 100 | 100 |
| 40 | 4 | 113/123 (92%) | 110 (97%) | 3 (3%) | 44 | 66 |
| 41 | 5 | 87/112 (78%) | 86 (99%) | 1 (1%) | 73 | 85 |
| 42 | 6 | 124/125 (99%) | 123 (99%) | 1 (1%) | 81 | 89 |
| 43 | 7 | 104/105 (99%) | 104 (100%) | 0 | 100 | 100 |
| 44 | 8 | 105/107 (98%) | 104 (99%) | 1 (1%) | 76 | 86 |
| 45 | 9 | 86/97 (89%) | 85 (99%) | 1 (1%) | 71 | 84 |
| 46 | A | 90/98 (92%) | 89 (99%) | 1 (1%) | 73 | 85 |
| 47 | B | 103/104 (99%) | 103 (100%) | 0 | 100 | 100 |
| 48 | D | 92/96 (96%) | 91 (99%) | 1 (1%) | 73 | 85 |
| 49 | E | 79/83 (95%) | 79 (100%) | 0 | 100 | 100 |
| 50 | F | 75/77 (97%) | 74 (99%) | 1 (1%) | 69 | 82 |
| 51 | G | 65/80 (81%) | 65 (100%) | 0 | 100 | 100 |
| 52 | H | 74/77 (96%) | 73 (99%) | 1 (1%) | 67 | 81 |

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| Mol | Chain | Analysed | Rotameric | Outliers | Percentiles | |
|-----|-------|-----------------|------------|----------|-------------|-----|
| 53 | I | 48/66 (73%) | 48 (100%) | 0 | 100 | 100 |
| 54 | J | 70/80 (88%) | 68 (97%) | 2 (3%) | 42 | 64 |
| 55 | K | 65/66 (98%) | 65 (100%) | 0 | 100 | 100 |
| 56 | s | 44/76 (58%) | 43 (98%) | 1 (2%) | 50 | 70 |
| All | All | 4818/5152 (94%) | 4776 (99%) | 42 (1%) | 79 | 87 |

5 of 42 residues with a non-rotameric sidechain are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 40 | 4 | 15 | LEU |
| 46 | A | 93 | ARG |
| 40 | 4 | 115 | LEU |
| 42 | 6 | 25 | LYS |
| 50 | F | 70 | LEU |

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

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 33 | U | 2 | GLN |
| 41 | 5 | 55 | HIS |
| 33 | U | 18 | GLN |
| 40 | 4 | 89 | HIS |
| 46 | A | 118 | HIS |

5.3.3 RNA [i](#)

| Mol | Chain | Analysed | Backbone Outliers | Pucker Outliers |
|-----|-------|-----------------|-------------------|-----------------|
| 1 | O | 117/120 (97%) | 21 (17%) | 1 (0%) |
| 30 | N | 2894/2903 (99%) | 520 (17%) | 34 (1%) |
| 34 | M | 74/75 (98%) | 11 (14%) | 0 |
| 35 | x | 13/692 (1%) | 11 (84%) | 0 |
| 36 | 0 | 1538/1539 (99%) | 281 (18%) | 21 (1%) |
| 58 | u | 72/73 (98%) | 19 (26%) | 0 |
| All | All | 4708/5402 (87%) | 863 (18%) | 56 (1%) |

5 of 863 RNA backbone outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1 | O | 13 | G |
| 1 | O | 25 | U |
| 1 | O | 31 | C |
| 1 | O | 35 | C |
| 1 | O | 41 | G |

5 of 56 RNA pucker outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|------|------|
| 30 | N | 2286 | G |
| 36 | 0 | 1528 | U |
| 36 | 0 | 64 | G |
| 36 | 0 | 1491 | G |
| 36 | 0 | 1190 | G |

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](#)

Of 3 ligands modelled in this entry, 3 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 [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

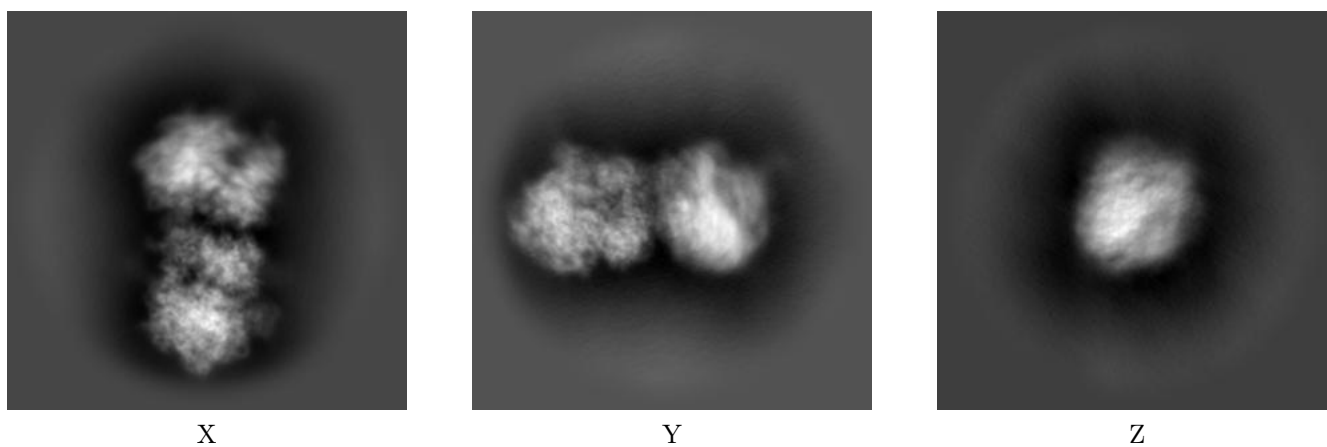
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-13955. These allow visual inspection of the internal detail of the map and identification of artifacts.

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

6.1 Orthogonal projections [i](#)

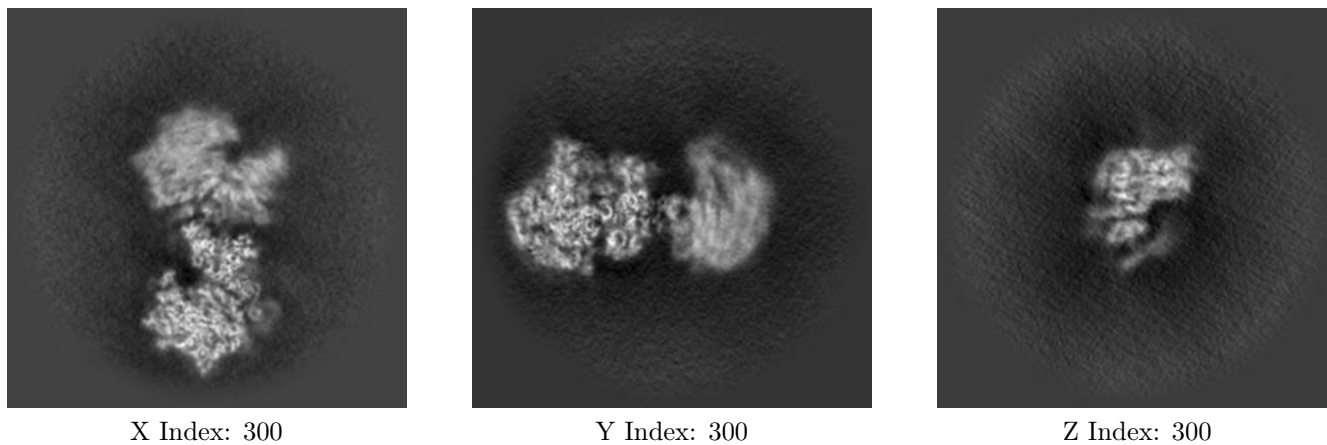
6.1.1 Primary map



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

6.2 Central slices [i](#)

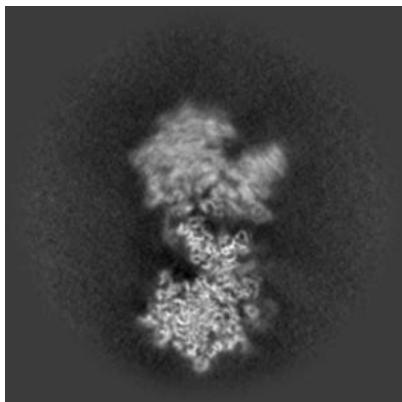
6.2.1 Primary map



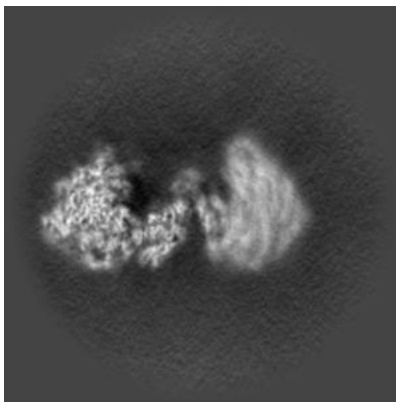
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

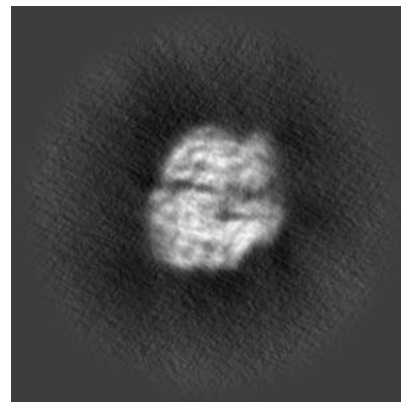
6.3.1 Primary map



X Index: 294



Y Index: 273



Z Index: 348

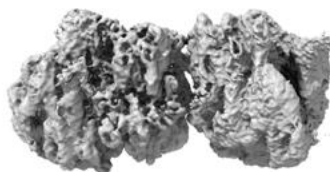
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal surface views [i](#)

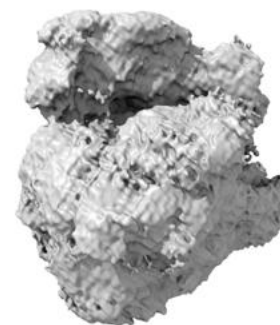
6.4.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.45. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

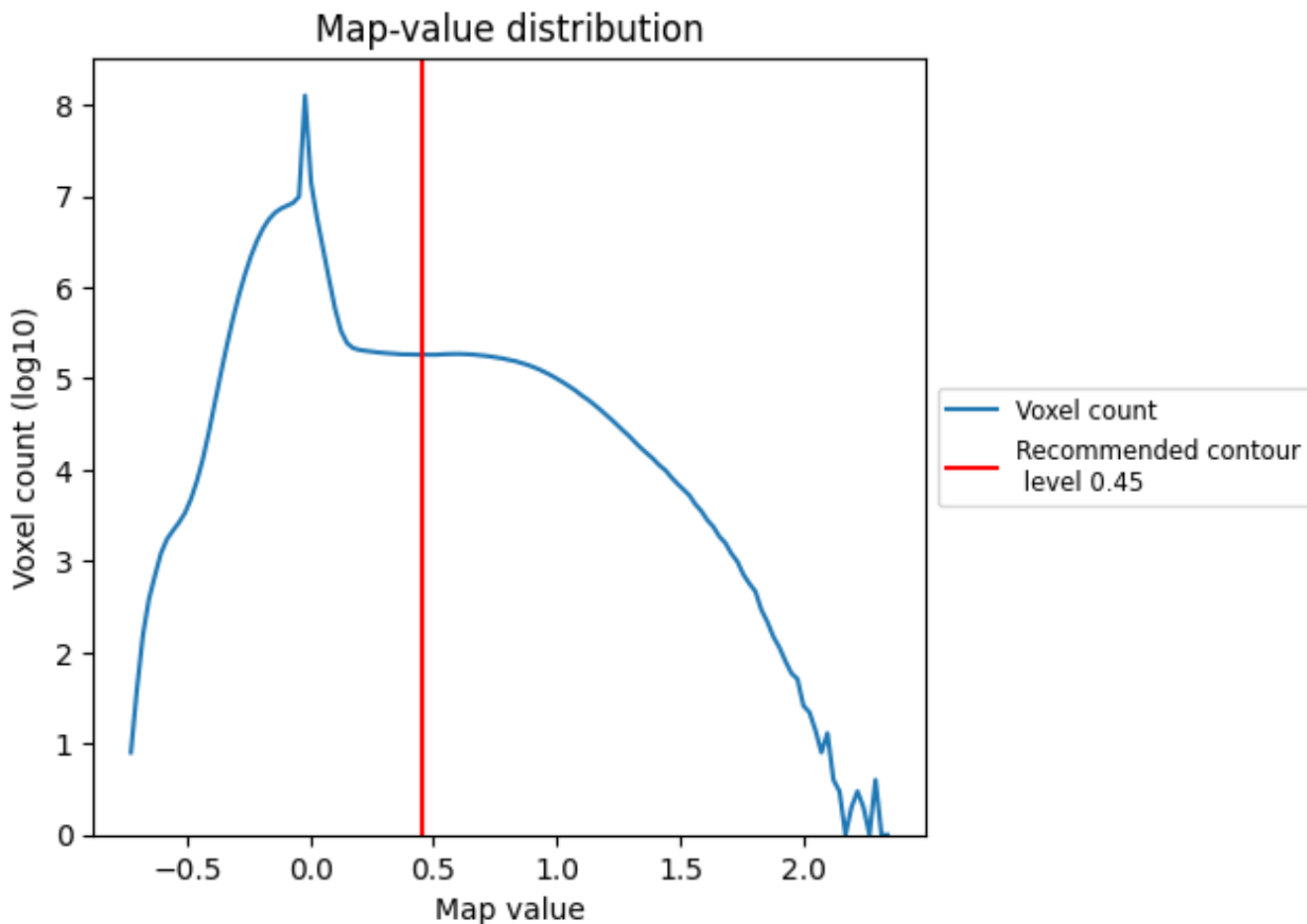
6.5 Mask visualisation

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

7 Map analysis [i](#)

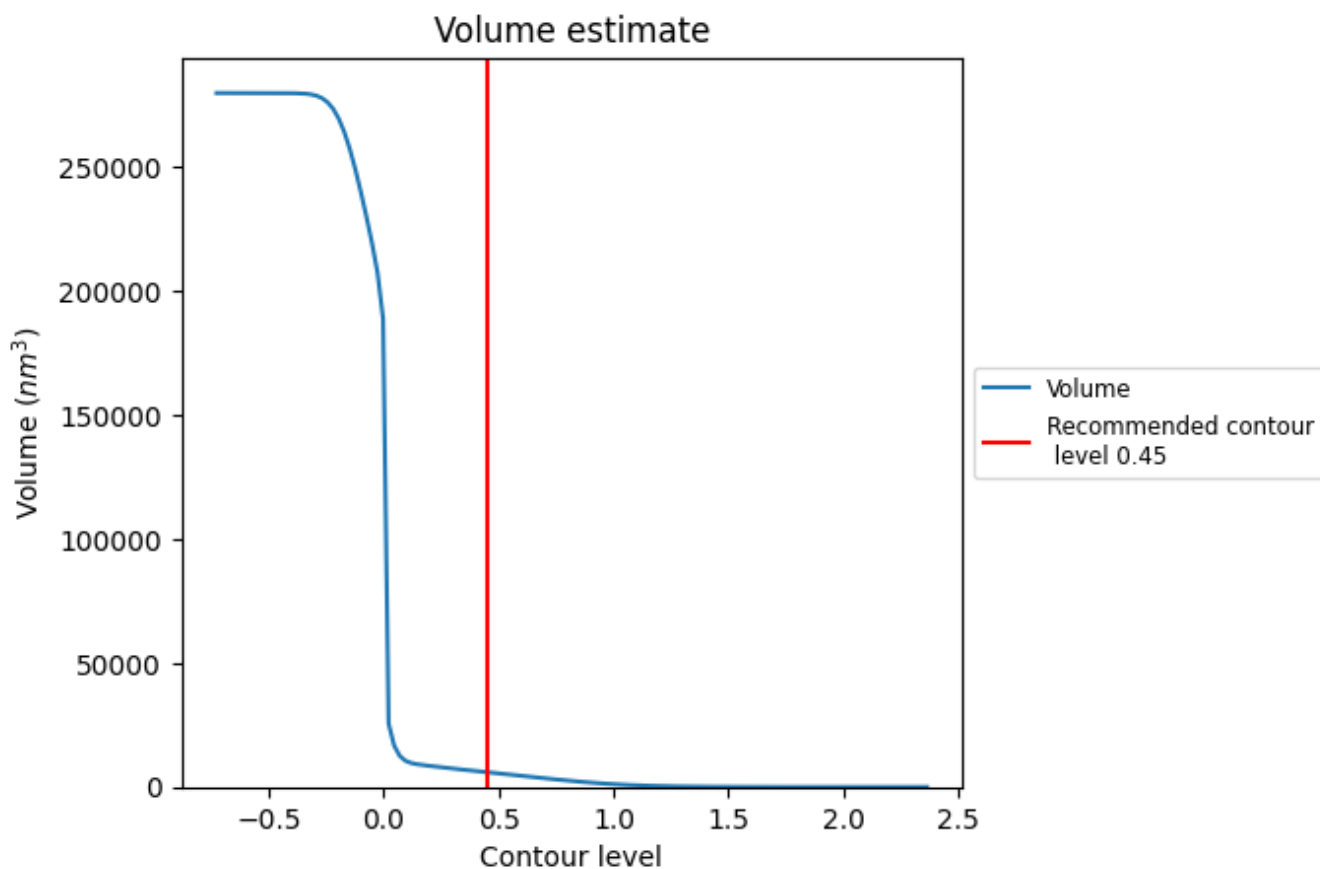
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

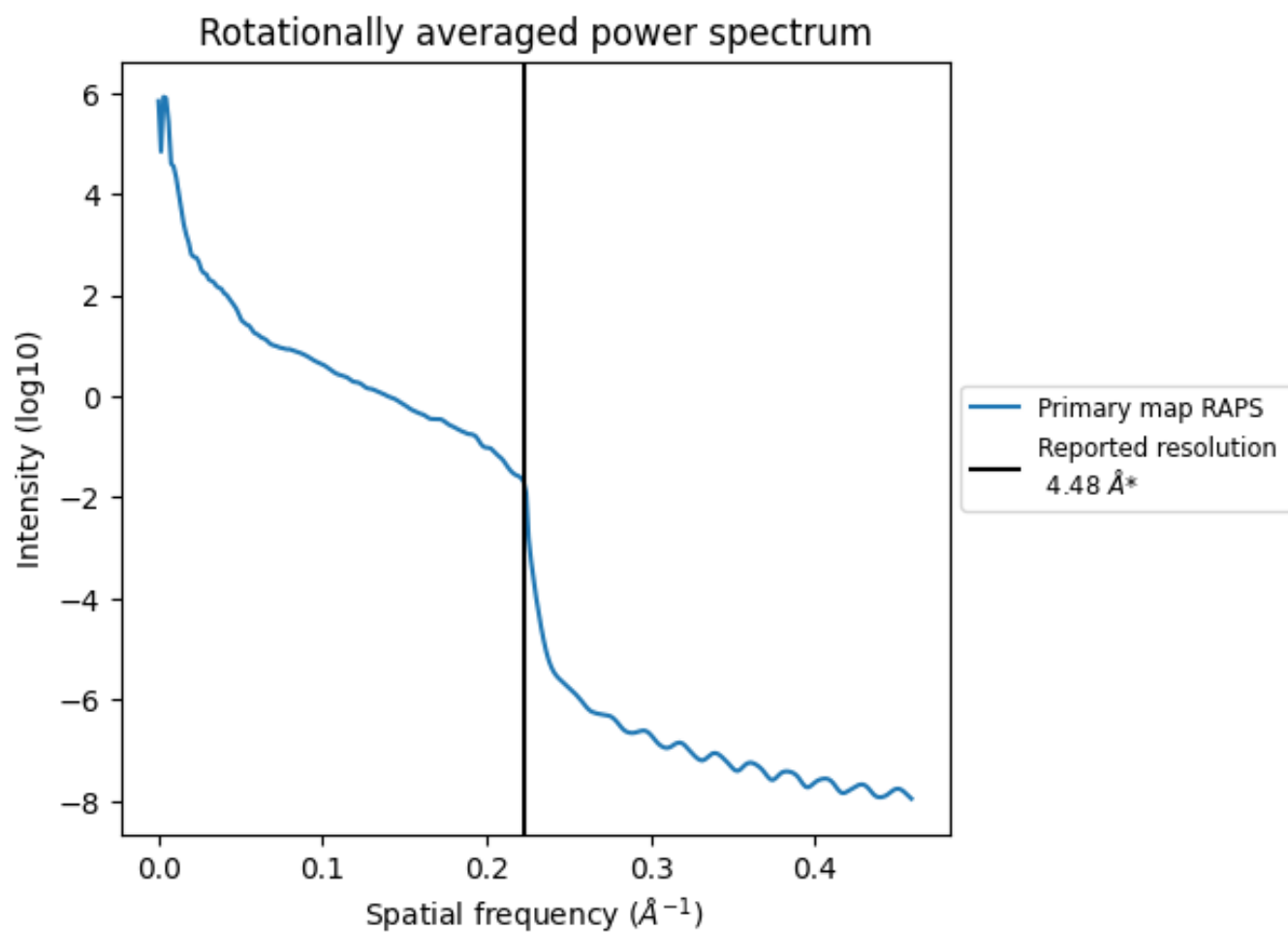
7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 5945 nm^3 ; this corresponds to an approximate mass of 5371 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 0.223\AA^{-1}

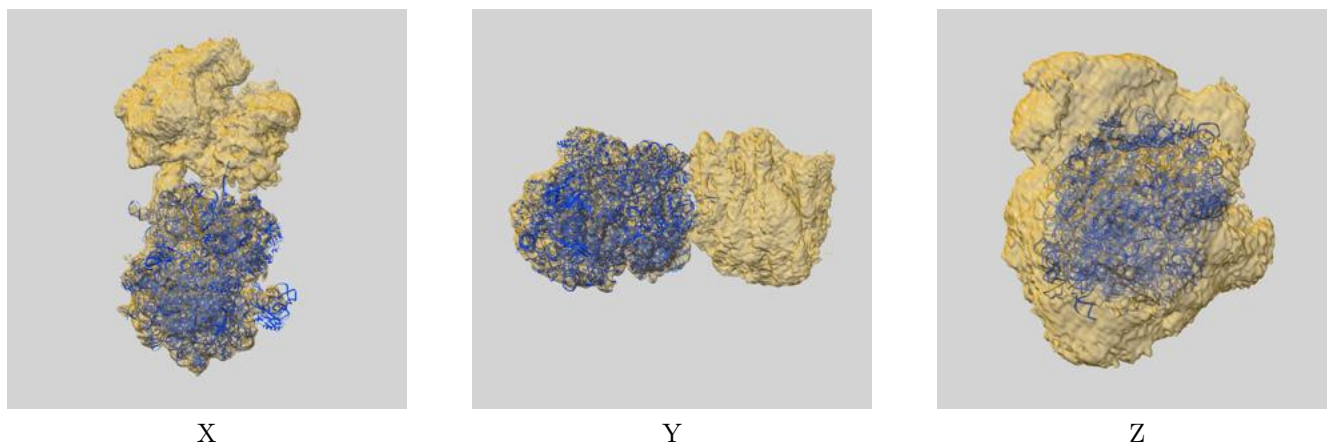
8 Fourier-Shell correlation

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

9 Map-model fit [i](#)

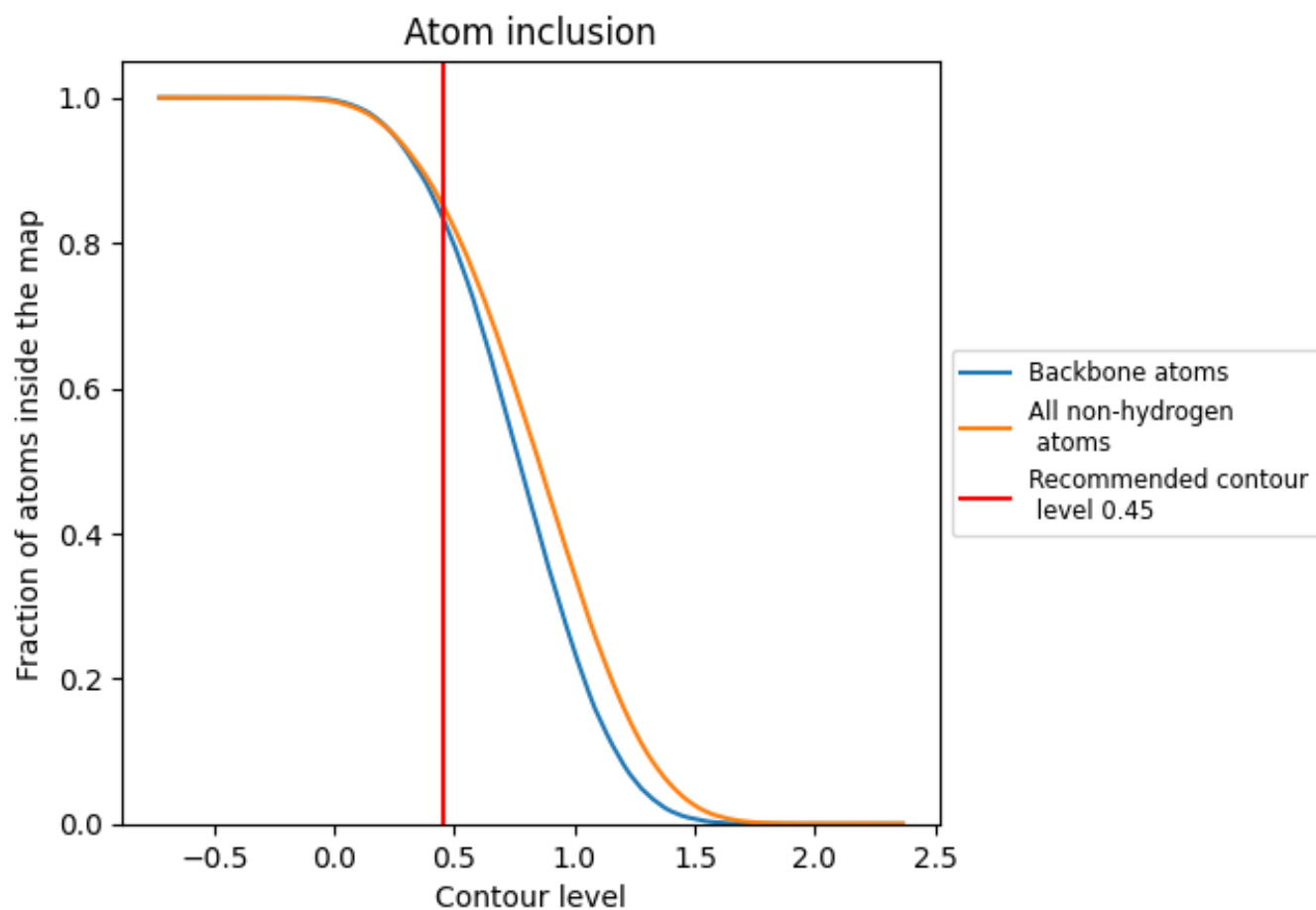
This section contains information regarding the fit between EMDB map EMD-13955 and PDB model 7QGH. Per-residue inclusion information can be found in section [3](#) on page [16](#).

9.1 Map-model overlay [i](#)



The images above show the 3D surface view of the map at the recommended contour level 0.45 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 Atom inclusion [i](#)



At the recommended contour level, 84% of all backbone atoms, 85% of all non-hydrogen atoms, are inside the map.