



wwPDB EM Validation Summary Report ⓘ

Dec 18, 2022 – 07:54 am GMT

PDB ID : 7A5K
EMDB ID : EMD-11646
Title : Structure of the human mitoribosome in the post translocation state bound to mtEF-G1
Authors : Desai, N.; Yang, H.; Chandrasekaran, V.; Kazi, R.; Minczuk, M.; Ramakrishnan, V.
Deposited on : 2020-08-21
Resolution : 3.70 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 types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

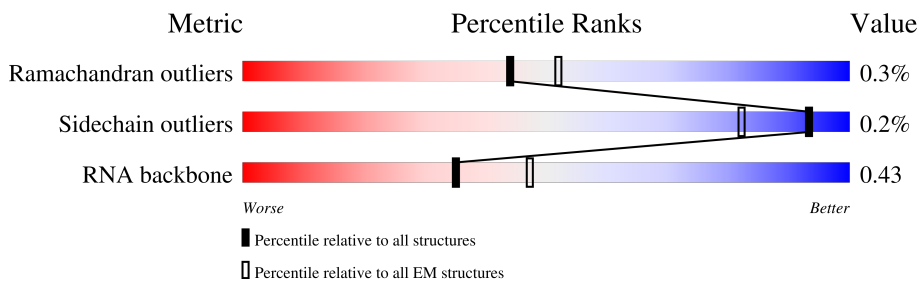
EMDB validation analysis : 0.0.1.dev43
Mogul : 1.8.4, CSD as541be (2020)
MolProbity : 4.02b-467
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.9
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.31.3

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 3.70 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 | r1 | 751 | |
| 2 | Y2 | 29 | |
| 3 | 8 | 1559 | |
| 3 | A3 | 1559 | |
| 4 | B3 | 73 | |
| 5 | D3 | 305 | |
| 6 | E3 | 348 | |
| 7 | F3 | 311 | |

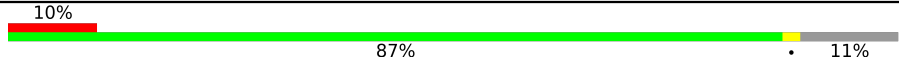

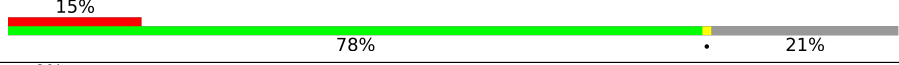

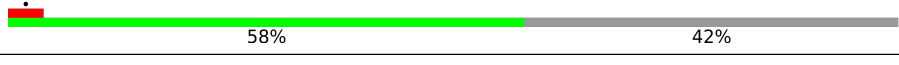
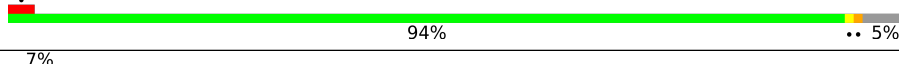
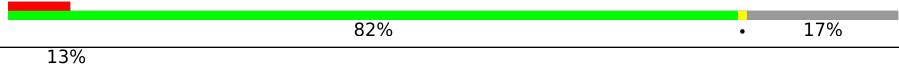
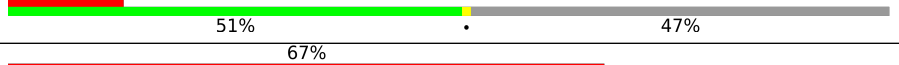
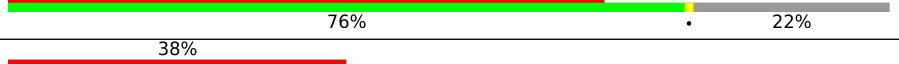


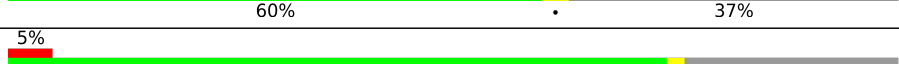
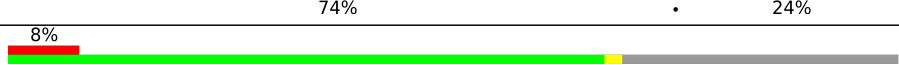
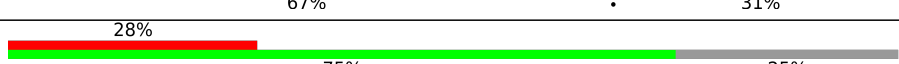
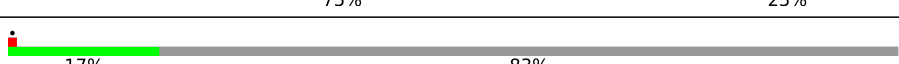

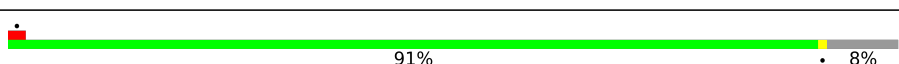
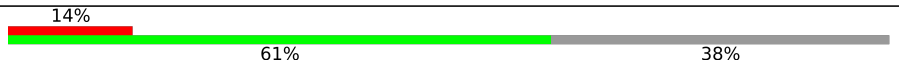
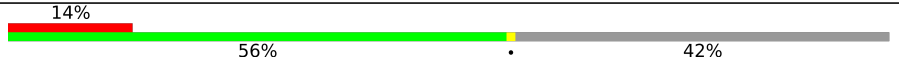


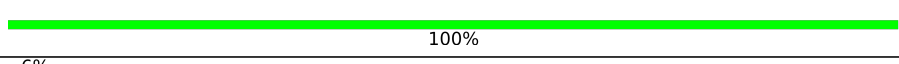
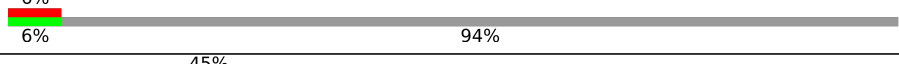


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| Mol | Chain | Length | Quality of chain |
|-----|-------|--------|------------------|
| 8 | D | 267 | |
| 8 | H3 | 267 | |
| 9 | I3 | 261 | |
| 10 | J3 | 192 | |
| 11 | K3 | 178 | |
| 12 | L3 | 145 | |
| 13 | M3 | 296 | |
| 14 | N3 | 251 | |
| 15 | O3 | 175 | |
| 16 | P3 | 179 | |
| 17 | Q3 | 292 | |
| 18 | R3 | 149 | |
| 19 | S3 | 205 | |
| 20 | T3 | 212 | |
| 21 | U3 | 153 | |
| 22 | V3 | 216 | |
| 23 | W3 | 148 | |
| 24 | X3 | 256 | |
| 25 | Y3 | 250 | |
| 26 | Z3 | 161 | |
| 27 | 03 | 188 | |
| 28 | 13 | 65 | |
| 29 | 23 | 92 | |
| 30 | 33 | 188 | |
| 31 | 43 | 103 | |

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| Mol | Chain | Length | Quality of chain |
|-----|-------|--------|--|
| 32 | 53 | 423 |  |
| 33 | 63 | 380 |  |
| 34 | 73 | 338 |  |
| 35 | 93 | 137 |  |
| 36 | a3 | 142 |  |
| 37 | b3 | 155 |  |
| 38 | c3 | 332 |  |
| 39 | d3 | 306 |  |
| 40 | e3 | 279 |  |
| 41 | f3 | 194 |  |
| 42 | g3 | 166 |  |
| 43 | h3 | 158 |  |
| 44 | i3 | 128 |  |
| 45 | j3 | 123 |  |
| 46 | k3 | 112 |  |
| 47 | l3 | 138 |  |
| 48 | m3 | 128 |  |
| 49 | o3 | 102 |  |
| 50 | p3 | 206 |  |
| 51 | q3 | 222 |  |
| 52 | r3 | 196 |  |
| 53 | s3 | 439 |  |
| 54 | u3 | 2 |  |
| 55 | A5 | 435 |  |
| 56 | B6 | 296 |  |

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| Mol | Chain | Length | Quality of chain |
|-----|-------|--------|-------------------|
| 57 | C6 | 167 | 78% 79% 21% |
| 58 | D6 | 430 | 43% 73% 25% |
| 59 | E6 | 125 | 78% 97% .. |
| 60 | F6 | 242 | 83% 81% .. 17% |
| 61 | G6 | 396 | 70% 76% 23% |
| 62 | H6 | 201 | 59% 60% 39% |
| 63 | I6 | 194 | 50% 69% 30% |
| 64 | J6 | 138 | 14% 77% 22% |
| 65 | K6 | 128 | 77% 78% 21% |
| 66 | L6 | 257 | 37% 63% 36% |
| 67 | M6 | 137 | 53% 82% 15% |
| 68 | N6 | 130 | 38% 79% 18% |
| 69 | O6 | 258 | 51% 68% 28% |
| 70 | P6 | 142 | 48% 65% 32% |
| 71 | Q6 | 87 | 56% 99% . |
| 72 | R6 | 360 | 56% 65% 33% |
| 73 | S6 | 190 | 52% 65% 34% |
| 74 | T6 | 173 | 54% 92% . 6% |
| 75 | U6 | 205 | 66% 83% 16% |
| 76 | V6 | 414 | 70% 78% 21% |
| 77 | W6 | 187 | 43% 51% 48% |
| 78 | X6 | 398 | 79% 78% 21% |
| 79 | Y6 | 395 | 27% 27% 73% |
| 80 | Z6 | 106 | 81% 82% 18% |
| 81 | a6 | 218 | 70% 88% 8% |

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| Mol | Chain | Length | Quality of chain |
|-----|-------|--------|---------------------------|
| 82 | b6 | 323 | <p>78% 77% 21%</p> |
| 83 | c6 | 118 | <p>73% 95%</p> |
| 84 | d6 | 199 | <p>9% 35% 65%</p> |
| 85 | e6 | 689 | <p>60% 59% 40%</p> |
| 86 | A6 | 954 | <p>28% 65% 29%</p> |
| 87 | 24 | 73 | <p>95% 41% 53% 5%</p> |
| 87 | FE | 73 | <p>73% 41% 53% 5%</p> |
| 88 | A | 206 | <p>62% 74% 21%</p> |
| 89 | n | 286 | <p>73% 75% 24%</p> |
| 90 | B | 28 | <p>71% 100%</p> |

2 Entry composition

There are 95 unique types of molecules in this entry. The entry contains 171122 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a protein called Elongation factor G, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|------|----|---------|-------|
| | | | Total | C | N | O | S | | |
| 1 | r1 | 696 | 5452 | 3435 | 940 | 1044 | 33 | 0 | 0 |

- Molecule 2 is a protein called nascent chain.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|-----|-------|----------|-------|----|----|----|---------|-------|
| | | | Total | C | N | O | | |
| 2 | Y2 | 29 | 145 | 87 | 29 | 29 | 0 | 0 |

- Molecule 3 is a RNA chain called 16S rRNA.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-------|------|-------|------|---------|-------|
| | | | Total | C | N | O | P | | |
| 3 | A3 | 1503 | 31913 | 14319 | 5761 | 10330 | 1503 | 0 | 0 |
| 3 | 8 | 8 | 175 | 79 | 37 | 51 | 8 | 0 | 0 |

There are 2 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
|-------|---------|----------|--------|----------|---------------|
| A3 | 3107 | U | UNK | conflict | GB 1025814679 |
| 8 | 663 | U | UNK | conflict | GB 1025814679 |

- Molecule 4 is a RNA chain called mt-tRNAVal.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|----|---------|-------|
| | | | Total | C | N | O | P | | |
| 4 | B3 | 56 | 1191 | 534 | 214 | 387 | 56 | 0 | 0 |

- Molecule 5 is a protein called 39S ribosomal protein L2, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 5 | D3 | 236 | Total | C | N | O | S | 0 | 0 |
| | | | 1842 | 1145 | 373 | 315 | 9 | | |

- Molecule 6 is a protein called 39S ribosomal protein L3, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 6 | E3 | 300 | Total | C | N | O | S | 0 | 0 |
| | | | 2365 | 1523 | 410 | 422 | 10 | | |

- Molecule 7 is a protein called 39S ribosomal protein L4, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 7 | F3 | 250 | Total | C | N | O | S | 0 | 0 |
| | | | 2013 | 1294 | 365 | 348 | 6 | | |

- Molecule 8 is a protein called 39S ribosomal protein L9, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 8 | H3 | 95 | Total | C | N | O | | 0 | 0 |
| | | | 784 | 498 | 152 | 134 | | | |
| 8 | D | 80 | Total | C | N | O | S | 0 | 0 |
| | | | 648 | 421 | 111 | 112 | 4 | | |

- Molecule 9 is a protein called 39S ribosomal protein L10, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|----|---------|-------|
| 9 | I3 | 158 | Total | C | N | O | S | 0 | 0 |
| | | | 1283 | 828 | 235 | 210 | 10 | | |

- Molecule 10 is a protein called 39S ribosomal protein L11, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 10 | J3 | 140 | Total | C | N | O | S | 0 | 0 |
| | | | 1061 | 680 | 192 | 187 | 2 | | |

- Molecule 11 is a protein called 39S ribosomal protein L13, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 11 | K3 | 177 | Total | C | N | O | S | 0 | 0 |
| | | | 1451 | 934 | 259 | 251 | 7 | | |

- Molecule 12 is a protein called 39S ribosomal protein L14, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 12 | L3 | 115 | Total | C | N | O | S | 0 | 0 |
| | | | 889 | 559 | 171 | 154 | 5 | | |

- Molecule 13 is a protein called 39S ribosomal protein L15, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 13 | M3 | 287 | Total | C | N | O | S | 0 | 0 |
| | | | 2305 | 1472 | 425 | 402 | 6 | | |

- Molecule 14 is a protein called 39S ribosomal protein L16, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 14 | N3 | 205 | Total | C | N | O | S | 0 | 0 |
| | | | 1654 | 1056 | 308 | 280 | 10 | | |

- Molecule 15 is a protein called 39S ribosomal protein L17, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 15 | O3 | 152 | Total | C | N | O | S | 0 | 0 |
| | | | 1245 | 784 | 239 | 215 | 7 | | |

- Molecule 16 is a protein called Mitochondrial ribosomal protein L18, isoform CRA_b.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 16 | P3 | 133 | Total | C | N | O | S | 0 | 0 |
| | | | 1080 | 677 | 209 | 189 | 5 | | |

- Molecule 17 is a protein called 39S ribosomal protein L19, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 17 | Q3 | 219 | Total | C | N | O | S | 0 | 0 |
| | | | 1822 | 1168 | 322 | 323 | 9 | | |

- Molecule 18 is a protein called 39S ribosomal protein L20, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 18 | R3 | 140 | Total | C | N | O | S | 0 | 0 |
| | | | 1153 | 732 | 231 | 186 | 4 | | |

- Molecule 19 is a protein called 39S ribosomal protein L21, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 19 | S3 | 156 | 1251 | 806 | 222 | 219 | 4 | 0 | 0 |

- Molecule 20 is a protein called 39S ribosomal protein L22, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 20 | T3 | 166 | 1368 | 875 | 254 | 232 | 7 | 0 | 0 |

- Molecule 21 is a protein called 39S ribosomal protein L23, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 21 | U3 | 111 | 922 | 591 | 176 | 153 | 2 | 0 | 0 |

- Molecule 22 is a protein called 39S ribosomal protein L24, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 22 | V3 | 189 | 1551 | 987 | 278 | 278 | 8 | 0 | 0 |

- Molecule 23 is a protein called 39S ribosomal protein L27, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 23 | W3 | 111 | 871 | 558 | 164 | 146 | 3 | 0 | 0 |

- Molecule 24 is a protein called 39S ribosomal protein L28, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 24 | X3 | 243 | 2027 | 1310 | 350 | 362 | 5 | 0 | 0 |

There are 3 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
|-------|---------|----------|--------|----------|------------|
| X3 | 148 | ALA | THR | conflict | UNP Q13084 |
| X3 | 149 | SER | PRO | conflict | UNP Q13084 |
| X3 | 150 | GLY | LYS | conflict | UNP Q13084 |

- Molecule 25 is a protein called 39S ribosomal protein L47, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 25 | Y3 | 176 | Total | C | N | O | S | 0 | 0 |
| | | | 1517 | 970 | 291 | 252 | 4 | | |

- Molecule 26 is a protein called 39S ribosomal protein L30, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 26 | Z3 | 120 | Total | C | N | O | S | 0 | 0 |
| | | | 978 | 626 | 183 | 166 | 3 | | |

- Molecule 27 is a protein called 39S ribosomal protein L32, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 27 | 03 | 108 | Total | C | N | O | S | 0 | 0 |
| | | | 880 | 545 | 172 | 157 | 6 | | |

- Molecule 28 is a protein called 39S ribosomal protein L33, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 28 | 13 | 52 | Total | C | N | O | S | 0 | 0 |
| | | | 433 | 278 | 83 | 70 | 2 | | |

- Molecule 29 is a protein called 39S ribosomal protein L34, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 29 | 23 | 46 | Total | C | N | O | S | 0 | 0 |
| | | | 376 | 233 | 83 | 59 | 1 | | |

- Molecule 30 is a protein called 39S ribosomal protein L35, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 30 | 33 | 95 | Total | C | N | O | S | 0 | 0 |
| | | | 831 | 539 | 162 | 127 | 3 | | |

- Molecule 31 is a protein called 39S ribosomal protein L36, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 31 | 43 | 36 | Total | C | N | O | S | 0 | 0 |
| | | | 322 | 203 | 70 | 46 | 3 | | |

- Molecule 32 is a protein called 39S ribosomal protein L37, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| | | | Total | C | N | O | S | | |
| 32 | 53 | 376 | 3064 | 1987 | 529 | 538 | 10 | 0 | 0 |

- Molecule 33 is a protein called 39S ribosomal protein L38, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 33 | 63 | 325 | 2636 | 1692 | 465 | 470 | 9 | 0 | 0 |

- Molecule 34 is a protein called 39S ribosomal protein L39, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| | | | Total | C | N | O | S | | |
| 34 | 73 | 266 | 2158 | 1383 | 371 | 388 | 16 | 0 | 0 |

- Molecule 35 is a protein called 39S ribosomal protein L41, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 35 | 93 | 109 | 873 | 565 | 152 | 154 | 2 | 0 | 0 |

- Molecule 36 is a protein called 39S ribosomal protein L42, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 36 | a3 | 82 | 686 | 434 | 124 | 123 | 5 | 0 | 0 |

- Molecule 37 is a protein called 39S ribosomal protein L43, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 37 | b3 | 148 | 1178 | 733 | 229 | 213 | 3 | 0 | 0 |

- Molecule 38 is a protein called 39S ribosomal protein L44, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 38 | c3 | 275 | 2217 | 1415 | 383 | 410 | 9 | 0 | 0 |

- Molecule 39 is a protein called 39S ribosomal protein L45, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 39 | d3 | 162 | 1347 | 870 | 234 | 235 | 8 | 0 | 0 |

- Molecule 40 is a protein called 39S ribosomal protein L46, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 40 | e3 | 217 | 1762 | 1124 | 310 | 323 | 5 | 0 | 0 |

- Molecule 41 is a protein called 39S ribosomal protein L48, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 41 | f3 | 131 | 1039 | 663 | 169 | 203 | 4 | 0 | 0 |

- Molecule 42 is a protein called 39S ribosomal protein L49, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 42 | g3 | 129 | 1067 | 690 | 185 | 190 | 2 | 0 | 0 |

- Molecule 43 is a protein called 39S ribosomal protein L50, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 43 | h3 | 100 | 827 | 524 | 146 | 155 | 2 | 0 | 0 |

- Molecule 44 is a protein called 39S ribosomal protein L51, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 44 | i3 | 97 | 827 | 532 | 165 | 126 | 4 | 0 | 0 |

- Molecule 45 is a protein called cDNA FLJ76418, highly similar to Homo sapiens mitochondrial ribosomal protein L52 (MRPL52), transcript variant 1, mRNA.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 45 | j3 | 85 | 684 | 423 | 133 | 126 | 2 | 0 | 0 |

- Molecule 46 is a protein called 39S ribosomal protein L53, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 46 | k3 | 84 | 655 | 407 | 122 | 121 | 5 | 0 | 0 |

- Molecule 47 is a protein called 39S ribosomal protein L54, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---------|-------|
| | | | Total | C | N | O | | |
| 47 | l3 | 23 | 221 | 137 | 52 | 32 | 0 | 0 |

- Molecule 48 is a protein called 39S ribosomal protein L55, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 48 | m3 | 45 | 372 | 232 | 76 | 62 | 2 | 0 | 0 |

- Molecule 49 is a protein called Ribosomal protein 63, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 49 | o3 | 94 | 797 | 501 | 165 | 128 | 3 | 0 | 0 |

- Molecule 50 is a protein called Peptidyl-tRNA hydrolase ICT1, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 50 | p3 | 127 | 1058 | 661 | 201 | 192 | 4 | 0 | 0 |

- Molecule 51 is a protein called Growth arrest and DNA damage-inducible proteins-interacting protein 1.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 51 | q3 | 128 | 1076 | 671 | 208 | 192 | 5 | 0 | 0 |

- Molecule 52 is a protein called 39S ribosomal protein S18a, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 52 | r3 | 146 | 1203 | 764 | 232 | 199 | 8 | 0 | 0 |

- Molecule 53 is a protein called 39S ribosomal protein S30, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| | | | Total | C | N | O | S | | |
| 53 | s3 | 370 | 3036 | 1946 | 542 | 534 | 14 | 0 | 0 |

- Molecule 54 is a RNA chain called RNA.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|----|---|----|---|---------|-------|
| | | | Total | C | N | O | P | | |
| 54 | u3 | 2 | 42 | 19 | 8 | 13 | 2 | 0 | 0 |

- Molecule 55 is a protein called Mitochondrial inner membrane protein OXA1L.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|-----|-------|----------|-------|----|----|----|---------|-------|
| | | | Total | C | N | O | | |
| 55 | A5 | 28 | 136 | 80 | 28 | 28 | 0 | 0 |

- Molecule 56 is a protein called 28S ribosomal protein S2, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| | | | Total | C | N | O | S | | |
| 56 | B6 | 217 | 1768 | 1131 | 321 | 306 | 10 | 0 | 0 |

- Molecule 57 is a protein called 28S ribosomal protein S24, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 57 | C6 | 132 | 1082 | 699 | 195 | 184 | 4 | 0 | 0 |

- Molecule 58 is a protein called 28S ribosomal protein S5, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| | | | Total | C | N | O | S | | |
| 58 | D6 | 322 | 2557 | 1611 | 476 | 457 | 13 | 0 | 0 |

- Molecule 59 is a protein called 28S ribosomal protein S6, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 59 | E6 | 122 | 972 | 614 | 177 | 177 | 4 | 0 | 0 |

- Molecule 60 is a protein called 28S ribosomal protein S7, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| | | | Total | C | N | O | S | | |
| 60 | F6 | 201 | 1668 | 1069 | 305 | 283 | 11 | 0 | 0 |

- Molecule 61 is a protein called 28S ribosomal protein S9, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| | | | Total | C | N | O | S | | |
| 61 | G6 | 305 | 2516 | 1599 | 448 | 455 | 14 | 0 | 0 |

- Molecule 62 is a protein called 28S ribosomal protein S10, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 62 | H6 | 122 | 999 | 643 | 168 | 185 | 3 | 0 | 0 |

- Molecule 63 is a protein called 28S ribosomal protein S11, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 63 | I6 | 136 | 1011 | 637 | 192 | 178 | 4 | 0 | 0 |

- Molecule 64 is a protein called 28S ribosomal protein S12, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 64 | J6 | 108 | 838 | 521 | 169 | 142 | 6 | 0 | 0 |

- Molecule 65 is a protein called 28S ribosomal protein S14, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 65 | K6 | 101 | 861 | 537 | 179 | 140 | 5 | 0 | 0 |

- Molecule 66 is a protein called 28S ribosomal protein S15, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 66 | L6 | 164 | 1382 | 883 | 257 | 235 | 7 | 0 | 0 |

- Molecule 67 is a protein called 28S ribosomal protein S16, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 67 | M6 | 116 | 920 | 582 | 182 | 150 | 6 | 0 | 0 |

- Molecule 68 is a protein called 28S ribosomal protein S17, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 68 | N6 | 107 | 846 | 549 | 153 | 141 | 3 | 0 | 0 |

- Molecule 69 is a protein called 28S ribosomal protein S18b, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 69 | O6 | 185 | 1528 | 970 | 285 | 267 | 6 | 0 | 0 |

- Molecule 70 is a protein called 28S ribosomal protein S18c, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 70 | P6 | 96 | 774 | 498 | 133 | 135 | 8 | 0 | 0 |

- Molecule 71 is a protein called 28S ribosomal protein S21, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 71 | Q6 | 86 | 740 | 458 | 150 | 124 | 8 | 0 | 0 |

There is a discrepancy between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
|-------|---------|----------|--------|----------|------------|
| Q6 | 50 | ARG | CYS | conflict | UNP P82921 |

- Molecule 72 is a protein called 28S ribosomal protein S22, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 72 | R6 | 242 | 2008 | 1285 | 343 | 372 | 8 | 0 | 0 |

- Molecule 73 is a protein called 28S ribosomal protein S23, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 73 | S6 | 126 | Total | C | N | O | S | 0 | 0 |
| | | | 1042 | 673 | 183 | 185 | 1 | | |

- Molecule 74 is a protein called 28S ribosomal protein S25, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|----|---------|-------|
| 74 | T6 | 162 | Total | C | N | O | S | 0 | 0 |
| | | | 1330 | 850 | 231 | 238 | 11 | | |

- Molecule 75 is a protein called 28S ribosomal protein S26, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 75 | U6 | 173 | Total | C | N | O | S | 0 | 0 |
| | | | 1461 | 900 | 294 | 263 | 4 | | |

- Molecule 76 is a protein called 28S ribosomal protein S27, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 76 | V6 | 328 | Total | C | N | O | S | 0 | 0 |
| | | | 2702 | 1737 | 452 | 502 | 11 | | |

- Molecule 77 is a protein called 28S ribosomal protein S28, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 77 | W6 | 97 | Total | C | N | O | S | 0 | 0 |
| | | | 766 | 486 | 137 | 139 | 4 | | |

- Molecule 78 is a protein called 28S ribosomal protein S29, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 78 | X6 | 316 | Total | C | N | O | S | 0 | 0 |
| | | | 2531 | 1625 | 440 | 455 | 11 | | |

- Molecule 79 is a protein called 28S ribosomal protein S31, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 79 | Y6 | 108 | Total | C | N | O | S | 0 | 0 |
| | | | 914 | 593 | 150 | 169 | 2 | | |

- Molecule 80 is a protein called 28S ribosomal protein S33, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 80 | Z6 | 87 | Total | C | N | O | S | 0 | 0 |
| | | | 740 | 473 | 133 | 130 | 4 | | |

- Molecule 81 is a protein called 28S ribosomal protein S34, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 81 | a6 | 201 | Total | C | N | O | S | 0 | 0 |
| | | | 1684 | 1065 | 322 | 292 | 5 | | |

- Molecule 82 is a protein called 28S ribosomal protein S35, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 82 | b6 | 256 | Total | C | N | O | S | 0 | 0 |
| | | | 2076 | 1321 | 350 | 395 | 10 | | |

- Molecule 83 is a protein called Coiled-coil-helix-coiled-coil-helix domain-containing protein 1.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 83 | c6 | 116 | Total | C | N | O | S | 0 | 0 |
| | | | 925 | 574 | 181 | 162 | 8 | | |

- Molecule 84 is a protein called Aurora kinase A-interacting protein.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|----|---|---------|-------|
| 84 | d6 | 69 | Total | C | N | O | S | 0 | 0 |
| | | | 610 | 393 | 130 | 86 | 1 | | |

- Molecule 85 is a protein called Pentatricopeptide repeat domain-containing protein 3, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 85 | e6 | 414 | Total | C | N | O | S | 0 | 0 |
| | | | 2838 | 1805 | 490 | 529 | 14 | | |

- Molecule 86 is a RNA chain called 12S rRNA.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|------|------|-----|---------|-------|
| 86 | A6 | 928 | Total | C | N | O | P | 0 | 0 |
| | | | 19716 | 8840 | 3560 | 6388 | 928 | | |

- Molecule 87 is a RNA chain called mt-tRNA.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|---------------|----------|----------|----------|---------|---------|-------|
| | | | Total | C | N | O | P | | |
| 87 | 24 | 73 | Total 1547 | C 696 | N 280 | O 499 | P 72 | 0 | 0 |
| 87 | FE | 73 | Total 1547 | C 696 | N 280 | O 499 | P 72 | 0 | 0 |

- Molecule 88 is a protein called 39S ribosomal protein L40, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|---------------|----------|----------|----------|--------|---------|-------|
| | | | Total | C | N | O | S | | |
| 88 | A | 162 | Total 1375 | C 876 | N 247 | O 249 | S 3 | 0 | 0 |

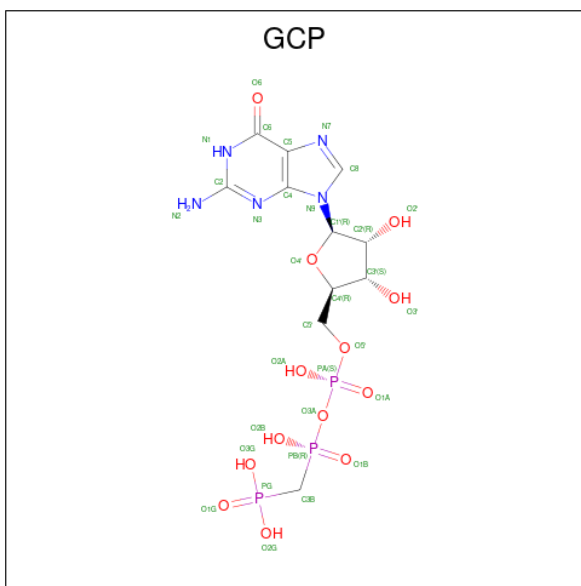
- Molecule 89 is a protein called 39S ribosomal protein L1, mitochondrial.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|---------------|-----------|----------|----------|--------|---------|-------|
| | | | Total | C | N | O | S | | |
| 89 | n | 218 | Total 1744 | C 1121 | N 294 | O 324 | S 5 | 0 | 0 |

- Molecule 90 is a protein called Unknown protein.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|-----|-------|----------|--------------|---------|---------|---------|---------|-------|
| | | | Total | C | N | O | | |
| 90 | B | 28 | Total 140 | C 84 | N 28 | O 28 | 0 | 0 |

- Molecule 91 is PHOSPHOMETHYLPHOSPHONIC ACID GUANYLATE ESTER (three-letter code: GCP) (formula: $C_{11}H_{18}N_5O_{13}P_3$).

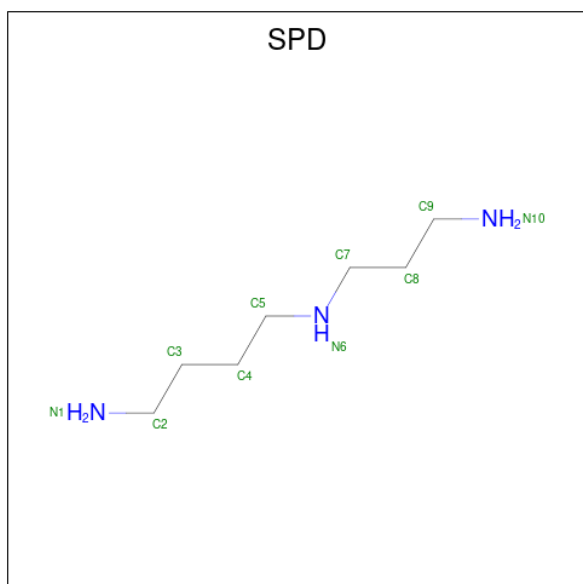


| Mol | Chain | Residues | Atoms | | | | | AltConf |
|-----|-------|----------|-------|----|---|----|---|---------|
| | | | Total | C | N | O | P | |
| 91 | r1 | 1 | 32 | 11 | 5 | 13 | 3 | 0 |

- Molecule 92 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

| Mol | Chain | Residues | Atoms | | AltConf |
|-----|-------|----------|-------|----|---------|
| | | | Total | Mg | |
| 92 | r1 | 1 | 1 | 1 | 0 |
| 92 | A3 | 95 | 95 | 95 | 0 |
| 92 | D3 | 1 | 1 | 1 | 0 |
| 92 | E3 | 1 | 1 | 1 | 0 |
| 92 | M3 | 1 | 1 | 1 | 0 |
| 92 | g3 | 1 | 1 | 1 | 0 |
| 92 | A6 | 28 | 28 | 28 | 0 |

- Molecule 93 is SPERMIDINE (three-letter code: SPD) (formula: C₇H₁₉N₃).

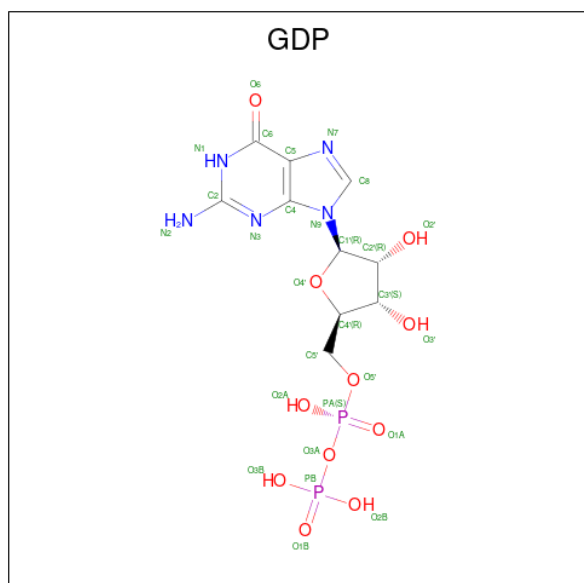


| Mol | Chain | Residues | Atoms | | | AltConf |
|-----|-------|----------|-------|---|---|---------|
| | | | Total | C | N | |
| 93 | A3 | 1 | 10 | 7 | 3 | 0 |

- Molecule 94 is ZINC ION (three-letter code: ZN) (formula: Zn).

| Mol | Chain | Residues | Atoms | | AltConf |
|-----|-------|----------|-------|----|---------|
| | | | Total | Zn | |
| 94 | 03 | 1 | 1 | 1 | 0 |
| 94 | 43 | 1 | 1 | 1 | 0 |
| 94 | r3 | 1 | 1 | 1 | 0 |
| 94 | B6 | 1 | 1 | 1 | 0 |
| 94 | O6 | 1 | 1 | 1 | 0 |
| 94 | P6 | 1 | 1 | 1 | 0 |
| 94 | T6 | 1 | 1 | 1 | 0 |

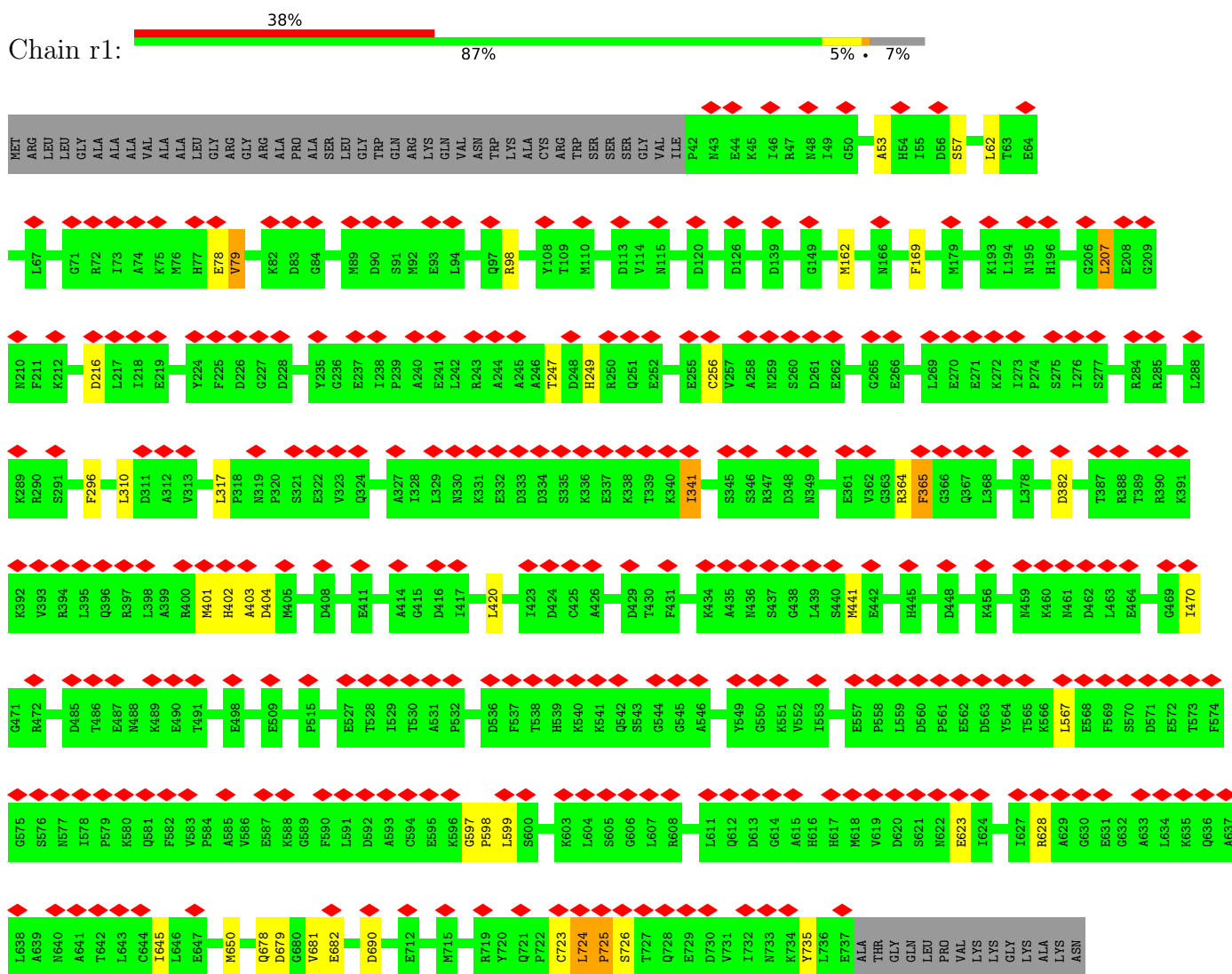
- Molecule 95 is GUANOSINE-5'-DIPHOSPHATE (three-letter code: GDP) (formula: C₁₀H₁₅N₅O₁₁P₂).



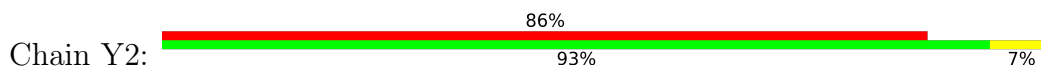
3 Residue-property plots

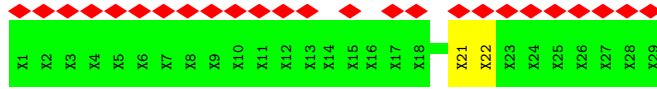
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion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

- Molecule 1: Elongation factor G, mitochondrial

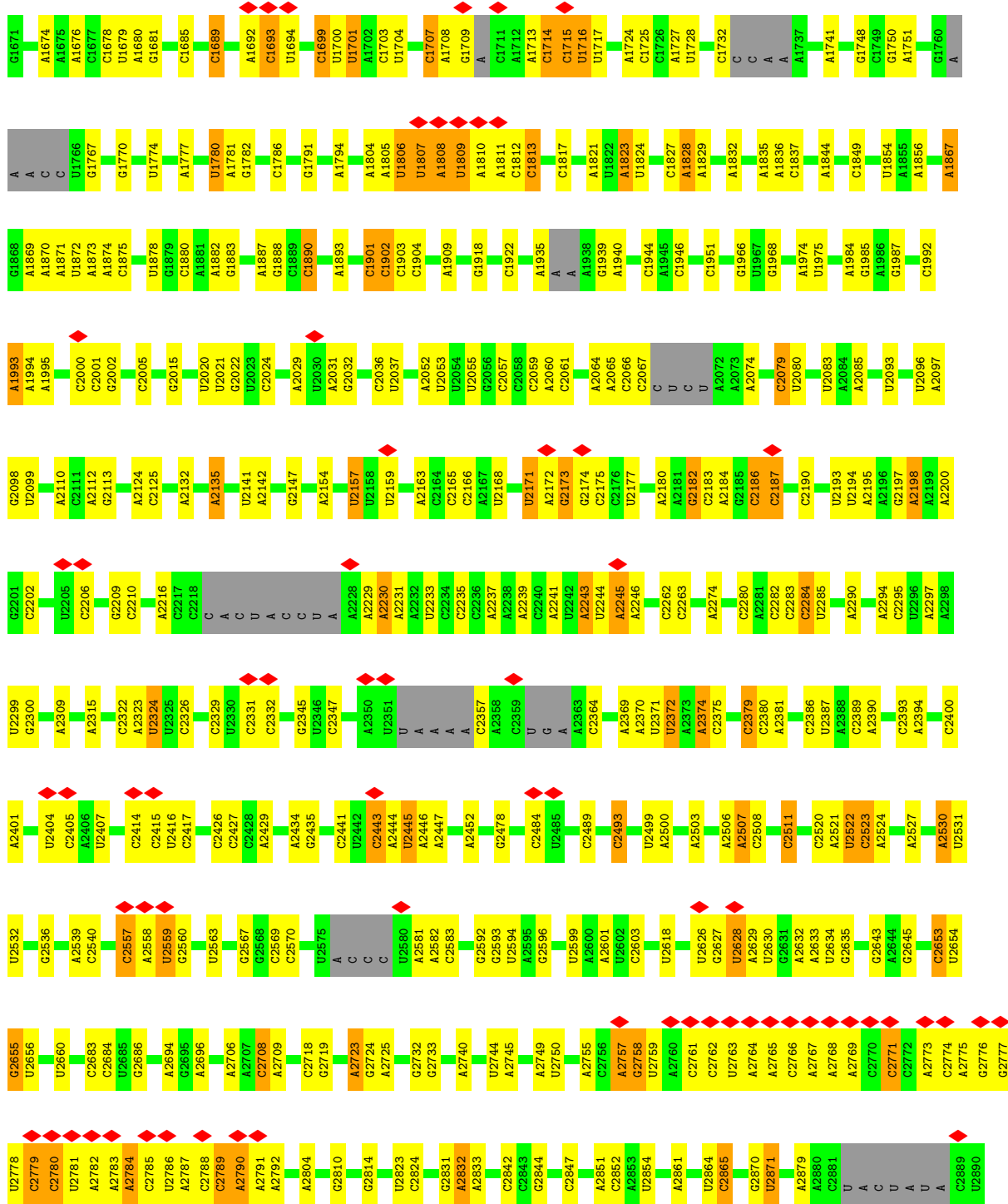


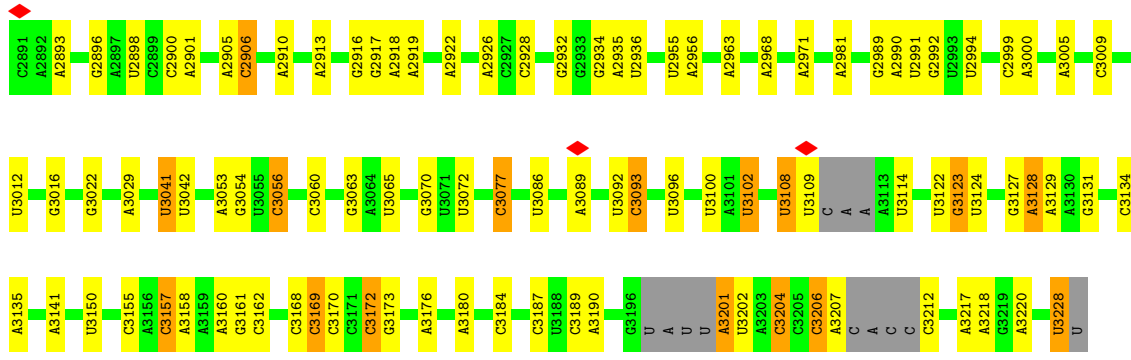
- Molecule 2: nascent chain





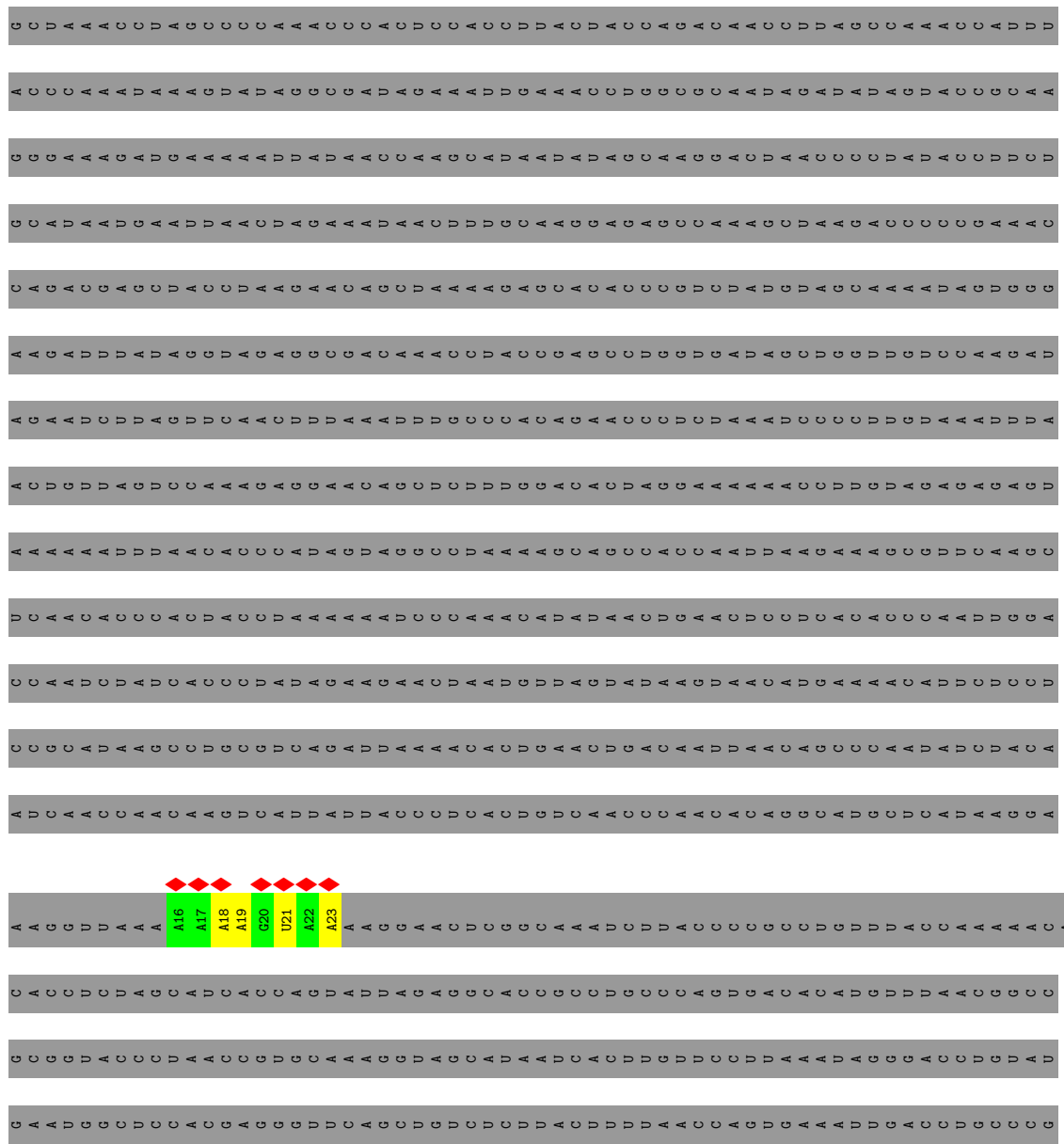
• Molecule 3: 16S rRNA

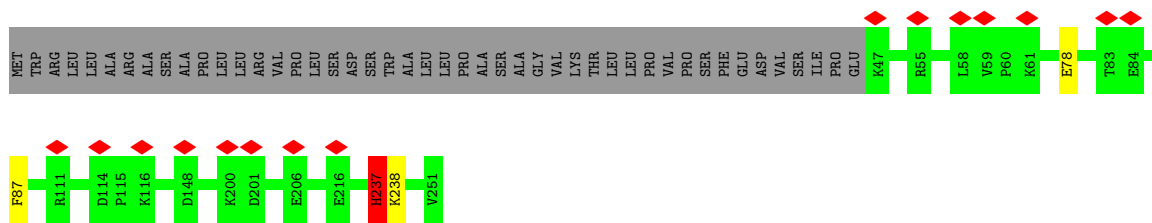




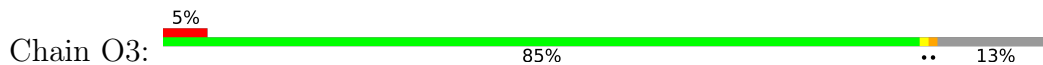
• Molecule 3: 16S rRNA

Chain 8: 99%

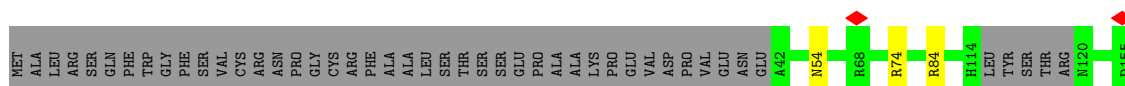




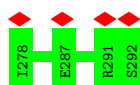
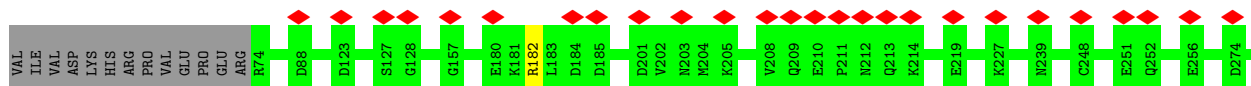
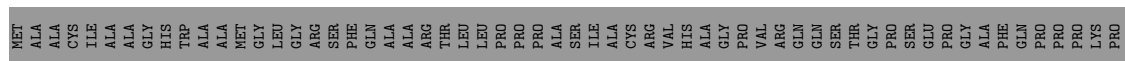
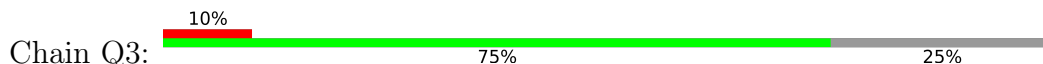
• Molecule 15: 39S ribosomal protein L17, mitochondrial



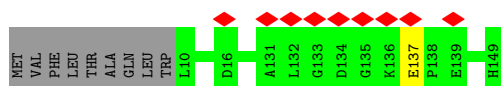
• Molecule 16: Mitochondrial ribosomal protein L18, isoform CRA_b



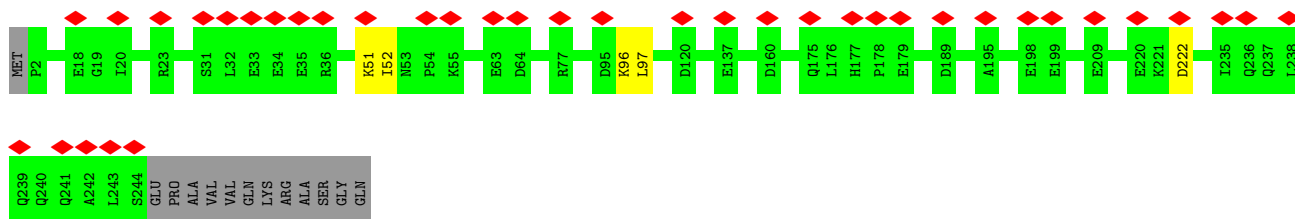
• Molecule 17: 39S ribosomal protein L19, mitochondrial



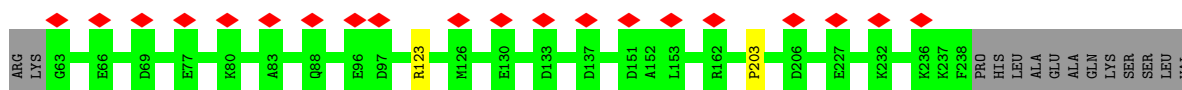
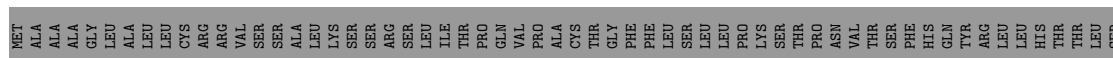
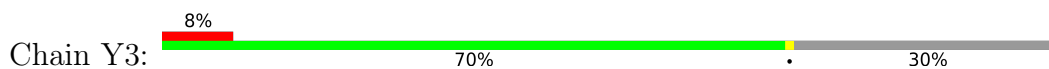
• Molecule 18: 39S ribosomal protein L20, mitochondrial



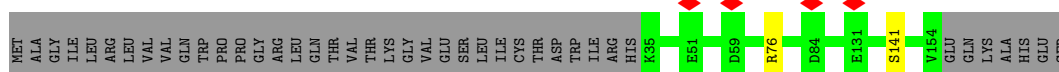
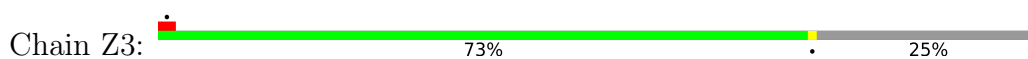
• Molecule 19: 39S ribosomal protein L21, mitochondrial



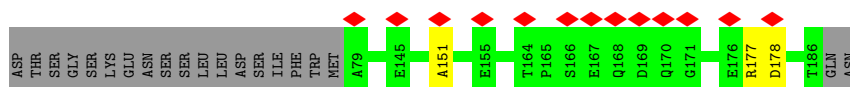
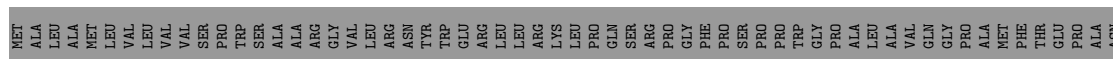
- Molecule 25: 39S ribosomal protein L47, mitochondrial



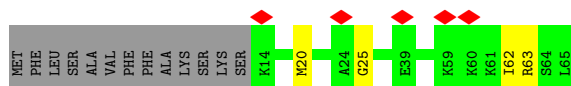
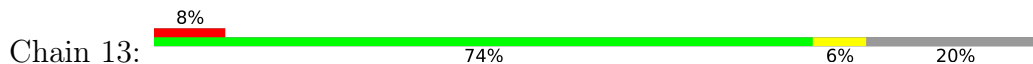
- Molecule 26: 39S ribosomal protein L30, mitochondrial



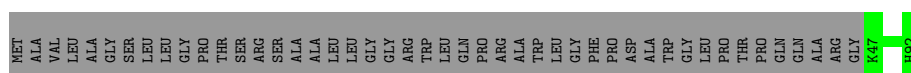
- Molecule 27: 39S ribosomal protein L32, mitochondrial



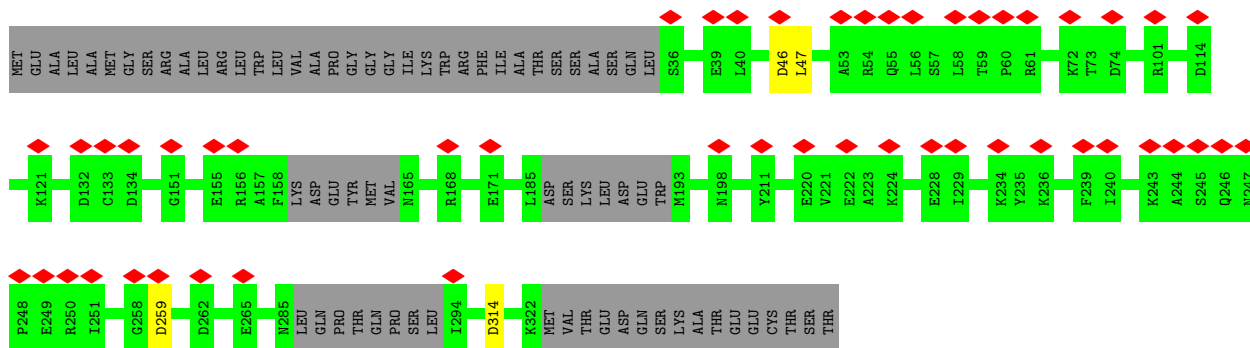
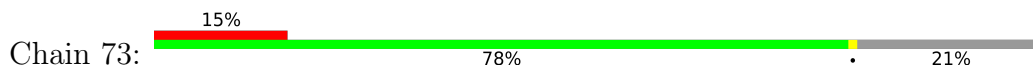
- Molecule 28: 39S ribosomal protein L33, mitochondrial



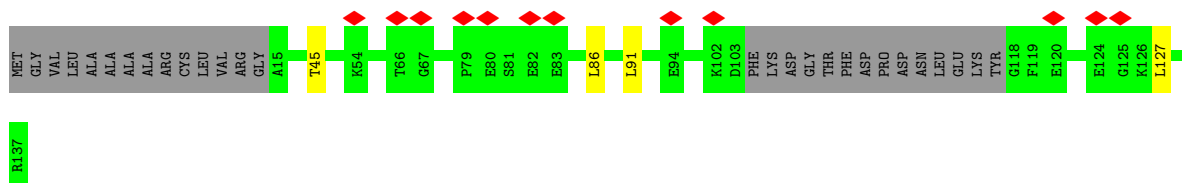
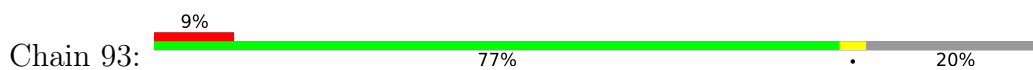
- Molecule 29: 39S ribosomal protein L34, mitochondrial



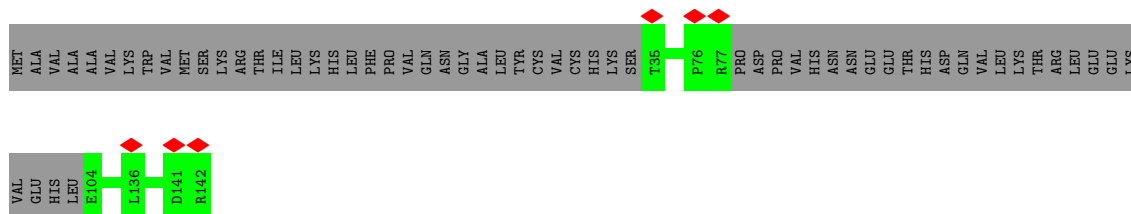
- Molecule 30: 39S ribosomal protein L35, mitochondrial



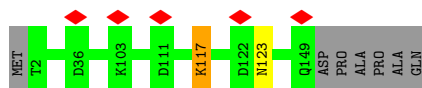
• Molecule 35: 39S ribosomal protein L41, mitochondrial



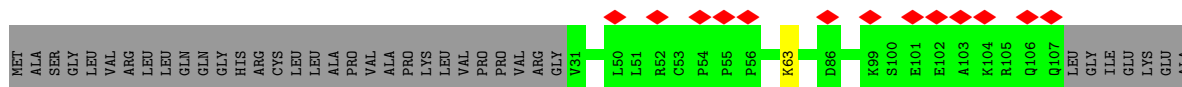
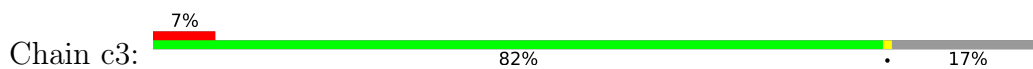
• Molecule 36: 39S ribosomal protein L42, mitochondrial

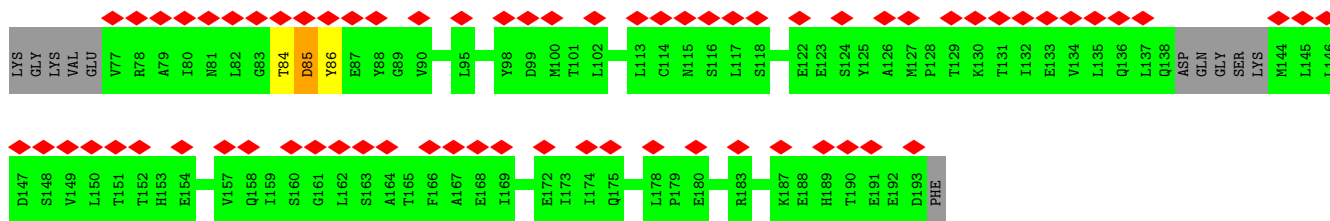


• Molecule 37: 39S ribosomal protein L43, mitochondrial

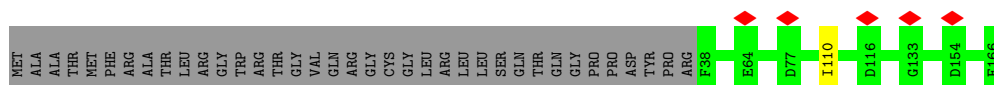
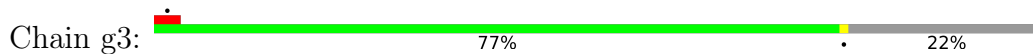


• Molecule 38: 39S ribosomal protein L44, mitochondrial





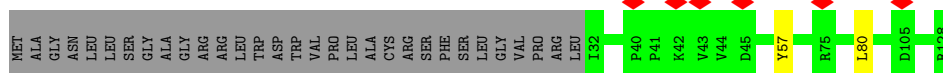
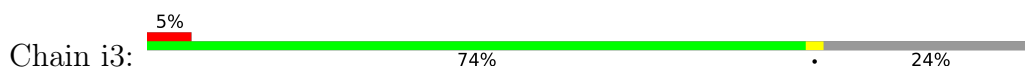
- Molecule 42: 39S ribosomal protein L49, mitochondrial



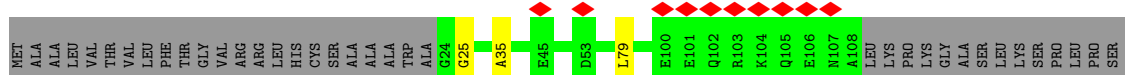
- Molecule 43: 39S ribosomal protein L50, mitochondrial



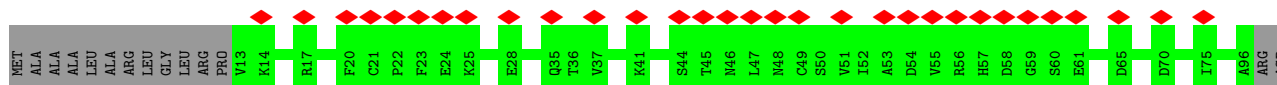
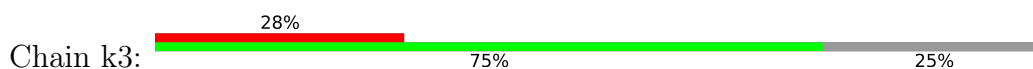
- Molecule 44: 39S ribosomal protein L51, mitochondrial



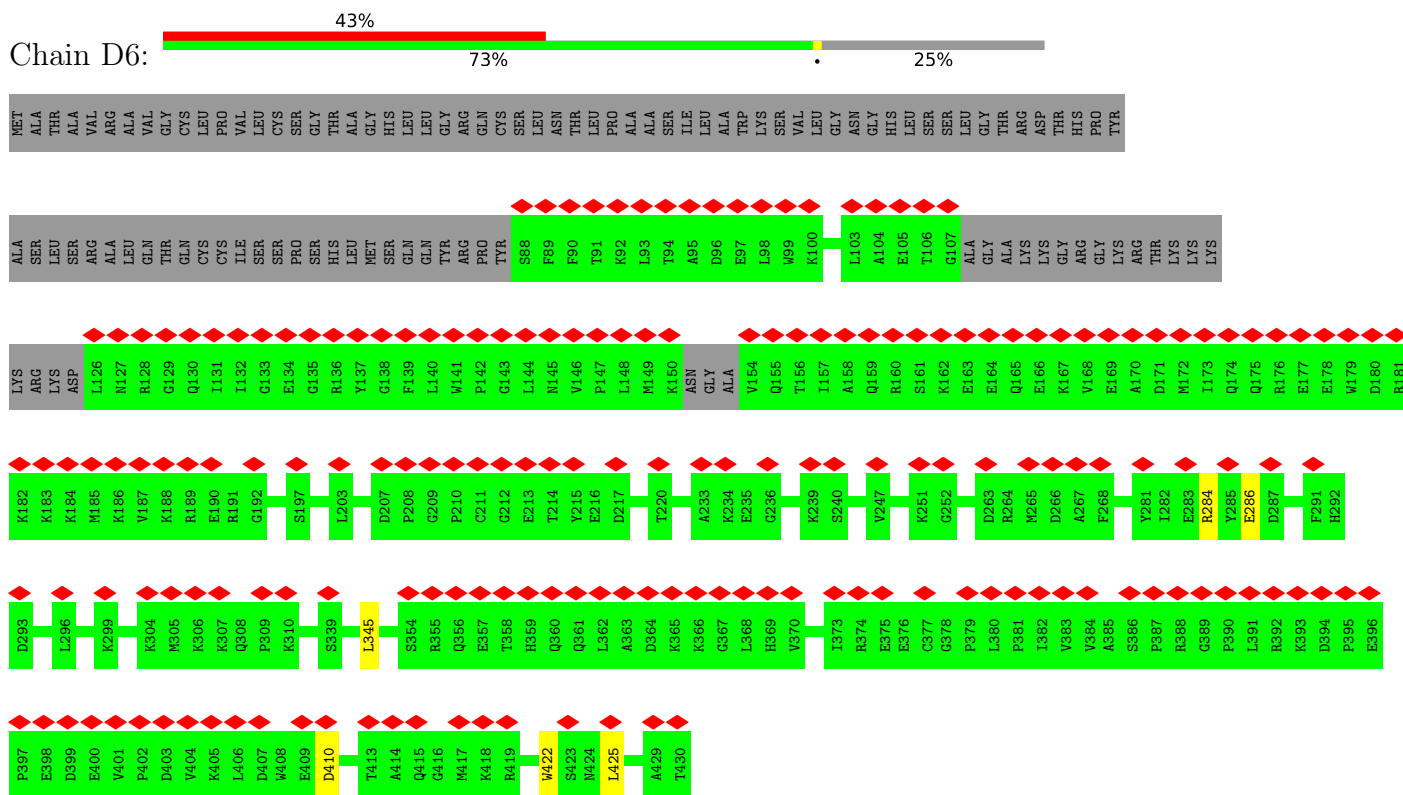
- Molecule 45: cDNA FLJ76418, highly similar to Homo sapiens mitochondrial ribosomal protein L52 (MRPL52), transcript variant 1, mRNA



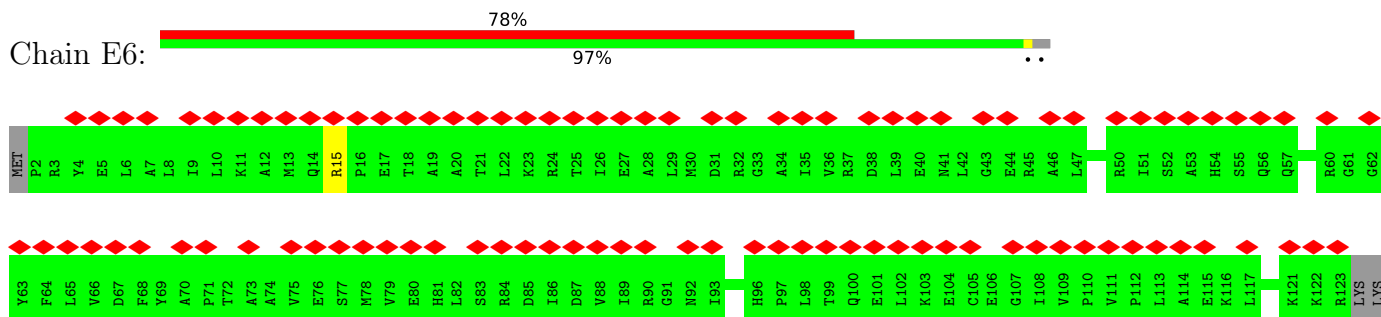
- Molecule 46: 39S ribosomal protein L53, mitochondrial



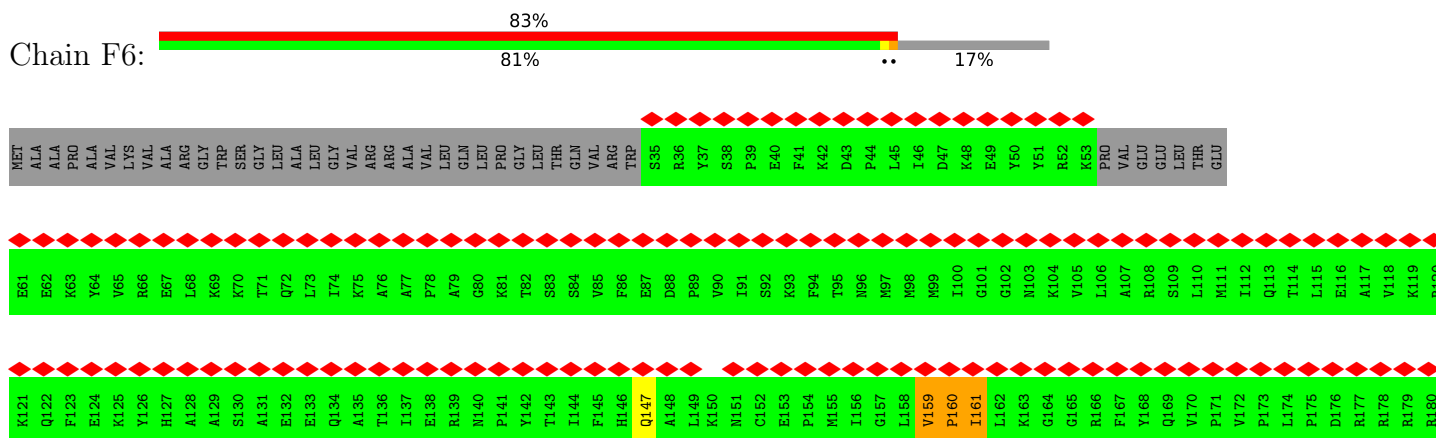
• Molecule 58: 28S ribosomal protein S5, mitochondrial

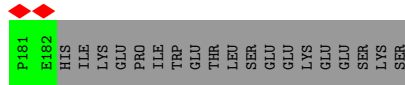


• Molecule 59: 28S ribosomal protein S6, mitochondrial

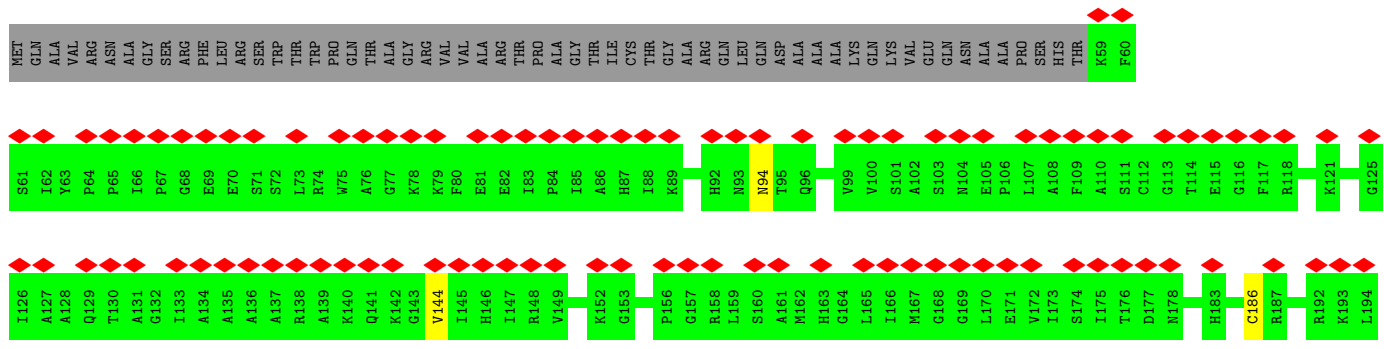


• Molecule 60: 28S ribosomal protein S7, mitochondrial

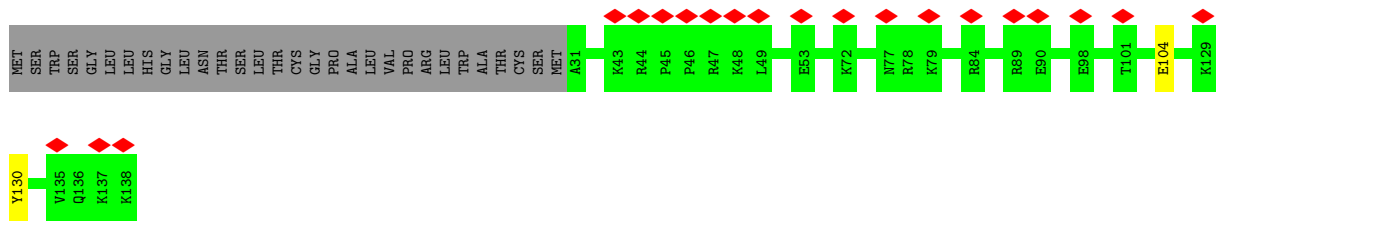
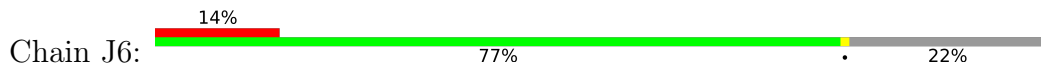




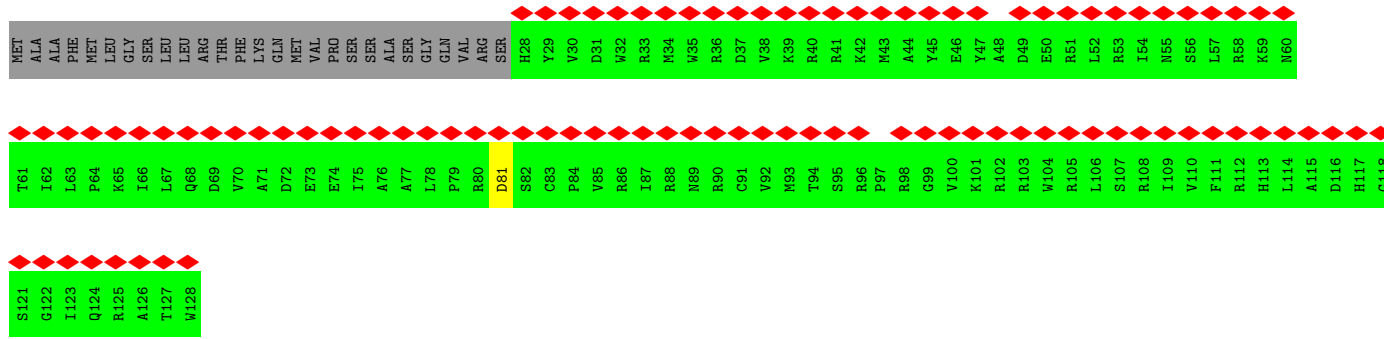
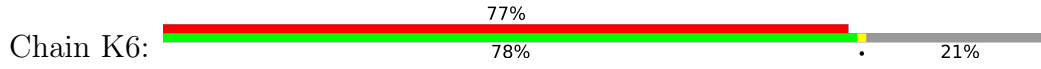
• Molecule 63: 28S ribosomal protein S11, mitochondrial



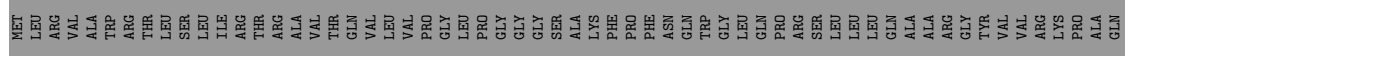
• Molecule 64: 28S ribosomal protein S12, mitochondrial

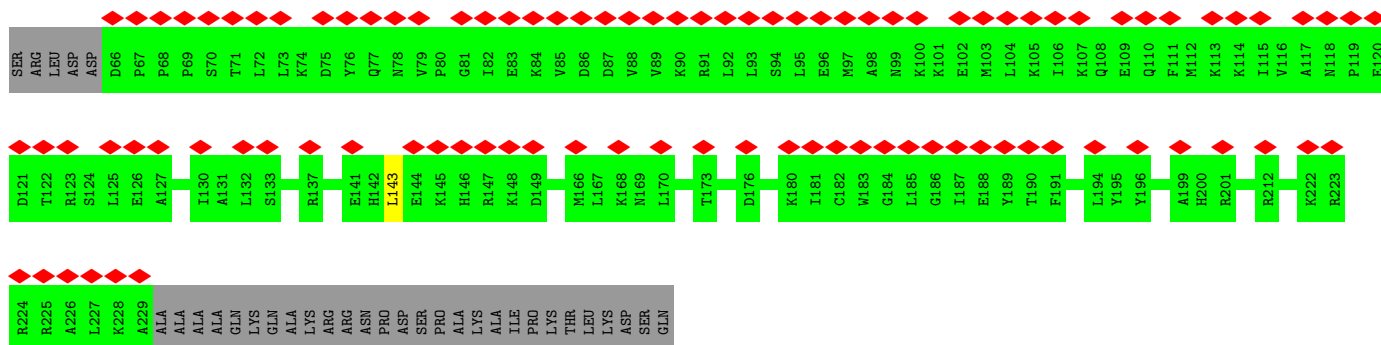


• Molecule 65: 28S ribosomal protein S14, mitochondrial



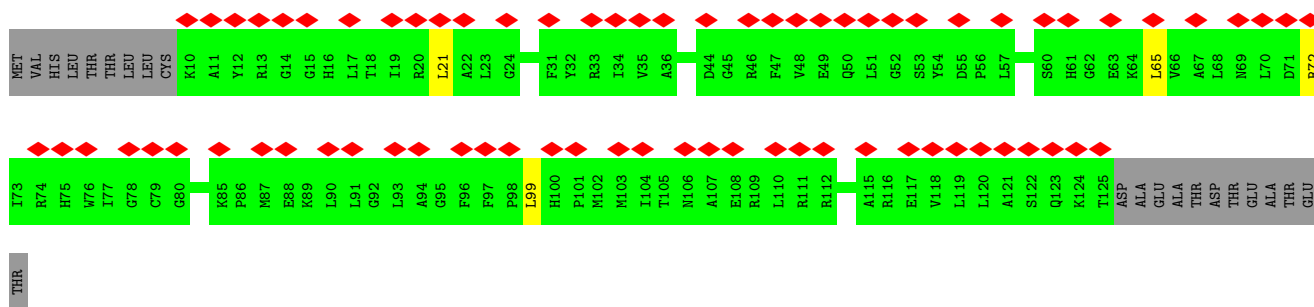
• Molecule 66: 28S ribosomal protein S15, mitochondrial





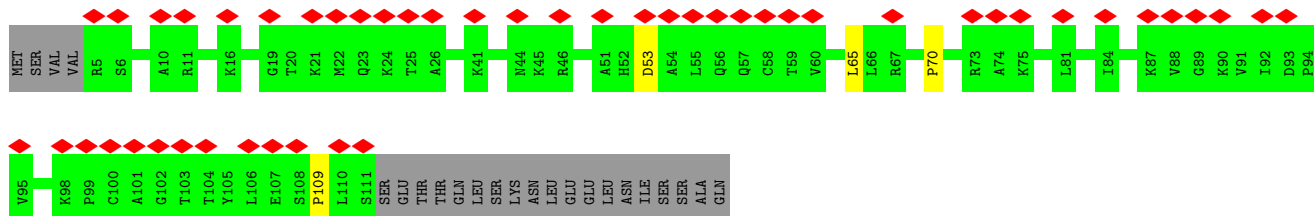
- Molecule 67: 28S ribosomal protein S16, mitochondrial

Chain M6: 53% 82% 15%



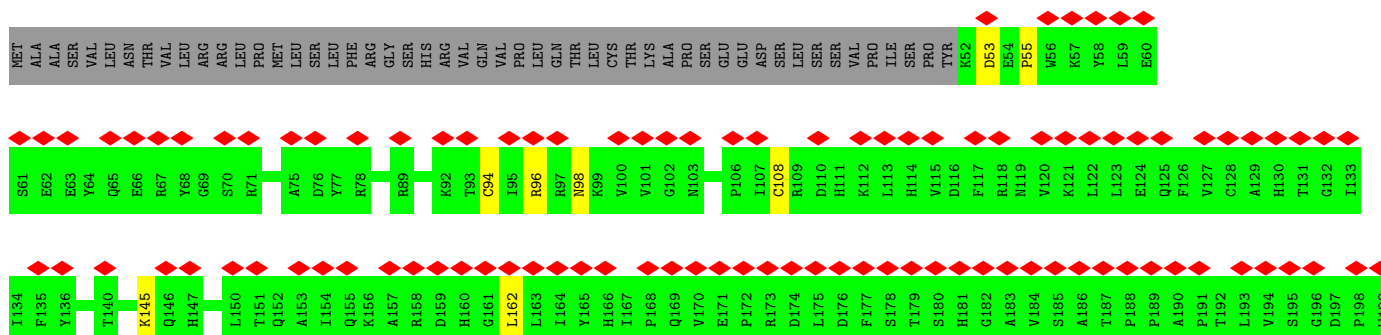
- Molecule 68: 28S ribosomal protein S17, mitochondrial

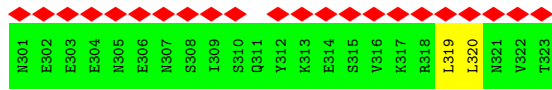
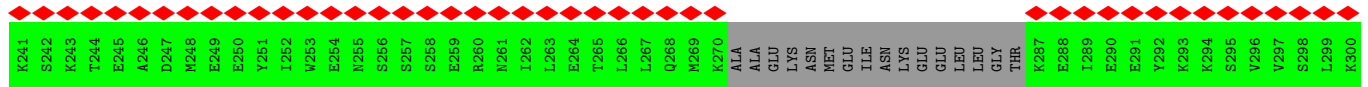
Chain N6: 38% 79% 18%



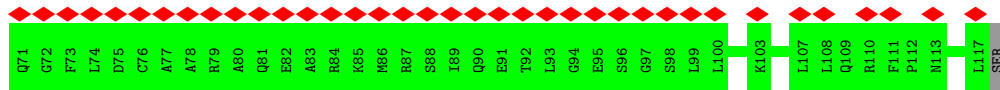
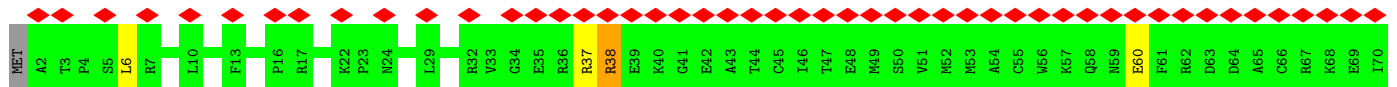
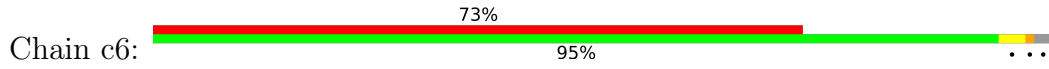
- Molecule 69: 28S ribosomal protein S18b, mitochondrial

Chain O6: 51% 68% 28%

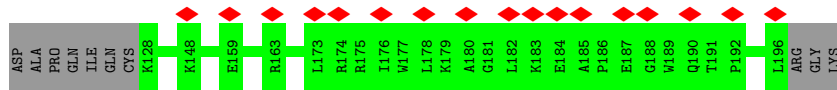




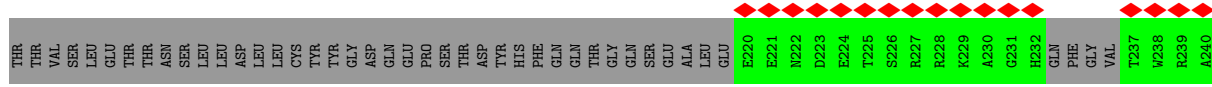
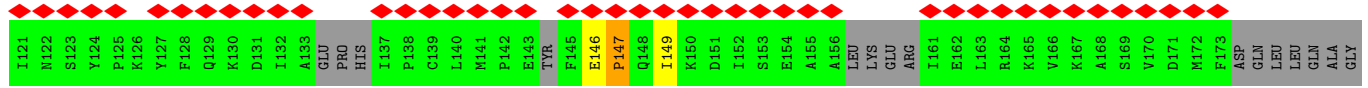
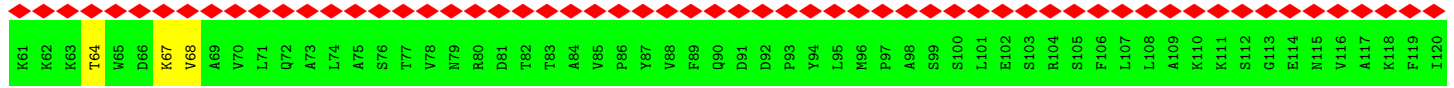
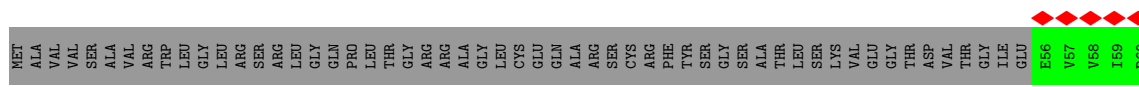
• Molecule 83: Coiled-coil-helix-coiled-coil-helix domain-containing protein 1



• Molecule 84: Aurora kinase A-interacting protein



• Molecule 85: Pentatricopeptide repeat domain-containing protein 3, mitochondrial

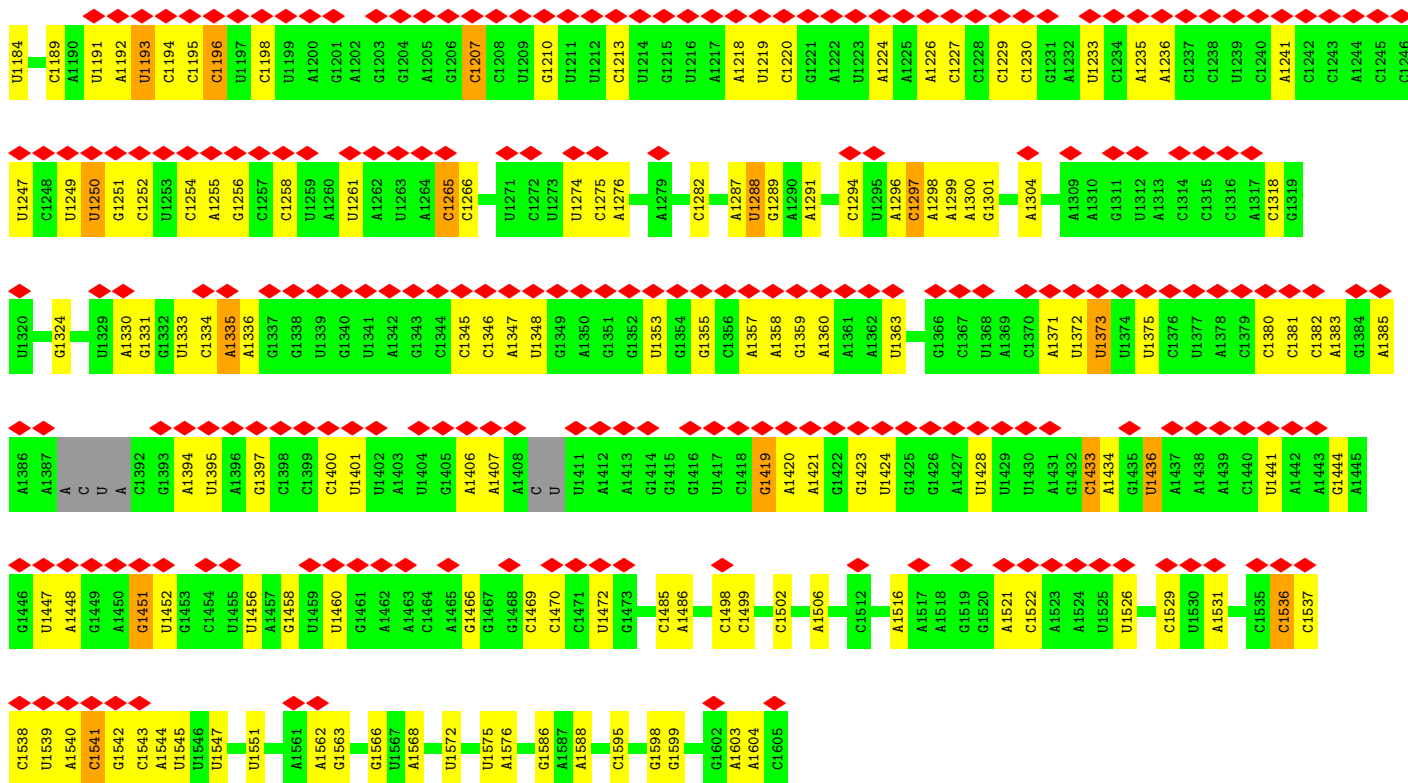


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|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| K241 | N242 | N243 | A244 | E245 | R246 | I247 | F248 | S249 | L250 | MET | PRO | GLU | LYS | N255 | E256 | H257 | S258 | Y259 | C260 | T261 | M262 | L263 | R264 | C265 | M266 | V267 | K268 | H269 | ARG | ALA | Y272 | E273 | Q274 | A275 | L276 | N277 | L278 | Y279 | T280 | E281 | L282 | L283 | N284 | N285 | ARG | LEU | HIS | HIS | ALA | D290 | V291 | Y292 | T293 | F294 | N295 | A296 | L297 | I298 | E299 | A300 | | | |
| THR | VAL | CYS | ALA | ILE | ASN | GLU | LYS | PHE | E311 | K312 | W313 | S314 | K315 | I316 | L317 | E318 | L319 | L320 | R321 | H322 | M323 | V324 | A325 | Q326 | LYS | VAL | LEU | PRO | N331 | L332 | Q333 | T334 | F335 | N336 | T337 | I338 | L339 | K340 | C341 | L342 | R343 | R344 | F345 | HIS | VAL | PHE | ALA | ASP | ASP | PRO | A353 | L354 | Q355 | Q356 | Q357 | R358 | E359 | M360 | | | | | |
| K361 | A362 | ILE | GLY | ILE | GLU | PRO | S368 | L369 | A370 | A371 | Y372 | H373 | H374 | I375 | I376 | R377 | L378 | F379 | D380 | GLN | PRO | GLY | ASP | PRO | L386 | K387 | R388 | S389 | S390 | F391 | I392 | I393 | D395 | Y394 | D395 | F456 | Y457 | Y458 | S459 | K460 | LEU | MET | GLY | THR | LYS | ARG | PHE | SER | PRO | VAL | HIS | ASP | ASP | PRO | ASP | ASP | K414 | F415 | F416 | Q417 | S418 | A419 | M420 |
| S421 | I422 | C423 | S424 | S425 | L426 | ARG | ASP | LEU | E430 | L431 | A432 | Y433 | Q434 | V435 | H436 | G437 | L438 | L439 | K440 | T441 | GLY | ASN | ASP | TRP | LYS | PHE | ILE | GLY | P450 | D451 | Q452 | H453 | R454 | M455 | F456 | Y457 | Y458 | S459 | K460 | F461 | F462 | D463 | L464 | I465 | C466 | M468 | GLN | I471 | D472 | V473 | T474 | L475 | K476 | W477 | Y478 | E479 | D480 | | | | | | |
| L481 | I482 | P483 | S484 | ALA | TRR | PHE | PRO | HIS | S490 | Q491 | T492 | M493 | I494 | H495 | L496 | L497 | Q498 | A499 | Y559 | E560 | S561 | D501 | V502 | A503 | ARG | L506 | E507 | V508 | I509 | P510 | K511 | I512 | W513 | K514 | D515 | S516 | K517 | E518 | T519 | GLY | HIS | THR | PHE | ARG | S525 | D526 | L527 | R528 | E529 | E530 | E531 | L532 | M533 | L534 | M535 | A536 | E537 | ASP | LYS | HIS | | | |
| PRO | PRO | GLU | L544 | Q545 | V546 | A547 | F548 | A549 | D550 | C551 | A552 | D554 | I555 | K556 | S557 | A558 | Y559 | E560 | S561 | GLN | PRO | PRO | ILE | ARG | GLN | THR | ALA | ASP | TRP | PRO | ALA | T574 | S575 | L576 | M577 | C578 | I579 | A580 | I581 | L582 | F583 | L584 | R585 | A586 | GLY | ARG | THR | Q590 | E591 | A592 | W593 | K594 | M595 | L596 | G597 | L598 | F599 | R600 | | | | | |
| K601 | H602 | ASN | LYS | ILE | PRO | ARG | SER | GLU | L610 | L611 | N612 | E613 | L614 | M615 | D616 | S617 | G618 | A619 | V620 | S621 | ASN | SER | PRO | S625 | Q626 | A627 | I628 | E629 | V630 | V631 | G632 | L633 | A634 | S635 | A636 | F637 | S638 | L639 | PRO | ILE | CYS | GLU | GLY | LEU | THR | GLN | ARG | VAL | MET | SER | ASP | PHE | ALA | ILE | ASN | GLN | GLU | GLN | LYS | | | | |
| GLU | ALA | LEU | SER | ASN | LEU | THR | ALA | LEU | THR | SER | ASP | SER | THR | SER | SER | ASP | ASP | ASP | THR | SER | GLY | GLU | GLY | S625 | Q626 | A627 | I628 | E629 | V630 | V631 | G632 | L633 | A634 | S635 | A636 | F637 | S638 | L639 | PRO | ILE | CYS | GLU | GLY | LEU | THR | GLN | ARG | VAL | MET | SER | ASP | PHE | ALA | ILE | ASN | GLN | GLU | GLN | LYS | | | | |

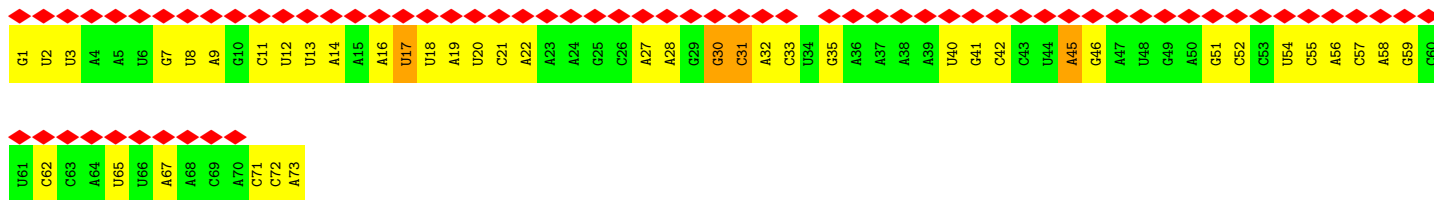
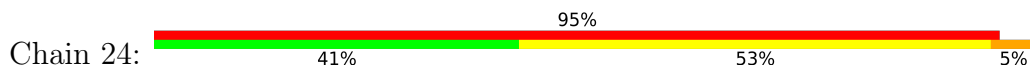
• Molecule 86: 12S rRNA



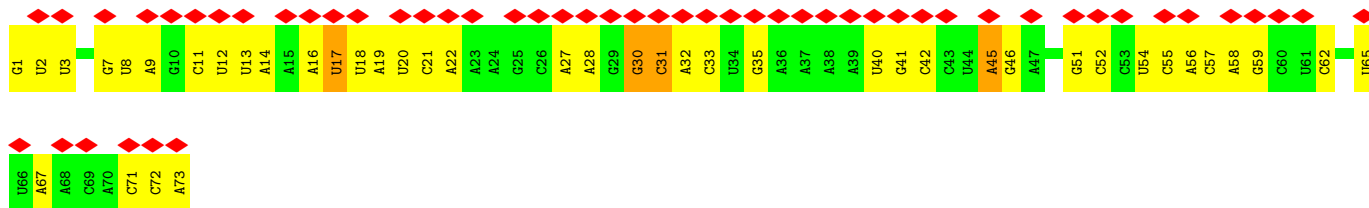
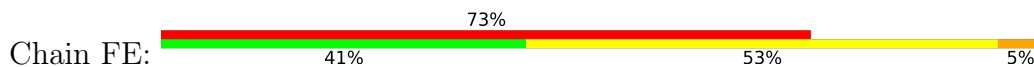
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|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| A | A653 | A654 | A655 | U675 | U678 | U682 | C683 | U684 | U685 | A686 | A692 | U693 | U694 | A695 | C698 | G701 | C702 | A707 | U708 | C709 | C710 | C711 | C712 | G713 | U714 | U715 | C716 | C717 | G721 | A722 | G723 | U724 | U725 | C726 | A727 | C738 | A | C | C | A | C | G744 | A749 | A757 | A761 | A765 | | | |
| U768 | C769 | G770 | C774 | A775 | U776 | U777 | A786 | A787 | C791 | U792 | G795 | C796 | C797 | U798 | A799 | G800 | C801 | C806 | C809 | C810 | A811 | C812 | G813 | A816 | A817 | A818 | C819 | A820 | G821 | A831 | U834 | U835 | U836 | C839 | A840 | A848 | A849 | A850 | C851 | U852 | U853 | C857 | U858 | A859 | U865 | | | | |
| U868 | A869 | A870 | C871 | C872 | C873 | C874 | C884 | A885 | A886 | U887 | U888 | U889 | C894 | C901 | G902 | C903 | U907 | C908 | A909 | C921 | A922 | A923 | G924 | U925 | C926 | G931 | A932 | A933 | G | C935 | C936 | G937 | G938 | A942 | A943 | A946 | G947 | U951 | U952 | U953 | A954 | U957 | C958 | A959 | C | C | C | | |
| C | U | C | C | C | C969 | A970 | A971 | C977 | U978 | A981 | A982 | U984 | C985 | A986 | C987 | C988 | U989 | G990 | A991 | G992 | U996 | A997 | A998 | C1003 | U1004 | C1005 | C1006 | A1007 | G1011 | A1012 | G1013 | A1014 | C1015 | A1018 | A1019 | A1023 | C1024 | U1025 | U1026 | G1032 | U1033 | G1034 | G1035 | C1036 | U1037 | U1038 | A1043 | U1044 | A1045 |
| U1046 | A1050 | A1051 | C1052 | A1053 | C1056 | C1068 | C1069 | C1070 | U1065 | A1086 | U1093 | C1102 | A1107 | A1108 | C1109 | C1110 | A1113 | U1119 | A | A | A | U | C1124 | A1125 | C1126 | C1127 | A1128 | A1129 | A1130 | U1133 | A1141 | G1142 | A1146 | C1147 | U1148 | C1155 | A1156 | C1157 | A1158 | A1170 | A1171 | C1181 | G1182 | G1183 | | | | | |



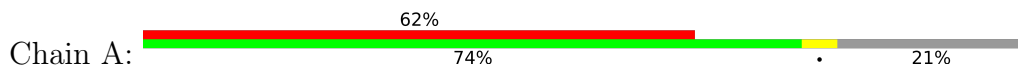
• Molecule 87: mt-tRNA



• Molecule 87: mt-tRNA



• Molecule 88: 39S ribosomal protein L40, mitochondrial



4 Experimental information

| Property | Value | Source |
|--------------------------------------|---|-----------|
| EM reconstruction method | SINGLE PARTICLE | Depositor |
| Imposed symmetry | POINT, Not provided | |
| Number of particles used | 19767 | 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 ($e^-/\text{\AA}^2$) | 60 | Depositor |
| Minimum defocus (nm) | Not provided | |
| Maximum defocus (nm) | Not provided | |
| Magnification | Not provided | |
| Image detector | FEI FALCON III (4k x 4k) | Depositor |
| Maximum map value | 0.294 | Depositor |
| Minimum map value | -0.153 | Depositor |
| Average map value | 0.000 | Depositor |
| Map value standard deviation | 0.008 | Depositor |
| Recommended contour level | 0.05 | Depositor |
| Map size (Å) | 532.48, 532.48, 532.48 | wwPDB |
| Map dimensions | 512, 512, 512 | wwPDB |
| Map angles (°) | 90.0, 90.0, 90.0 | wwPDB |
| Pixel spacing (Å) | 1.04, 1.04, 1.04 | 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: ZN, GCP, GDP, MG, SPD

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 | r1 | 0.47 | 0/5552 | 0.93 | 15/7490 (0.2%) |
| 3 | 8 | 0.52 | 0/197 | 1.06 | 0/305 |
| 3 | A3 | 1.06 | 7/35697 (0.0%) | 1.18 | 306/55544 (0.6%) |
| 4 | B3 | 0.57 | 0/1328 | 1.02 | 6/2056 (0.3%) |
| 5 | D3 | 0.46 | 0/1879 | 0.69 | 2/2527 (0.1%) |
| 6 | E3 | 0.54 | 0/2433 | 0.68 | 3/3299 (0.1%) |
| 7 | F3 | 0.55 | 0/2071 | 0.75 | 1/2817 (0.0%) |
| 8 | D | 4.69 | 3/665 (0.5%) | 1.19 | 7/905 (0.8%) |
| 8 | H3 | 0.44 | 0/798 | 0.73 | 1/1073 (0.1%) |
| 9 | I3 | 0.41 | 0/1308 | 0.71 | 0/1761 |
| 10 | J3 | 0.39 | 0/1077 | 0.74 | 1/1452 (0.1%) |
| 11 | K3 | 0.55 | 0/1495 | 0.70 | 2/2029 (0.1%) |
| 12 | L3 | 0.47 | 0/904 | 0.71 | 0/1218 |
| 13 | M3 | 0.55 | 1/2359 (0.0%) | 0.73 | 4/3185 (0.1%) |
| 14 | N3 | 0.55 | 0/1697 | 0.73 | 2/2281 (0.1%) |
| 15 | O3 | 0.56 | 1/1269 (0.1%) | 0.77 | 1/1708 (0.1%) |
| 16 | P3 | 0.54 | 0/1103 | 0.77 | 2/1491 (0.1%) |
| 17 | Q3 | 0.49 | 0/1863 | 0.70 | 0/2509 |
| 18 | R3 | 0.60 | 0/1174 | 0.66 | 0/1572 |
| 19 | S3 | 0.55 | 0/1276 | 0.72 | 3/1729 (0.2%) |
| 20 | T3 | 0.56 | 0/1402 | 0.64 | 1/1886 (0.1%) |
| 21 | U3 | 0.60 | 0/946 | 0.71 | 0/1283 |
| 22 | V3 | 0.47 | 0/1590 | 0.75 | 2/2151 (0.1%) |
| 23 | W3 | 0.64 | 0/893 | 0.71 | 1/1204 (0.1%) |
| 24 | X3 | 0.46 | 0/2081 | 0.78 | 3/2812 (0.1%) |
| 25 | Y3 | 0.53 | 1/1552 (0.1%) | 0.64 | 0/2079 |
| 26 | Z3 | 0.51 | 0/1003 | 0.69 | 1/1354 (0.1%) |
| 27 | 03 | 0.47 | 0/895 | 0.65 | 0/1201 |
| 28 | 13 | 0.47 | 0/438 | 0.87 | 1/583 (0.2%) |
| 29 | 23 | 0.53 | 0/382 | 0.64 | 0/507 |
| 30 | 33 | 0.60 | 0/852 | 0.69 | 1/1136 (0.1%) |
| 31 | 43 | 0.58 | 0/329 | 0.61 | 0/435 |

| Mol | Chain | Bond lengths | | Bond angles | |
|-----|-------|--------------|---------------|-------------|---------------|
| | | RMSZ | # Z >5 | RMSZ | # Z >5 |
| 32 | 53 | 0.46 | 0/3154 | 0.67 | 1/4295 (0.0%) |
| 33 | 63 | 0.49 | 0/2722 | 0.72 | 3/3709 (0.1%) |
| 34 | 73 | 0.45 | 0/2207 | 0.74 | 4/2978 (0.1%) |
| 35 | 93 | 0.48 | 0/896 | 0.74 | 3/1205 (0.2%) |
| 36 | a3 | 0.51 | 0/709 | 0.65 | 0/963 |
| 37 | b3 | 0.51 | 0/1202 | 0.67 | 1/1626 (0.1%) |
| 38 | c3 | 0.48 | 0/2264 | 0.68 | 1/3059 (0.0%) |
| 39 | d3 | 0.45 | 0/1385 | 0.81 | 2/1877 (0.1%) |
| 40 | e3 | 0.35 | 0/1797 | 0.76 | 3/2422 (0.1%) |
| 41 | f3 | 0.43 | 0/1055 | 0.83 | 1/1427 (0.1%) |
| 42 | g3 | 0.58 | 0/1102 | 0.69 | 0/1503 |
| 43 | h3 | 0.41 | 0/847 | 0.71 | 2/1150 (0.2%) |
| 44 | i3 | 0.58 | 0/849 | 0.76 | 1/1135 (0.1%) |
| 45 | j3 | 0.48 | 0/698 | 0.62 | 1/940 (0.1%) |
| 46 | k3 | 0.35 | 0/665 | 0.74 | 0/897 |
| 47 | l3 | 0.45 | 0/226 | 0.63 | 0/299 |
| 48 | m3 | 0.36 | 0/379 | 0.73 | 0/510 |
| 49 | o3 | 0.58 | 0/818 | 0.62 | 0/1097 |
| 50 | p3 | 0.37 | 0/1071 | 0.59 | 0/1433 |
| 51 | q3 | 0.42 | 0/1107 | 0.62 | 0/1498 |
| 52 | r3 | 0.56 | 0/1238 | 0.70 | 0/1676 |
| 53 | s3 | 0.51 | 1/3114 (0.0%) | 0.74 | 3/4225 (0.1%) |
| 54 | u3 | 1.03 | 0/46 | 0.98 | 0/69 |
| 55 | A5 | 0.28 | 0/135 | 0.72 | 1/185 (0.5%) |
| 56 | B6 | 0.39 | 0/1811 | 0.76 | 2/2451 (0.1%) |
| 57 | C6 | 0.36 | 0/1112 | 0.63 | 0/1505 |
| 58 | D6 | 0.40 | 0/2607 | 0.74 | 2/3498 (0.1%) |
| 59 | E6 | 0.39 | 0/989 | 0.74 | 0/1335 |
| 60 | F6 | 0.41 | 1/1708 (0.1%) | 0.68 | 2/2291 (0.1%) |
| 61 | G6 | 0.38 | 0/2570 | 0.72 | 4/3443 (0.1%) |
| 62 | H6 | 0.34 | 0/1019 | 0.71 | 1/1379 (0.1%) |
| 63 | I6 | 0.35 | 0/1031 | 0.65 | 1/1390 (0.1%) |
| 64 | J6 | 0.56 | 1/854 (0.1%) | 0.77 | 0/1148 |
| 65 | K6 | 0.36 | 0/879 | 0.66 | 1/1182 (0.1%) |
| 66 | L6 | 0.35 | 0/1406 | 0.69 | 1/1878 (0.1%) |
| 67 | M6 | 0.41 | 0/941 | 1.00 | 5/1265 (0.4%) |
| 68 | N6 | 0.54 | 1/864 (0.1%) | 0.85 | 5/1169 (0.4%) |
| 69 | O6 | 0.43 | 1/1580 (0.1%) | 0.76 | 4/2150 (0.2%) |
| 70 | P6 | 0.39 | 0/791 | 0.76 | 0/1062 |
| 71 | Q6 | 0.43 | 0/752 | 0.74 | 0/1001 |
| 72 | R6 | 0.36 | 0/2050 | 0.75 | 2/2770 (0.1%) |
| 73 | S6 | 0.62 | 1/1069 (0.1%) | 0.98 | 5/1441 (0.3%) |
| 74 | T6 | 0.42 | 0/1361 | 0.74 | 0/1829 |

| Mol | Chain | Bond lengths | | Bond angles | |
|-----|-------|--------------|------------------|-------------|-------------------|
| | | RMSZ | # Z >5 | RMSZ | # Z >5 |
| 75 | U6 | 0.36 | 0/1482 | 0.62 | 0/1987 |
| 76 | V6 | 0.36 | 0/2758 | 0.71 | 4/3724 (0.1%) |
| 77 | W6 | 0.35 | 0/778 | 0.78 | 1/1048 (0.1%) |
| 78 | X6 | 0.34 | 0/2596 | 0.70 | 2/3519 (0.1%) |
| 79 | Y6 | 0.34 | 0/943 | 0.65 | 1/1274 (0.1%) |
| 80 | Z6 | 0.31 | 0/757 | 0.63 | 0/1011 |
| 81 | a6 | 0.40 | 0/1727 | 0.82 | 7/2338 (0.3%) |
| 82 | b6 | 0.33 | 0/2121 | 0.74 | 4/2873 (0.1%) |
| 83 | c6 | 0.34 | 0/939 | 0.69 | 1/1256 (0.1%) |
| 84 | d6 | 0.42 | 0/621 | 0.72 | 0/820 |
| 85 | e6 | 0.29 | 0/2859 | 0.58 | 3/3864 (0.1%) |
| 86 | A6 | 0.67 | 0/22053 | 1.10 | 125/34324 (0.4%) |
| 87 | 24 | 1.16 | 6/1731 (0.3%) | 1.31 | 21/2693 (0.8%) |
| 87 | FE | 1.16 | 6/1731 (0.3%) | 1.31 | 20/2693 (0.7%) |
| 88 | A | 0.35 | 0/1403 | 0.73 | 3/1880 (0.2%) |
| 89 | n | 4.89 | 7/1776 (0.4%) | 0.75 | 3/2397 (0.1%) |
| All | All | 0.87 | 38/179863 (0.0%) | 0.92 | 623/255648 (0.2%) |

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

| Mol | Chain | #Chirality outliers | #Planarity outliers |
|-----|-------|---------------------|---------------------|
| 1 | r1 | 0 | 23 |
| 2 | Y2 | 0 | 2 |
| 5 | D3 | 0 | 1 |
| 6 | E3 | 0 | 5 |
| 7 | F3 | 0 | 2 |
| 8 | D | 0 | 2 |
| 8 | H3 | 0 | 1 |
| 9 | I3 | 0 | 1 |
| 10 | J3 | 0 | 2 |
| 11 | K3 | 0 | 2 |
| 13 | M3 | 0 | 4 |
| 14 | N3 | 0 | 2 |
| 15 | O3 | 0 | 1 |
| 17 | Q3 | 0 | 1 |
| 18 | R3 | 0 | 1 |
| 20 | T3 | 0 | 1 |
| 22 | V3 | 0 | 2 |
| 24 | X3 | 0 | 1 |

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| Mol | Chain | #Chirality outliers | #Planarity outliers |
|-----|-------|---------------------|---------------------|
| 26 | Z3 | 0 | 1 |
| 27 | 03 | 0 | 2 |
| 28 | 13 | 0 | 2 |
| 32 | 53 | 0 | 4 |
| 33 | 63 | 0 | 2 |
| 35 | 93 | 0 | 1 |
| 38 | c3 | 0 | 1 |
| 39 | d3 | 0 | 5 |
| 41 | f3 | 0 | 4 |
| 42 | g3 | 0 | 1 |
| 43 | h3 | 0 | 2 |
| 44 | i3 | 0 | 1 |
| 45 | j3 | 0 | 1 |
| 49 | o3 | 0 | 1 |
| 51 | q3 | 0 | 1 |
| 53 | s3 | 0 | 2 |
| 56 | B6 | 0 | 1 |
| 58 | D6 | 0 | 4 |
| 60 | F6 | 0 | 4 |
| 61 | G6 | 0 | 1 |
| 63 | I6 | 0 | 2 |
| 64 | J6 | 0 | 1 |
| 68 | N6 | 0 | 1 |
| 69 | O6 | 0 | 3 |
| 70 | P6 | 0 | 3 |
| 72 | R6 | 0 | 3 |
| 73 | S6 | 0 | 1 |
| 75 | U6 | 0 | 2 |
| 76 | V6 | 0 | 2 |
| 81 | a6 | 0 | 1 |
| 82 | b6 | 0 | 1 |
| 83 | c6 | 0 | 1 |
| 85 | e6 | 0 | 2 |
| 88 | A | 0 | 6 |
| 89 | n | 0 | 1 |
| All | All | 0 | 125 |

The worst 5 of 38 bond length outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed(Å) | Ideal(Å) |
|-----|-------|-----|------|-------|--------|-------------|----------|
| 89 | n | 220 | LYS | CE-NZ | 125.36 | 4.62 | 1.49 |
| 8 | D | 194 | PHE | CB-CG | 119.68 | 3.54 | 1.51 |

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| Mol | Chain | Res | Type | Atoms | Z | Observed(Å) | Ideal(Å) |
|-----|-------|-----|------|---------|-------|-------------|----------|
| 89 | n | 92 | TYR | CD1-CE1 | 88.52 | 2.72 | 1.39 |
| 89 | n | 92 | TYR | CD2-CE2 | 84.32 | 2.65 | 1.39 |
| 89 | n | 92 | TYR | CE2-CZ | 59.95 | 2.16 | 1.38 |

The worst 5 of 623 bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed(°) | Ideal(°) |
|-----|-------|------|------|-----------|--------|-------------|----------|
| 3 | A3 | 2790 | A | OP1-P-OP2 | -28.97 | 76.15 | 119.60 |
| 3 | A3 | 2790 | A | O5'-P-OP2 | -28.55 | 76.44 | 110.70 |
| 73 | S6 | 90 | PRO | N-CD-CG | -18.72 | 75.12 | 103.20 |
| 3 | A3 | 2790 | A | O5'-P-OP1 | 15.95 | 129.84 | 110.70 |
| 87 | 24 | 30 | G | C8-N9-C4 | -15.63 | 100.15 | 106.40 |

There are no chirality outliers.

5 of 125 planarity outliers are listed below:

| Mol | Chain | Res | Type | Group |
|-----|-------|-----|------|---------|
| 1 | r1 | 162 | MET | Peptide |
| 1 | r1 | 53 | ALA | Peptide |
| 1 | r1 | 57 | SER | Peptide |
| 1 | r1 | 78 | GLU | Peptide |
| 1 | r1 | 98 | 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 | |
|-----|-------|---------------|-----------|-----------|----------|-------------|----|
| 1 | r1 | 694/751 (92%) | 523 (75%) | 159 (23%) | 12 (2%) | 9 | 42 |

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| Mol | Chain | Analysed | Favoured | Allowed | Outliers | Percentiles | |
|-----|-------|---------------|-----------|----------|----------|-------------|-----|
| 5 | D3 | 234/305 (77%) | 216 (92%) | 17 (7%) | 1 (0%) | 34 | 69 |
| 6 | E3 | 296/348 (85%) | 258 (87%) | 38 (13%) | 0 | 100 | 100 |
| 7 | F3 | 248/311 (80%) | 224 (90%) | 24 (10%) | 0 | 100 | 100 |
| 8 | D | 78/267 (29%) | 60 (77%) | 18 (23%) | 0 | 100 | 100 |
| 8 | H3 | 93/267 (35%) | 84 (90%) | 9 (10%) | 0 | 100 | 100 |
| 9 | I3 | 154/261 (59%) | 145 (94%) | 9 (6%) | 0 | 100 | 100 |
| 10 | J3 | 138/192 (72%) | 124 (90%) | 14 (10%) | 0 | 100 | 100 |
| 11 | K3 | 175/178 (98%) | 153 (87%) | 19 (11%) | 3 (2%) | 9 | 42 |
| 12 | L3 | 113/145 (78%) | 104 (92%) | 9 (8%) | 0 | 100 | 100 |
| 13 | M3 | 285/296 (96%) | 254 (89%) | 30 (10%) | 1 (0%) | 34 | 69 |
| 14 | N3 | 203/251 (81%) | 189 (93%) | 12 (6%) | 2 (1%) | 15 | 51 |
| 15 | O3 | 150/175 (86%) | 130 (87%) | 19 (13%) | 1 (1%) | 22 | 59 |
| 16 | P3 | 129/179 (72%) | 118 (92%) | 11 (8%) | 0 | 100 | 100 |
| 17 | Q3 | 217/292 (74%) | 192 (88%) | 25 (12%) | 0 | 100 | 100 |
| 18 | R3 | 138/149 (93%) | 128 (93%) | 10 (7%) | 0 | 100 | 100 |
| 19 | S3 | 154/205 (75%) | 139 (90%) | 15 (10%) | 0 | 100 | 100 |
| 20 | T3 | 164/212 (77%) | 152 (93%) | 12 (7%) | 0 | 100 | 100 |
| 21 | U3 | 109/153 (71%) | 96 (88%) | 13 (12%) | 0 | 100 | 100 |
| 22 | V3 | 183/216 (85%) | 155 (85%) | 26 (14%) | 2 (1%) | 14 | 50 |
| 23 | W3 | 109/148 (74%) | 103 (94%) | 6 (6%) | 0 | 100 | 100 |
| 24 | X3 | 241/256 (94%) | 220 (91%) | 20 (8%) | 1 (0%) | 34 | 69 |
| 25 | Y3 | 174/250 (70%) | 161 (92%) | 12 (7%) | 1 (1%) | 25 | 62 |
| 26 | Z3 | 118/161 (73%) | 108 (92%) | 10 (8%) | 0 | 100 | 100 |
| 27 | 03 | 106/188 (56%) | 94 (89%) | 11 (10%) | 1 (1%) | 17 | 54 |
| 28 | 13 | 50/65 (77%) | 46 (92%) | 3 (6%) | 1 (2%) | 7 | 39 |
| 29 | 23 | 44/92 (48%) | 42 (96%) | 2 (4%) | 0 | 100 | 100 |
| 30 | 33 | 93/188 (50%) | 89 (96%) | 4 (4%) | 0 | 100 | 100 |
| 31 | 43 | 34/103 (33%) | 34 (100%) | 0 | 0 | 100 | 100 |
| 32 | 53 | 368/423 (87%) | 326 (89%) | 40 (11%) | 2 (0%) | 29 | 66 |
| 33 | 63 | 313/380 (82%) | 283 (90%) | 30 (10%) | 0 | 100 | 100 |
| 34 | 73 | 258/338 (76%) | 233 (90%) | 25 (10%) | 0 | 100 | 100 |

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| Mol | Chain | Analysed | Favoured | Allowed | Outliers | Percentiles | |
|-----|-------|---------------|-----------|----------|----------|-------------|-----|
| 35 | 93 | 105/137 (77%) | 88 (84%) | 17 (16%) | 0 | 100 | 100 |
| 36 | a3 | 78/142 (55%) | 74 (95%) | 4 (5%) | 0 | 100 | 100 |
| 37 | b3 | 146/155 (94%) | 132 (90%) | 13 (9%) | 1 (1%) | 22 | 59 |
| 38 | c3 | 271/332 (82%) | 251 (93%) | 20 (7%) | 0 | 100 | 100 |
| 39 | d3 | 156/306 (51%) | 139 (89%) | 15 (10%) | 2 (1%) | 12 | 47 |
| 40 | e3 | 211/279 (76%) | 193 (92%) | 18 (8%) | 0 | 100 | 100 |
| 41 | f3 | 125/194 (64%) | 103 (82%) | 19 (15%) | 3 (2%) | 6 | 35 |
| 42 | g3 | 127/166 (76%) | 119 (94%) | 8 (6%) | 0 | 100 | 100 |
| 43 | h3 | 96/158 (61%) | 84 (88%) | 11 (12%) | 1 (1%) | 15 | 51 |
| 44 | i3 | 95/128 (74%) | 87 (92%) | 8 (8%) | 0 | 100 | 100 |
| 45 | j3 | 83/123 (68%) | 78 (94%) | 4 (5%) | 1 (1%) | 13 | 48 |
| 46 | k3 | 82/112 (73%) | 66 (80%) | 16 (20%) | 0 | 100 | 100 |
| 47 | l3 | 21/138 (15%) | 21 (100%) | 0 | 0 | 100 | 100 |
| 48 | m3 | 43/128 (34%) | 36 (84%) | 7 (16%) | 0 | 100 | 100 |
| 49 | o3 | 92/102 (90%) | 86 (94%) | 6 (6%) | 0 | 100 | 100 |
| 50 | p3 | 119/206 (58%) | 113 (95%) | 6 (5%) | 0 | 100 | 100 |
| 51 | q3 | 126/222 (57%) | 119 (94%) | 5 (4%) | 2 (2%) | 9 | 43 |
| 52 | r3 | 140/196 (71%) | 125 (89%) | 15 (11%) | 0 | 100 | 100 |
| 53 | s3 | 366/439 (83%) | 340 (93%) | 26 (7%) | 0 | 100 | 100 |
| 55 | A5 | 26/435 (6%) | 17 (65%) | 9 (35%) | 0 | 100 | 100 |
| 56 | B6 | 215/296 (73%) | 200 (93%) | 15 (7%) | 0 | 100 | 100 |
| 57 | C6 | 130/167 (78%) | 122 (94%) | 8 (6%) | 0 | 100 | 100 |
| 58 | D6 | 316/430 (74%) | 272 (86%) | 44 (14%) | 0 | 100 | 100 |
| 59 | E6 | 120/125 (96%) | 113 (94%) | 6 (5%) | 1 (1%) | 19 | 56 |
| 60 | F6 | 197/242 (81%) | 182 (92%) | 14 (7%) | 1 (0%) | 29 | 66 |
| 61 | G6 | 301/396 (76%) | 276 (92%) | 25 (8%) | 0 | 100 | 100 |
| 62 | H6 | 120/201 (60%) | 103 (86%) | 17 (14%) | 0 | 100 | 100 |
| 63 | I6 | 134/194 (69%) | 122 (91%) | 12 (9%) | 0 | 100 | 100 |
| 64 | J6 | 106/138 (77%) | 93 (88%) | 13 (12%) | 0 | 100 | 100 |
| 65 | K6 | 99/128 (77%) | 88 (89%) | 11 (11%) | 0 | 100 | 100 |
| 66 | L6 | 162/257 (63%) | 151 (93%) | 11 (7%) | 0 | 100 | 100 |

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| Mol | Chain | Analysed | Favoured | Allowed | Outliers | Percentiles | |
|-----|-------|-------------------|-------------|------------|----------|-------------|-----|
| 67 | M6 | 114/137 (83%) | 100 (88%) | 14 (12%) | 0 | 100 | 100 |
| 68 | N6 | 105/130 (81%) | 93 (89%) | 12 (11%) | 0 | 100 | 100 |
| 69 | O6 | 183/258 (71%) | 159 (87%) | 24 (13%) | 0 | 100 | 100 |
| 70 | P6 | 94/142 (66%) | 82 (87%) | 12 (13%) | 0 | 100 | 100 |
| 71 | Q6 | 84/87 (97%) | 75 (89%) | 9 (11%) | 0 | 100 | 100 |
| 72 | R6 | 240/360 (67%) | 210 (88%) | 30 (12%) | 0 | 100 | 100 |
| 73 | S6 | 124/190 (65%) | 110 (89%) | 14 (11%) | 0 | 100 | 100 |
| 74 | T6 | 160/173 (92%) | 140 (88%) | 19 (12%) | 1 (1%) | 25 | 62 |
| 75 | U6 | 171/205 (83%) | 159 (93%) | 12 (7%) | 0 | 100 | 100 |
| 76 | V6 | 320/414 (77%) | 287 (90%) | 33 (10%) | 0 | 100 | 100 |
| 77 | W6 | 95/187 (51%) | 81 (85%) | 14 (15%) | 0 | 100 | 100 |
| 78 | X6 | 310/398 (78%) | 264 (85%) | 45 (14%) | 1 (0%) | 41 | 74 |
| 79 | Y6 | 106/395 (27%) | 96 (91%) | 10 (9%) | 0 | 100 | 100 |
| 80 | Z6 | 85/106 (80%) | 79 (93%) | 6 (7%) | 0 | 100 | 100 |
| 81 | a6 | 197/218 (90%) | 174 (88%) | 23 (12%) | 0 | 100 | 100 |
| 82 | b6 | 252/323 (78%) | 223 (88%) | 29 (12%) | 0 | 100 | 100 |
| 83 | c6 | 114/118 (97%) | 98 (86%) | 15 (13%) | 1 (1%) | 17 | 54 |
| 84 | d6 | 67/199 (34%) | 62 (92%) | 5 (8%) | 0 | 100 | 100 |
| 85 | e6 | 362/689 (52%) | 328 (91%) | 29 (8%) | 5 (1%) | 11 | 45 |
| 88 | A | 158/206 (77%) | 139 (88%) | 19 (12%) | 0 | 100 | 100 |
| 89 | n | 216/286 (76%) | 166 (77%) | 50 (23%) | 0 | 100 | 100 |
| All | All | 13828/19638 (70%) | 12301 (89%) | 1479 (11%) | 48 (0%) | 44 | 74 |

5 of 48 Ramachandran outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1 | r1 | 365 | PHE |
| 1 | r1 | 598 | PRO |
| 1 | r1 | 623 | GLU |
| 1 | r1 | 724 | LEU |
| 1 | r1 | 725 | PRO |

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 | |
|-----|-------|---------------|------------|----------|-------------|-----|
| 1 | r1 | 592/630 (94%) | 591 (100%) | 1 (0%) | 93 | 97 |
| 5 | D3 | 190/245 (78%) | 190 (100%) | 0 | 100 | 100 |
| 6 | E3 | 255/290 (88%) | 255 (100%) | 0 | 100 | 100 |
| 7 | F3 | 217/262 (83%) | 216 (100%) | 1 (0%) | 88 | 94 |
| 8 | D | 73/228 (32%) | 73 (100%) | 0 | 100 | 100 |
| 8 | H3 | 86/228 (38%) | 86 (100%) | 0 | 100 | 100 |
| 9 | I3 | 145/232 (62%) | 145 (100%) | 0 | 100 | 100 |
| 10 | J3 | 113/150 (75%) | 113 (100%) | 0 | 100 | 100 |
| 11 | K3 | 155/156 (99%) | 154 (99%) | 1 (1%) | 86 | 93 |
| 12 | L3 | 98/124 (79%) | 98 (100%) | 0 | 100 | 100 |
| 13 | M3 | 245/249 (98%) | 243 (99%) | 2 (1%) | 81 | 89 |
| 14 | N3 | 172/211 (82%) | 172 (100%) | 0 | 100 | 100 |
| 15 | O3 | 133/150 (89%) | 133 (100%) | 0 | 100 | 100 |
| 16 | P3 | 115/154 (75%) | 113 (98%) | 2 (2%) | 60 | 79 |
| 17 | Q3 | 201/256 (78%) | 201 (100%) | 0 | 100 | 100 |
| 18 | R3 | 118/126 (94%) | 118 (100%) | 0 | 100 | 100 |
| 19 | S3 | 141/180 (78%) | 140 (99%) | 1 (1%) | 84 | 91 |
| 20 | T3 | 146/182 (80%) | 146 (100%) | 0 | 100 | 100 |
| 21 | U3 | 99/135 (73%) | 98 (99%) | 1 (1%) | 76 | 86 |
| 22 | V3 | 169/191 (88%) | 168 (99%) | 1 (1%) | 86 | 93 |
| 23 | W3 | 91/119 (76%) | 91 (100%) | 0 | 100 | 100 |
| 24 | X3 | 217/227 (96%) | 216 (100%) | 1 (0%) | 88 | 94 |
| 25 | Y3 | 159/223 (71%) | 159 (100%) | 0 | 100 | 100 |
| 26 | Z3 | 111/147 (76%) | 111 (100%) | 0 | 100 | 100 |
| 27 | 03 | 97/164 (59%) | 97 (100%) | 0 | 100 | 100 |
| 28 | 13 | 49/60 (82%) | 49 (100%) | 0 | 100 | 100 |

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| Mol | Chain | Analysed | Rotameric | Outliers | Percentiles | |
|-----|-------|---------------|------------|----------|-------------|-----|
| 29 | 23 | 40/72 (56%) | 40 (100%) | 0 | 100 | 100 |
| 30 | 33 | 88/166 (53%) | 88 (100%) | 0 | 100 | 100 |
| 31 | 43 | 35/89 (39%) | 35 (100%) | 0 | 100 | 100 |
| 32 | 53 | 337/368 (92%) | 335 (99%) | 2 (1%) | 86 | 93 |
| 33 | 63 | 266/332 (80%) | 265 (100%) | 1 (0%) | 91 | 95 |
| 34 | 73 | 242/303 (80%) | 242 (100%) | 0 | 100 | 100 |
| 35 | 93 | 91/112 (81%) | 91 (100%) | 0 | 100 | 100 |
| 36 | a3 | 78/133 (59%) | 78 (100%) | 0 | 100 | 100 |
| 37 | b3 | 130/135 (96%) | 129 (99%) | 1 (1%) | 81 | 89 |
| 38 | c3 | 241/288 (84%) | 241 (100%) | 0 | 100 | 100 |
| 39 | d3 | 151/274 (55%) | 151 (100%) | 0 | 100 | 100 |
| 40 | e3 | 188/236 (80%) | 187 (100%) | 1 (0%) | 88 | 94 |
| 41 | f3 | 117/173 (68%) | 117 (100%) | 0 | 100 | 100 |
| 42 | g3 | 119/148 (80%) | 119 (100%) | 0 | 100 | 100 |
| 43 | h3 | 95/148 (64%) | 95 (100%) | 0 | 100 | 100 |
| 44 | i3 | 86/110 (78%) | 86 (100%) | 0 | 100 | 100 |
| 45 | j3 | 68/97 (70%) | 68 (100%) | 0 | 100 | 100 |
| 46 | k3 | 74/90 (82%) | 74 (100%) | 0 | 100 | 100 |
| 47 | l3 | 23/116 (20%) | 23 (100%) | 0 | 100 | 100 |
| 48 | m3 | 40/113 (35%) | 39 (98%) | 1 (2%) | 47 | 70 |
| 49 | o3 | 80/87 (92%) | 80 (100%) | 0 | 100 | 100 |
| 50 | p3 | 117/181 (65%) | 116 (99%) | 1 (1%) | 78 | 88 |
| 51 | q3 | 110/178 (62%) | 110 (100%) | 0 | 100 | 100 |
| 52 | r3 | 133/169 (79%) | 133 (100%) | 0 | 100 | 100 |
| 53 | s3 | 326/381 (86%) | 326 (100%) | 0 | 100 | 100 |
| 56 | B6 | 191/249 (77%) | 190 (100%) | 1 (0%) | 88 | 94 |
| 57 | C6 | 115/143 (80%) | 115 (100%) | 0 | 100 | 100 |
| 58 | D6 | 269/357 (75%) | 269 (100%) | 0 | 100 | 100 |
| 59 | E6 | 104/107 (97%) | 104 (100%) | 0 | 100 | 100 |
| 60 | F6 | 178/209 (85%) | 178 (100%) | 0 | 100 | 100 |
| 61 | G6 | 265/342 (78%) | 264 (100%) | 1 (0%) | 91 | 95 |

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| Mol | Chain | Analysed | Rotameric | Outliers | Percentiles | |
|-----|-------|-------------------|--------------|----------|-------------|-----|
| 62 | H6 | 112/180 (62%) | 112 (100%) | 0 | 100 | 100 |
| 63 | I6 | 104/147 (71%) | 104 (100%) | 0 | 100 | 100 |
| 64 | J6 | 93/118 (79%) | 93 (100%) | 0 | 100 | 100 |
| 65 | K6 | 91/113 (80%) | 91 (100%) | 0 | 100 | 100 |
| 66 | L6 | 152/226 (67%) | 152 (100%) | 0 | 100 | 100 |
| 67 | M6 | 95/113 (84%) | 95 (100%) | 0 | 100 | 100 |
| 68 | N6 | 93/115 (81%) | 93 (100%) | 0 | 100 | 100 |
| 69 | O6 | 166/230 (72%) | 165 (99%) | 1 (1%) | 86 | 93 |
| 70 | P6 | 87/123 (71%) | 87 (100%) | 0 | 100 | 100 |
| 71 | Q6 | 78/79 (99%) | 78 (100%) | 0 | 100 | 100 |
| 72 | R6 | 224/318 (70%) | 222 (99%) | 2 (1%) | 78 | 88 |
| 73 | S6 | 109/164 (66%) | 109 (100%) | 0 | 100 | 100 |
| 74 | T6 | 150/157 (96%) | 149 (99%) | 1 (1%) | 84 | 91 |
| 75 | U6 | 149/174 (86%) | 149 (100%) | 0 | 100 | 100 |
| 76 | V6 | 295/364 (81%) | 295 (100%) | 0 | 100 | 100 |
| 77 | W6 | 84/158 (53%) | 84 (100%) | 0 | 100 | 100 |
| 78 | X6 | 275/351 (78%) | 274 (100%) | 1 (0%) | 91 | 95 |
| 79 | Y6 | 99/357 (28%) | 99 (100%) | 0 | 100 | 100 |
| 80 | Z6 | 80/95 (84%) | 80 (100%) | 0 | 100 | 100 |
| 81 | a6 | 176/190 (93%) | 175 (99%) | 1 (1%) | 86 | 93 |
| 82 | b6 | 237/291 (81%) | 236 (100%) | 1 (0%) | 91 | 95 |
| 83 | c6 | 99/101 (98%) | 97 (98%) | 2 (2%) | 55 | 74 |
| 84 | d6 | 63/166 (38%) | 63 (100%) | 0 | 100 | 100 |
| 85 | e6 | 226/609 (37%) | 226 (100%) | 0 | 100 | 100 |
| 88 | A | 151/190 (80%) | 151 (100%) | 0 | 100 | 100 |
| 89 | n | 194/254 (76%) | 194 (100%) | 0 | 100 | 100 |
| All | All | 12266/16608 (74%) | 12237 (100%) | 29 (0%) | 93 | 97 |

5 of 29 residues with a non-rotameric sidechain are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 37 | b3 | 123 | ASN |
| 83 | c6 | 37 | ARG |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 50 | p3 | 82 | ARG |
| 78 | X6 | 312 | GLN |
| 48 | m3 | 72 | ARG |

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 23 such sidechains are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 63 | I6 | 98 | GLN |
| 70 | P6 | 115 | GLN |
| 70 | P6 | 71 | HIS |
| 74 | T6 | 59 | ASN |
| 10 | J3 | 103 | GLN |

5.3.3 RNA [i](#)

| Mol | Chain | Analysed | Backbone Outliers | Pucker Outliers |
|-----|-------|-----------------|-------------------|-----------------|
| 3 | 8 | 7/1559 (0%) | 4 (57%) | 0 |
| 3 | A3 | 1490/1559 (95%) | 415 (27%) | 38 (2%) |
| 4 | B3 | 51/73 (69%) | 15 (29%) | 1 (1%) |
| 54 | u3 | 1/2 (50%) | 0 | 0 |
| 86 | A6 | 921/954 (96%) | 267 (28%) | 14 (1%) |
| 87 | 24 | 73/73 (100%) | 38 (52%) | 1 (1%) |
| 87 | FE | 73/73 (100%) | 38 (52%) | 1 (1%) |
| All | All | 2616/4293 (60%) | 777 (29%) | 55 (2%) |

5 of 777 RNA backbone outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|------|------|
| 3 | A3 | 1674 | A |
| 3 | A3 | 1676 | A |
| 3 | A3 | 1678 | C |
| 3 | A3 | 1679 | U |
| 3 | A3 | 1680 | A |

5 of 55 RNA pucker outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|------|------|
| 3 | A3 | 2788 | C |
| 3 | A3 | 3157 | C |
| 87 | FE | 1 | G |

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| Mol | Chain | Res | Type |
|-----|-------|------|------|
| 86 | A6 | 1419 | G |
| 3 | A3 | 2789 | C |

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 138 ligands modelled in this entry, 135 are monoatomic - leaving 3 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

| Mol | Type | Chain | Res | Link | Bond lengths | | | Bond angles | | |
|-----|------|-------|------|------|--------------|------|----------|-------------|------|----------|
| | | | | | Counts | RMSZ | # Z > 2 | Counts | RMSZ | # Z > 2 |
| 95 | GDP | X6 | 500 | - | 24,30,30 | 0.95 | 1 (4%) | 30,47,47 | 1.29 | 4 (13%) |
| 93 | SPD | A3 | 3396 | - | 9,9,9 | 0.35 | 0 | 8,8,8 | 0.50 | 0 |
| 91 | GCP | r1 | 801 | 1,92 | 27,34,34 | 3.59 | 11 (40%) | 34,54,54 | 5.22 | 13 (38%) |

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

| Mol | Type | Chain | Res | Link | Chirals | Torsions | Rings |
|-----|------|-------|------|------|---------|------------|---------|
| 95 | GDP | X6 | 500 | - | - | 4/12/32/32 | 0/3/3/3 |
| 93 | SPD | A3 | 3396 | - | - | 6/7/7/7 | - |
| 91 | GCP | r1 | 801 | 1,92 | - | 8/15/38/38 | 0/3/3/3 |

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

| Mol | Chain | Res | Type | Atoms | Z | Observed(Å) | Ideal(Å) |
|-----|-------|-----|------|---------|-------|-------------|----------|
| 91 | r1 | 801 | GCP | O4'-C1' | -8.41 | 1.29 | 1.41 |
| 91 | r1 | 801 | GCP | C2'-C3' | -8.15 | 1.31 | 1.53 |
| 91 | r1 | 801 | GCP | PB-O3A | 6.28 | 1.65 | 1.58 |
| 91 | r1 | 801 | GCP | C2-N2 | 6.23 | 1.46 | 1.33 |
| 91 | r1 | 801 | GCP | O6-C6 | 6.18 | 1.40 | 1.24 |

The worst 5 of 17 bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed(°) | Ideal(°) |
|-----|-------|-----|------|------------|--------|-------------|----------|
| 91 | r1 | 801 | GCP | O3G-PG-C3B | -16.88 | 65.45 | 106.40 |
| 91 | r1 | 801 | GCP | O3G-PG-O1G | -14.36 | 74.41 | 112.39 |
| 91 | r1 | 801 | GCP | O1G-PG-C3B | 13.11 | 139.50 | 111.24 |
| 91 | r1 | 801 | GCP | O3G-PG-O2G | 12.05 | 143.27 | 108.08 |
| 91 | r1 | 801 | GCP | PB-O3A-PA | -4.10 | 119.55 | 132.56 |

There are no chirality outliers.

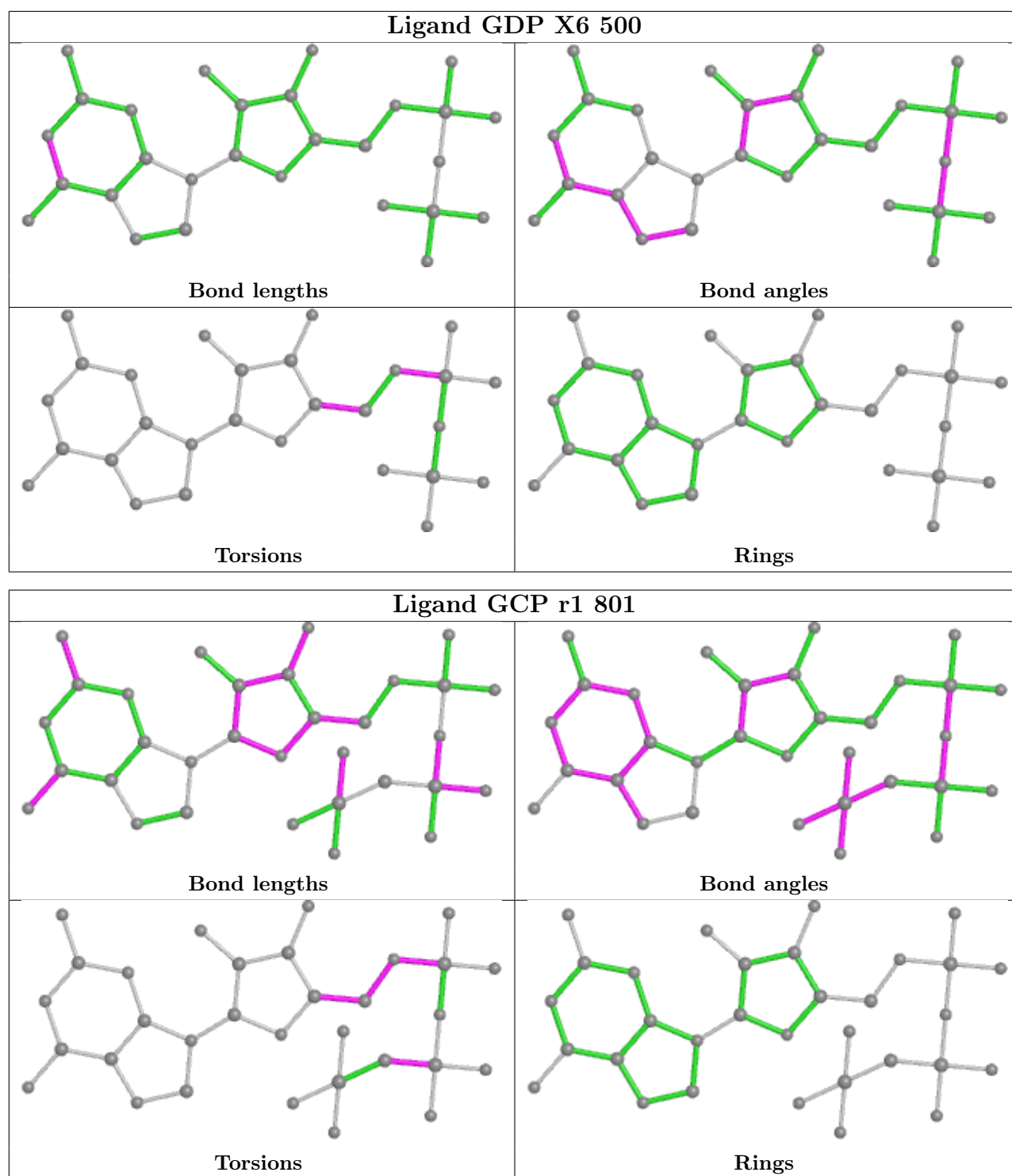
5 of 18 torsion outliers are listed below:

| Mol | Chain | Res | Type | Atoms |
|-----|-------|-----|------|----------------|
| 91 | r1 | 801 | GCP | PG-C3B-PB-O1B |
| 91 | r1 | 801 | GCP | PG-C3B-PB-O2B |
| 91 | r1 | 801 | GCP | PG-C3B-PB-O3A |
| 91 | r1 | 801 | GCP | C5'-O5'-PA-O1A |
| 95 | X6 | 500 | GDP | C5'-O5'-PA-O1A |

There are no ring outliers.

No monomer is involved in short contacts.

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.



5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues

The following chains have linkage breaks:

| Mol | Chain | Number of breaks |
|-----|-------|------------------|
| 13 | M3 | 1 |
| 25 | Y3 | 1 |

All chain breaks are listed below:

| Model | Chain | Residue-1 | Atom-1 | Residue-2 | Atom-2 | Distance (Å) |
|-------|-------|-----------|--------|-----------|--------|--------------|
| 1 | M3 | 61:THR | C | 62:ARG | N | 1.19 |
| 1 | Y3 | 123:ARG | C | 124:LEU | N | 1.19 |

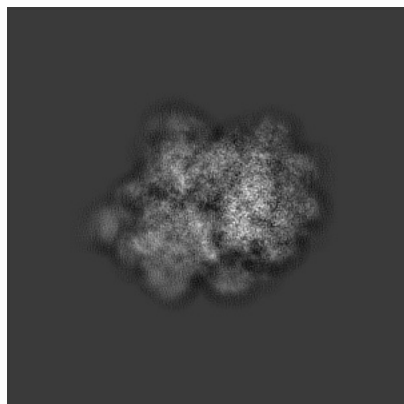
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-11646. These allow visual inspection of the internal detail of the map and identification of artifacts.

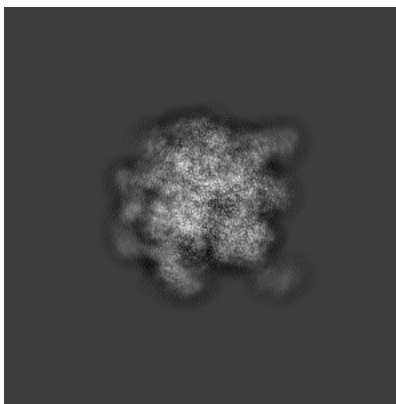
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

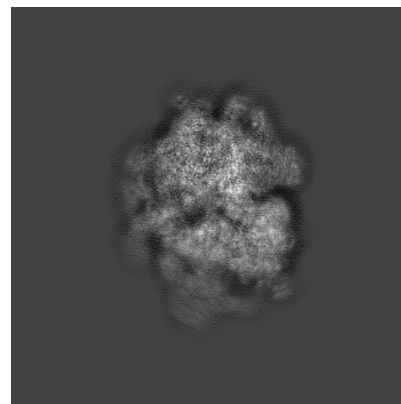
6.1.1 Primary map



X

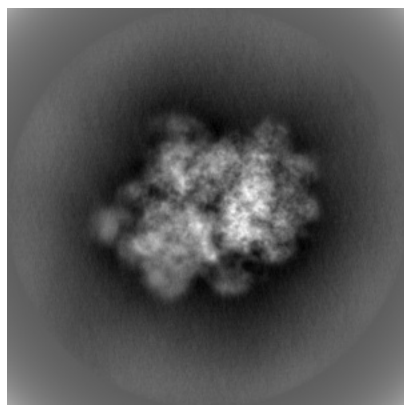


Y

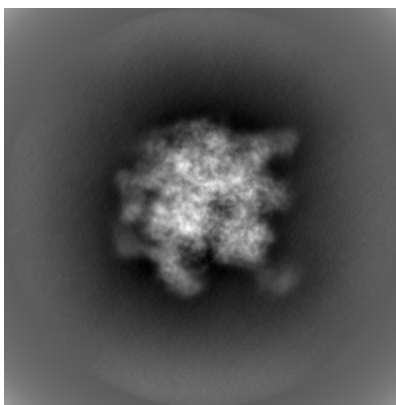


Z

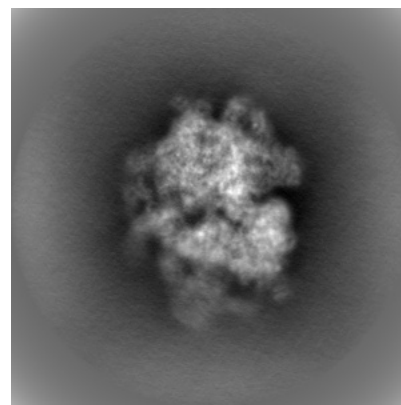
6.1.2 Raw map



X



Y

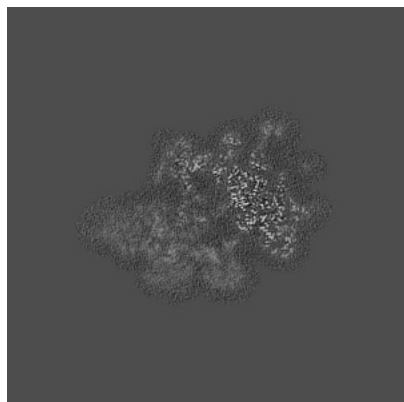


Z

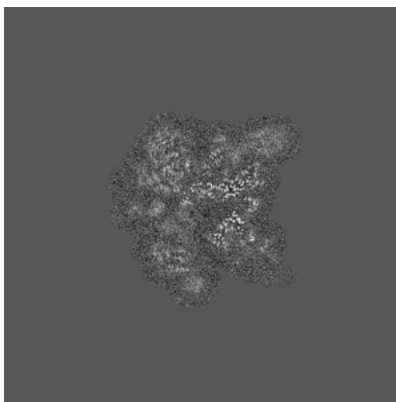
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

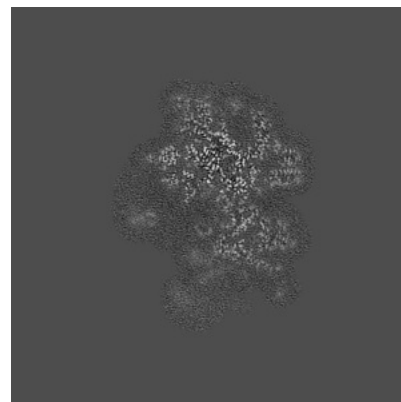
6.2.1 Primary map



X Index: 256

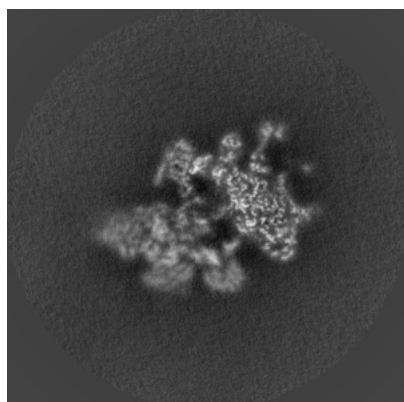


Y Index: 256

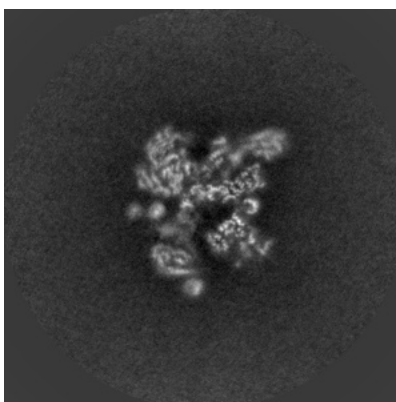


Z Index: 256

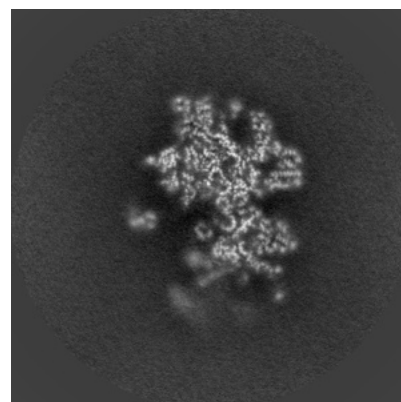
6.2.2 Raw map



X Index: 256



Y Index: 256

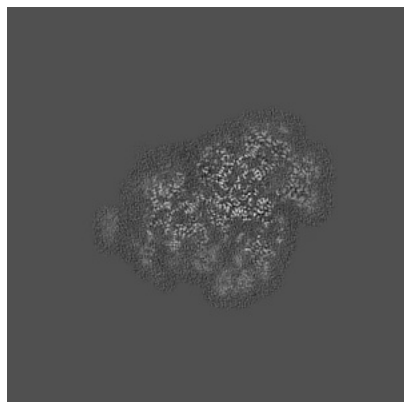


Z Index: 256

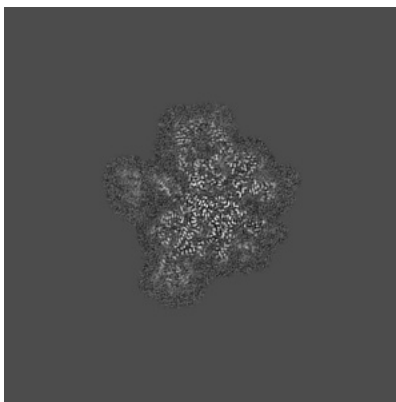
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

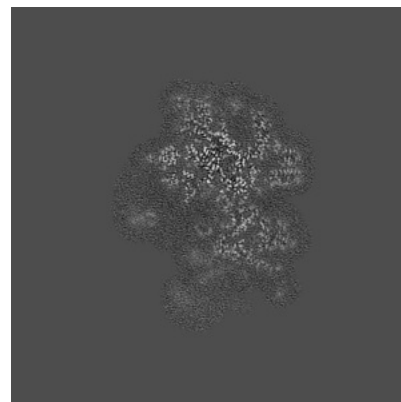
6.3.1 Primary map



X Index: 286

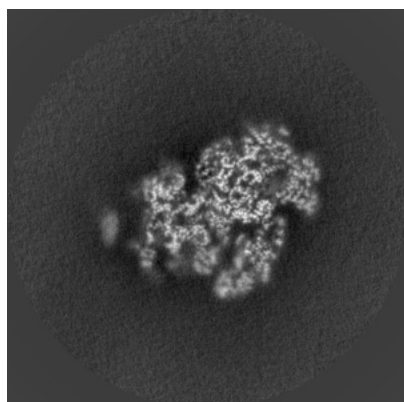


Y Index: 305

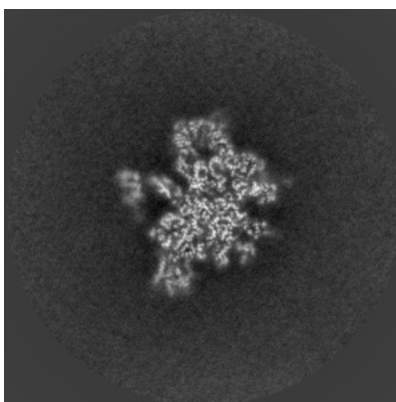


Z Index: 256

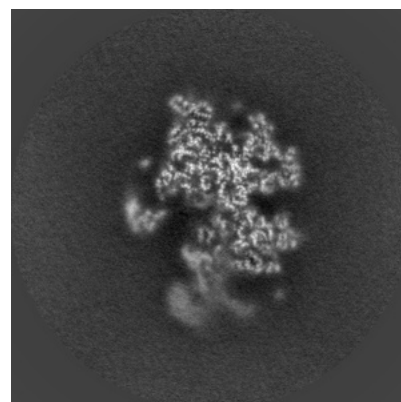
6.3.2 Raw map



X Index: 286



Y Index: 305

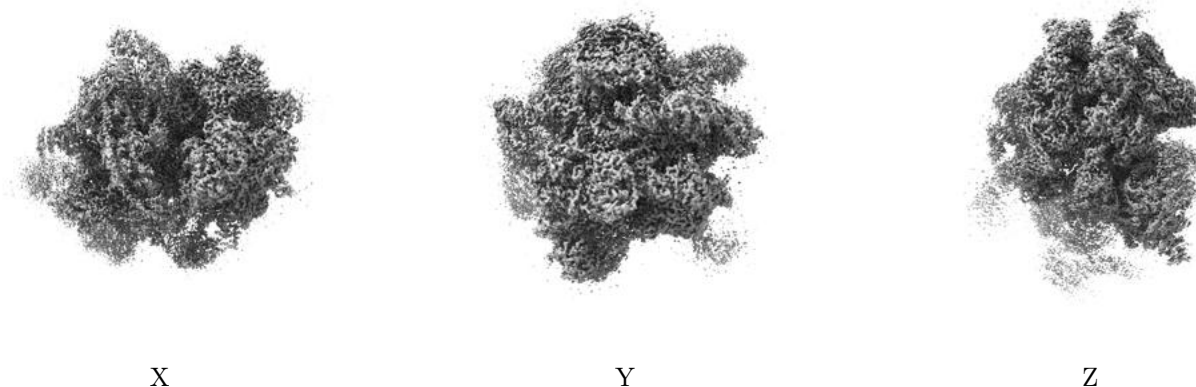


Z Index: 247

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



The images above show the 3D surface view of the map at the recommended contour level 0.05. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.4.2 Raw map



These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

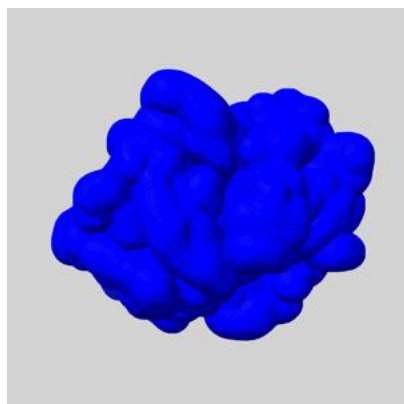
6.5 Mask visualisation [i](#)

This section shows the 3D surface view of the primary map at 50% transparency overlaid with the specified mask at 0% transparency

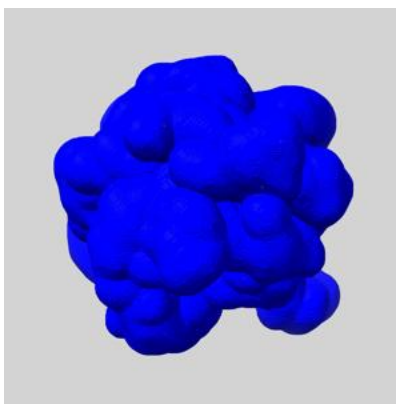
A mask typically either:

- Encompasses the whole structure
- Separates out a domain, a functional unit, a monomer or an area of interest from a larger structure

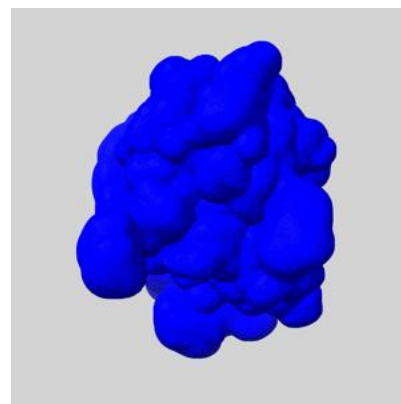
6.5.1 emd_11646_msk_1.map [i](#)



X



Y

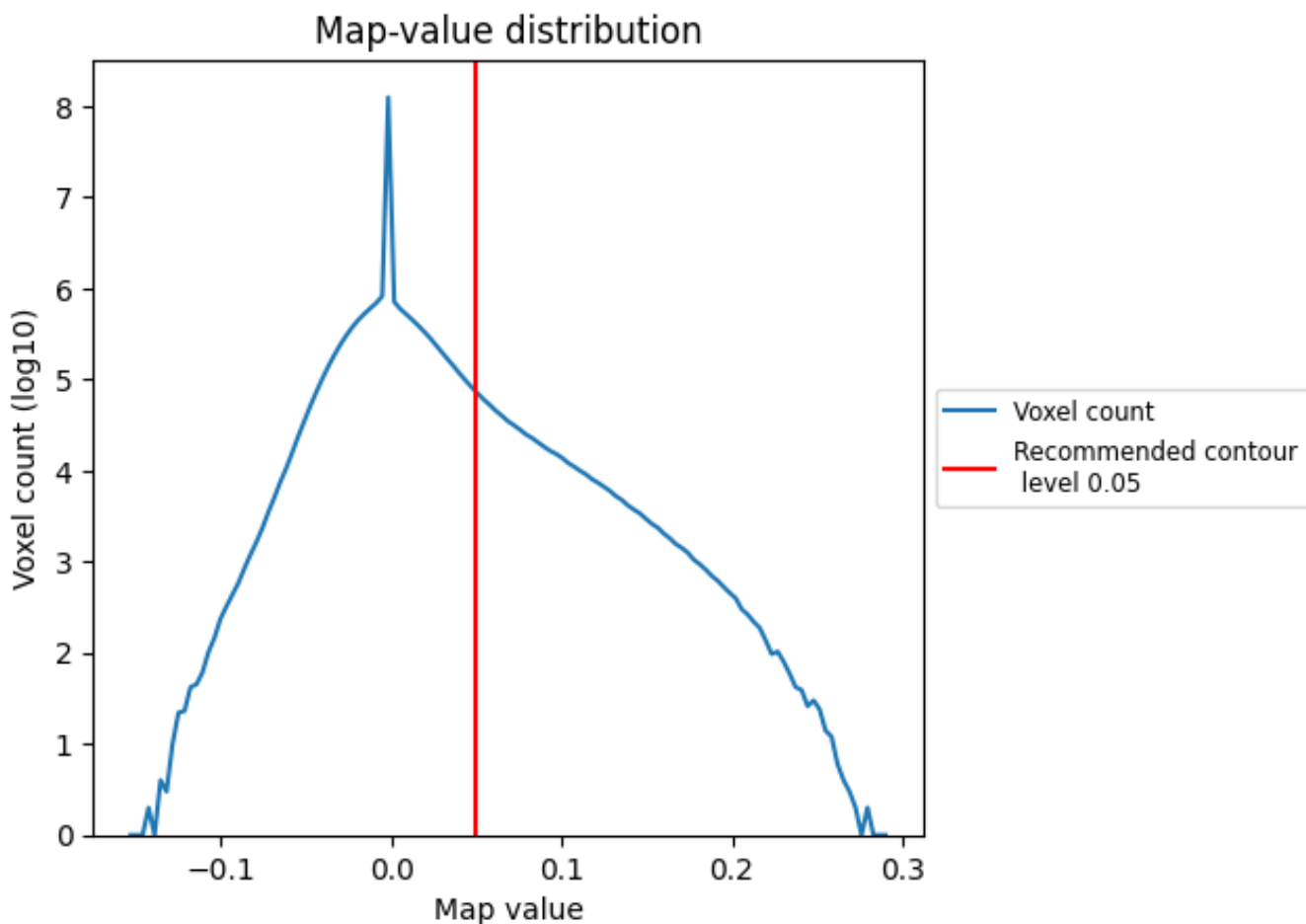


Z

7 Map analysis [i](#)

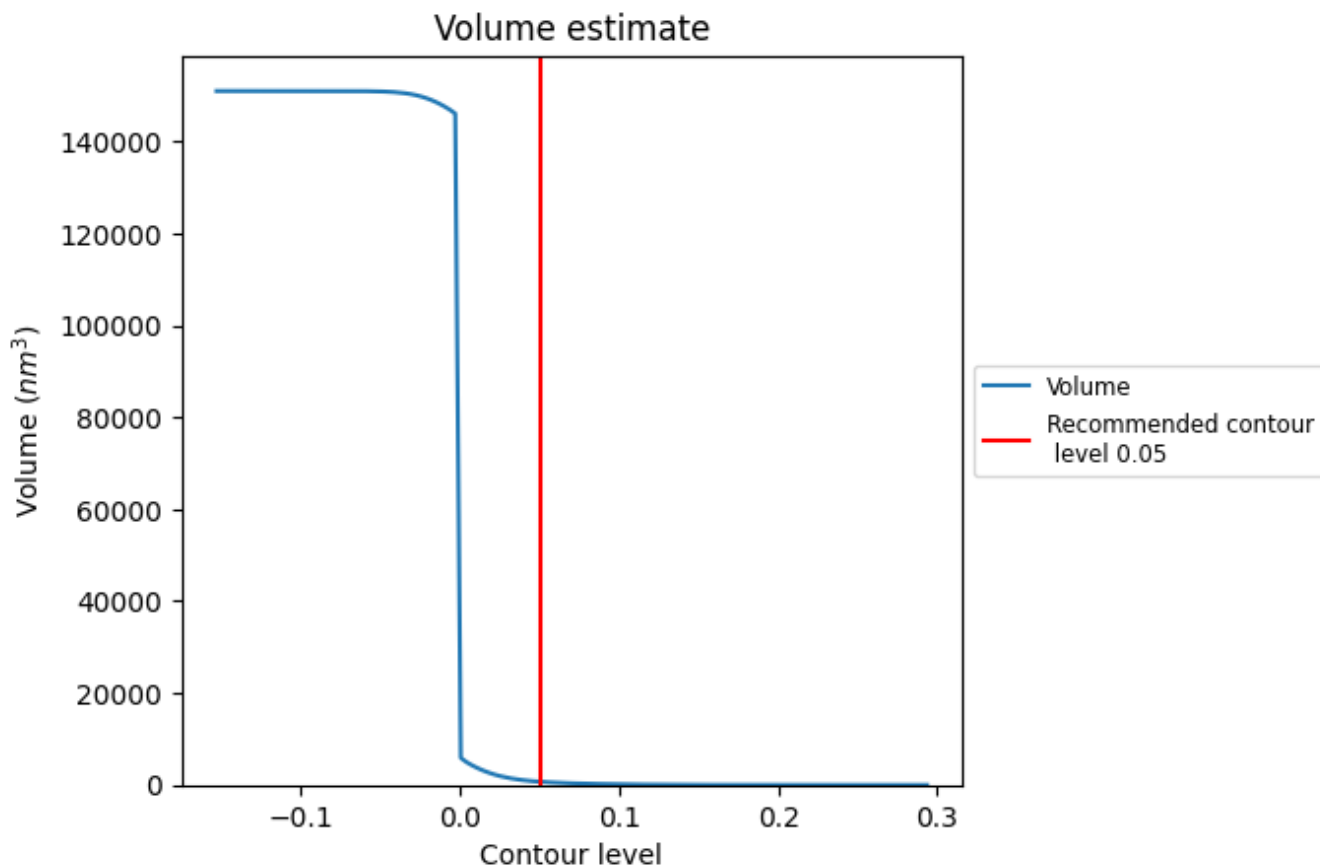
This section contains the results of statistical analysis of the map.

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.

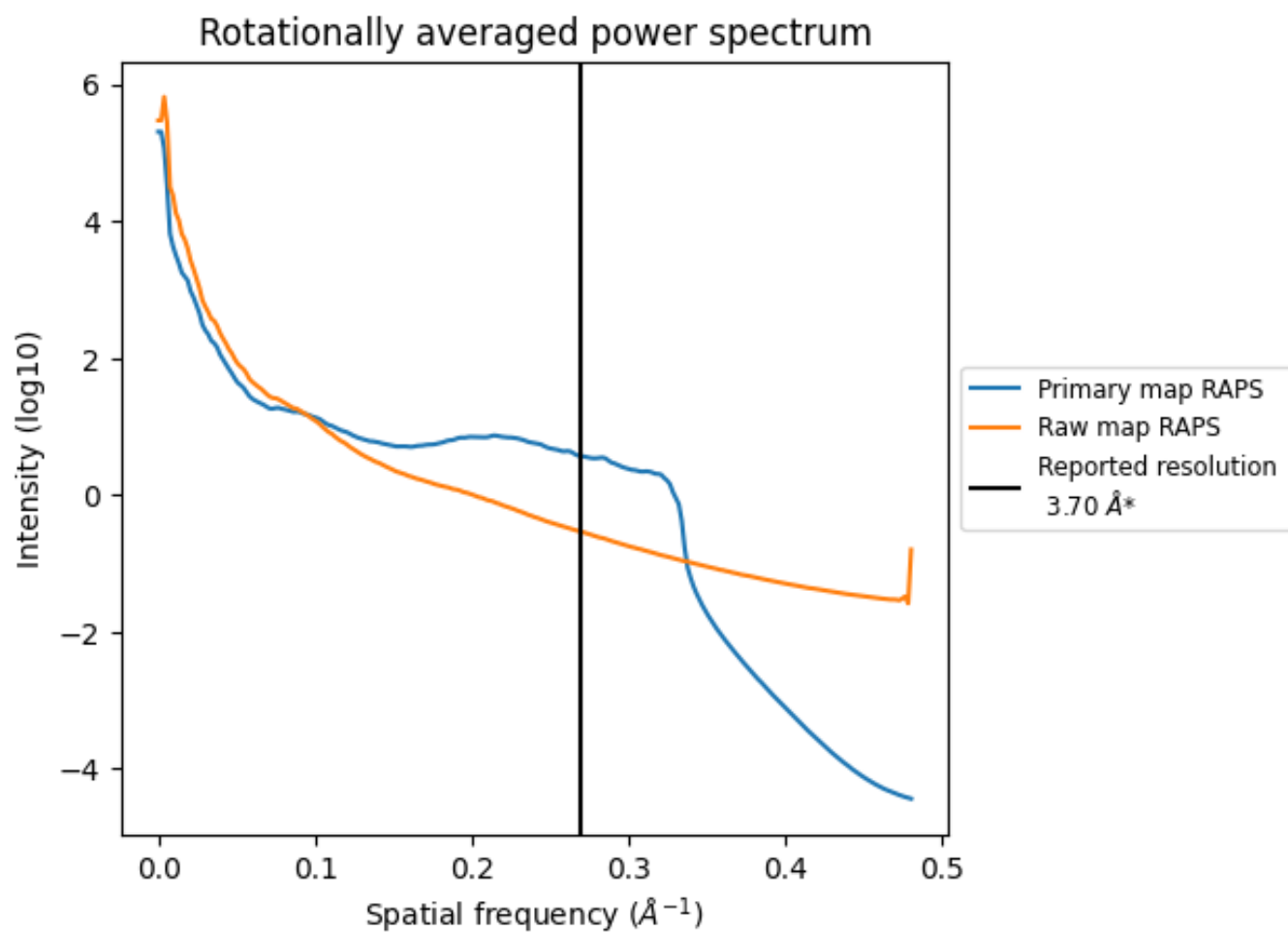
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 706 nm³; this corresponds to an approximate mass of 638 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](#)

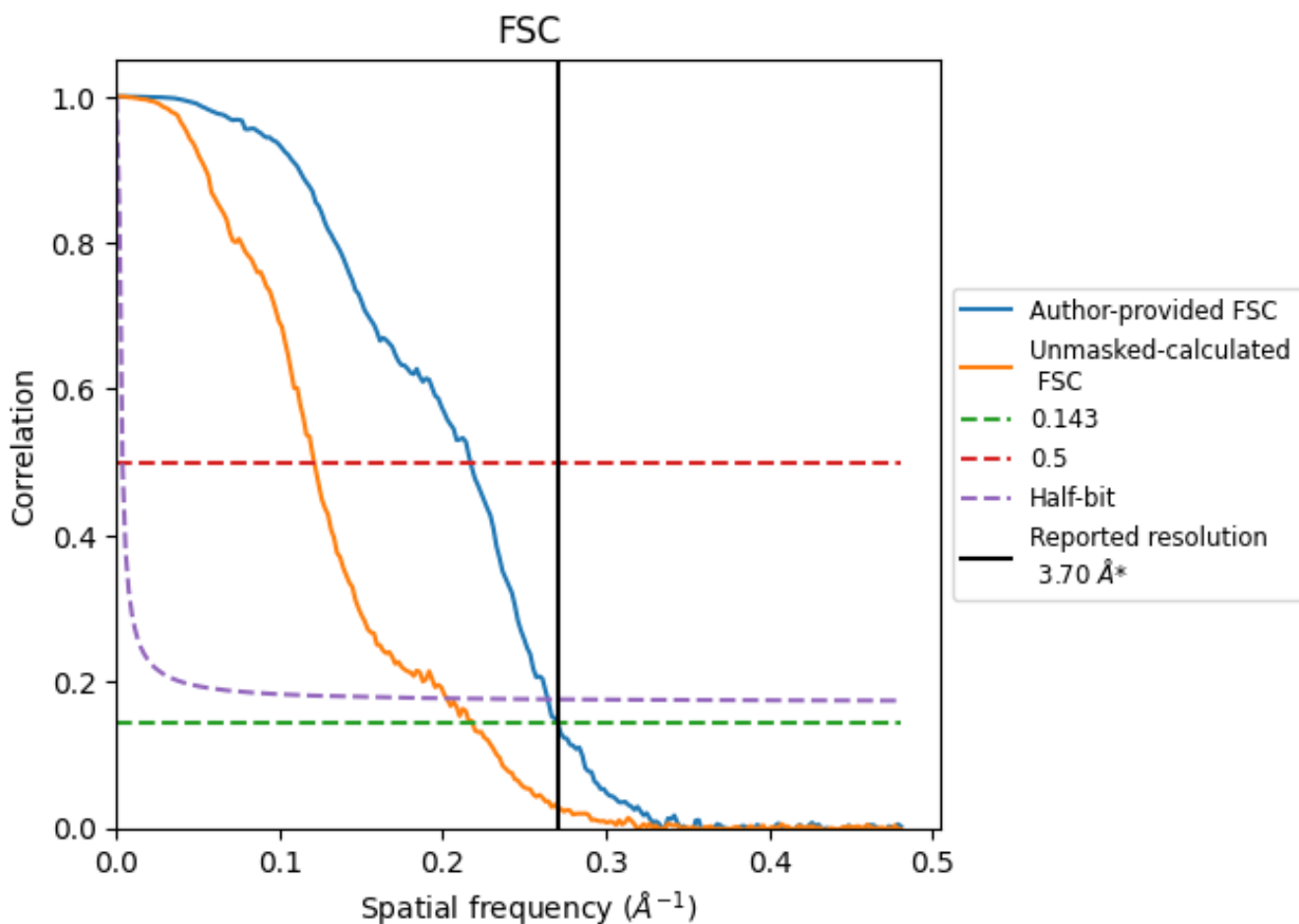


*Reported resolution corresponds to spatial frequency of 0.270 Å⁻¹

8 Fourier-Shell correlation [i](#)

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of 0.270 \AA^{-1}

8.2 Resolution estimates [i](#)

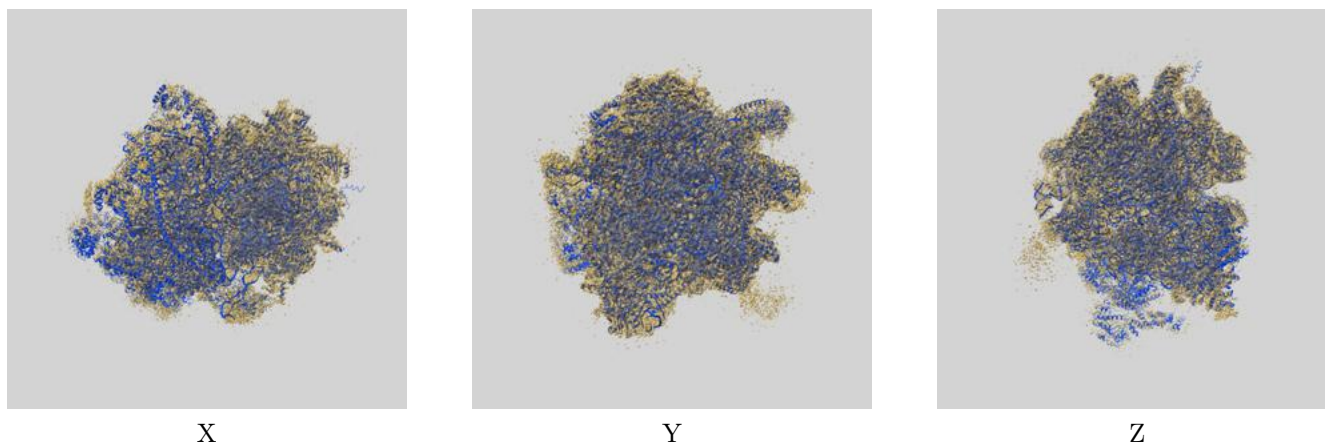
| Resolution estimate (Å) | Estimation criterion (FSC cut-off) | | |
|---------------------------|------------------------------------|------|----------|
| | 0.143 | 0.5 | Half-bit |
| Reported by author | 3.70 | - | - |
| Author-provided FSC curve | 3.70 | 4.61 | 3.78 |
| Unmasked-calculated* | 4.58 | 8.26 | 4.94 |

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 4.58 differs from the reported value 3.7 by more than 10 %

9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-11646 and PDB model 7A5K. Per-residue inclusion information can be found in section 3 on page 23.

9.1 Map-model overlay [i](#)

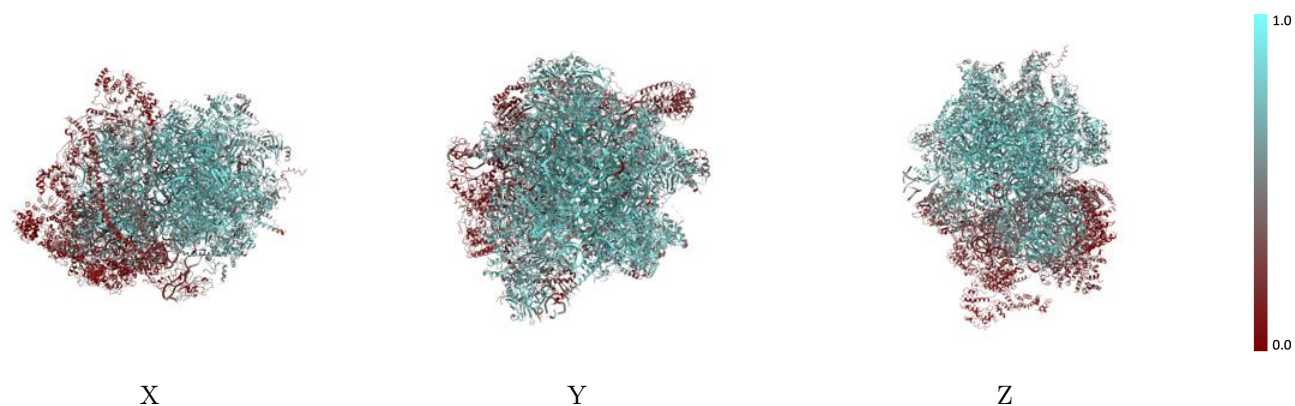


The images above show the 3D surface view of the map at the recommended contour level 0.05 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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

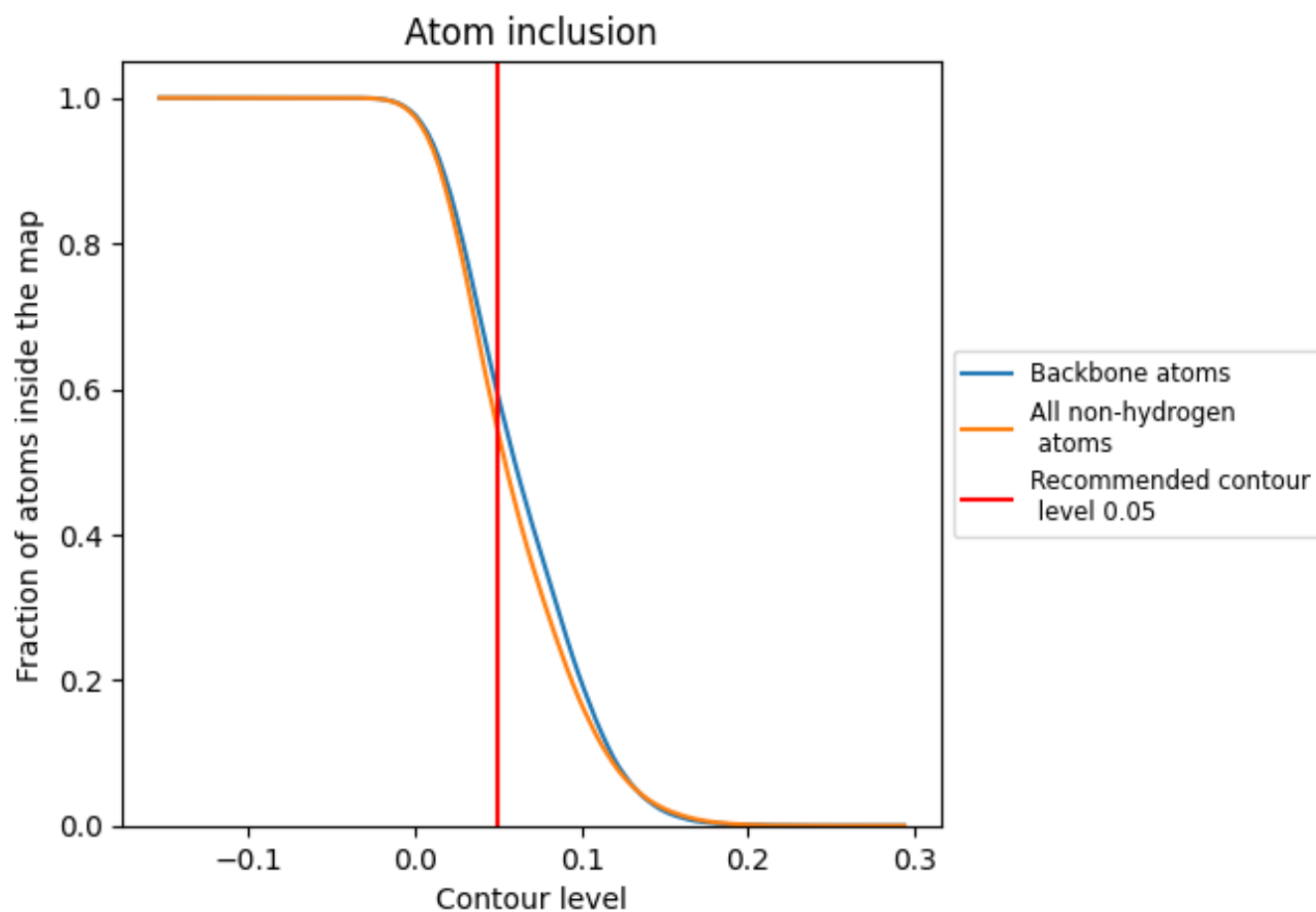
This section was not generated.

9.3 Atom inclusion mapped to coordinate model [i](#)



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.05).




































9.4 Atom inclusion [i](#)



At the recommended contour level, 59% of all backbone atoms, 54% 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 (0.05) and Q-score for the entire model and for each chain.

| Chain | Atom inclusion |
|-------|--|
| All |  0.5403 |
| 03 |  0.6659 |
| 13 |  0.6714 |
| 23 |  0.7889 |
| 24 |  0.1138 |
| 33 |  0.7807 |
| 43 |  0.7850 |
| 53 |  0.6443 |
| 63 |  0.6389 |
| 73 |  0.6060 |
| 8 |  0.1486 |
| 93 |  0.6365 |
| A |  0.2203 |
| A3 |  0.8367 |
| A5 |  0.0000 |
| A6 |  0.5826 |
| B |  0.3000 |
| B3 |  0.6331 |
| B6 |  0.3386 |
| C6 |  0.0752 |
| D |  0.1997 |
| D3 |  0.6719 |
| D6 |  0.3431 |
| E3 |  0.7274 |
| E6 |  0.2540 |
| F3 |  0.7219 |
| F6 |  0.0375 |
| FE |  0.2864 |
| G6 |  0.1465 |
| H3 |  0.5831 |
| H6 |  0.0962 |
| I3 |  0.4944 |
| I6 |  0.2779 |
| J3 |  0.3244 |
| J6 |  0.5644 |




















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| Chain | Atom inclusion |
|-------|--|
| K3 |  0.7544 |
| K6 |  0.1152 |
| L3 |  0.6371 |
| L6 |  0.3696 |
| M3 |  0.7177 |
| M6 |  0.3202 |
| N3 |  0.7013 |
| N6 |  0.4547 |
| O3 |  0.7108 |
| O6 |  0.2784 |
| P3 |  0.6715 |
| P6 |  0.2852 |
| Q3 |  0.6368 |
| Q6 |  0.4077 |
| R3 |  0.7292 |
| R6 |  0.1849 |
| S3 |  0.7250 |
| S6 |  0.2376 |
| T3 |  0.7151 |
| T6 |  0.3367 |
| U3 |  0.7556 |
| U6 |  0.2359 |
| V3 |  0.5650 |
| V6 |  0.1583 |
| W3 |  0.7368 |
| W6 |  0.1952 |
| X3 |  0.6322 |
| X6 |  0.0481 |
| Y2 |  0.1655 |
| Y3 |  0.6990 |
| Y6 |  0.0631 |
| Z3 |  0.7312 |
| Z6 |  0.0766 |
| a3 |  0.7128 |
| a6 |  0.2410 |
| b3 |  0.7144 |
| b6 |  0.0747 |
| c3 |  0.6528 |
| c6 |  0.2302 |
| d3 |  0.5691 |
| d6 |  0.5447 |
| e3 |  0.2203 |

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| Chain | Atom inclusion |
|-------|--|
| e6 |  0.0488 |
| f3 |  0.3717 |
| g3 |  0.6987 |
| h3 |  0.5665 |
| i3 |  0.7472 |
| j3 |  0.6657 |
| k3 |  0.4540 |
| l3 |  0.7136 |
| m3 |  0.3598 |
| n |  0.0909 |
| o3 |  0.7546 |
| p3 |  0.5773 |
| q3 |  0.5620 |
| r1 |  0.4441 |
| r3 |  0.7461 |
| s3 |  0.6872 |
| u3 |  0.8571 |