# wwPDB EM Validation Summary Report

Nov 9, 2022 – 04:52 PM EST

| | | |
|---|---|---|
| PDB ID | : | 6P5N |
| EMDB ID | : | EMD-20258 |
| Title | : | Structure of a mammalian 80S ribosome in complex with a single translocated Israeli Acute Paralysis Virus IRES and eRF1 |
| Authors | : | Acosta-Reyes, F.J.; Neupane, R.; Frank, J.; Fernandez, I.S. |
| Deposited on | : | 2019-05-30 |
| Resolution | : | 3.20 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:

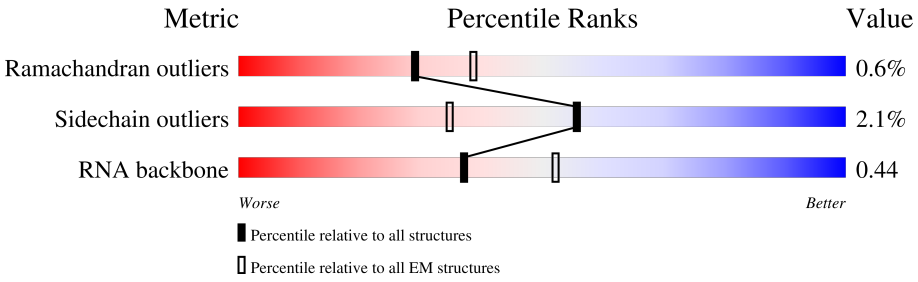
| | | |
|---|---|---|
| EMDB validation analysis | : | 0.0.1.dev43 |
| MolProbity | : | 4.02b-467 |
| Percentile statistics | : | 20191225.v01 (using entries in the PDB archive December 25th 2019) |
| MapQ | : | 1.9.9 |
| Ideal geometry (proteins) | : | Engh & Huber (2001) |
| Ideal geometry (DNA, RNA)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

# 1 Overall quality at a glance (i)

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

The reported resolution of this entry is 3.20 Å.

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




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

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

| Mol | Chain | Length | Quality of chain |
|---|---|---|---|
| 1 | 5 | 3594 | 7% 73% 27% |
| 2 | 7 | 119 | 84% 16% |
| 3 | 8 | 156 | 74% 22% |
| 4 | AA | 257 | 94% |
| 5 | AB | 402 | 96% |
| 6 | AC | 392 | 87% 5% 8% |
| 7 | AD | 297 | 97% |
| 8 | AE | 291 | 73% 26% |

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| Mol | Chain | Length | Quality of chain |
|---|---|---|---|
| 9 | AF | 249 | 88% 10% |
| 10 | AG | 242 | 6% 92% 7% |
| 11 | AH | 192 | 99% |
| 12 | AI | 214 | 5% 95% |
| 13 | AJ | 178 | 7% 94% |
| 14 | AL | 211 | 93% 5% |
| 15 | AM | 198 | 66% 30% |
| 16 | AN | 204 | 97% |
| 17 | AO | 203 | 95% |
| 18 | AP | 184 | 83% 17% |
| 19 | AQ | 188 | 94% 6% |
| 20 | AR | 196 | 7% 88% 8% |
| 21 | AS | 176 | 93% 7% |
| 22 | AT | 160 | 6% 96% |
| 23 | AU | 128 | 14% 72% 5% 23% |
| 24 | AV | 140 | 91% 8% |
| 25 | AW | 157 | 40% 60% |
| 26 | AX | 156 | 75% 24% |
| 27 | AY | 145 | 89% 8% |
| 28 | AZ | 136 | 99% |
| 29 | Aa | 148 | 98% |
| 30 | Ab | 226 | 7% 45% 54% |
| 31 | Ac | 115 | 84% 15% |
| 32 | Ad | 125 | 6% 84% 14% |
| 33 | Ae | 135 | 93% 5% |

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| Mol | Chain | Length | Quality of chain |
|---|---|---|---|
| 34 | Af | 110 | 97% |
| 35 | Ag | 126 | 6% 88% 10% |
| 36 | Ah | 123 | 98% |
| 37 | Ai | 105 | 97% |
| 38 | Aj | 97 | 86% 11% |
| 39 | Ak | 70 | 14% 94% |
| 40 | Al | 51 | 96% |
| 41 | Am | 52 | 100% |
| 42 | An | 25 | 100% |
| 43 | Ao | 106 | 5% 97% |
| 44 | Ap | 92 | 97% |
| 45 | Ar | 137 | 90% 9% |
| 46 | AK | 217 | 90% 86% 12% |
| 47 | 2 | 1869 | 8% 63% 27% 9% |
| 48 | B | 295 | 6% 73% 26% |
| 49 | C | 264 | 7% 80% 19% |
| 50 | D | 255 | 86% 13% |
| 51 | E | 281 | 31% 80% 19% |
| 52 | F | 263 | 10% 98% |
| 53 | G | 204 | 8% 90% 9% |
| 54 | H | 249 | 21% 94% 5% |
| 55 | I | 194 | 20% 95% 5% |
| 56 | J | 207 | 9% 97% |
| 57 | K | 194 | 7% 94% 5% |
| 58 | L | 149 | 45% 63% 36% |

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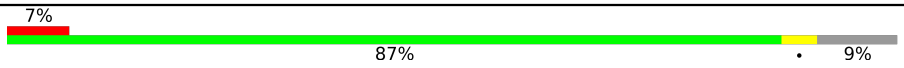
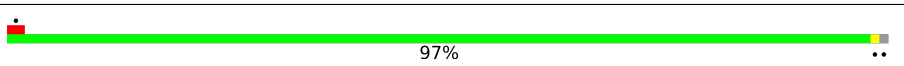
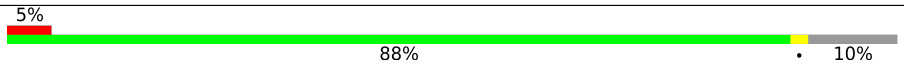
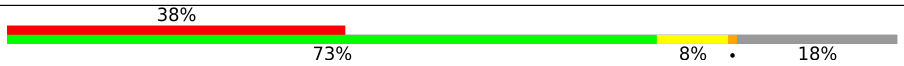
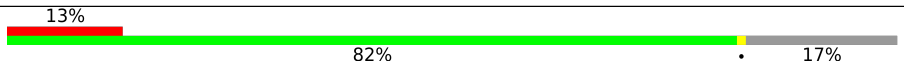
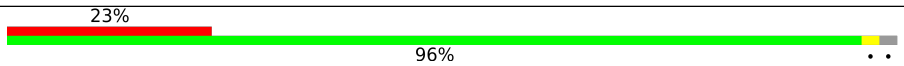
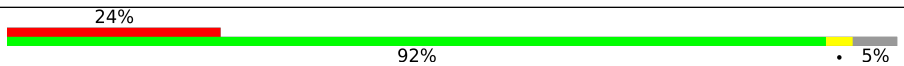
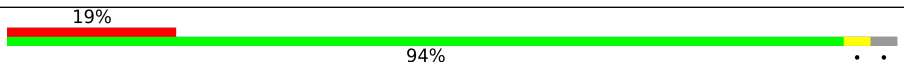
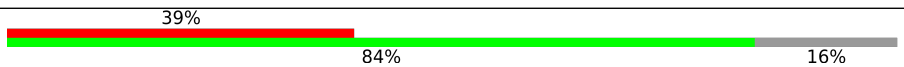
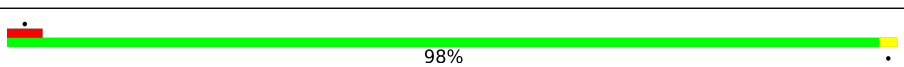
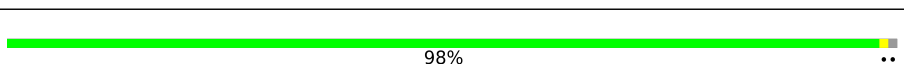
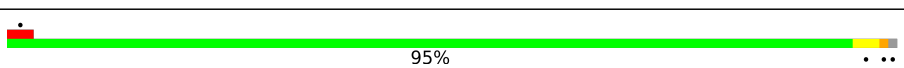
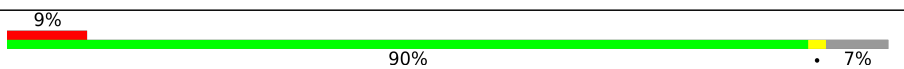
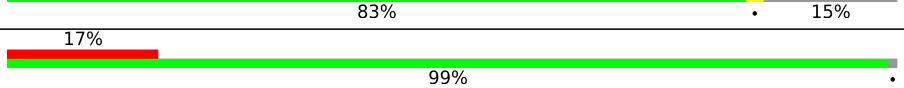
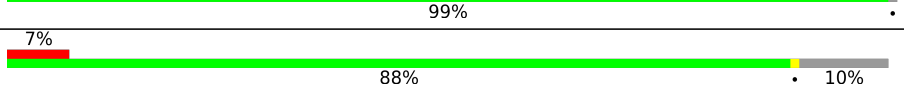
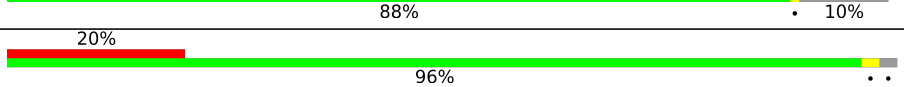
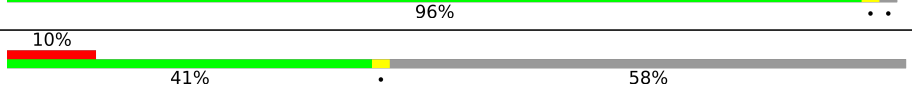
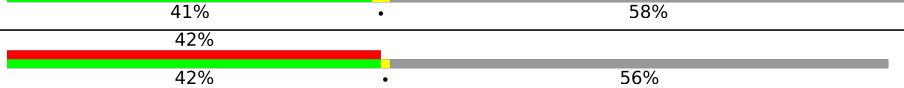
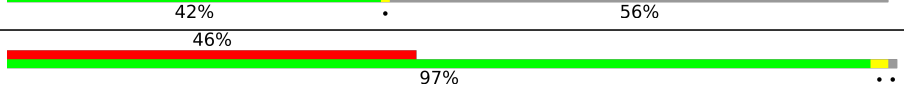
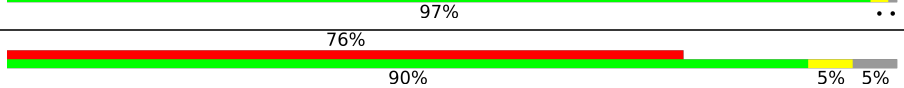
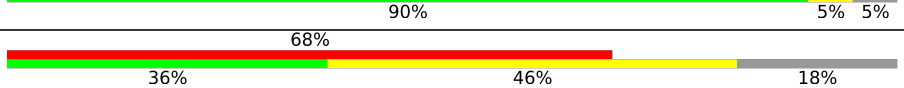
| Mol | Chain | Length | Quality of chain |
|---|---|---|---|
| 59 | M | 158 |   |
| 60 | N | 132 | |
| 61 | O | 151 |   |
| 62 | P | 151 |   |
| 63 | Q | 145 |   |
| 64 | R | 172 |   |
| 65 | S | 135 |   |
| 66 | T | 152 |   |
| 67 | U | 145 |   |
| 68 | V | 119 |   |
| 69 | W | 83 |   |
| 70 | X | 130 |   |
| 71 | Y | 143 |   |
| 72 | Z | 134 |   |
| 73 | a | 125 | |
| 74 | b | 115 | |
| 75 | c | 84 |   |
| 76 | d | 69 |   |
| 77 | e | 56 |   |
| 78 | f | 133 |   |
| 79 | g | 156 |   |
| 80 | h | 317 |   |
| 81 | Aq | 437 |   |
| 82 | 1 | 251 |   |

# 2 Entry composition (i)

There are 82 unique types of molecules in this entry. The entry contains 219295 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a RNA chain called 28S rRNA.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| | | | Total | C | N | O | P | | |
| 1 | 5 | 3594 | 77074 | 34325 | 14116 | 25039 | 3594 | 0 | 0 |

- Molecule 2 is a RNA chain called 5S rRNA.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| | | | Total | C | N | O | P | | |
| 2 | 7 | 119 | 2538 | 1132 | 454 | 834 | 118 | 0 | 0 |

- Molecule 3 is a RNA chain called 5.8S rRNA.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| | | | Total | C | N | O | P | | |
| 3 | 8 | 151 | 3208 | 1432 | 564 | 1062 | 150 | 0 | 0 |

- Molecule 4 is a protein called uL2.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| | | | Total | C | N | O | S | | |
| 4 | AA | 248 | 1895 | 1186 | 389 | 314 | 6 | 0 | 0 |

- Molecule 5 is a protein called uL3.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| | | | Total | C | N | O | S | | |
| 5 | AB | 394 | 3172 | 2020 | 597 | 542 | 13 | 0 | 0 |

- Molecule 6 is a protein called uL4.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| | | | Total | C | N | O | S | | |
| 6 | AC | 362 | 2883 | 1812 | 577 | 480 | 14 | 0 | 0 |

- Molecule 7 is a protein called uL18.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 7 | AD | 293 | Total | C | N | O | S | 0 | 0 |
| | | | 2391 | 1512 | 438 | 427 | 14 | | |

- Molecule 8 is a protein called eL6.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 8 | AE | 216 | Total | C | N | O | S | 0 | 0 |
| | | | 1729 | 1115 | 329 | 282 | 3 | | |

- Molecule 9 is a protein called L30.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 9 | AF | 225 | Total | C | N | O | S | 0 | 0 |
| | | | 1875 | 1205 | 358 | 303 | 9 | | |

- Molecule 10 is a protein called eL8.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 10 | AG | 225 | Total | C | N | O | S | 0 | 0 |
| | | | 1819 | 1161 | 351 | 303 | 4 | | |

- Molecule 11 is a protein called uL6.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 11 | AH | 190 | Total | C | N | O | S | 0 | 0 |
| | | | 1516 | 954 | 284 | 272 | 6 | | |

- Molecule 12 is a protein called uL16.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 12 | AI | 205 | Total | C | N | O | S | 0 | 0 |
| | | | 1664 | 1056 | 321 | 274 | 13 | | |

- Molecule 13 is a protein called uL11.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 13 | AJ | 170 | Total | C | N | O | S | 0 | 0 |
| | | | 1362 | 861 | 254 | 241 | 6 | | |

- Molecule 14 is a protein called eL13.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 14 | AL | 201 | Total | C | N | O | S | 0 | 0 |
| | | | 1627 | 1020 | 341 | 262 | 4 | | |

- Molecule 15 is a protein called L14e.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 15 | AM | 138 | Total | C | N | O | S | 0 | 0 |
| | | | 1137 | 727 | 221 | 182 | 7 | | |

- Molecule 16 is a protein called eL15.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 16 | AN | 203 | Total | C | N | O | S | 0 | 0 |
| | | | 1701 | 1072 | 359 | 266 | 4 | | |

- Molecule 17 is a protein called uL13.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 17 | AO | 199 | Total | C | N | O | S | 0 | 0 |
| | | | 1631 | 1052 | 319 | 255 | 5 | | |

- Molecule 18 is a protein called uL22.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 18 | AP | 153 | Total | C | N | O | S | 0 | 0 |
| | | | 1242 | 777 | 241 | 215 | 9 | | |

- Molecule 19 is a protein called eL18.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 19 | AQ | 187 | Total | C | N | O | S | 0 | 0 |
| | | | 1526 | 964 | 306 | 252 | 4 | | |

- Molecule 20 is a protein called eL19.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 20 | AR | 180 | Total | C | N | O | S | 0 | 0 |
| | | | 1503 | 931 | 324 | 238 | 10 | | |

- Molecule 21 is a protein called eL20.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 21 | AS | 176 | Total | C | N | O | S | 0 | 0 |
| | | | 1457 | 928 | 283 | 235 | 11 | | |

- Molecule 22 is a protein called eL21.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 22 | AT | 159 | Total | C | N | O | S | 0 | 0 |
| | | | 1298 | 823 | 252 | 217 | 6 | | |

- Molecule 23 is a protein called eL22.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 23 | AU | 99 | Total | C | N | O | S | 0 | 0 |
| | | | 818 | 520 | 146 | 150 | 2 | | |

- Molecule 24 is a protein called uL14.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 24 | AV | 129 | Total | C | N | O | S | 0 | 0 |
| | | | 969 | 613 | 182 | 169 | 5 | | |

- Molecule 25 is a protein called eL24.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 25 | AW | 63 | Total | C | N | O | S | 0 | 0 |
| | | | 528 | 337 | 103 | 85 | 3 | | |

- Molecule 26 is a protein called eL23.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 26 | AX | 118 | Total | C | N | O | S | 0 | 0 |
| | | | 967 | 618 | 181 | 167 | 1 | | |

- Molecule 27 is a protein called uL24.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 27 | AY | 134 | Total | C | N | O | S | 0 | 0 |
| | | | 1115 | 700 | 226 | 186 | 3 | | |

- Molecule 28 is a protein called eL27.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 28 | AZ | 135 | Total | C | N | O | S | 0 | 0 |
| | | | 1107 | 714 | 208 | 182 | 3 | | |

- Molecule 29 is a protein called uL15.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 29 | Aa | 147 | Total | C | N | O | S | 0 | 0 |
| | | | 1162 | 734 | 239 | 185 | 4 | | |

- Molecule 30 is a protein called eL29.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 30 | Ab | 104 | Total | C | N | O | S | 0 | 0 |
| | | | 848 | 527 | 189 | 129 | 3 | | |

- Molecule 31 is a protein called eL30.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 31 | Ac | 98 | Total | C | N | O | S | 0 | 0 |
| | | | 761 | 481 | 134 | 140 | 6 | | |

- Molecule 32 is a protein called eL31.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 32 | Ad | 107 | Total | C | N | O | S | 0 | 0 |
| | | | 888 | 560 | 171 | 155 | 2 | | |

- Molecule 33 is a protein called eL32.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 33 | Ae | 128 | Total | C | N | O | S | 0 | 0 |
| | | | 1053 | 667 | 216 | 165 | 5 | | |

- Molecule 34 is a protein called eL33.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 34 | Af | 109 | Total | C | N | O | S | 0 | 0 |
| | | | 876 | 555 | 174 | 143 | 4 | | |

- Molecule 35 is a protein called eL34.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 35 | Ag | 114 | Total | C | N | O | S | 0 | 0 |
| | | | 906 | 566 | 187 | 147 | 6 | | |

- Molecule 36 is a protein called eL35.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 36 | Ah | 122 | Total | C | N | O | S | 0 | 0 |
| | | | 1013 | 640 | 204 | 168 | 1 | | |

- Molecule 37 is a protein called eL36.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 37 | Ai | 102 | Total | C | N | O | S | 0 | 0 |
| | | | 830 | 520 | 176 | 129 | 5 | | |

- Molecule 38 is a protein called eL37.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 38 | Aj | 86 | Total | C | N | O | S | 0 | 0 |
| | | | 705 | 434 | 155 | 111 | 5 | | |

- Molecule 39 is a protein called eL38.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 39 | Ak | 69 | Total | C | N | O | S | 0 | 0 |
| | | | 569 | 366 | 101 | 99 | 3 | | |

- Molecule 40 is a protein called eL39.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 40 | Al | 50 | Total | C | N | O | S | 0 | 0 |
| | | | 447 | 286 | 96 | 64 | 1 | | |

- Molecule 41 is a protein called eL40.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 41 | Am | 52 | Total | C | N | O | S | 0 | 0 |
| | | | 429 | 266 | 90 | 67 | 6 | | |

- Molecule 42 is a protein called eL41.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 42 | An | 25 | Total | C | N | O | S | 0 | 0 |
| | | | 239 | 145 | 64 | 27 | 3 | | |

- Molecule 43 is a protein called eL42.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 43 | Ao | 104 | Total | C | N | O | S | 0 | 0 |
| | | | 851 | 533 | 174 | 138 | 6 | | |

- Molecule 44 is a protein called eL43.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 44 | Ap | 91 | Total | C | N | O | S | 0 | 0 |
| | | | 708 | 445 | 136 | 120 | 7 | | |

- Molecule 45 is a protein called eL28.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 45 | Ar | 124 | Total | C | N | O | S | 0 | 0 |
| | | | 994 | 616 | 205 | 167 | 6 | | |

- Molecule 46 is a protein called uL1.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 46 | AK | 212 | Total | C | N | O | S | 0 | 0 |
| | | | 1705 | 1091 | 306 | 300 | 8 | | |

- Molecule 47 is a RNA chain called 18S rRNA.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 47 | 2 | 1697 | Total | C | N | O | P | 0 | 0 |
| | | | 36229 | 16171 | 6507 | 11855 | 1696 | | |

- Molecule 48 is a protein called uS2.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 48 | B | 217 | Total | C | N | O | S | 0 | 0 |
| | | | 1706 | 1085 | 295 | 317 | 9 | | |

- Molecule 49 is a protein called eS1.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 49 | C | 213 | Total | C | N | O | S | 0 | 0 |
| | | | 1729 | 1098 | 309 | 308 | 14 | | |

- Molecule 50 is a protein called uS5.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 50 | D | 221 | Total | C | N | O | S | 0 | 0 |
| | | | 1712 | 1107 | 296 | 299 | 10 | | |

- Molecule 51 is a protein called uS3.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 51 | E | 228 | Total | C | N | O | S | 0 | 0 |
| | | | 1768 | 1126 | 318 | 316 | 8 | | |

- Molecule 52 is a protein called eS4.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 52 | F | 262 | Total | C | N | O | S | 0 | 0 |
| | | | 2073 | 1323 | 384 | 357 | 9 | | |

- Molecule 53 is a protein called uS7.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 53 | G | 185 | Total | C | N | O | S | 0 | 0 |
| | | | 1471 | 921 | 277 | 266 | 7 | | |

- Molecule 54 is a protein called eS6.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 54 | H | 237 | Total | C | N | O | S | 0 | 0 |
| | | | 1923 | 1200 | 387 | 329 | 7 | | |

- Molecule 55 is a protein called eS7.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 55 | I | 185 | Total | C | N | O | S | 0 | 0 |
| | | | 1488 | 952 | 271 | 264 | 1 | | |

- Molecule 56 is a protein called eS8.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 56 | J | 206 | Total | C | N | O | S | 0 | 0 |
| | | | 1686 | 1058 | 332 | 291 | 5 | | |

- Molecule 57 is a protein called uS4.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 57 | K | 185 | Total | C | N | O | S | 0 | 0 |
| | | | 1525 | 969 | 306 | 248 | 2 | | |

- Molecule 58 is a protein called eS10.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 58 | L | 96 | Total | C | N | O | S | 0 | 0 |
| | | | 810 | 530 | 143 | 131 | 6 | | |

- Molecule 59 is a protein called uS17.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 59 | M | 143 | Total | C | N | O | S | 0 | 0 |
| | | | 1175 | 749 | 222 | 198 | 6 | | |

- Molecule 60 is a protein called eS12.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 60 | N | 117 | Total | C | N | O | S | 0 | 0 |
| | | | 908 | 570 | 161 | 169 | 8 | | |

- Molecule 61 is a protein called uS15.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 61 | O | 149 | Total | C | N | O | S | 0 | 0 |
| | | | 1202 | 770 | 228 | 203 | 1 | | |

- Molecule 62 is a protein called uS11.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 62 | P | 136 | Total | C | N | O | S | 0 | 0 |
| | | | 1016 | 621 | 199 | 190 | 6 | | |

- Molecule 63 is a protein called uS19.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 63 | Q | 119 | Total<br>990 | C<br>630 | N<br>186 | O<br>167 | S<br>7 | 0 | 0 |

- Molecule 64 is a protein called uS9.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 64 | R | 142 | Total<br>1128 | C<br>717 | N<br>213 | O<br>195 | S<br>3 | 0 | 0 |

- Molecule 65 is a protein called eS17.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 65 | S | 132 | Total<br>1068 | C<br>670 | N<br>199 | O<br>195 | S<br>4 | 0 | 0 |

- Molecule 66 is a protein called uS13.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 66 | T | 144 | Total<br>1190 | C<br>746 | N<br>241 | O<br>202 | S<br>1 | 0 | 0 |

- Molecule 67 is a protein called eS19.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 67 | U | 141 | Total<br>1097 | C<br>688 | N<br>211 | O<br>195 | S<br>3 | 0 | 0 |

- Molecule 68 is a protein called uS10.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 68 | V | 100 | Total<br>795 | C<br>498 | N<br>152 | O<br>141 | S<br>4 | 0 | 0 |

- Molecule 69 is a protein called eS21.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 69 | W | 83 | Total<br>630 | C<br>387 | N<br>118 | O<br>120 | S<br>5 | 0 | 0 |

- Molecule 70 is a protein called uS8.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 70 | X | 129 | Total | C | N | O | S | 0 | 0 |
| | | | 1034 | 659 | 193 | 176 | 6 | | |

- Molecule 71 is a protein called uS12.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 71 | Y | 141 | Total | C | N | O | S | 0 | 0 |
| | | | 1098 | 693 | 219 | 183 | 3 | | |

- Molecule 72 is a protein called eS24.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 72 | Z | 124 | Total | C | N | O | S | 0 | 0 |
| | | | 1011 | 640 | 198 | 168 | 5 | | |

- Molecule 73 is a protein called eS25.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 73 | a | 75 | Total | C | N | O | S | 0 | 0 |
| | | | 598 | 382 | 111 | 104 | 1 | | |

- Molecule 74 is a protein called eS26.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 74 | b | 98 | Total | C | N | O | S | 0 | 0 |
| | | | 778 | 485 | 158 | 129 | 6 | | |

- Molecule 75 is a protein called eS27.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 75 | c | 83 | Total | C | N | O | S | 0 | 0 |
| | | | 651 | 408 | 121 | 115 | 7 | | |

- Molecule 76 is a protein called eS28.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 76 | d | 62 | Total | C | N | O | S | 0 | 0 |
| | | | 488 | 297 | 97 | 92 | 2 | | |

- Molecule 77 is a protein called eS29.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 77 | e | 55 | Total | C | N | O | S | 0 | 0 |
| | | | 459 | 286 | 94 | 74 | 5 | | |

- Molecule 78 is a protein called eS30.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 78 | f | 56 | Total | C | N | O | S | 0 | 0 |
| | | | 447 | 276 | 98 | 72 | 1 | | |

- Molecule 79 is a protein called eS31.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 79 | g | 68 | Total | C | N | O | S | 0 | 0 |
| | | | 555 | 351 | 103 | 94 | 7 | | |

- Molecule 80 is a protein called RACK1.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 80 | h | 313 | Total | C | N | O | S | 0 | 0 |
| | | | 2436 | 1535 | 424 | 465 | 12 | | |

- Molecule 81 is a protein called Eukaryotic peptide chain release factor subunit 1.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 81 | Aq | 416 | Total | C | N | O | S | 0 | 0 |
| | | | 3278 | 2085 | 559 | 623 | 11 | | |

- Molecule 82 is a RNA chain called IAPV-IRES.

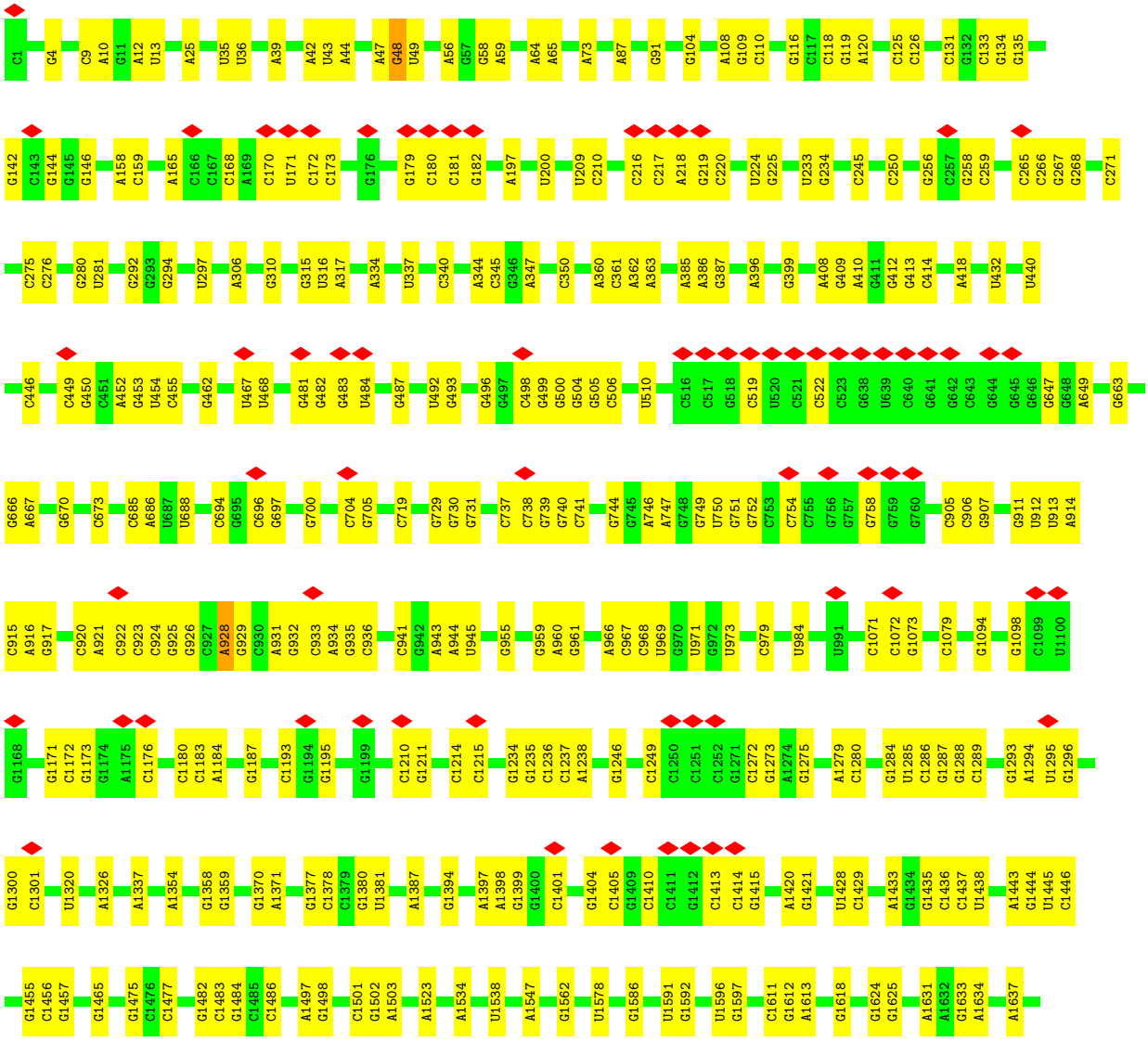
| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 82 | 1 | 207 | Total | C | N | O | P | 0 | 0 |
| | | | 4407 | 1970 | 781 | 1449 | 207 | | |

# 3 Residue-property plots (i)

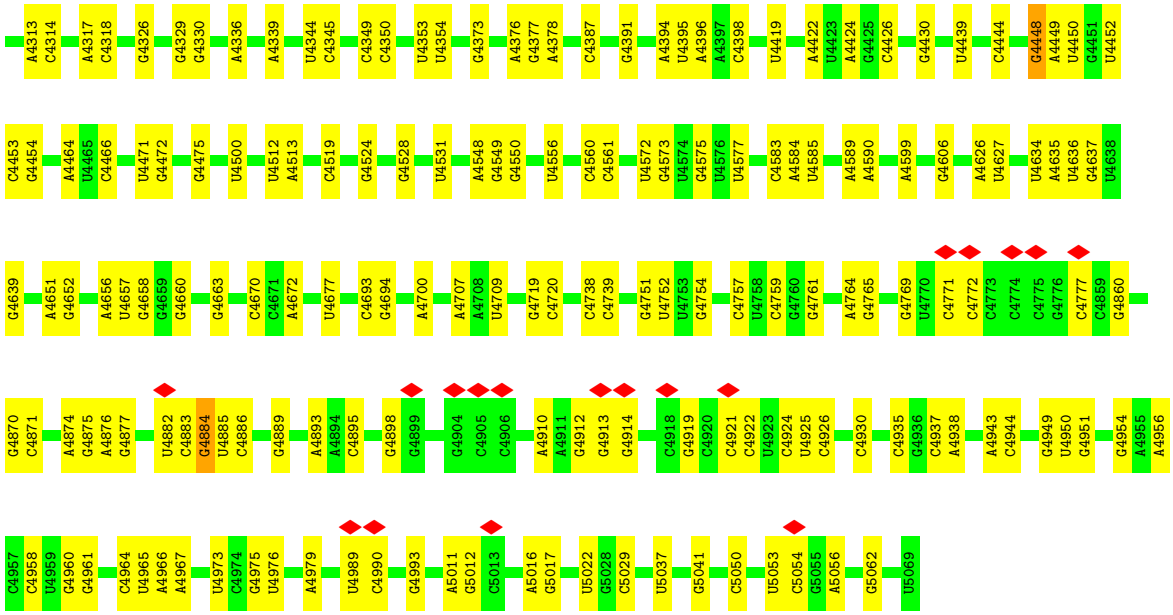
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion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

- Molecule 1: 28S rRNA

Chain 5:

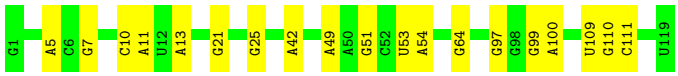


C1640 G1651 G1654 G1658 U1659 U1660 C1661 C1676 U1677 C1678 A1679 G1721 C1731 C1732 G1733 G1734 C1740 G1741 A1742 A1743 G1750 U1754 C1755 U1756 U1757 G1758 G1759 G1760 G1761 C1762 C1763 G1764 A1765 A1766 A1767 C1768 G1769 A1770 U1771 C1772 U1773 C1774 A1775 A1787 G1797 A1804 A1805
C1809 G1815 U1820 G1821 C1828 G1829 G1830 G1833 U1834 G1835 G1836 A1837 G1842 G1855 G1865 G1869 C1881 U1882 G1886 U1889 A1897 C1898 G1899 G1910 C1915 U1918 G1919 C1920 C1921 G1922 C1931 A1939 G1940 A1941 U1947 G1952 U1957 A1958 U1959 A1960
G1961 A1962 C1963 A1964 G1965 C1966 A1967 A1970 U1971 G1972 G1973 U1974 G1975 G1976 C1977 C1978 A1979 U1980 G1981 G1982 A1983 A1984 G1985 U1986 C1987 G1988 G1989 A1990 A1991 U1992 C1993 C1994 G1995 C1996 U1997 A1998 A1999 G2000 G2001 A2002 G2003 U2004 G2005 U2006 G2007 U2008 A2009 A2010 C2011 A2012 A2013 C2014 U2015 C2018 C2019 U2020 G2021 C2022
C2023 G2024 A2025 A2026 A2042 A2043 U2044 G2045 G2046 A2047 U2048 G2052 G2055 G2056 A2057 G2058 A2069 U2070 U2084 A2088 G2089 U2090 G2093 C2094 A2097 G2098 C2099 G2100 A2101 G2102 A2103 A2104 A2107 G2108 A2109 G2110 G2259 C2260 C2266 U2267 A2268 C2269 G2275 A2276 C2277 G2280
C2289 G2294 A2300 G2301 A2313 G2314 C2325 A2332 G2333 G2348 A2349 U2350 C2351 G2364 C2365 A2366 A2370 A2374 G2387 A2395 A2396 G2397 U2398 G2399 G2400 U2409 A2417 C2422 A2428 G2433 C2437 C2441 U2444 U2447 G2450 G2471 G2475
G2476 A2477 C2478 G2481 C2482 G2483 A2484 U2485 G2486 G2487 C2488 G2489 U2490 C2491 C2492 G2493 U2494 U2495 C2499 A2502 G2503 C2504 C2505 G2506 A2511 A2512 A2513 G2514 A2529 U2530 A2537 G2544 U2545 G2546 G2547 C2548 G2549 G2552 A2553 U2554 G2555 C2558 C2561 G2562 C2563 G2564 A2565 G2566 G2567 C2568
G2569 U2570 U2575 G2586 A2587 C2588 C2589 A2601 G2618 A2623 C2627 U2628 U2639 G2649 C2653 C2654 C2655 U2656 A2659 A2660 U2661 G2662 G2663 C2669 C2670 C2686 U2687 A2695 A2696 U2701 C2704 U2707 U2708 C2709 C2710 G2711 G2712 C2713 G2714 C2715 C2716 C2719
U2723 G2724 G2732 G2735 U2740 A2743 A2744 G2750 U2761 G2762 U2763 A2764 U2769 C2770 U2782 A2787 U2788 A2789 U2790 G2796 C2797 A2798 A2815 U2826 G2827 U2828 U2829 C2842 U2843 A2844 G2848 A2849 A2850 G2855 C2856 G2862 U2874 C2875 G2898 G3603 A3604
G3617 C3618 G3625 G3626 A3630 A3635 U3644 U3645 A3646 A3647 A3648 A3653 A3662 A3663 C3670 C3673 U3679 C3696 G3705 G3710 A3711 A3712 U3713 G3714 U3729 U3734 G3740 A3748 G3753 U3758 A3759 A3760 C3761 U3762 A3763 U3764 G3765 A3766 C3767 A3774
A3775 G3776 G3777 U3778 A3784 A3785 U3786 A3795 G3809 C3810 G3811 C3812 A3813 U3814 A3817 U3818 G3819 G3839 U3840 A3862 A3876 A3877 C3878 G3879 G3880 C3887 G3888 G3889 G3897 A3901 G3904 A3905 A3906 G3907 A3908 U3915 G3916 A3917 A3923 G3938 G3939 G3944 A3945 G3946 A3947
C3948 A3949 U3950 G3951 A3954 G3955 G3956 U3957 G3958 U3959 A3960 G3961 A3962 A3963 U3964 A3965 A3966 G3967 U3968 G3969 G3970 G3971 A3972 C3975 C3976 C3977 G4034 G4035 G4036 C4037 C4038 G4039 C4040 C4041 G4042 G4043 U4044 G4045 A4046 A4047 A4048 U4049 A4050 C4051 C4052 A4053 C4054 U4055 A4056 C4057 U4058 C4059 U4060 G4061 A4062 U4063 C4064 G4065
U4066 U4067 U4070 U4071 C4072 A4073 C4074 U4075 G4076 A4077 A4085 G4086 G4093 G4094 G4095 C4096 G4097 A4098 G4099 C4100 C4101 G4107 C4108 G4109 C4110 U4111 C4112 U4113 C4114 G4115 C4116 U4117 U4118 C4119 U4120 G4121 G4122 C4123 G4124 A4127 G4131 G4135 G4136 C4137 C4138 G4146 C4147 C4148 C4149 G4152 C4156 A4157
C4158 C4159 C4162 U4163 A4170 C4171 A4172 G4179 G4180 U4181 G4182 G4183 G4184 G4191 A4203 C4204 A4205 C4206 C4221 U4229 U4232 A4233 C4237 G4249 G4250 A4251 C4252 A4253 G4254 A4257 G4266 G4267 A4268 A4271 G4272 A4273 A4280 A4281 G4291 G4297 G4305 U4306 A4307



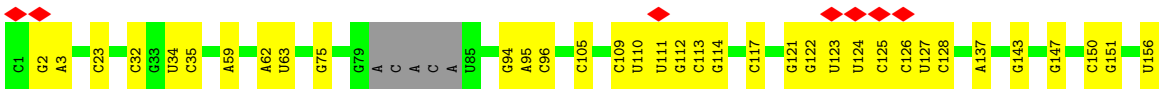

• Molecule 2: 5S rRNA

Chain 7:



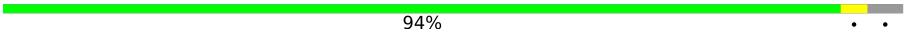

• Molecule 3: 5.8S rRNA

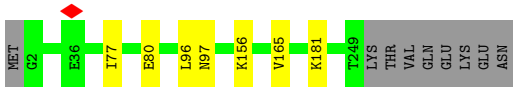
Chain 8:




• Molecule 4: uL2

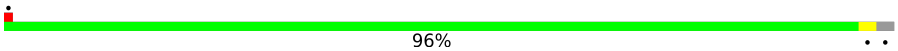
Chain AA:

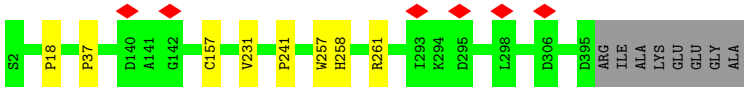



• Molecule 5: uL3

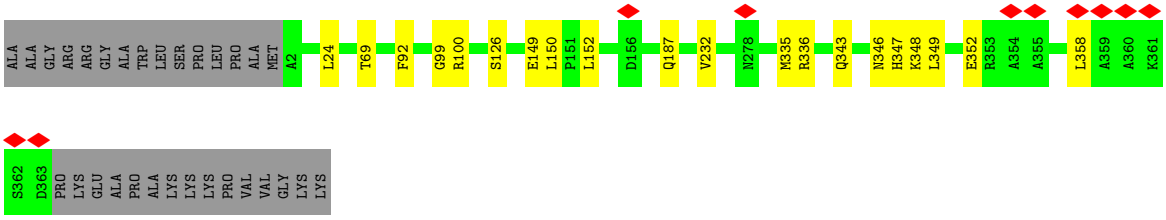
Chain AB:



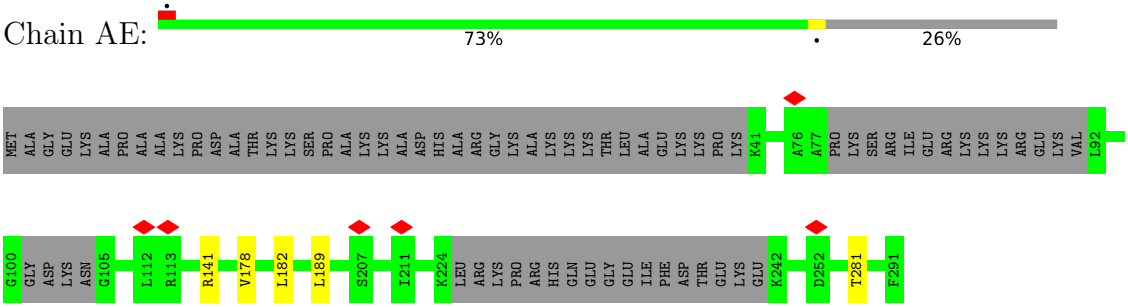

• Molecule 6: uL4

Chain AC:

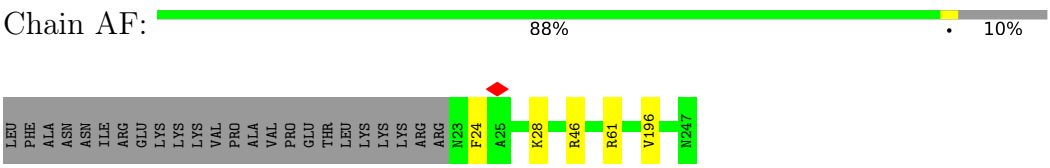



• Molecule 7: uL18

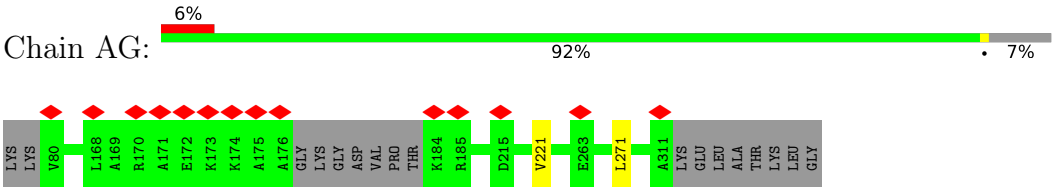
• Molecule 8: eL6



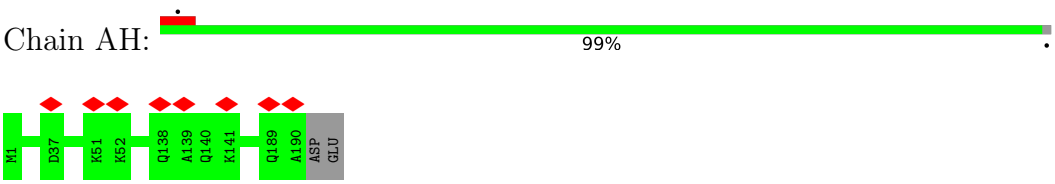

• Molecule 9: L30




• Molecule 10: eL8

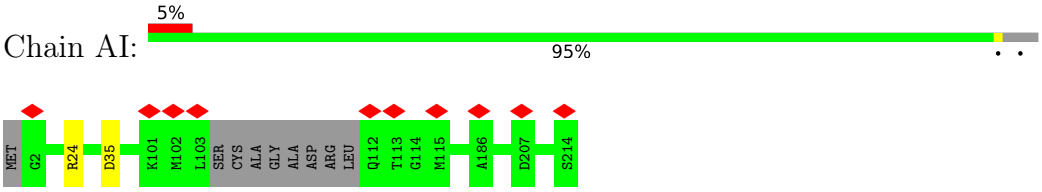



• Molecule 11: uL6



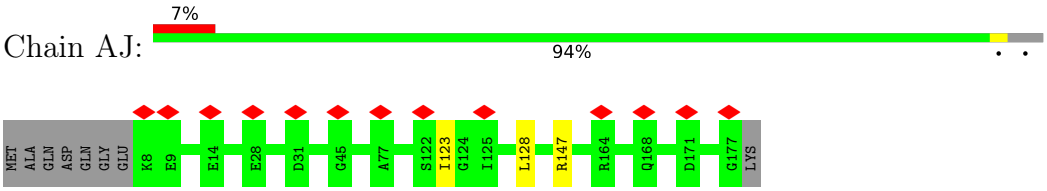

• Molecule 12: uL16

Chain AI:



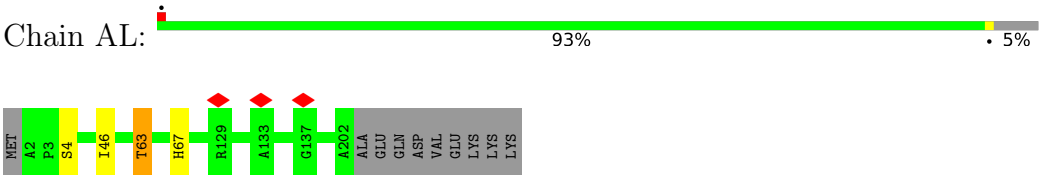

• Molecule 13: uL11

Chain AJ:



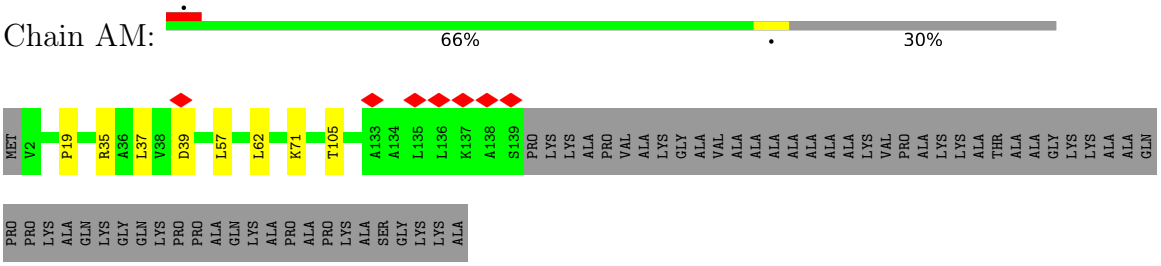

• Molecule 14: eL13

Chain AL:



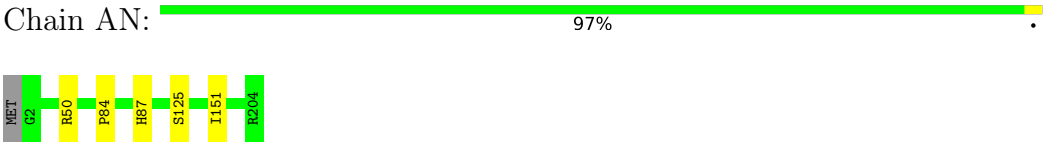

• Molecule 15: L14e

Chain AM:



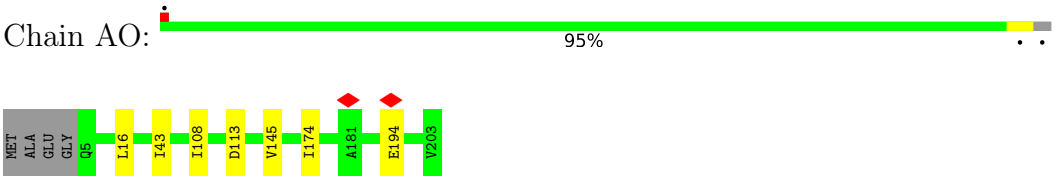

• Molecule 16: eL15

Chain AN:



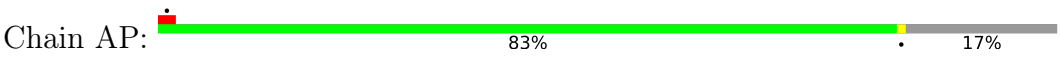

• Molecule 17: uL13

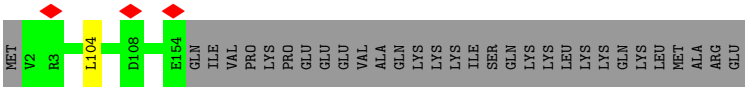
Chain AO:




• Molecule 18: uL22

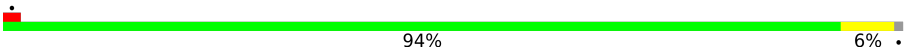
Chain AP:

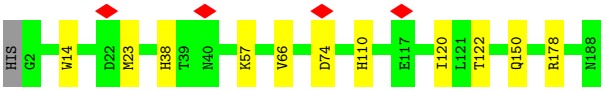





• Molecule 19: eL18

Chain AQ:



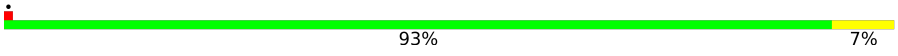




• Molecule 20: eL19

Chain AR:

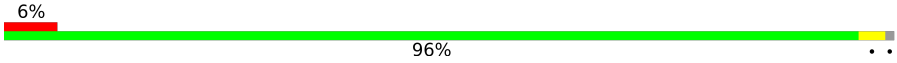
• Molecule 21: eL20

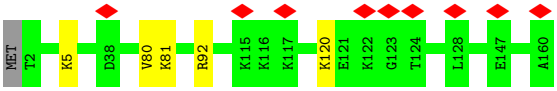
Chain AS:



• Molecule 22: eL21

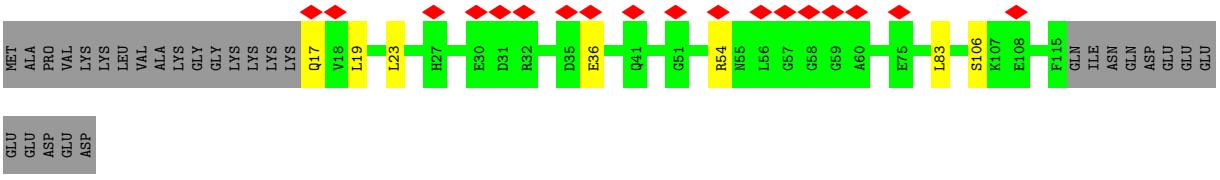
Chain AT:



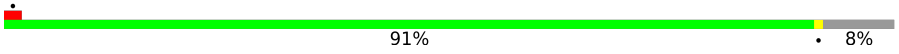

• Molecule 23: eL22

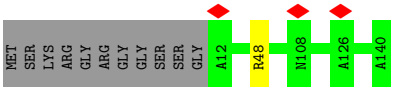
Chain AU:




• Molecule 24: uL14

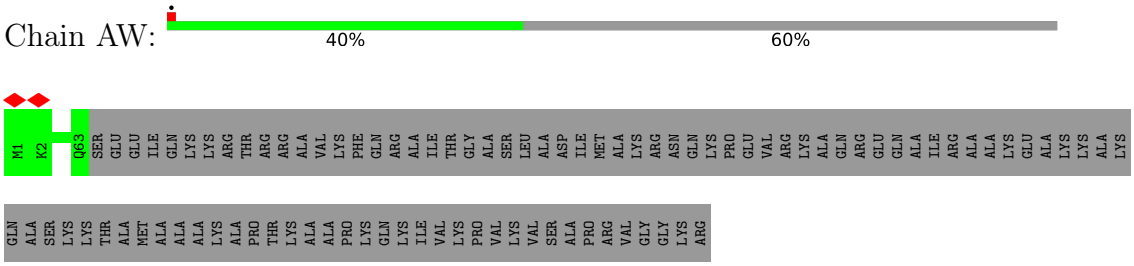
Chain AV:



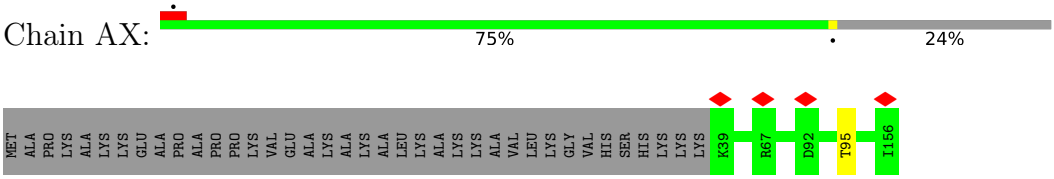
• Molecule 25: eL24

Chain AW:



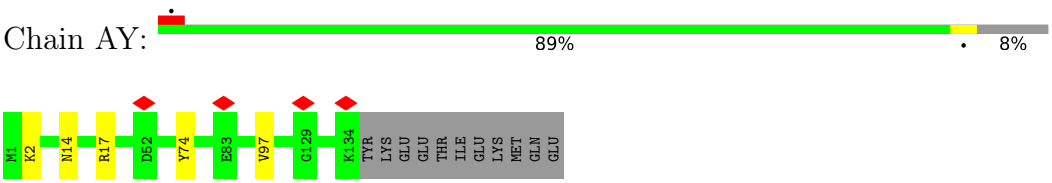

• Molecule 26: eL23

Chain AX:



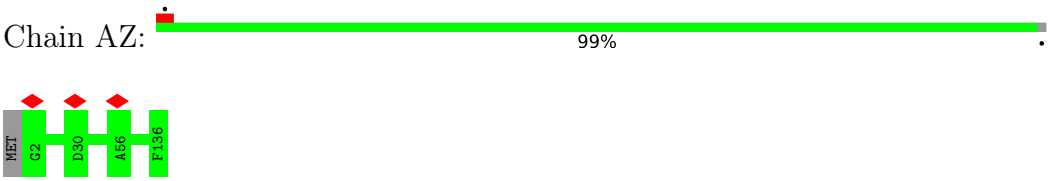

• Molecule 27: uL24

Chain AY:



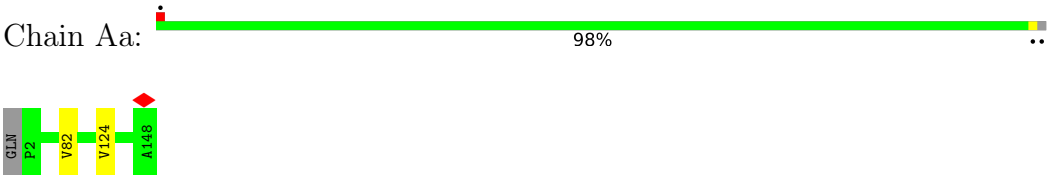

• Molecule 28: eL27

Chain AZ:



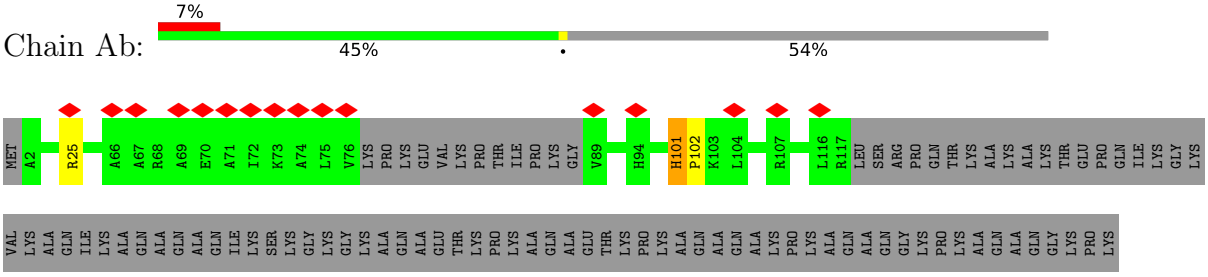

• Molecule 29: uL15

Chain Aa:



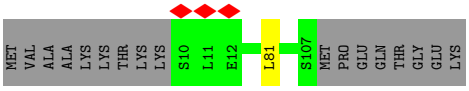

• Molecule 30: eL29

Chain Ab:



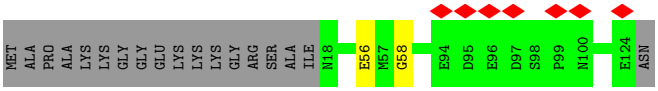
• Molecule 31: eL30

Chain Ac:



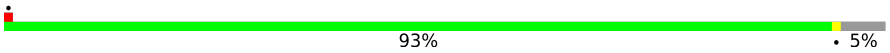

• Molecule 32: eL31

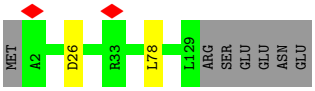
Chain Ad:




• Molecule 33: eL32

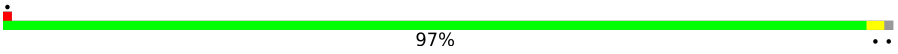
Chain Ae:

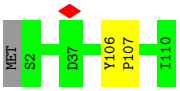



• Molecule 34: eL33

Chain Af:



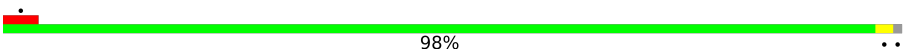



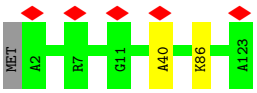

• Molecule 35: eL34

Chain Ag:

• Molecule 36: eL35

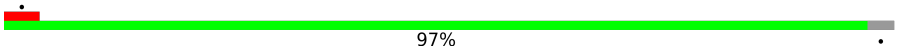
Chain Ah:

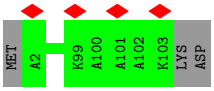



• Molecule 37: eL36

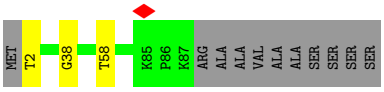
Chain Ai:





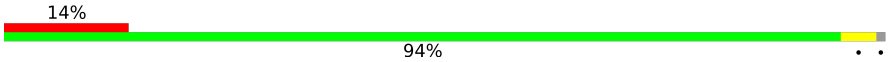

• Molecule 38: eL37

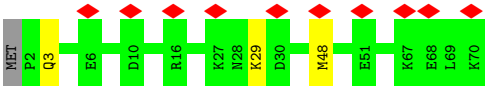
Chain Aj:




• Molecule 39: eL38

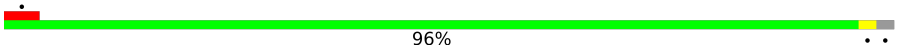
Chain Ak:

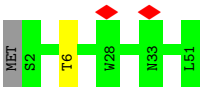



• Molecule 40: eL39

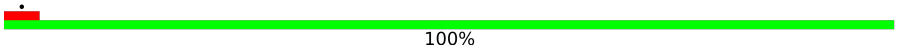
Chain Al:



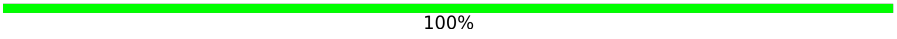

• Molecule 41: eL40

Chain Am:



• Molecule 42: eL41

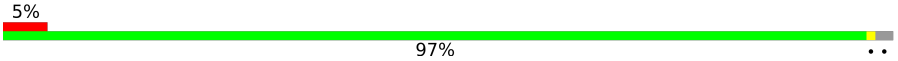
Chain An:

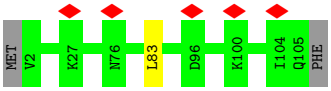



There are no outlier residues recorded for this chain.

• Molecule 43: eL42

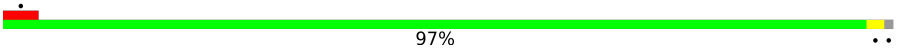
Chain Ao:

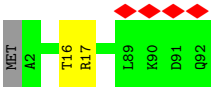



• Molecule 44: eL43

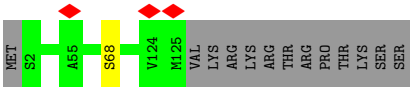
Chain Ap:





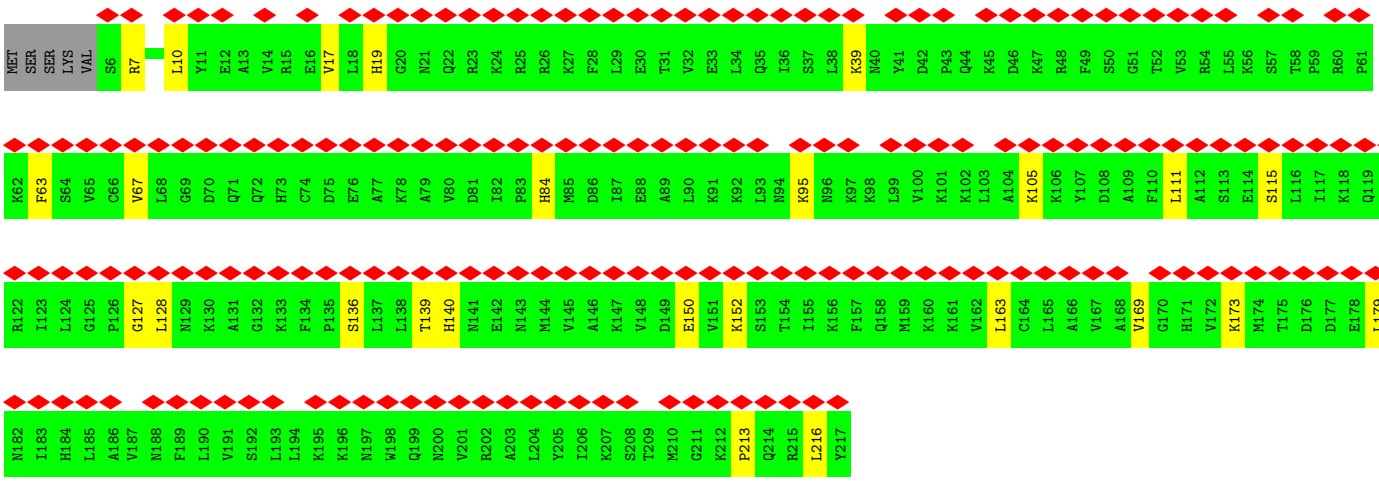

• Molecule 45: eL28

Chain Ar:



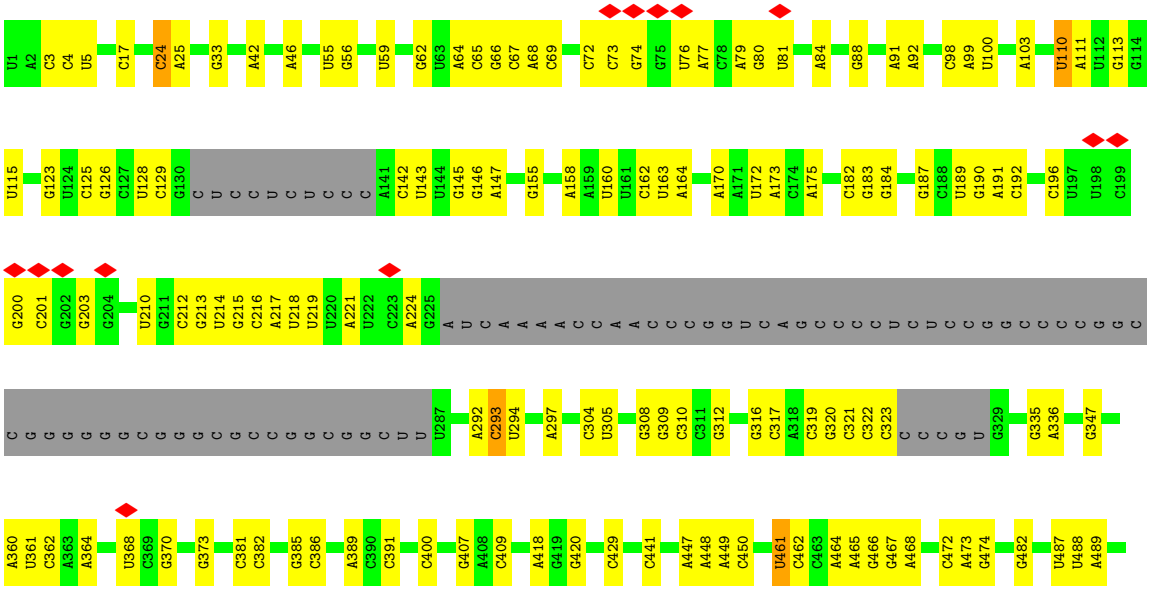

• Molecule 46: uL1

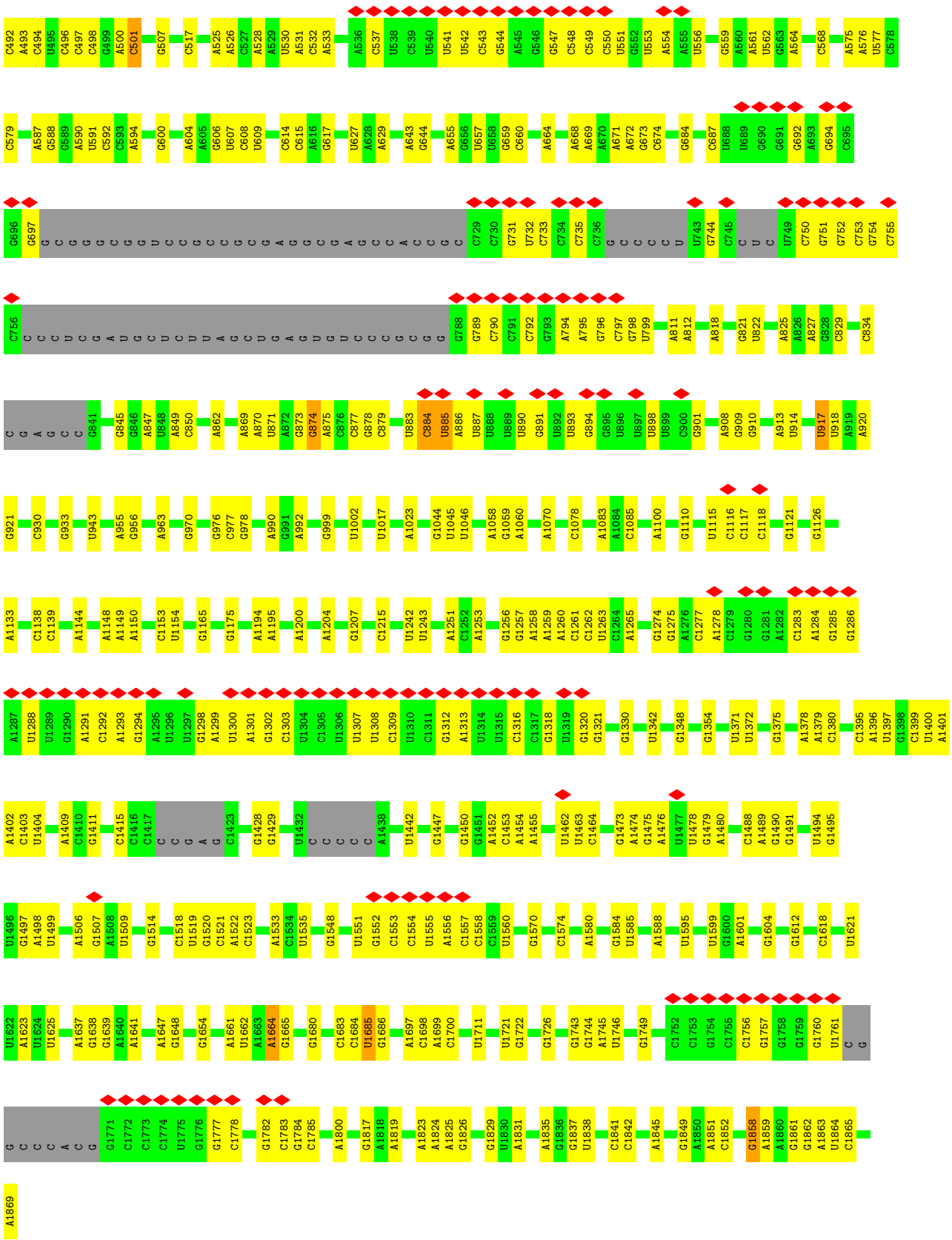
Chain AK:




• Molecule 47: 18S rRNA

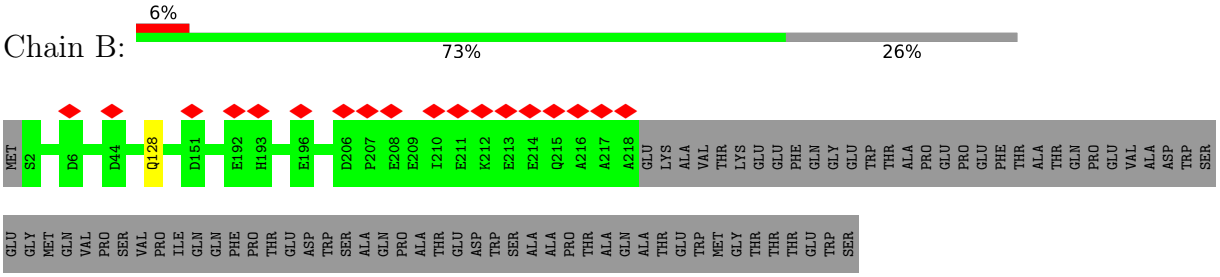
Chain 2:





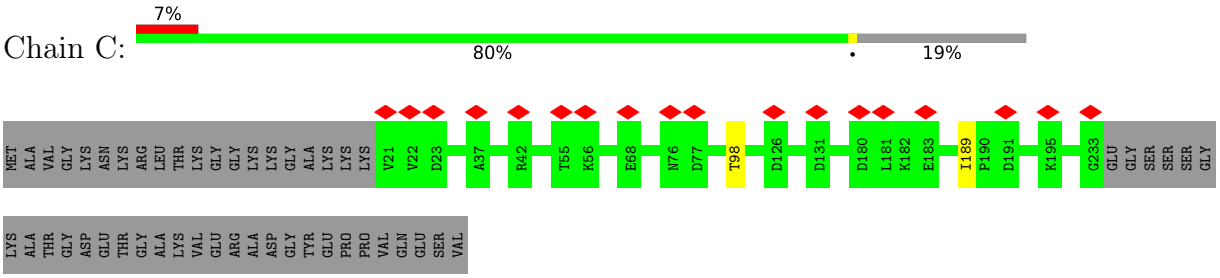
• Molecule 48: uS2

Chain B:



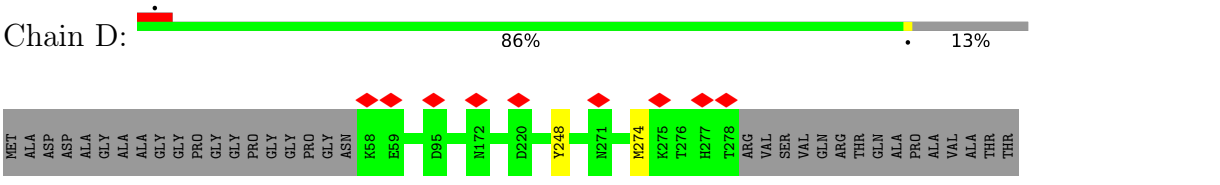

• Molecule 49: eS1

Chain C:



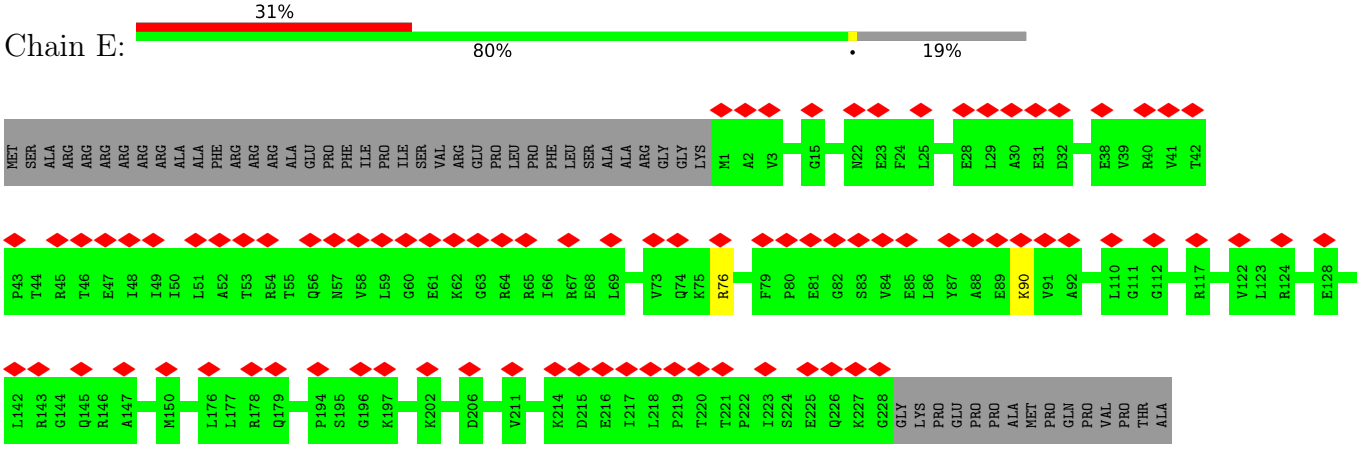

• Molecule 50: uS5

Chain D:



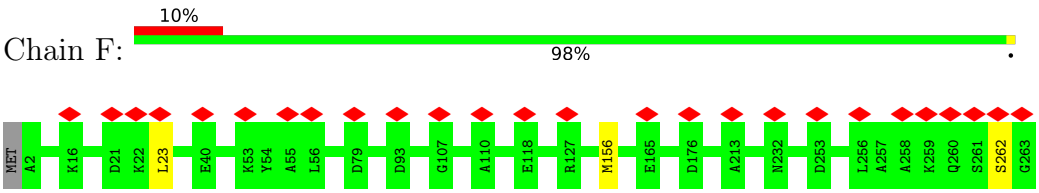

• Molecule 51: uS3

Chain E:



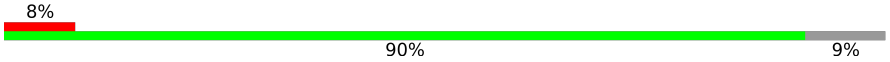

• Molecule 52: eS4

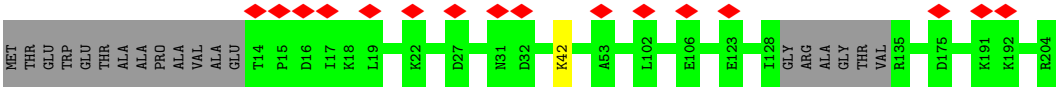
Chain F:




• Molecule 53: uS7

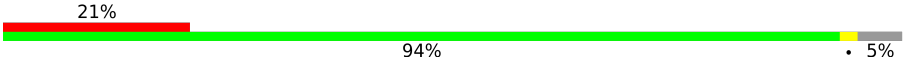
Chain G:

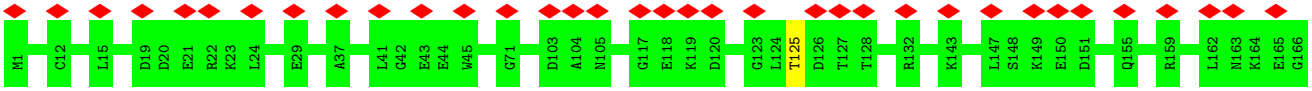


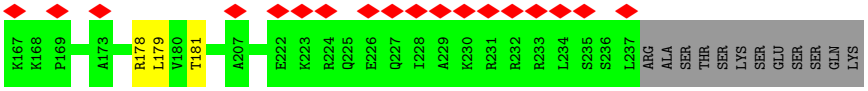



- Molecule 54: eS6

Chain H:

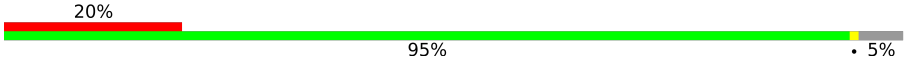


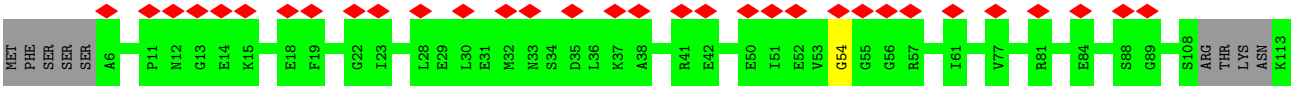



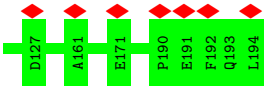




- Molecule 55: eS7

Chain I:

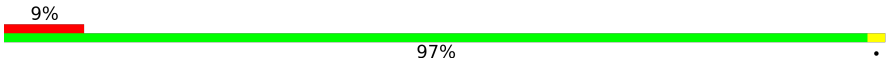


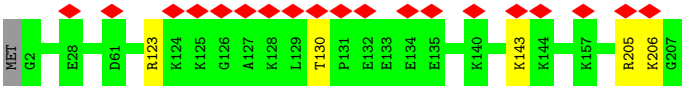




- Molecule 56: eS8

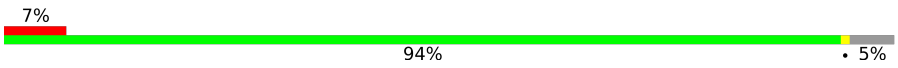
Chain J:

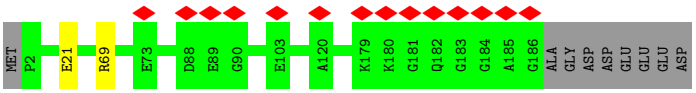



- Molecule 57: uS4

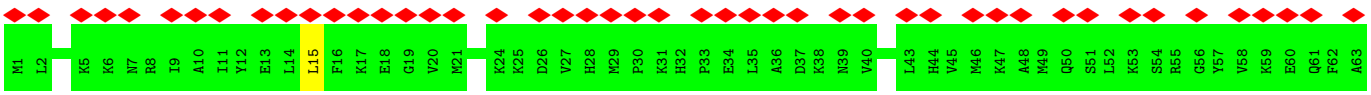
Chain K:

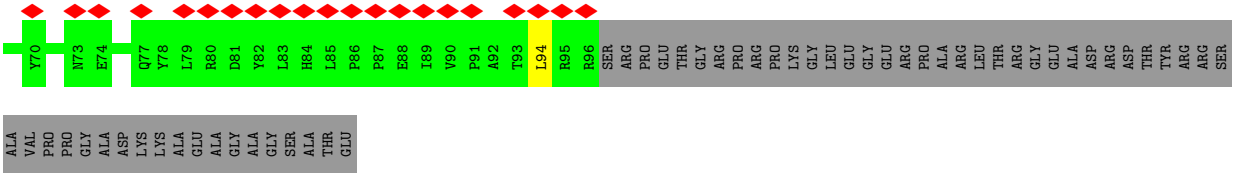



- Molecule 58: eS10

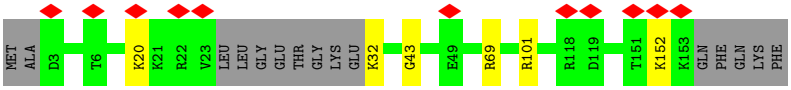
Chain L:





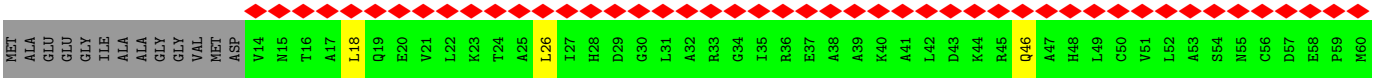

• Molecule 59: uS17

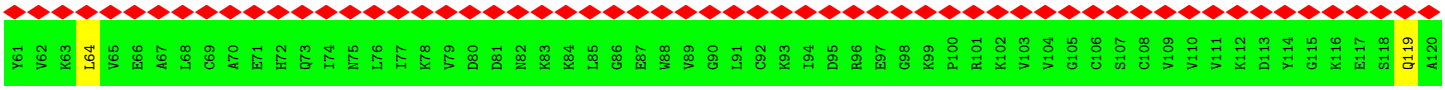
Chain M:

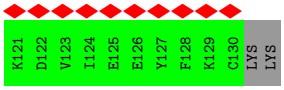



• Molecule 60: eS12

Chain N:

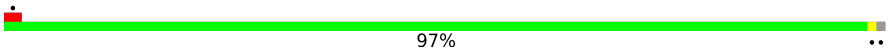


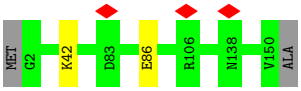




• Molecule 61: uS15

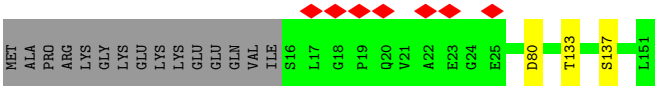
Chain O:



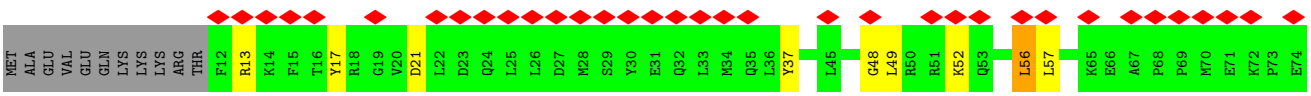

• Molecule 62: uS11

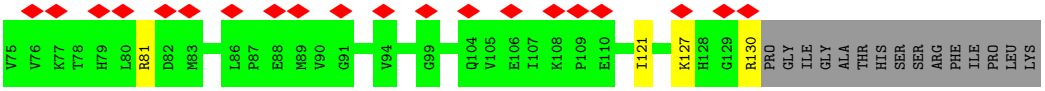
Chain P:



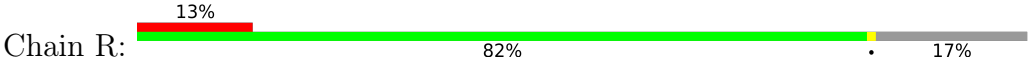

• Molecule 63: uS19

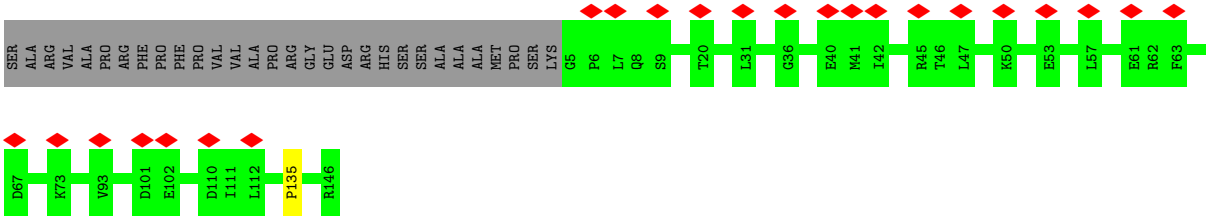
Chain Q:



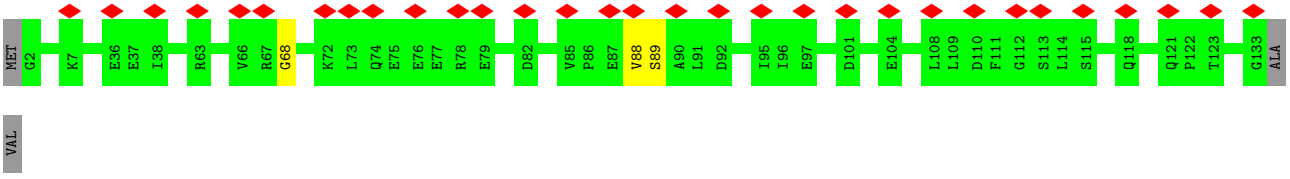



• Molecule 64: uS9

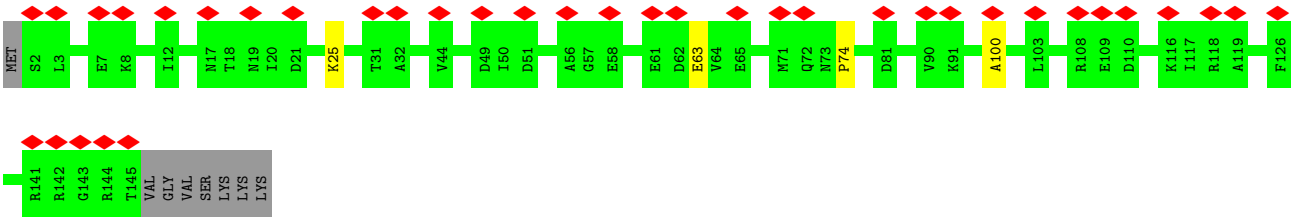


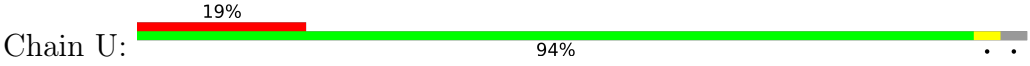

• Molecule 65: eS17

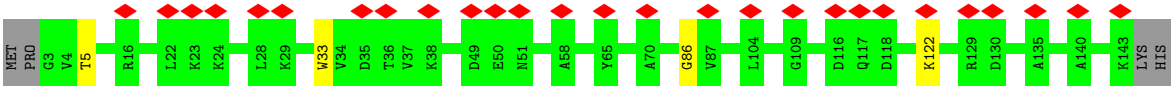



• Molecule 66: uS13

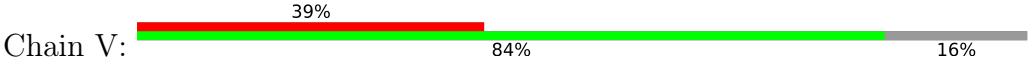


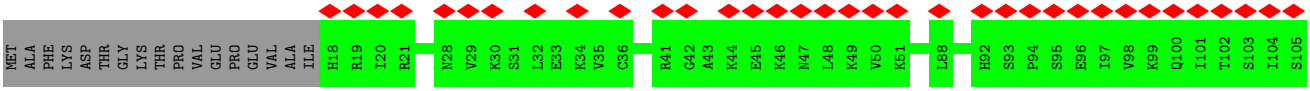

• Molecule 67: eS19

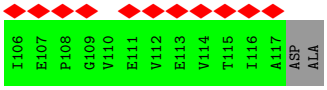



• Molecule 68: uS10

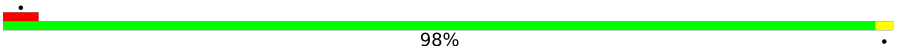


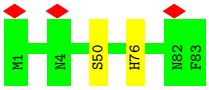






• Molecule 69: eS21

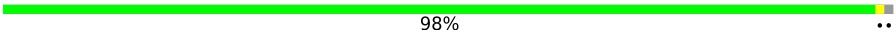
Chain W:



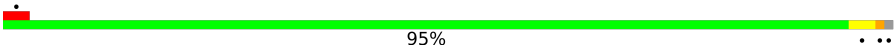

• Molecule 70: uS8

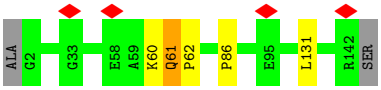
Chain X:



• Molecule 71: uS12

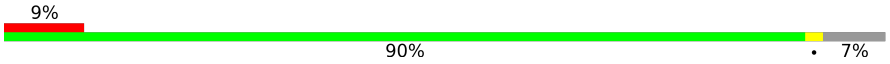
Chain Y:

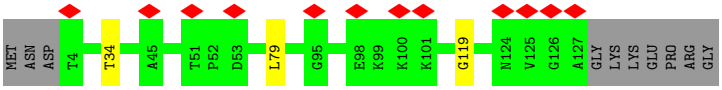



• Molecule 72: eS24

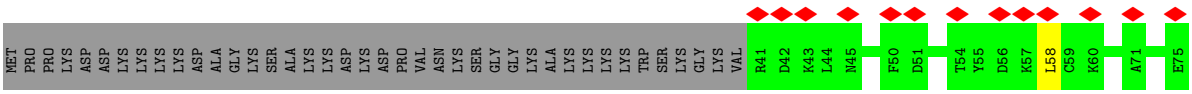
Chain Z:

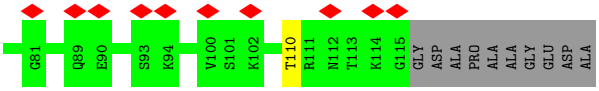



• Molecule 73: eS25

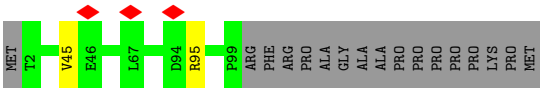
Chain a:



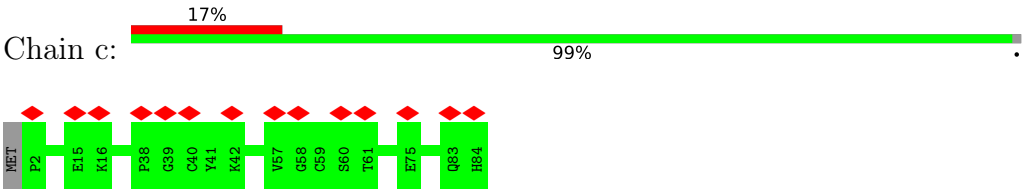

• Molecule 74: eS26

Chain b:



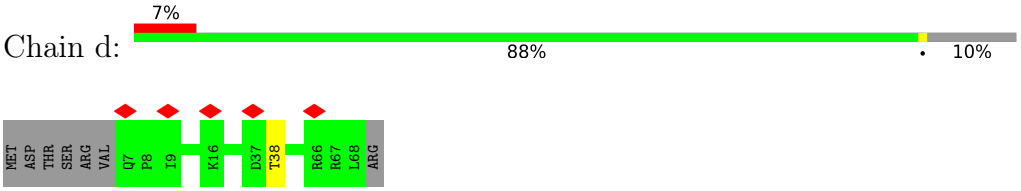
• Molecule 75: eS27

Chain c:



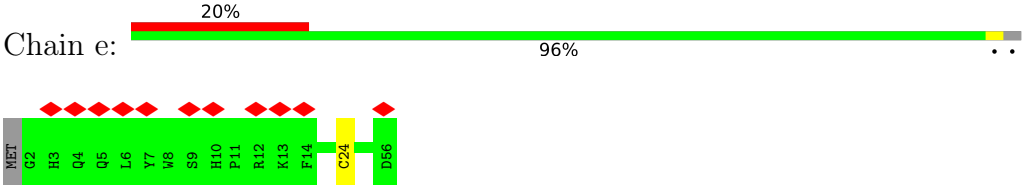

• Molecule 76: eS28

Chain d:



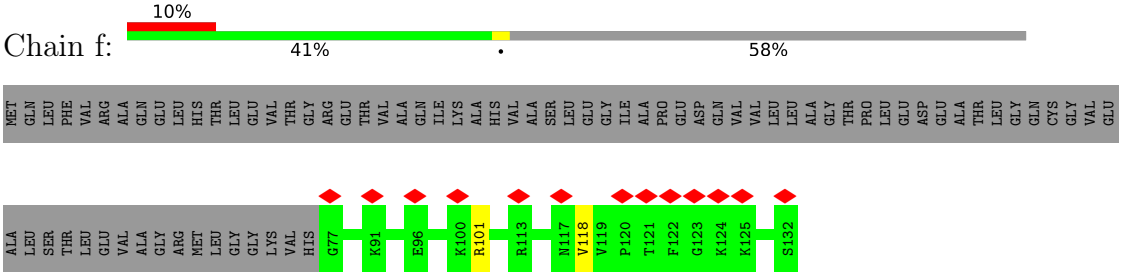

• Molecule 77: eS29

Chain e:



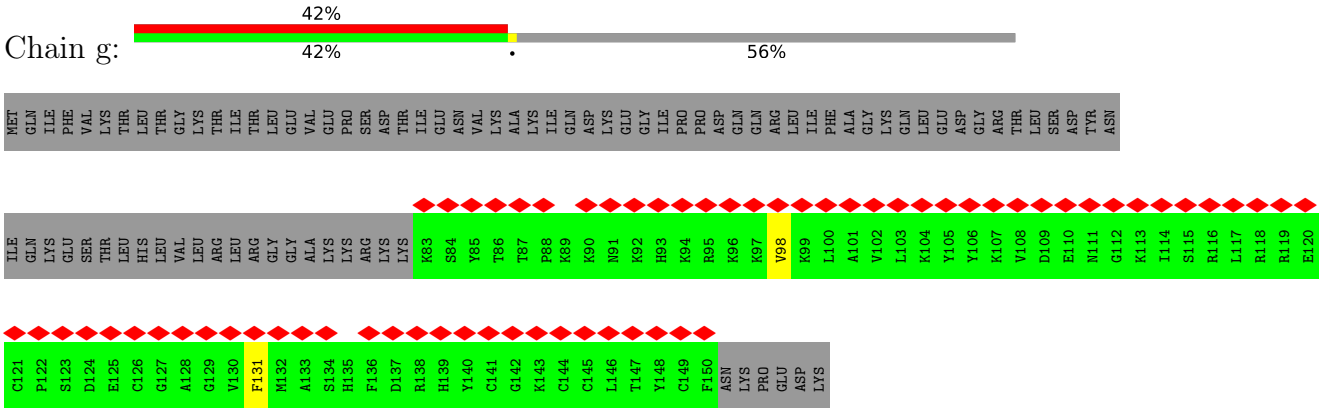

• Molecule 78: eS30

Chain f:



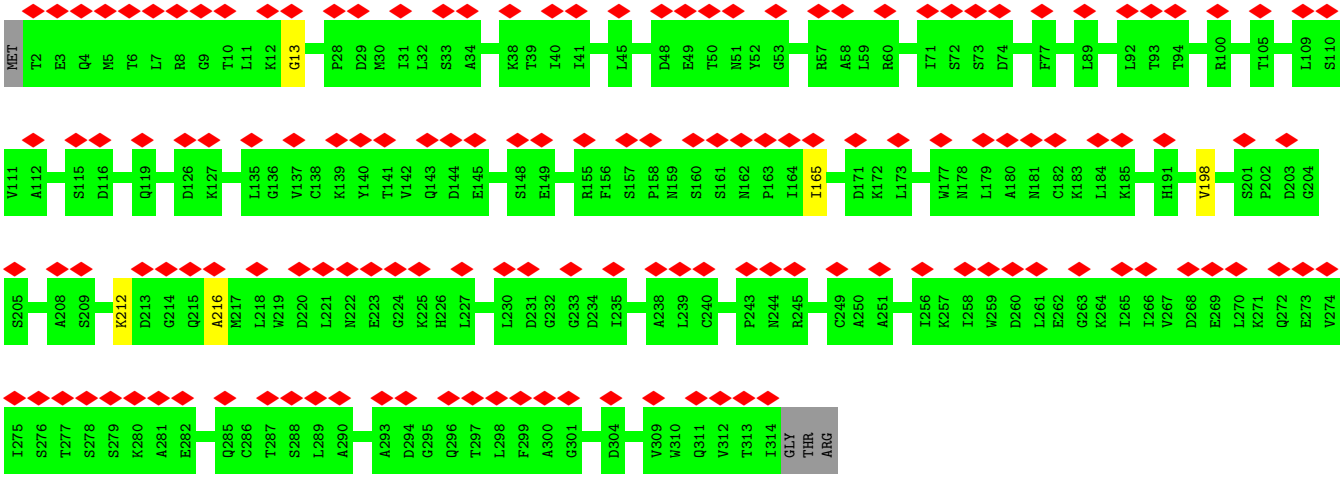

• Molecule 79: eS31

Chain g:



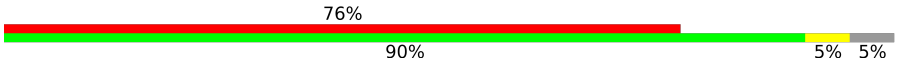

• Molecule 80: RACK1

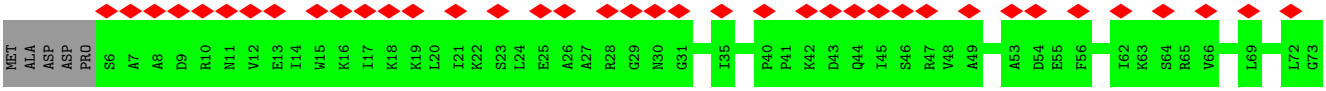
Chain h:

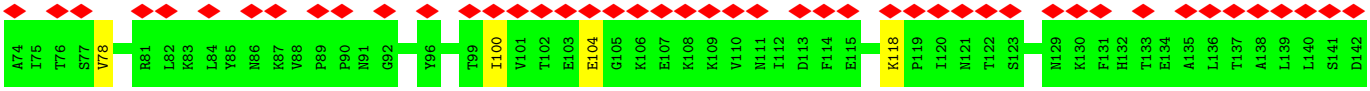



• Molecule 81: Eukaryotic peptide chain release factor subunit 1

Chain Aq:

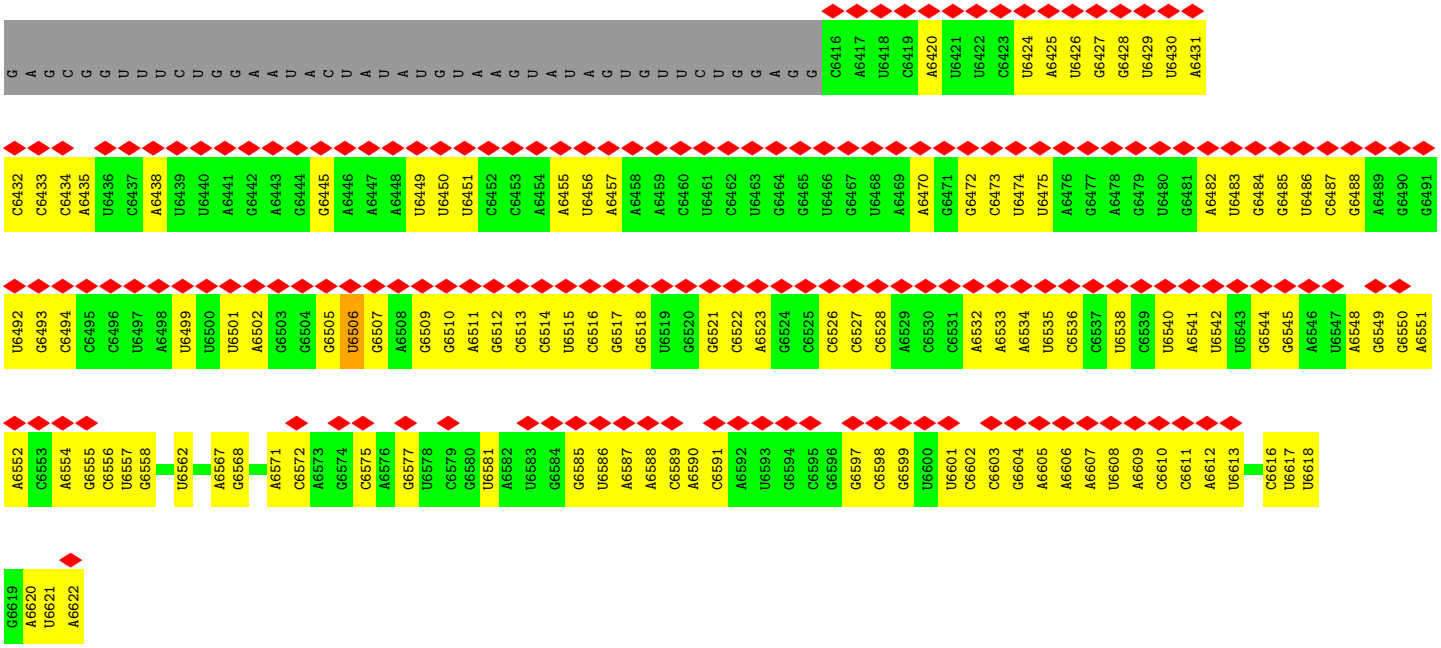



• Molecule 82: IAPV-IRES

Chain 1:


G A G C G G U U U C U G G A A U A C U A U A U G U A A A G U A U A G U U U C U G G A G C6416 A6417 U6418 C6419 A6420 U6421 U6422 C6423 U6424 A6425 U6426 G6427 G6428 U6429 U6430 A6431
C6432 C6433 C6434 A6435 U6436 C6437 A6438 U6439 U6440 A6441 G6442 A6443 G6444 G6445 A6446 A6447 A6448 U6449 U6450 U6451 C6452 C6453 A6454 A6455 U6456 A6457 A6458 A6459 C6460 U6461 C6462 U6463 G6464 G6465 U6466 G6467 U6468 A6469 A6470 G6471 G6472 C6473 U6474 U6475 A6476 G6477 A6478 G6479 U6480 G6481 A6482 U6483 G6484 G6485 U6486 C6487 G6488 A6489 G6490 G6491
U6492 G6493 C6494 C6495 C6496 U6497 A6498 U6499 U6500 U6501 A6502 G6503 G6504 G6505 U6506 G6507 A6508 G6509 G6510 A6511 G6512 C6513 C6514 U6515 C6516 G6517 G6518 U6519 G6520 G6521 C6522 A6523 G6524 C6525 C6526 C6527 C6528 A6529 C6530 C6531 A6532 A6533 A6534 U6535 C6536 C6537 U6538 C6539 U6540 A6541 U6542 U6543 G6544 G6545 A6546 U6547 A6548 G6549 G6550 A6551
A6552 C6553 A6554 G6555 C6556 U6557 G6558 U6562 A6567 G6568 A6571 C6572 A6573 G6574 C6575 A6576 G6577 U6578 C6579 G6580 U6581 A6582 U6583 G6584 G6585 U6586 A6587 A6588 C6589 A6590 C6591 A6592 U6593 G6594 C6595 G6596 G6597 C6598 G6599 U6600 U6601 C6602 C6603 G6604 A6605 A6606 A6607 U6608 A6609 C6610 C6611 A6612 U6613 C6616 U6617 U6618
G6619 A6620 U6621 A6622

# 4 Experimental information (i)

| Property | Value | Source |
|---|---|---|
| EM reconstruction method | SINGLE PARTICLE | Depositor |
| Imposed symmetry | POINT, C1 | Depositor |
| Number of particles used | 27658 | 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 ($e^-/Å^2$) | 56.90 | Depositor |
| Minimum defocus (nm) | 1200 | Depositor |
| Maximum defocus (nm) | 4900 | Depositor |
| Magnification | 130000 | Depositor |
| Image detector | GATAN K2 SUMMIT (4k x 4k) | Depositor |
| Maximum map value | 0.192 | Depositor |
| Minimum map value | -0.108 | Depositor |
| Average map value | 0.001 | Depositor |
| Map value standard deviation | 0.008 | Depositor |
| Recommended contour level | 0.03 | Depositor |
| Map size (Å) | 441.168, 441.168, 441.168 | wwPDB |
| Map dimensions | 416, 416, 416 | wwPDB |
| Map angles (°) | 90.0, 90.0, 90.0 | wwPDB |
| Pixel spacing (Å) | 1.0605, 1.0605, 1.0605 | Depositor |

# 5 Model quality (i)

## 5.1 Standard geometry (i)

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 | 5 | 0.24 | 0/86214 | 0.68 | 7/134455 (0.0%) |
| 2 | 7 | 0.22 | 0/2836 | 0.66 | 0/4421 |
| 3 | 8 | 0.25 | 0/3581 | 0.68 | 0/5577 |
| 4 | AA | 0.68 | 0/1933 | 0.84 | 0/2592 |
| 5 | AB | 0.66 | 0/3240 | 0.80 | 0/4339 |
| 6 | AC | 0.65 | 0/2937 | 0.79 | 0/3946 |
| 7 | AD | 0.67 | 0/2437 | 0.79 | 0/3264 |
| 8 | AE | 0.68 | 0/1762 | 0.83 | 0/2362 |
| 9 | AF | 0.66 | 0/1911 | 0.79 | 0/2549 |
| 10 | AG | 0.67 | 0/1850 | 0.82 | 0/2491 |
| 11 | AH | 0.70 | 0/1535 | 0.81 | 0/2063 |
| 12 | AI | 0.66 | 0/1702 | 0.82 | 0/2272 |
| 13 | AJ | 0.68 | 0/1385 | 0.80 | 0/1852 |
| 14 | AL | 0.66 | 0/1658 | 0.85 | 0/2219 |
| 15 | AM | 0.67 | 0/1158 | 0.79 | 0/1547 |
| 16 | AN | 0.64 | 0/1746 | 0.84 | 0/2338 |
| 17 | AO | 0.67 | 0/1663 | 0.81 | 0/2223 |
| 18 | AP | 0.65 | 0/1268 | 0.80 | 0/1700 |
| 19 | AQ | 0.65 | 0/1557 | 0.82 | 0/2086 |
| 20 | AR | 0.66 | 0/1519 | 0.82 | 0/2006 |
| 21 | AS | 0.65 | 0/1498 | 0.79 | 0/2012 |
| 22 | AT | 0.65 | 0/1326 | 0.81 | 0/1770 |
| 23 | AU | 0.67 | 0/832 | 0.76 | 0/1116 |
| 24 | AV | 0.71 | 0/983 | 0.81 | 0/1319 |
| 25 | AW | 0.65 | 0/541 | 0.82 | 0/720 |
| 26 | AX | 0.65 | 0/984 | 0.78 | 0/1323 |
| 27 | AY | 0.66 | 0/1132 | 0.82 | 0/1504 |
| 28 | AZ | 0.66 | 0/1130 | 0.83 | 0/1507 |
| 29 | Aa | 0.65 | 0/1191 | 0.82 | 0/1590 |
| 30 | Ab | 0.68 | 0/861 | 0.83 | 0/1138 |
| 31 | Ac | 0.70 | 0/771 | 0.76 | 0/1034 |
| 32 | Ad | 0.66 | 0/903 | 0.82 | 0/1216 |
| 33 | Ae | 0.66 | 0/1071 | 0.80 | 0/1429 |
| 34 | Af | 0.66 | 0/895 | 0.82 | 0/1198 |

| Mol | Chain | Bond lengths | | Bond angles | |
|---|---|---|---|---|---|
| | | RMSZ | $\#\|Z\|>5$ | RMSZ | $\#\|Z\|>5$ |
| 35 | Ag | 0.68 | 0/916 | 0.86 | 0/1220 |
| 36 | Ah | 0.67 | 0/1021 | 0.82 | 0/1348 |
| 37 | Ai | 0.68 | 0/841 | 0.82 | 0/1112 |
| 38 | Aj | 0.65 | 0/720 | 0.86 | 0/952 |
| 39 | Ak | 0.67 | 0/575 | 0.81 | 0/759 |
| 40 | Al | 0.63 | 0/459 | 0.78 | 0/608 |
| 41 | Am | 0.66 | 0/435 | 0.79 | 0/575 |
| 42 | An | 0.61 | 0/240 | 0.87 | 0/305 |
| 43 | Ao | 0.65 | 0/864 | 0.82 | 0/1140 |
| 44 | Ap | 0.69 | 0/718 | 0.84 | 0/953 |
| 45 | Ar | 0.68 | 0/1010 | 0.84 | 0/1354 |
| 46 | AK | 0.70 | 0/1733 | 0.85 | 0/2324 |
| 47 | 2 | 0.24 | 0/40509 | 0.70 | 14/63128 (0.0%) |
| 48 | B | 0.68 | 0/1744 | 0.76 | 0/2371 |
| 49 | C | 0.67 | 0/1756 | 0.79 | 0/2350 |
| 50 | D | 0.68 | 0/1748 | 0.77 | 0/2362 |
| 51 | E | 0.70 | 0/1796 | 0.82 | 0/2417 |
| 52 | F | 0.67 | 0/2115 | 0.80 | 0/2843 |
| 53 | G | 0.69 | 0/1492 | 0.78 | 0/2005 |
| 54 | H | 0.68 | 0/1946 | 0.84 | 0/2590 |
| 55 | I | 0.68 | 0/1510 | 0.79 | 0/2022 |
| 56 | J | 0.67 | 0/1715 | 0.80 | 0/2287 |
| 57 | K | 0.68 | 0/1550 | 0.83 | 0/2069 |
| 58 | L | 0.66 | 0/834 | 0.77 | 0/1125 |
| 59 | M | 0.66 | 0/1195 | 0.82 | 0/1597 |
| 60 | N | 0.72 | 0/918 | 0.82 | 0/1233 |
| 61 | O | 0.67 | 0/1226 | 0.79 | 0/1649 |
| 62 | P | 0.69 | 0/1029 | 0.84 | 0/1380 |
| 63 | Q | 0.68 | 0/1009 | 0.81 | 0/1346 |
| 64 | R | 0.68 | 0/1146 | 0.82 | 0/1534 |
| 65 | S | 0.69 | 0/1082 | 0.80 | 0/1452 |
| 66 | T | 0.69 | 0/1208 | 0.82 | 0/1618 |
| 67 | U | 0.70 | 0/1115 | 0.81 | 0/1493 |
| 68 | V | 0.69 | 0/805 | 0.82 | 0/1081 |
| 69 | W | 0.70 | 0/638 | 0.79 | 0/855 |
| 70 | X | 0.67 | 0/1051 | 0.80 | 0/1406 |
| 71 | Y | 0.69 | 0/1116 | 0.81 | 0/1490 |
| 72 | Z | 0.67 | 0/1028 | 0.82 | 0/1366 |
| 73 | a | 0.70 | 0/604 | 0.84 | 0/810 |
| 74 | b | 0.67 | 0/791 | 0.82 | 0/1062 |
| 75 | c | 0.68 | 0/665 | 0.81 | 0/891 |
| 76 | d | 0.68 | 0/490 | 0.82 | 0/656 |
| 77 | e | 0.67 | 0/470 | 0.83 | 0/623 |

| Mol | Chain | Bond lengths | | Bond angles | |
|---|---|---|---|---|---|
| | | RMSZ | #\|Z\| >5 | RMSZ | #\|Z\| >5 |
| 78 | f | 0.71 | 0/451 | 0.85 | 0/592 |
| 79 | g | 0.69 | 0/567 | 0.88 | 0/753 |
| 80 | h | 0.69 | 0/2493 | 0.80 | 0/3394 |
| 81 | Aq | 0.71 | 0/3331 | 0.81 | 1/4479 (0.0%) |
| 82 | 1 | 0.23 | 0/4927 | 0.72 | 1/7675 (0.0%) |
| All | All | 0.47 | 0/235612 | 0.74 | 23/345832 (0.0%) |

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 |
|---|---|---|---|
| 5 | AB | 0 | 3 |
| 14 | AL | 0 | 1 |
| 30 | Ab | 0 | 1 |
| 34 | Af | 0 | 1 |
| 36 | Ah | 0 | 1 |
| 46 | AK | 0 | 4 |
| 49 | C | 0 | 1 |
| 53 | G | 0 | 1 |
| 60 | N | 0 | 1 |
| 63 | Q | 0 | 1 |
| 65 | S | 0 | 1 |
| 66 | T | 0 | 1 |
| 70 | X | 0 | 1 |
| 71 | Y | 0 | 1 |
| 79 | g | 0 | 1 |
| All | All | 0 | 20 |

There are no bond length outliers.

The worst 5 of 23 bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed($^o$) | Ideal($^o$) |
|---|---|---|---|---|---|---|---|
| 47 | 2 | 1858 | G | C2'-C3'-O3' | 8.65 | 128.52 | 109.50 |
| 1 | 5 | 928 | A | C2'-C3'-O3' | 5.98 | 123.27 | 113.70 |
| 1 | 5 | 48 | G | C2'-C3'-O3' | 5.86 | 123.07 | 113.70 |
| 82 | 1 | 6506 | U | C2'-C3'-O3' | 5.85 | 123.05 | 113.70 |
| 47 | 2 | 885 | U | C2'-C3'-O3' | 5.83 | 123.02 | 113.70 |

There are no chirality outliers.

5 of 20 planarity outliers are listed below:

| Mol | Chain | Res | Type | Group |
|---|---|---|---|---|
| 5 | AB | 241 | PRO | Peptide |
| 5 | AB | 257 | TRP | Peptide |
| 5 | AB | 258 | HIS | Peptide |
| 14 | AL | 46 | ILE | Peptide |
| 30 | Ab | 101 | HIS | 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 | |
|---|---|---|---|---|---|---|---|
| 4 | AA | 246/257 (96%) | 222 (90%) | 24 (10%) | 0 | 100 | 100 |
| 5 | AB | 392/402 (98%) | 372 (95%) | 18 (5%) | 2 (0%) | 29 | 67 |
| 6 | AC | 360/392 (92%) | 329 (91%) | 28 (8%) | 3 (1%) | 19 | 58 |
| 7 | AD | 291/297 (98%) | 272 (94%) | 18 (6%) | 1 (0%) | 41 | 74 |
| 8 | AE | 208/291 (72%) | 187 (90%) | 20 (10%) | 1 (0%) | 29 | 67 |
| 9 | AF | 223/249 (90%) | 210 (94%) | 11 (5%) | 2 (1%) | 17 | 56 |
| 10 | AG | 221/242 (91%) | 208 (94%) | 13 (6%) | 0 | 100 | 100 |
| 11 | AH | 188/192 (98%) | 176 (94%) | 12 (6%) | 0 | 100 | 100 |
| 12 | AI | 201/214 (94%) | 181 (90%) | 20 (10%) | 0 | 100 | 100 |
| 13 | AJ | 168/178 (94%) | 160 (95%) | 7 (4%) | 1 (1%) | 25 | 64 |
| 14 | AL | 199/211 (94%) | 191 (96%) | 7 (4%) | 1 (0%) | 29 | 67 |
| 15 | AM | 136/198 (69%) | 122 (90%) | 13 (10%) | 1 (1%) | 22 | 61 |
| 16 | AN | 201/204 (98%) | 194 (96%) | 6 (3%) | 1 (0%) | 29 | 67 |
| 17 | AO | 197/203 (97%) | 191 (97%) | 5 (2%) | 1 (0%) | 29 | 67 |

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| Mol | Chain | Analysed | Favoured | Allowed | Outliers | Percentiles | |
|---|---|---|---|---|---|---|---|
| 18 | AP | 151/184 (82%) | 140 (93%) | 11 (7%) | 0 | 100 | 100 |
| 19 | AQ | 185/188 (98%) | 170 (92%) | 14 (8%) | 1 (0%) | 29 | 67 |
| 20 | AR | 178/196 (91%) | 171 (96%) | 6 (3%) | 1 (1%) | 25 | 64 |
| 21 | AS | 174/176 (99%) | 159 (91%) | 13 (8%) | 2 (1%) | 14 | 51 |
| 22 | AT | 157/160 (98%) | 145 (92%) | 9 (6%) | 3 (2%) | 8 | 39 |
| 23 | AU | 97/128 (76%) | 90 (93%) | 7 (7%) | 0 | 100 | 100 |
| 24 | AV | 127/140 (91%) | 122 (96%) | 5 (4%) | 0 | 100 | 100 |
| 25 | AW | 61/157 (39%) | 57 (93%) | 4 (7%) | 0 | 100 | 100 |
| 26 | AX | 116/156 (74%) | 111 (96%) | 5 (4%) | 0 | 100 | 100 |
| 27 | AY | 132/145 (91%) | 125 (95%) | 7 (5%) | 0 | 100 | 100 |
| 28 | AZ | 133/136 (98%) | 125 (94%) | 8 (6%) | 0 | 100 | 100 |
| 29 | Aa | 145/148 (98%) | 135 (93%) | 10 (7%) | 0 | 100 | 100 |
| 30 | Ab | 100/226 (44%) | 92 (92%) | 6 (6%) | 2 (2%) | 7 | 38 |
| 31 | Ac | 96/115 (84%) | 91 (95%) | 5 (5%) | 0 | 100 | 100 |
| 32 | Ad | 105/125 (84%) | 96 (91%) | 7 (7%) | 2 (2%) | 8 | 39 |
| 33 | Ae | 126/135 (93%) | 118 (94%) | 8 (6%) | 0 | 100 | 100 |
| 34 | Af | 107/110 (97%) | 95 (89%) | 11 (10%) | 1 (1%) | 17 | 56 |
| 35 | Ag | 112/126 (89%) | 108 (96%) | 4 (4%) | 0 | 100 | 100 |
| 36 | Ah | 120/123 (98%) | 119 (99%) | 0 | 1 (1%) | 19 | 58 |
| 37 | Ai | 100/105 (95%) | 94 (94%) | 6 (6%) | 0 | 100 | 100 |
| 38 | Aj | 84/97 (87%) | 77 (92%) | 6 (7%) | 1 (1%) | 13 | 49 |
| 39 | Ak | 67/70 (96%) | 64 (96%) | 3 (4%) | 0 | 100 | 100 |
| 40 | Al | 48/51 (94%) | 43 (90%) | 5 (10%) | 0 | 100 | 100 |
| 41 | Am | 50/52 (96%) | 47 (94%) | 3 (6%) | 0 | 100 | 100 |
| 42 | An | 23/25 (92%) | 22 (96%) | 1 (4%) | 0 | 100 | 100 |
| 43 | Ao | 102/106 (96%) | 95 (93%) | 7 (7%) | 0 | 100 | 100 |
| 44 | Ap | 89/92 (97%) | 85 (96%) | 4 (4%) | 0 | 100 | 100 |
| 45 | Ar | 122/137 (89%) | 112 (92%) | 9 (7%) | 1 (1%) | 19 | 58 |
| 46 | AK | 210/217 (97%) | 149 (71%) | 53 (25%) | 8 (4%) | 3 | 22 |
| 48 | B | 215/295 (73%) | 194 (90%) | 21 (10%) | 0 | 100 | 100 |
| 49 | C | 211/264 (80%) | 192 (91%) | 19 (9%) | 0 | 100 | 100 |

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| Mol | Chain | Analysed | Favoured | Allowed | Outliers | Percentiles | |
|---|---|---|---|---|---|---|---|
| 50 | D | 219/255 (86%) | 208 (95%) | 11 (5%) | 0 | 100 | 100 |
| 51 | E | 226/281 (80%) | 204 (90%) | 22 (10%) | 0 | 100 | 100 |
| 52 | F | 260/263 (99%) | 237 (91%) | 23 (9%) | 0 | 100 | 100 |
| 53 | G | 181/204 (89%) | 167 (92%) | 14 (8%) | 0 | 100 | 100 |
| 54 | H | 235/249 (94%) | 213 (91%) | 20 (8%) | 2 (1%) | 17 | 56 |
| 55 | I | 181/194 (93%) | 167 (92%) | 13 (7%) | 1 (1%) | 25 | 64 |
| 56 | J | 204/207 (99%) | 184 (90%) | 18 (9%) | 2 (1%) | 15 | 54 |
| 57 | K | 183/194 (94%) | 169 (92%) | 14 (8%) | 0 | 100 | 100 |
| 58 | L | 94/149 (63%) | 83 (88%) | 11 (12%) | 0 | 100 | 100 |
| 59 | M | 139/158 (88%) | 126 (91%) | 12 (9%) | 1 (1%) | 22 | 61 |
| 60 | N | 115/132 (87%) | 91 (79%) | 24 (21%) | 0 | 100 | 100 |
| 61 | O | 147/151 (97%) | 138 (94%) | 9 (6%) | 0 | 100 | 100 |
| 62 | P | 134/151 (89%) | 117 (87%) | 16 (12%) | 1 (1%) | 22 | 61 |
| 63 | Q | 117/145 (81%) | 100 (86%) | 12 (10%) | 5 (4%) | 2 | 20 |
| 64 | R | 140/172 (81%) | 128 (91%) | 11 (8%) | 1 (1%) | 22 | 61 |
| 65 | S | 130/135 (96%) | 112 (86%) | 16 (12%) | 2 (2%) | 10 | 44 |
| 66 | T | 142/152 (93%) | 124 (87%) | 16 (11%) | 2 (1%) | 11 | 46 |
| 67 | U | 139/145 (96%) | 127 (91%) | 11 (8%) | 1 (1%) | 22 | 61 |
| 68 | V | 98/119 (82%) | 91 (93%) | 7 (7%) | 0 | 100 | 100 |
| 69 | W | 81/83 (98%) | 75 (93%) | 6 (7%) | 0 | 100 | 100 |
| 70 | X | 127/130 (98%) | 118 (93%) | 9 (7%) | 0 | 100 | 100 |
| 71 | Y | 139/143 (97%) | 127 (91%) | 8 (6%) | 4 (3%) | 4 | 28 |
| 72 | Z | 122/134 (91%) | 112 (92%) | 9 (7%) | 1 (1%) | 19 | 58 |
| 73 | a | 73/125 (58%) | 69 (94%) | 4 (6%) | 0 | 100 | 100 |
| 74 | b | 96/115 (84%) | 86 (90%) | 10 (10%) | 0 | 100 | 100 |
| 75 | c | 81/84 (96%) | 74 (91%) | 7 (9%) | 0 | 100 | 100 |
| 76 | d | 60/69 (87%) | 55 (92%) | 5 (8%) | 0 | 100 | 100 |
| 77 | e | 53/56 (95%) | 47 (89%) | 6 (11%) | 0 | 100 | 100 |
| 78 | f | 54/133 (41%) | 47 (87%) | 7 (13%) | 0 | 100 | 100 |
| 79 | g | 66/156 (42%) | 56 (85%) | 10 (15%) | 0 | 100 | 100 |
| 80 | h | 311/317 (98%) | 263 (85%) | 46 (15%) | 2 (1%) | 25 | 64 |

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| Mol | Chain | Analysed | Favoured | Allowed | Outliers | Percentiles |
|---|---|---|---|---|---|---|
| 81 | Aq | 414/437 (95%) | 359 (87%) | 50 (12%) | 5 (1%) | 13 49 |
| All | All | 11735/13353 (88%) | 10732 (92%) | 936 (8%) | 67 (1%) | 29 64 |

5 of 67 Ramachandran outliers are listed below:

| Mol | Chain | Res | Type |
|---|---|---|---|
| 45 | Ar | 68 | SER |
| 46 | AK | 152 | LYS |
| 56 | J | 206 | LYS |
| 6 | AC | 126 | SER |
| 13 | AJ | 147 | ARG |

### 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 |
|---|---|---|---|---|---|
| 4 | AA | 189/199 (95%) | 182 (96%) | 7 (4%) | 34 68 |
| 5 | AB | 342/347 (99%) | 339 (99%) | 3 (1%) | 78 91 |
| 6 | AC | 302/323 (94%) | 285 (94%) | 17 (6%) | 21 57 |
| 7 | AD | 247/250 (99%) | 244 (99%) | 3 (1%) | 71 88 |
| 8 | AE | 190/251 (76%) | 186 (98%) | 4 (2%) | 53 79 |
| 9 | AF | 196/218 (90%) | 193 (98%) | 3 (2%) | 65 85 |
| 10 | AG | 194/208 (93%) | 192 (99%) | 2 (1%) | 76 90 |
| 11 | AH | 169/171 (99%) | 169 (100%) | 0 | 100 100 |
| 12 | AI | 175/181 (97%) | 173 (99%) | 2 (1%) | 73 88 |
| 13 | AJ | 143/149 (96%) | 141 (99%) | 2 (1%) | 67 86 |
| 14 | AL | 167/176 (95%) | 164 (98%) | 3 (2%) | 59 82 |
| 15 | AM | 117/151 (78%) | 110 (94%) | 7 (6%) | 19 54 |
| 16 | AN | 171/172 (99%) | 167 (98%) | 4 (2%) | 50 78 |
| 17 | AO | 171/173 (99%) | 165 (96%) | 6 (4%) | 36 69 |
| 18 | AP | 134/163 (82%) | 133 (99%) | 1 (1%) | 84 94 |

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| Mol | Chain | Analysed | Rotameric | Outliers | Percentiles |
|---|---|---|---|---|---|
| 19 | AQ | 166/167 (99%) | 156 (94%) | 10 (6%) | 19 54 |
| 20 | AR | 159/175 (91%) | 153 (96%) | 6 (4%) | 33 67 |
| 21 | AS | 155/155 (100%) | 144 (93%) | 11 (7%) | 14 47 |
| 22 | AT | 139/140 (99%) | 137 (99%) | 2 (1%) | 67 86 |
| 23 | AU | 91/116 (78%) | 84 (92%) | 7 (8%) | 13 44 |
| 24 | AV | 100/107 (94%) | 99 (99%) | 1 (1%) | 76 90 |
| 25 | AW | 55/126 (44%) | 55 (100%) | 0 | 100 100 |
| 26 | AX | 106/134 (79%) | 105 (99%) | 1 (1%) | 78 91 |
| 27 | AY | 124/135 (92%) | 119 (96%) | 5 (4%) | 31 66 |
| 28 | AZ | 117/118 (99%) | 117 (100%) | 0 | 100 100 |
| 29 | Aa | 119/120 (99%) | 117 (98%) | 2 (2%) | 60 83 |
| 30 | Ab | 84/172 (49%) | 83 (99%) | 1 (1%) | 71 88 |
| 31 | Ac | 84/98 (86%) | 83 (99%) | 1 (1%) | 71 88 |
| 32 | Ad | 98/110 (89%) | 98 (100%) | 0 | 100 100 |
| 33 | Ae | 114/121 (94%) | 112 (98%) | 2 (2%) | 59 82 |
| 34 | Af | 88/89 (99%) | 88 (100%) | 0 | 100 100 |
| 35 | Ag | 98/106 (92%) | 95 (97%) | 3 (3%) | 40 72 |
| 36 | Ah | 109/110 (99%) | 109 (100%) | 0 | 100 100 |
| 37 | Ai | 86/89 (97%) | 86 (100%) | 0 | 100 100 |
| 38 | Aj | 73/80 (91%) | 71 (97%) | 2 (3%) | 44 75 |
| 39 | Ak | 64/65 (98%) | 61 (95%) | 3 (5%) | 26 62 |
| 40 | Al | 47/48 (98%) | 46 (98%) | 1 (2%) | 53 79 |
| 41 | Am | 48/48 (100%) | 48 (100%) | 0 | 100 100 |
| 42 | An | 24/24 (100%) | 24 (100%) | 0 | 100 100 |
| 43 | Ao | 92/94 (98%) | 91 (99%) | 1 (1%) | 73 88 |
| 44 | Ap | 74/75 (99%) | 72 (97%) | 2 (3%) | 44 75 |
| 45 | Ar | 108/121 (89%) | 108 (100%) | 0 | 100 100 |
| 46 | AK | 190/196 (97%) | 177 (93%) | 13 (7%) | 16 49 |
| 48 | B | 180/245 (74%) | 179 (99%) | 1 (1%) | 86 94 |
| 49 | C | 194/231 (84%) | 193 (100%) | 1 (0%) | 88 95 |
| 50 | D | 186/205 (91%) | 184 (99%) | 2 (1%) | 73 88 |

*Continued on next page...*

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| Mol | Chain | Analysed | Rotameric | Outliers | Percentiles | |
|---|---|---|---|---|---|---|
| 51 | E | 190/232 (82%) | 188 (99%) | 2 (1%) | 73 | 88 |
| 52 | F | 223/225 (99%) | 220 (99%) | 3 (1%) | 69 | 87 |
| 53 | G | 158/170 (93%) | 158 (100%) | 0 | 100 | 100 |
| 54 | H | 207/218 (95%) | 205 (99%) | 2 (1%) | 76 | 90 |
| 55 | I | 165/174 (95%) | 165 (100%) | 0 | 100 | 100 |
| 56 | J | 178/179 (99%) | 175 (98%) | 3 (2%) | 60 | 83 |
| 57 | K | 161/168 (96%) | 159 (99%) | 2 (1%) | 71 | 88 |
| 58 | L | 87/125 (70%) | 85 (98%) | 2 (2%) | 50 | 78 |
| 59 | M | 130/142 (92%) | 125 (96%) | 5 (4%) | 33 | 67 |
| 60 | N | 99/108 (92%) | 95 (96%) | 4 (4%) | 31 | 66 |
| 61 | O | 130/131 (99%) | 128 (98%) | 2 (2%) | 65 | 85 |
| 62 | P | 106/119 (89%) | 104 (98%) | 2 (2%) | 57 | 81 |
| 63 | Q | 108/130 (83%) | 100 (93%) | 8 (7%) | 13 | 46 |
| 64 | R | 117/140 (84%) | 117 (100%) | 0 | 100 | 100 |
| 65 | S | 119/121 (98%) | 119 (100%) | 0 | 100 | 100 |
| 66 | T | 125/132 (95%) | 124 (99%) | 1 (1%) | 81 | 93 |
| 67 | U | 111/116 (96%) | 108 (97%) | 3 (3%) | 44 | 75 |
| 68 | V | 92/107 (86%) | 92 (100%) | 0 | 100 | 100 |
| 69 | W | 68/68 (100%) | 66 (97%) | 2 (3%) | 42 | 74 |
| 70 | X | 112/113 (99%) | 112 (100%) | 0 | 100 | 100 |
| 71 | Y | 113/114 (99%) | 112 (99%) | 1 (1%) | 78 | 91 |
| 72 | Z | 107/115 (93%) | 105 (98%) | 2 (2%) | 57 | 81 |
| 73 | a | 66/103 (64%) | 64 (97%) | 2 (3%) | 41 | 73 |
| 74 | b | 86/99 (87%) | 84 (98%) | 2 (2%) | 50 | 78 |
| 75 | c | 75/76 (99%) | 75 (100%) | 0 | 100 | 100 |
| 76 | d | 55/62 (89%) | 54 (98%) | 1 (2%) | 59 | 82 |
| 77 | e | 48/49 (98%) | 47 (98%) | 1 (2%) | 53 | 79 |
| 78 | f | 46/106 (43%) | 44 (96%) | 2 (4%) | 29 | 64 |
| 79 | g | 61/140 (44%) | 60 (98%) | 1 (2%) | 62 | 84 |
| 80 | h | 272/275 (99%) | 269 (99%) | 3 (1%) | 73 | 88 |
| 81 | Aq | 358/376 (95%) | 342 (96%) | 16 (4%) | 27 | 63 |

*Continued on next page...*

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| Mol | Chain | Analysed | Rotameric | Outliers | Percentiles |
|---|---|---|---|---|---|
| All | All | 10252/11385 (90%) | 10038 (98%) | 214 (2%) | 56 79 |

5 of 214 residues with a non-rotameric sidechain are listed below:

| Mol | Chain | Res | Type |
|---|---|---|---|
| 35 | Ag | 105 | LYS |
| 51 | E | 90 | LYS |
| 81 | Aq | 100 | ILE |
| 39 | Ak | 29 | LYS |
| 46 | AK | 95 | LYS |

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 92 such sidechains are listed below:

| Mol | Chain | Res | Type |
|---|---|---|---|
| 48 | B | 128 | GLN |
| 55 | I | 165 | ASN |
| 48 | B | 180 | GLN |
| 53 | G | 118 | ASN |
| 59 | M | 100 | ASN |

### 5.3.3 RNA (i)

| Mol | Chain | Analysed | Backbone Outliers | Pucker Outliers |
|---|---|---|---|---|
| 1 | 5 | 3569/3594 (99%) | 943 (26%) | 77 (2%) |
| 2 | 7 | 118/119 (99%) | 18 (15%) | 1 (0%) |
| 3 | 8 | 149/156 (95%) | 34 (22%) | 1 (0%) |
| 47 | 2 | 1685/1869 (90%) | 504 (29%) | 50 (2%) |
| 82 | 1 | 206/251 (82%) | 115 (55%) | 14 (6%) |
| All | All | 5727/5989 (95%) | 1614 (28%) | 143 (2%) |

5 of 1614 RNA backbone outliers are listed below:

| Mol | Chain | Res | Type |
|---|---|---|---|
| 1 | 5 | 4 | G |
| 1 | 5 | 9 | C |
| 1 | 5 | 10 | A |
| 1 | 5 | 12 | A |
| 1 | 5 | 13 | U |

5 of 143 RNA pucker outliers are listed below:

| Mol | Chain | Res | Type |
|---|---|---|---|
| 47 | 2 | 1488 | C |
| 47 | 2 | 1554 | C |
| 82 | 1 | 6450 | U |
| 1 | 5 | 3603 | G |
| 1 | 5 | 2848 | G |

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

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

## 5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

## 5.6 Ligand geometry (i)

There are no ligands in this entry.

## 5.7 Other polymers (i)

There are no such residues in this entry.

## 5.8 Polymer linkage issues (i)

The following chains have linkage breaks:

| Mol | Chain | Number of breaks |
|---|---|---|
| 1 | 5 | 26 |

The worst 5 of 26 chain breaks are listed below:

| Model | Chain | Residue-1 | Atom-1 | Residue-2 | Atom-2 | Distance (Å) |
|---|---|---|---|---|---|---|
| 1 | 5 | 2113:G | O3' | 2258:C | P | 41.75 |
| 1 | 5 | 1252:C | O3' | 1271:G | P | 37.28 |
| 1 | 5 | 1405:C | O3' | 1409:G | P | 20.58 |
| 1 | 5 | 1219:G | O3' | 1233:G | P | 19.67 |
| 1 | 5 | 1696:C | O3' | 1720:C | P | 18.85 |

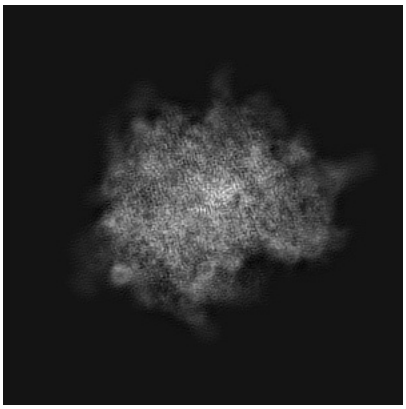
# 6 Map visualisation

This section contains visualisations of the EMDB entry EMD-20258. These allow visual inspection of the internal detail of the map and identification of artifacts.

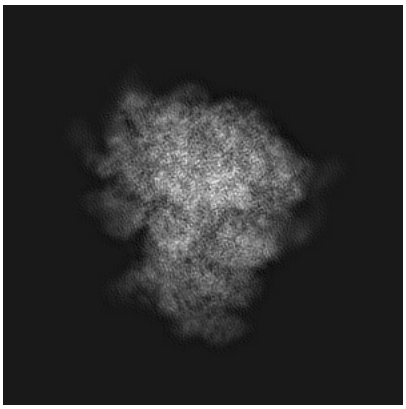
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

## 6.1 Orthogonal projections

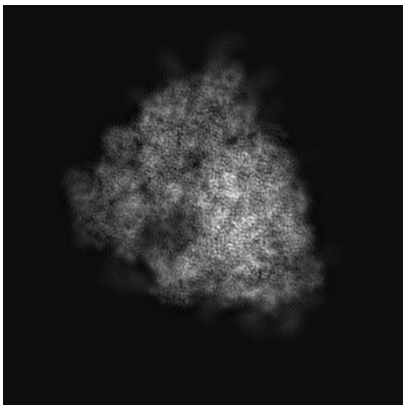
### 6.1.1 Primary map



X

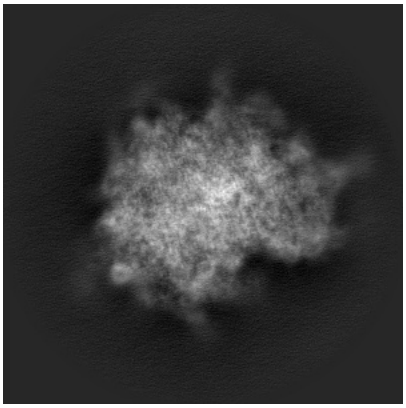


Y

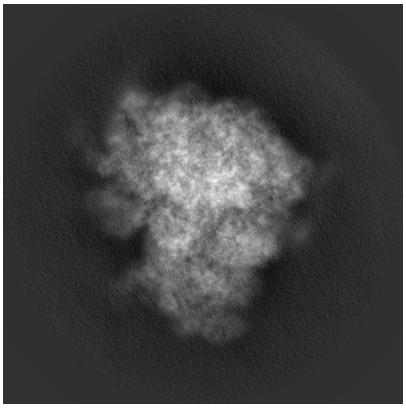


Z

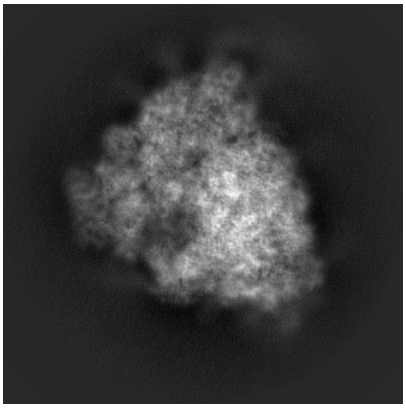
### 6.1.2 Raw map



X



Y

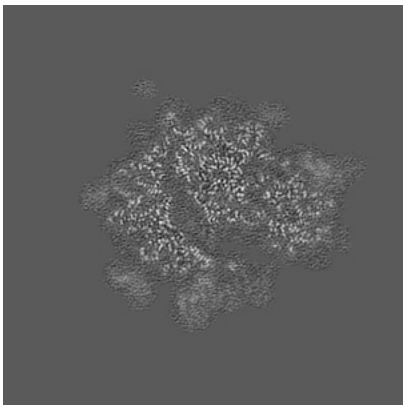


Z

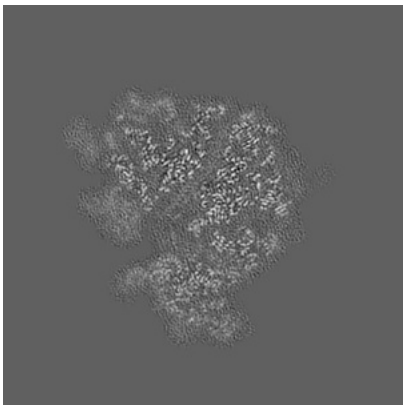
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices (i)

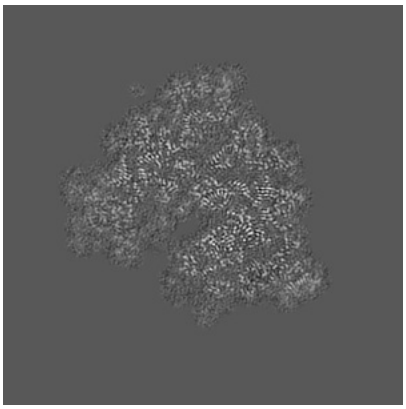
### 6.2.1 Primary map



X Index: 208

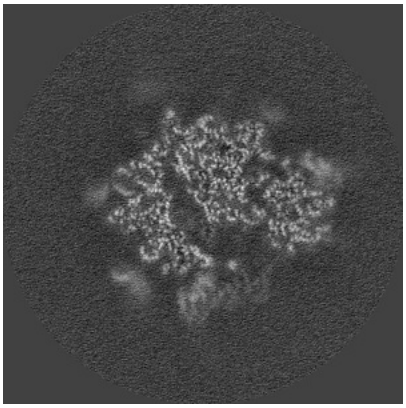


Y Index: 208

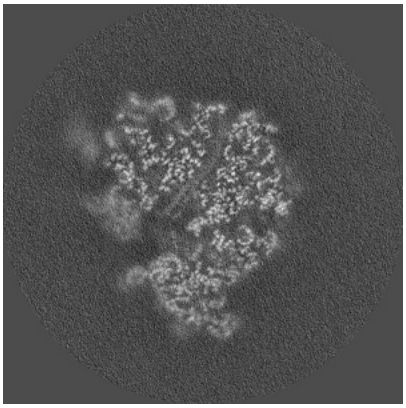


Z Index: 208

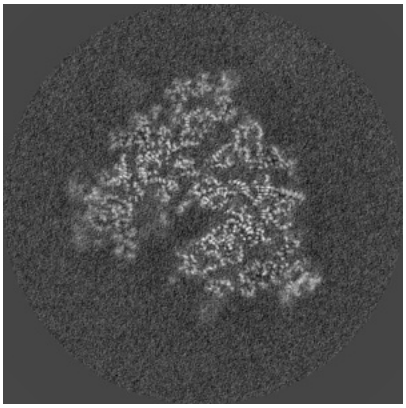
### 6.2.2 Raw map



X Index: 208



Y Index: 208

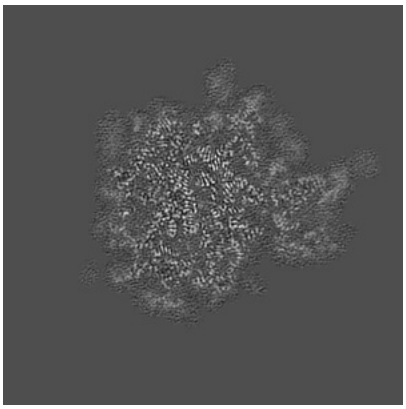


Z Index: 208

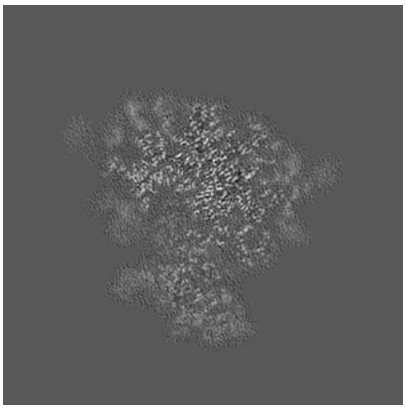
The images above show central slices of the map in three orthogonal directions.

## 6.3 Largest variance slices (i)

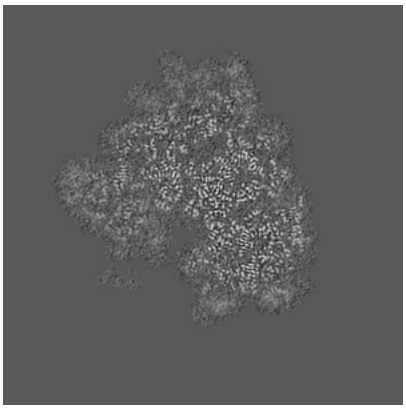
### 6.3.1 Primary map



X Index: 239

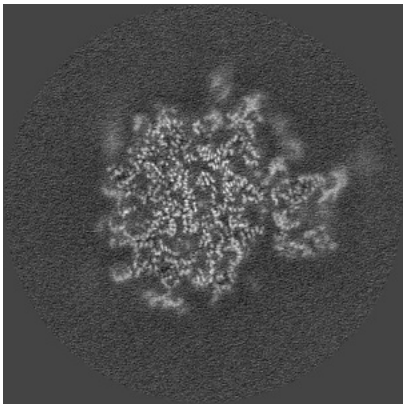


Y Index: 217

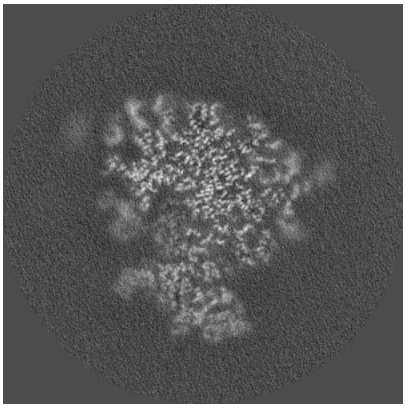


Z Index: 225

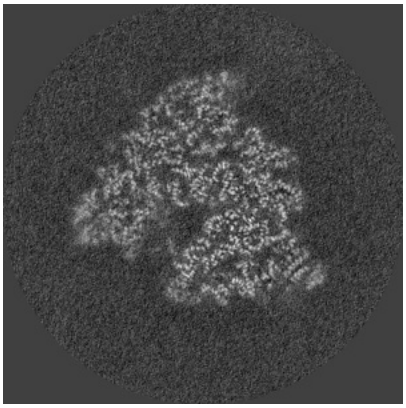
### 6.3.2 Raw map



X Index: 239



Y Index: 217



Z Index: 199

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

## 6.4 Orthogonal surface views (i)

### 6.4.1 Primary map

X Y Z

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

### 6.4.2 Raw map

X Y Z

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.

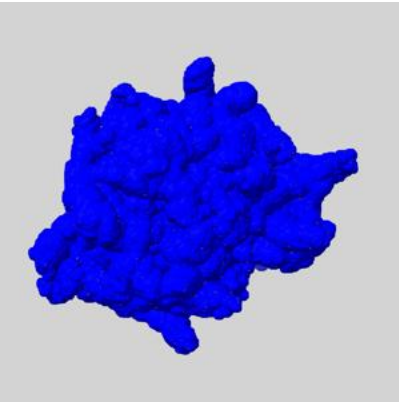
## 6.5 Mask visualisation (i)

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

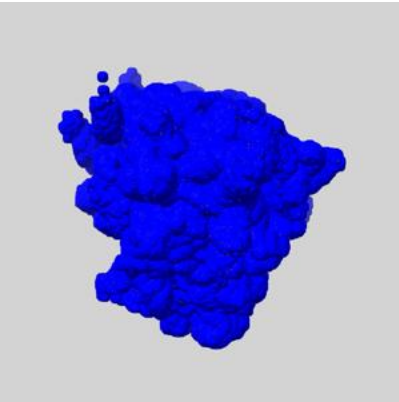
A mask typically either:

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

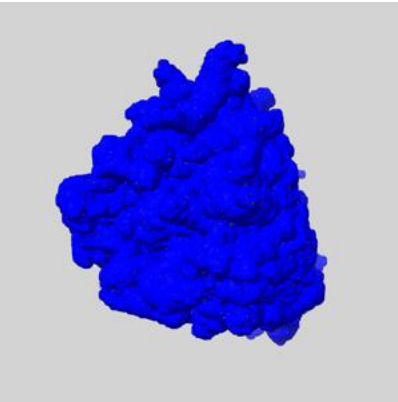
### 6.5.1 emd_20258_msk_1.map (i)



X



Y

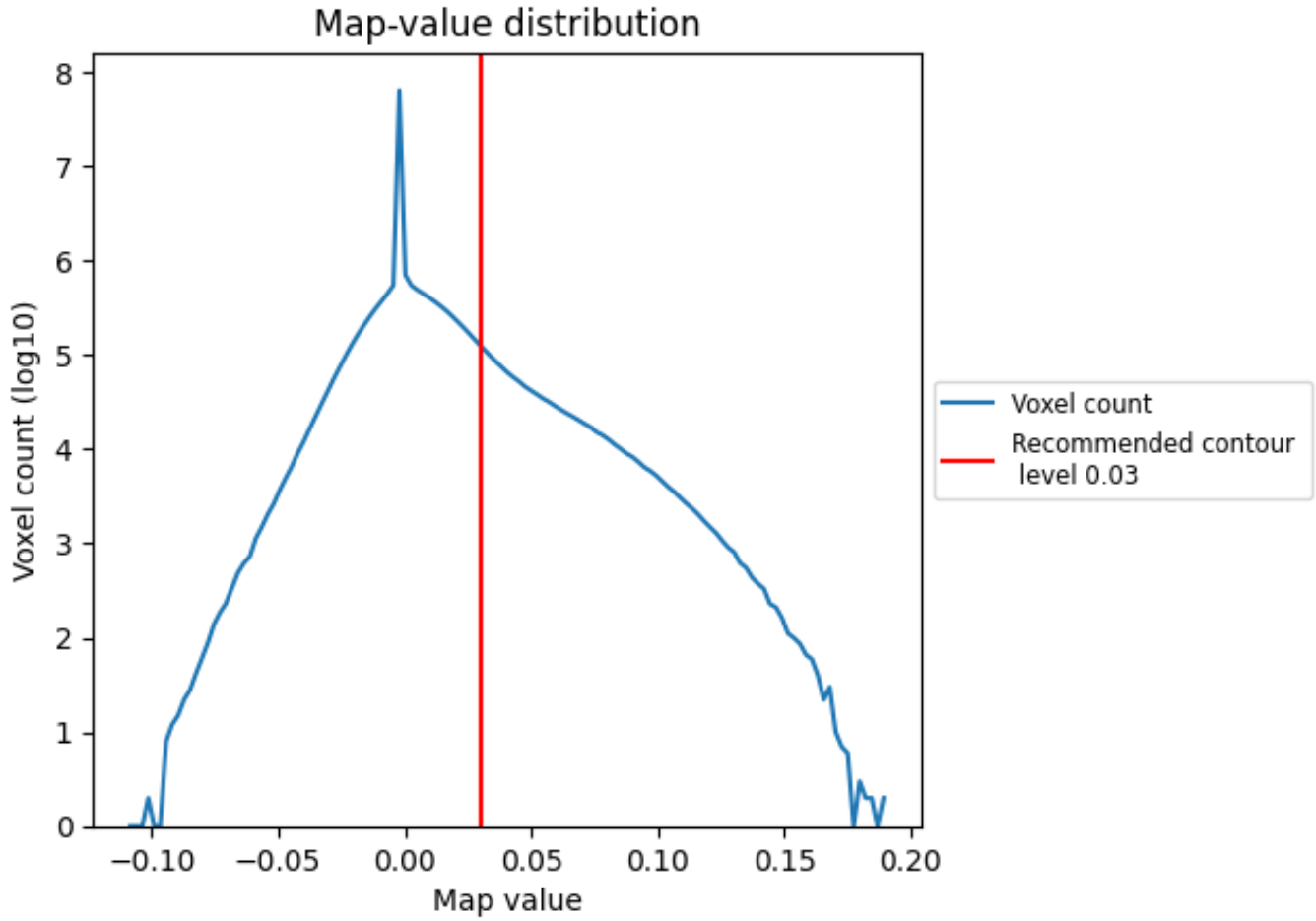


Z

# 7 Map analysis

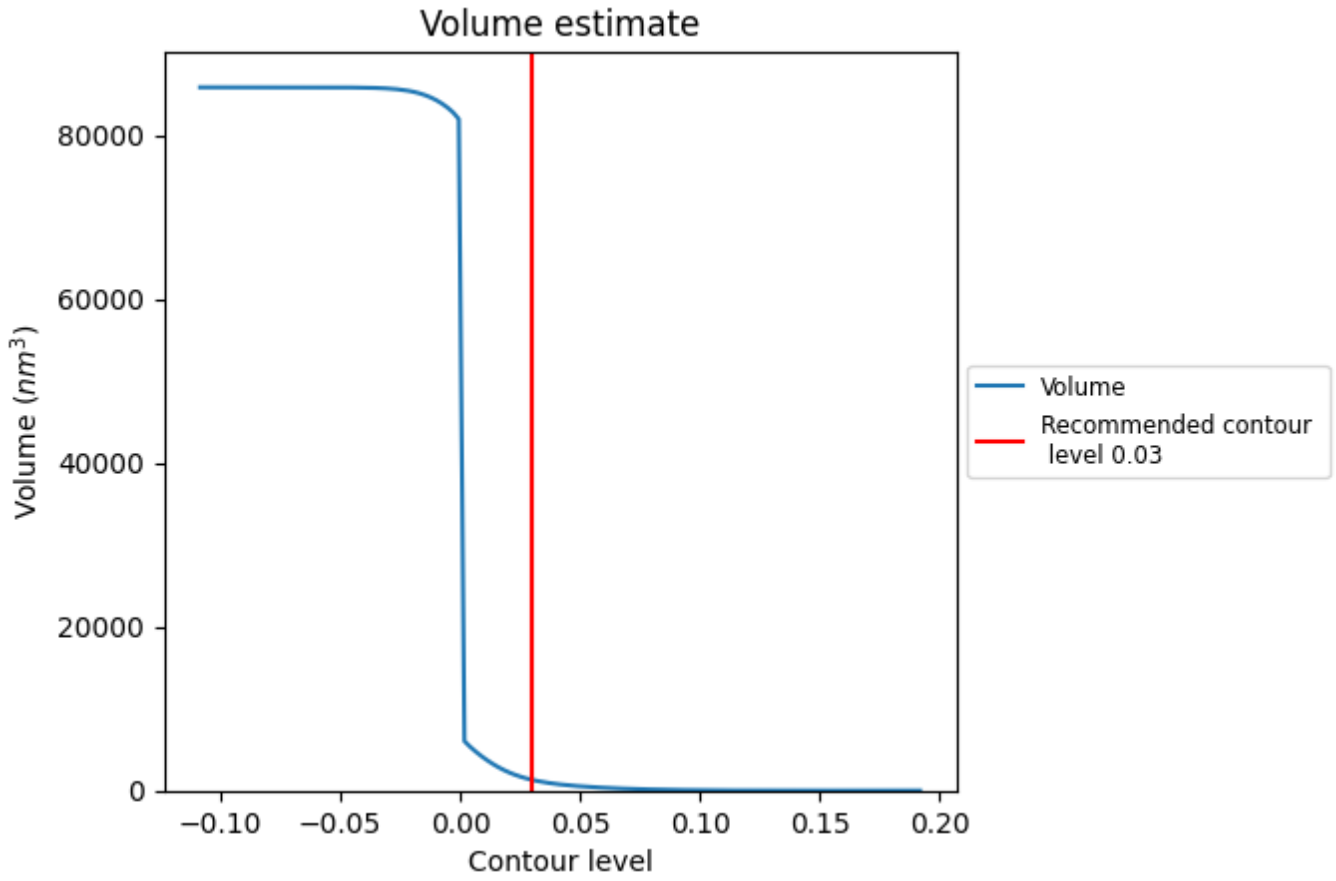
This section contains the results of statistical analysis of the map.

## 7.1 Map-value distribution




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

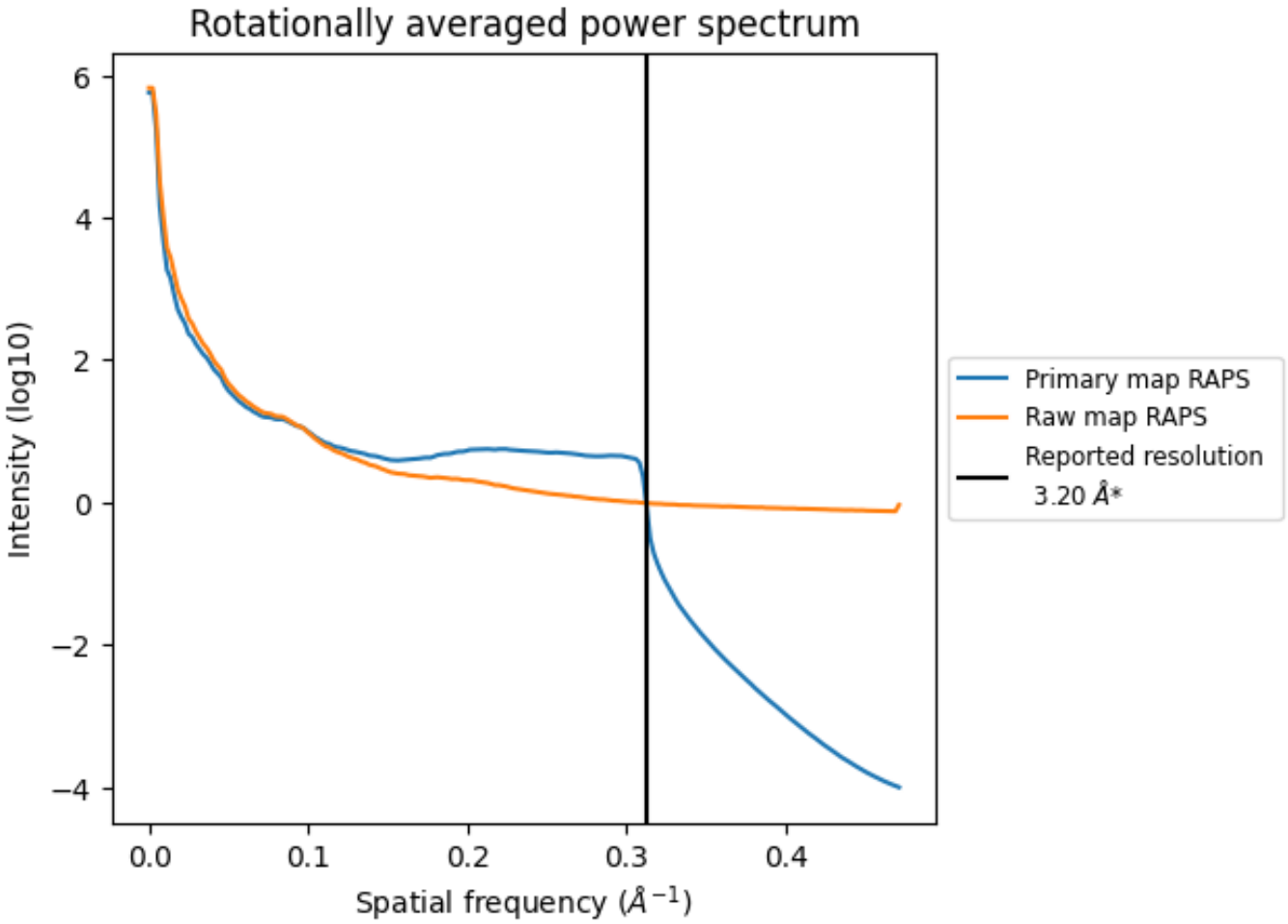
## 7.2 Volume estimate (i)




The volume at the recommended contour level is 1309 $nm^3$; this corresponds to an approximate mass of 1182 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)

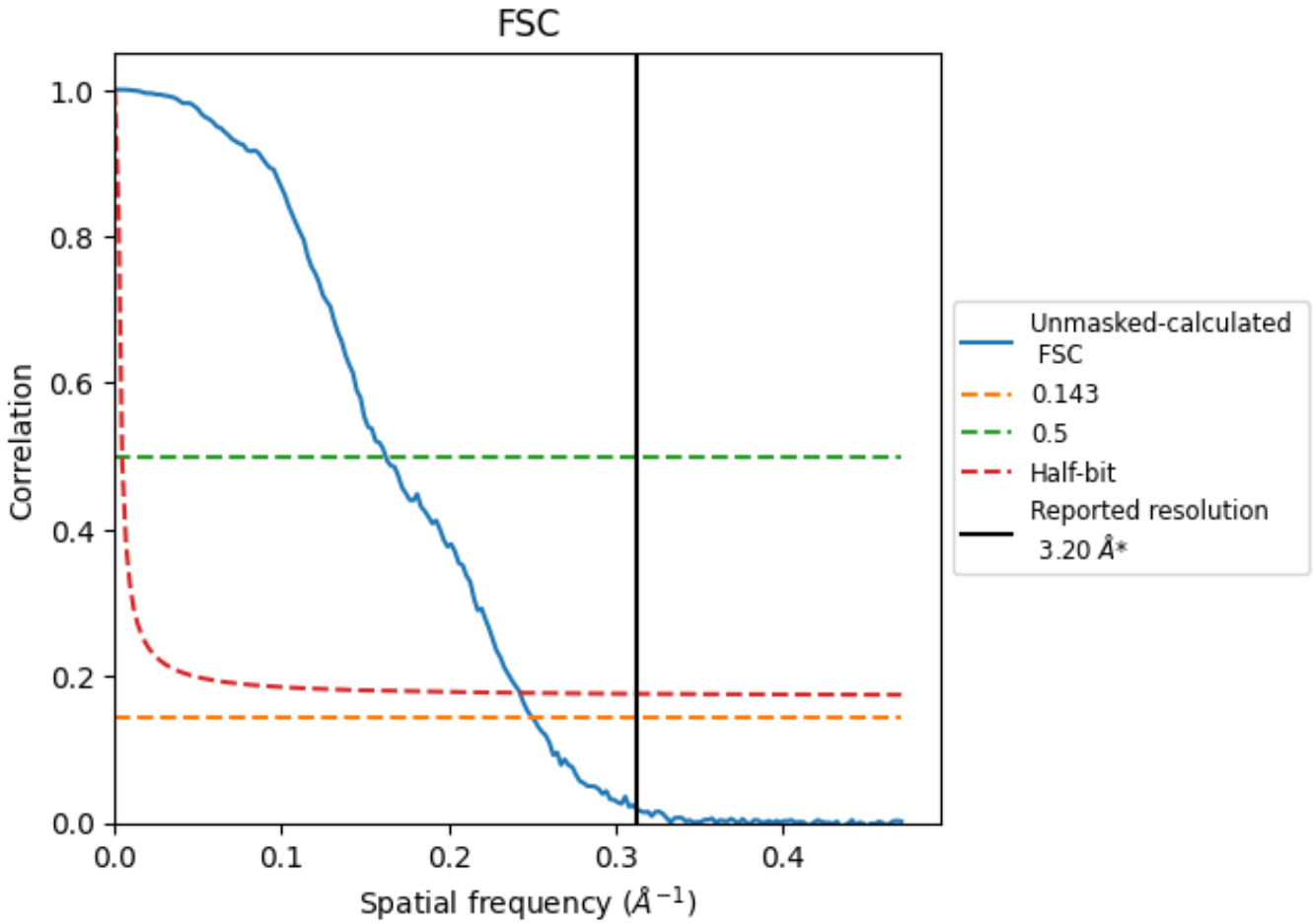



*Reported resolution corresponds to spatial frequency of 0.312 Å$^{-1}$

# 8 Fourier-Shell correlation

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




*Reported resolution corresponds to spatial frequency of 0.312 Å$^{-1}$

## 8.2 Resolution estimates (i)

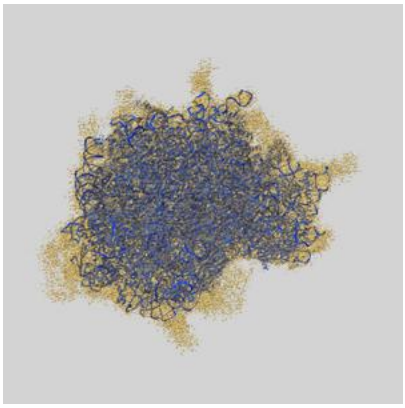
| Resolution estimate (Å) | Estimation criterion (FSC cut-off) | | |
|---|---|---|---|
| | 0.143 | 0.5 | Half-bit |
| Reported by author | 3.20 | - | - |
| Author-provided FSC curve | - | - | - |
| Unmasked-calculated* | 3.99 | 6.16 | 4.12 |

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 3.99 differs from the reported value 3.2 by more than 10 %

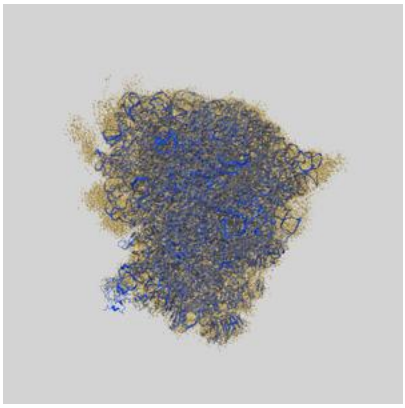
# 9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-20258 and PDB model 6P5N. Per-residue inclusion information can be found in section 3 on page 18.

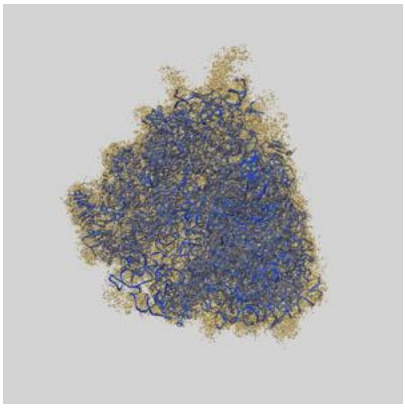
## 9.1 Map-model overlay



X



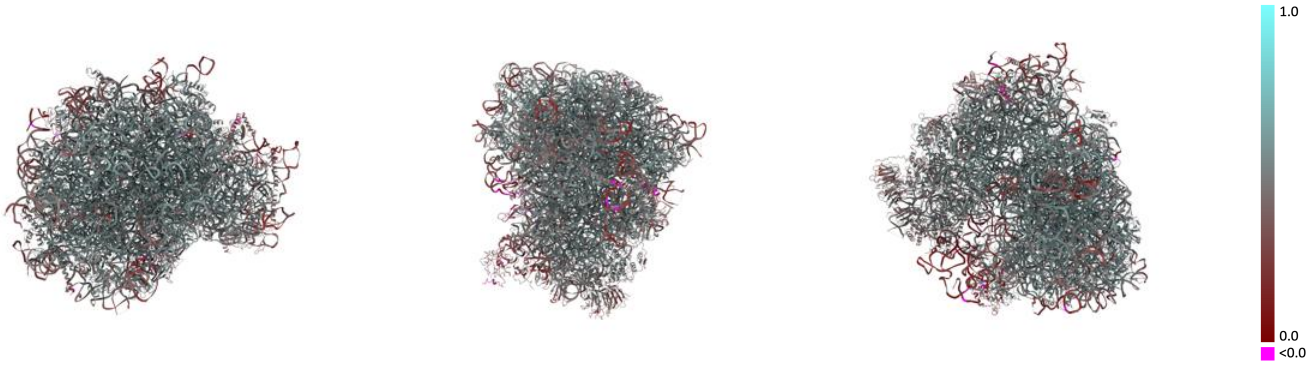
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.03 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

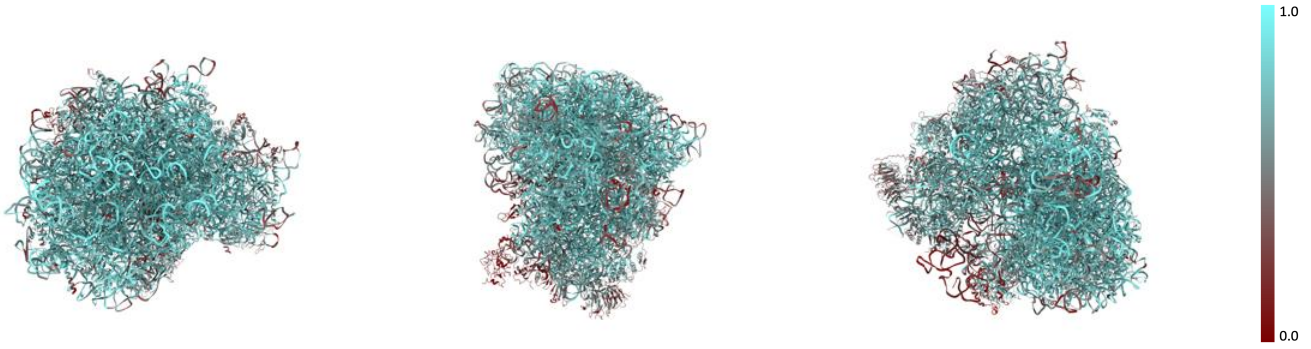
## 9.2 Q-score mapped to coordinate model (i)




X Y Z

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

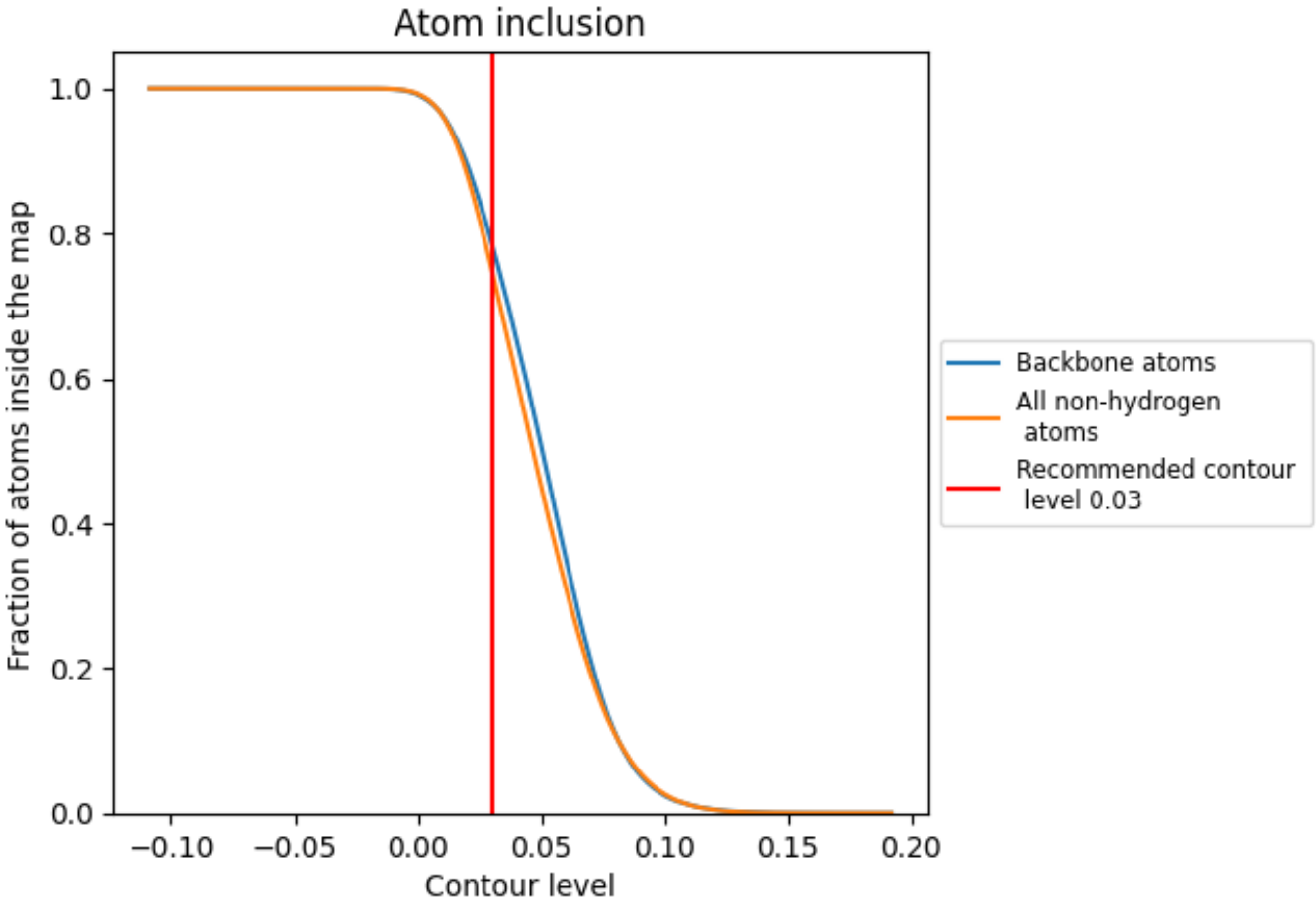
## 9.3 Atom inclusion mapped to coordinate model (i)




X Y Z

The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.03).

## 9.4 Atom inclusion (i)




At the recommended contour level, 79% of all backbone atoms, 75% of all non-hydrogen atoms, are inside the map.

## 9.5 Map-model fit summary

The table lists the average atom inclusion at the recommended contour level (0.03) and Q-score for the entire model and for each chain.

| Chain | Atom inclusion | Q-score |
|---|---|---|
| All | 0.7502 | 0.4850 |
| 1 | 0.2503 | 0.2150 |
| 2 | 0.8021 | 0.4770 |
| 5 | 0.8373 | 0.4960 |
| 7 | 0.9271 | 0.5430 |
| 8 | 0.8660 | 0.5170 |
| AA | 0.8281 | 0.5530 |
| AB | 0.8059 | 0.5410 |
| AC | 0.7949 | 0.5350 |
| AD | 0.7598 | 0.5180 |
| AE | 0.7439 | 0.5010 |
| AF | 0.8026 | 0.5440 |
| AG | 0.7184 | 0.5010 |
| AH | 0.7185 | 0.5150 |
| AI | 0.7534 | 0.5300 |
| AJ | 0.7010 | 0.4970 |
| AK | 0.1627 | 0.2730 |
| AL | 0.7697 | 0.5280 |
| AM | 0.7580 | 0.5210 |
| AN | 0.8586 | 0.5640 |
| AO | 0.7953 | 0.5310 |
| AP | 0.8043 | 0.5460 |
| AQ | 0.7947 | 0.5490 |
| AR | 0.7285 | 0.4860 |
| AS | 0.8019 | 0.5340 |
| AT | 0.7609 | 0.5360 |
| AU | 0.6579 | 0.4710 |
| AV | 0.7835 | 0.5410 |
| AW | 0.7839 | 0.5430 |
| AX | 0.7479 | 0.5300 |
| AY | 0.7681 | 0.5330 |
| AZ | 0.7642 | 0.5230 |
| Aa | 0.8378 | 0.5550 |
| Ab | 0.6810 | 0.4740 |
| Ac | 0.7903 | 0.5340 |

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| Chain | Atom inclusion | Q-score |
|---|---|---|
| Ad | 0.7363 | 0.5270 |
| Ae | 0.7955 | 0.5480 |
| Af | 0.8207 | 0.5500 |
| Ag | 0.7710 | 0.5320 |
| Ah | 0.7344 | 0.5040 |
| Ai | 0.7236 | 0.5050 |
| Aj | 0.8497 | 0.5560 |
| Ak | 0.6458 | 0.4770 |
| Al | 0.7892 | 0.5420 |
| Am | 0.7590 | 0.5380 |
| An | 0.7890 | 0.5430 |
| Ao | 0.7830 | 0.5460 |
| Ap | 0.7645 | 0.5340 |
| Aq | 0.2125 | 0.3460 |
| Ar | 0.7941 | 0.5400 |
| B | 0.6870 | 0.4970 |
| C | 0.6963 | 0.5030 |
| D | 0.7286 | 0.5150 |
| E | 0.4893 | 0.4330 |
| F | 0.7011 | 0.5030 |
| G | 0.6383 | 0.4810 |
| H | 0.5795 | 0.4290 |
| I | 0.5886 | 0.4480 |
| J | 0.7191 | 0.5110 |
| K | 0.6969 | 0.4950 |
| L | 0.3139 | 0.3490 |
| M | 0.7263 | 0.5250 |
| N | 0.0268 | 0.2410 |
| O | 0.7573 | 0.5240 |
| P | 0.7224 | 0.5180 |
| Q | 0.4415 | 0.3940 |
| R | 0.6163 | 0.4630 |
| S | 0.5713 | 0.4440 |
| T | 0.5389 | 0.4260 |
| U | 0.5604 | 0.4150 |
| V | 0.4625 | 0.4270 |
| W | 0.6899 | 0.4890 |
| X | 0.7723 | 0.5240 |
| Y | 0.7302 | 0.5240 |
| Z | 0.6626 | 0.4740 |
| a | 0.5163 | 0.4170 |
| b | 0.7457 | 0.5230 |

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| Chain | Atom inclusion | Q-score |
|---|---|---|
| c | 0.6526 | 0.4970 |
| d | 0.6468 | 0.5090 |
| e | 0.6122 | 0.4390 |
| f | 0.5651 | 0.4630 |
| g | 0.0815 | 0.2690 |
| h | 0.4220 | 0.3740 |