# wwPDB EM Validation Summary Report

Aug 19, 2024 – 01:13 pm BST

| | | |
|---|---|---|
| PDB ID | : | 8Q87 |
| EMDB ID | : | EMD-18169 |
| Title | : | Structure of the G. gallus 80S rotated ribosome in complex with eEF2 and SERBP1 |
| Authors | : | Nurullina, L.; Jenner, L.; Yusupov, M. |
| Deposited on | : | 2023-08-18 |
| Resolution | : | 2.40 Å(reported) |

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

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

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

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

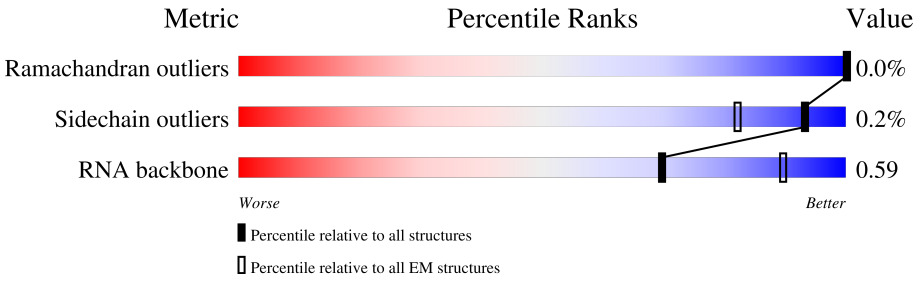
| | | |
|---|---|---|
| EMDB validation analysis | : | 0.0.1.dev92 |
| Mogul | : | 1.8.4, CSD as541be (2020) |
| MolProbity | : | 4.02b-467 |
| buster-report | : | 1.1.7 (2018) |
| Percentile statistics | : | 20191225.v01 (using entries in the PDB archive December 25th 2019) |
| MapQ | : | 1.9.13 |
| Ideal geometry (proteins) | : | Engh & Huber (2001) |
| Ideal geometry (DNA, RNA) | : | Parkinson et al. (1996) |
| Validation Pipeline (wwPDB-VP) | : | 2.37.1 |

# 1 Overall quality at a glance

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

The reported resolution of this entry is 2.40 Å.

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




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

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

| Mol | Chain | Length | Quality of chain |
|---|---|---|---|
| 1 | B5 | 4441 | 9% 68% 14% 18% |
| 2 | B8 | 157 | 6% 85% 15% |
| 3 | B7 | 119 | 92% 8% |
| 4 | Az | 25 | 12% 100% |
| 5 | BA | 257 | 96% |
| 6 | BB | 403 | 99% |
| 7 | BC | 421 | 86% 14% |
| 8 | BD | 297 | 8% 100% |

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| Mol | Chain | Length | Quality of chain |
|---|---|---|---|
| 9 | BE | 298 | 5% 76% 24% |
| 10 | BF | 246 | 95% 5% |
| 11 | BG | 266 | 9% 79% 21% |
| 12 | BH | 192 | 100% |
| 13 | BI | 214 | 5% 99% |
| 14 | BJ | 178 | 18% 95% |
| 15 | BL | 211 | 6% 98% |
| 16 | BM | 131 | 99% |
| 17 | BN | 204 | 100% |
| 18 | BO | 203 | 99% |
| 19 | BP | 184 | 84% 16% |
| 20 | BQ | 187 | 100% |
| 21 | BR | 196 | 10% 85% 15% |
| 22 | BS | 176 | 100% |
| 23 | BT | 160 | 99% |
| 24 | BU | 128 | 19% 78% 22% |
| 25 | BV | 140 | 99% |
| 26 | BW | 157 | 39% 61% |
| 27 | BX | 155 | 77% 23% |
| 28 | BY | 145 | 92% 8% |
| 29 | BZ | 136 | 99% |
| 30 | Ba | 148 | 99% |
| 31 | Bb | 71 | 14% 99% |
| 32 | Bc | 115 | 7% 83% 17% |
| 33 | Bd | 176 | 5% 60% 40% |

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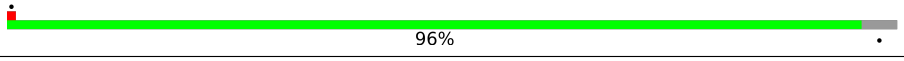
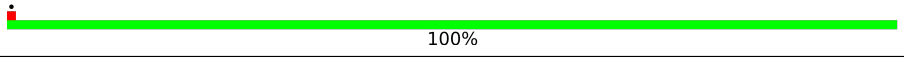
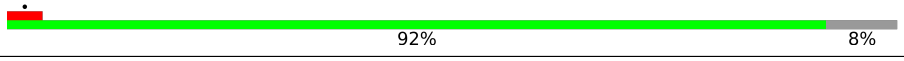
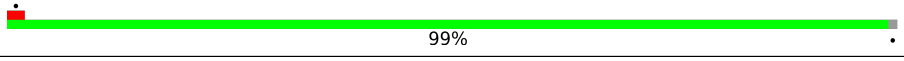
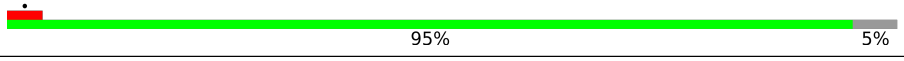
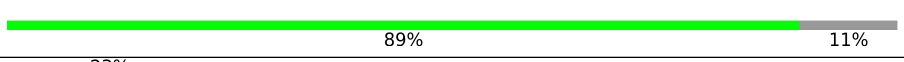
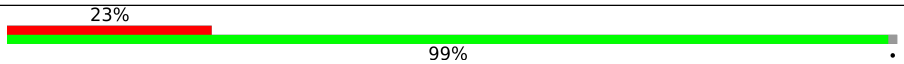
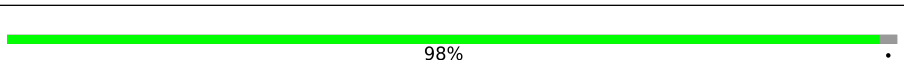
| Mol | Chain | Length | Quality of chain |
|---|---|---|---|
| 34 | Be | 135 |   |
| 35 | Bf | 110 |   |
| 36 | Bg | 117 |   |
| 37 | Bh | 123 |   |
| 38 | Bi | 105 |   |
| 39 | Bj | 97 |   |
| 40 | Bk | 70 |   |
| 41 | Bl | 51 |   |
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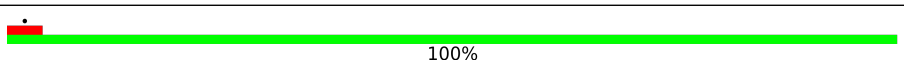
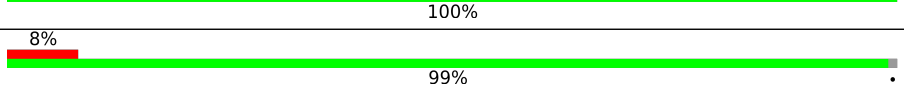
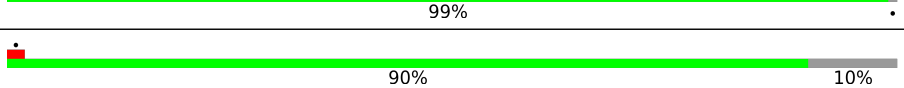
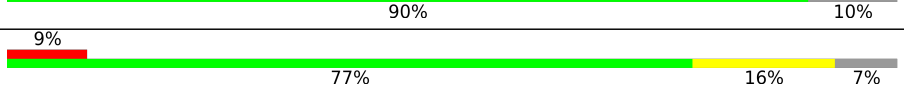
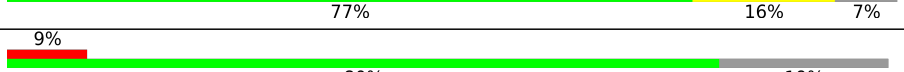
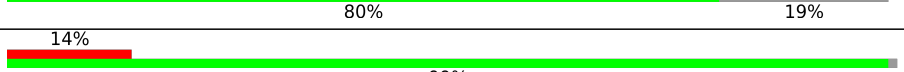
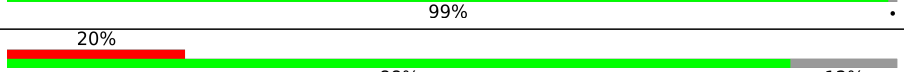
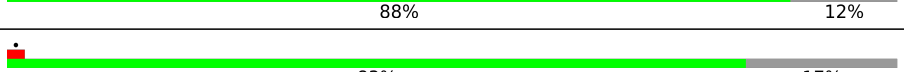
| 43 | Bo | 105 |   |
| 44 | Bp | 92 |   |
| 45 | Br | 138 |   |
| 46 | A2 | 1823 |   |
| 47 | Aa | 264 |   |
| 48 | AA | 84 |   |
| 49 | AB | 69 |   |
| 50 | Ab | 264 |   |
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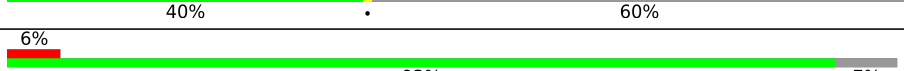
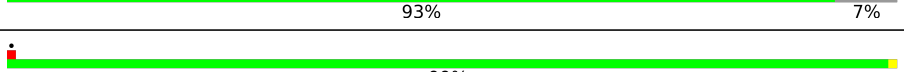
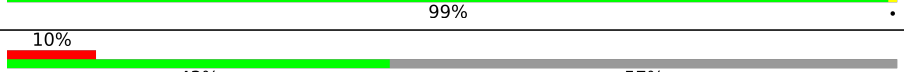
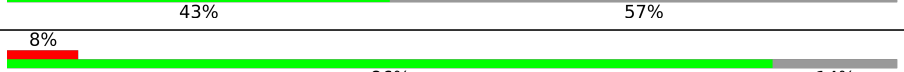
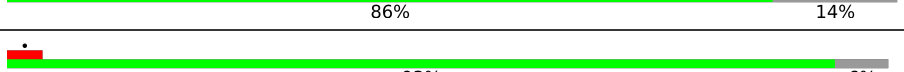
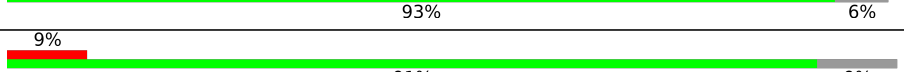
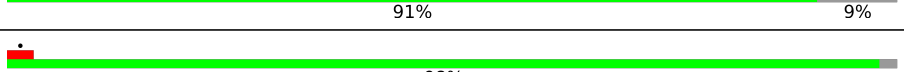
| 52 | Ac | 243 |   |
| 53 | Ad | 263 |   |
| 54 | AD | 133 |   |
| 55 | AE | 115 |   |
| 56 | Ae | 204 |   |
| 57 | Af | 249 |   |
| 58 | AF | 317 |   |

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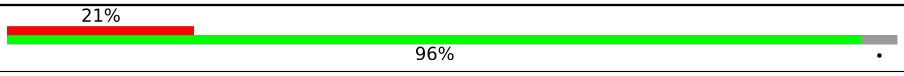
| Mol | Chain | Length | Quality of chain |
|---|---|---|---|
| 59 | Ag | 194 |   |
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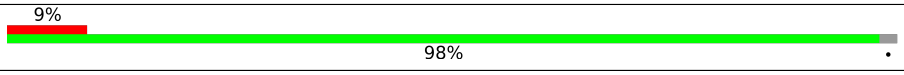
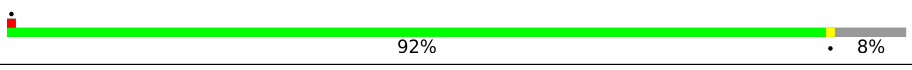
| 61 | Ah | 207 |   |
| 62 | Ai | 194 |   |
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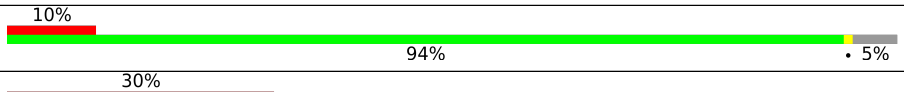
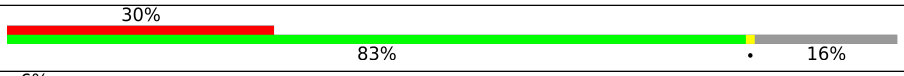
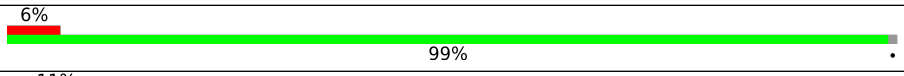
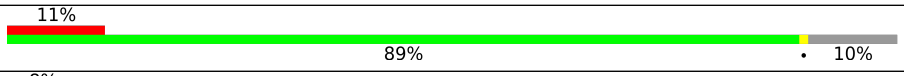
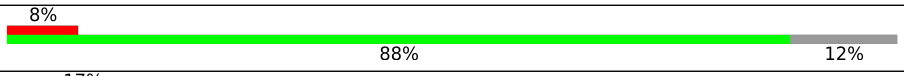
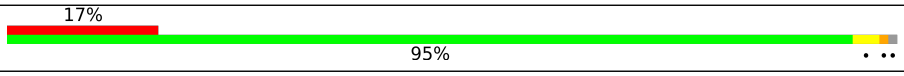
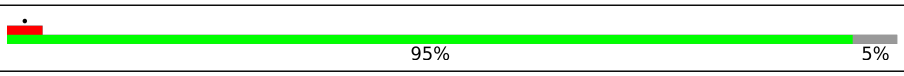
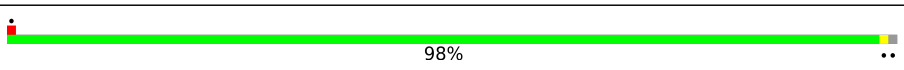
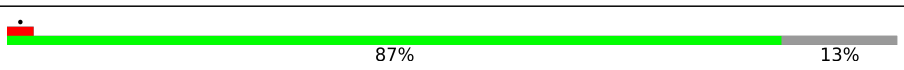
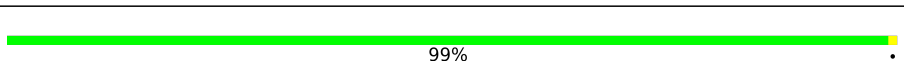
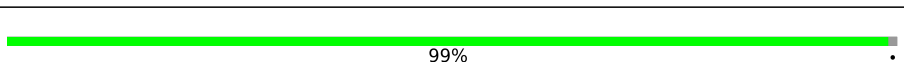
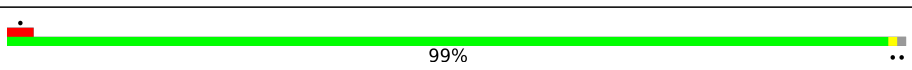
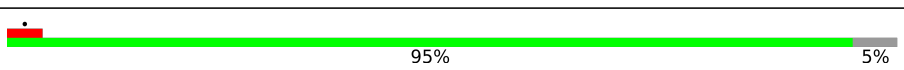
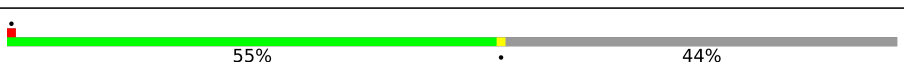
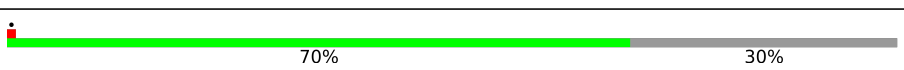
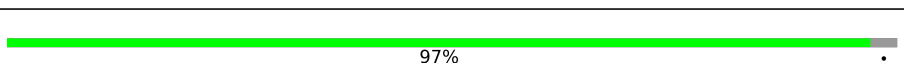
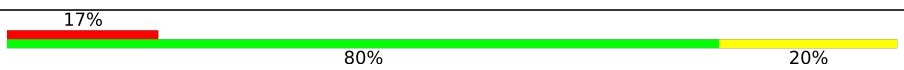
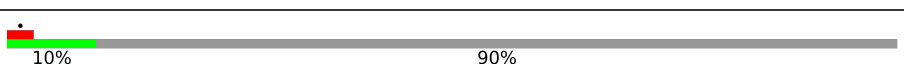
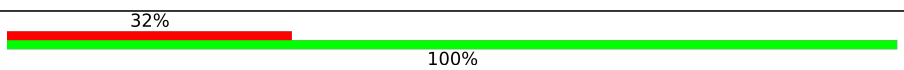
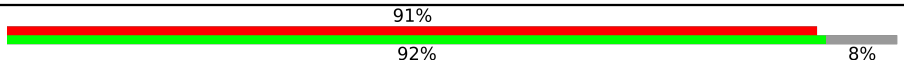
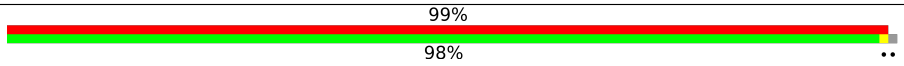
| 64 | Ak | 158 |   |
| 65 | Al | 132 |   |
| 66 | Am | 151 |   |
| 67 | An | 151 |   |
| 68 | Ao | 145 |   |
| 69 | Aq | 135 |   |
| 70 | Ar | 152 |   |
| 71 | As | 145 |   |
| 72 | At | 119 |   |
| 73 | Au | 83 |   |
| 74 | Av | 130 |   |
| 75 | Aw | 143 |   |
| 76 | Ax | 131 |   |
| 77 | Ay | 125 |   |
| 78 | AZ | 296 |   |
| 79 | Ap | 146 |   |
| 80 | V | 76 |   |
| 81 | S | 404 |   |
| 82 | A | 858 |   |
| 83 | Bs | 316 | |

*Continued on next page...*

*Continued from previous page...*

| Mol | Chain | Length | Quality of chain |
|---|---|---|---|
| 84 | Bt | 165 |   |
| 85 | Bv | 217 |   |

# 2 Entry composition (i)

There are 89 unique types of molecules in this entry. The entry contains 228127 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 | B5 | 3638 | 78070 | 34789 | 14272 | 25371 | 3638 | 0 | 0 |

There is a discrepancy between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
|---|---|---|---|---|---|
| B5 | 3295 | UY1 | U | conflict | GB KT445934.2 |

- Molecule 2 is a RNA chain called 5.8S rRNA.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| | | | Total | C | N | O | P | | |
| 2 | B8 | 157 | 3338 | 1490 | 588 | 1103 | 157 | 0 | 0 |

- Molecule 3 is a RNA chain called 5S rRNA.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| | | | Total | C | N | O | P | | |
| 3 | B7 | 119 | 2536 | 1130 | 449 | 838 | 119 | 0 | 0 |

- Molecule 4 is a protein called 60S ribosomal protein L41.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| | | | Total | C | N | O | S | | |
| 4 | Az | 25 | 239 | 145 | 64 | 27 | 3 | 0 | 0 |

- Molecule 5 is a protein called 60S ribosomal protein L8.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| | | | Total | C | N | O | S | | |
| 5 | BA | 246 | 1887 | 1185 | 385 | 311 | 6 | 0 | 0 |

- Molecule 6 is a protein called Ribosomal protein uL3.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 6 | BB | 398 | Total | C | N | O | S | 0 | 0 |
| | | | 3209 | 2042 | 603 | 550 | 14 | | |

- Molecule 7 is a protein called 60S ribosomal protein L4 C-terminal domain-containing protein.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 7 | BC | 361 | Total | C | N | O | S | 0 | 0 |
| | | | 2888 | 1816 | 574 | 484 | 14 | | |

- Molecule 8 is a protein called Large ribosomal subunit protein uL18.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 8 | BD | 296 | Total | C | N | O | S | 0 | 0 |
| | | | 2388 | 1506 | 437 | 433 | 12 | | |

- Molecule 9 is a protein called 60S ribosomal protein L6.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 9 | BE | 225 | Total | C | N | O | S | 0 | 0 |
| | | | 1820 | 1167 | 355 | 296 | 2 | | |

- Molecule 10 is a protein called Large ribosomal subunit protein uL30.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 10 | BF | 234 | Total | C | N | O | S | 0 | 0 |
| | | | 1939 | 1245 | 377 | 309 | 8 | | |

- Molecule 11 is a protein called Large ribosomal subunit protein eL8.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 11 | BG | 210 | Total | C | N | O | S | 0 | 0 |
| | | | 1704 | 1089 | 326 | 284 | 5 | | |

- Molecule 12 is a protein called 60S ribosomal protein L9.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 12 | BH | 192 | Total | C | N | O | S | 0 | 0 |
| | | | 1533 | 962 | 288 | 277 | 6 | | |

- Molecule 13 is a protein called Ribosomal protein uL16,Large ribosomal subunit protein uL16,Large ribosomal subunit protein uL16.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 13 | BI | 213 | Total | C | N | O | S | 0 | 0 |
| | | | 1710 | 1082 | 334 | 279 | 15 | | |

- Molecule 14 is a protein called 60S ribosomal protein L11.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 14 | BJ | 170 | Total | C | N | O | S | 0 | 0 |
| | | | 1362 | 861 | 255 | 241 | 5 | | |

- Molecule 15 is a protein called Large ribosomal subunit protein eL13.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 15 | BL | 208 | Total | C | N | O | S | 0 | 0 |
| | | | 1691 | 1060 | 350 | 276 | 5 | | |

- Molecule 16 is a protein called 60S ribosomal protein L14.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 16 | BM | 130 | Total | C | N | O | S | 0 | 0 |
| | | | 1077 | 688 | 209 | 172 | 8 | | |

- Molecule 17 is a protein called Ribosomal protein L15.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 17 | BN | 203 | Total | C | N | O | S | 0 | 0 |
| | | | 1700 | 1071 | 359 | 266 | 4 | | |

- Molecule 18 is a protein called Ribosomal protein uL13.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 18 | BO | 201 | Total | C | N | O | S | 0 | 0 |
| | | | 1642 | 1058 | 321 | 258 | 5 | | |

- Molecule 19 is a protein called 60S ribosomal protein L17.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 19 | BP | 155 | Total | C | N | O | S | 0 | 0 |
| | | | 1259 | 788 | 244 | 218 | 9 | | |

- Molecule 20 is a protein called Ribosomal protein eL18.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 20 | BQ | 187 | Total | C | N | O | S | 0 | 0 |
| | | | 1502 | 939 | 314 | 244 | 5 | | |

- Molecule 21 is a protein called Ribosomal protein L19.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 21 | BR | 166 | Total | C | N | O | S | 0 | 0 |
| | | | 1378 | 856 | 295 | 217 | 10 | | |

- Molecule 22 is a protein called Ribosomal protein eL20.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 22 | BS | 176 | Total | C | N | O | S | 0 | 0 |
| | | | 1463 | 931 | 286 | 235 | 11 | | |

- Molecule 23 is a protein called 60S ribosomal protein L21.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 23 | BT | 159 | Total | C | N | O | S | 0 | 0 |
| | | | 1299 | 825 | 252 | 216 | 6 | | |

- Molecule 24 is a protein called Large ribosomal subunit protein eL22.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 24 | BU | 100 | Total | C | N | O | S | 0 | 0 |
| | | | 817 | 523 | 143 | 149 | 2 | | |

- Molecule 25 is a protein called Ribosomal protei uL14.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 25 | BV | 139 | Total | C | N | O | S | 0 | 0 |
| | | | 1033 | 648 | 199 | 181 | 5 | | |

- Molecule 26 is a protein called Ribosomal protein L24.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 26 | BW | 62 | Total | C | N | O | S | 0 | 0 |
| | | | 519 | 332 | 101 | 83 | 3 | | |

- Molecule 27 is a protein called Ribosomal protein uL23.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 27 | BX | 119 | Total | C | N | O | S | 0 | 0 |
| | | | 976 | 624 | 183 | 168 | 1 | | |

- Molecule 28 is a protein called Ribosomal protein L26 like 1.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 28 | BY | 133 | Total | C | N | O | S | 0 | 0 |
| | | | 1106 | 694 | 224 | 185 | 3 | | |

- Molecule 29 is a protein called Large ribosomal subunit protein eL27.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 29 | BZ | 135 | Total | C | N | O | S | 0 | 0 |
| | | | 1107 | 714 | 208 | 182 | 3 | | |

- Molecule 30 is a protein called Ribosomal protein uL15.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 30 | Ba | 147 | Total | C | N | O | S | 0 | 0 |
| | | | 1179 | 748 | 240 | 187 | 4 | | |

- Molecule 31 is a protein called 60S ribosomal protein L29.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 31 | Bb | 70 | Total | C | N | O | S | 0 | 0 |
| | | | 582 | 360 | 126 | 94 | 2 | | |

- Molecule 32 is a protein called Large ribosomal subunit protein eL30.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 32 | Bc | 95 | Total | C | N | O | S | 0 | 0 |
| | | | 738 | 468 | 131 | 133 | 6 | | |

- Molecule 33 is a protein called 60S ribosomal protein L31.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 33 | Bd | 105 | Total | C | N | O | S | 0 | 0 |
| | | | 867 | 549 | 168 | 148 | 2 | | |

- Molecule 34 is a protein called Ribosomal protein L32.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 34 | Be | 130 | Total | C | N | O | S | 0 | 0 |
| | | | 1074 | 681 | 219 | 169 | 5 | | |

- Molecule 35 is a protein called Ribosomal protein eL33.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 35 | Bf | 110 | Total | C | N | O | S | 0 | 0 |
| | | | 886 | 559 | 178 | 144 | 5 | | |

- Molecule 36 is a protein called 60S ribosomal protein L34.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 36 | Bg | 108 | Total | C | N | O | S | 0 | 0 |
| | | | 860 | 540 | 178 | 137 | 5 | | |

- Molecule 37 is a protein called Large ribosomal subunit protein uL29.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 37 | Bh | 122 | Total | C | N | O | S | 1 | 0 |
| | | | 1023 | 646 | 208 | 168 | 1 | | |

- Molecule 38 is a protein called Large ribosomal subunit protein eL36.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 38 | Bi | 100 | Total | C | N | O | S | 0 | 0 |
| | | | 821 | 515 | 173 | 127 | 6 | | |

- Molecule 39 is a protein called Ribosomal protein L37.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 39 | Bj | 86 | Total | C | N | O | S | 0 | 0 |
| | | | 704 | 432 | 155 | 112 | 5 | | |

- Molecule 40 is a protein called 60S ribosomal protein L38.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 40 | Bk | 69 | Total | C | N | O | S | 0 | 0 |
| | | | 569 | 366 | 103 | 99 | 1 | | |

- Molecule 41 is a protein called Large ribosomal subunit protein eL39.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 41 | Bl | 50 | Total | C | N | O | S | 0 | 0 |
| | | | 442 | 281 | 96 | 64 | 1 | | |

- Molecule 42 is a protein called Ubiquitin-60S ribosomal protein L40.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 42 | Bm | 52 | Total | C | N | O | S | 0 | 0 |
| | | | 429 | 266 | 90 | 67 | 6 | | |

- Molecule 43 is a protein called Ribosomal protein L36a like.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 43 | Bo | 105 | Total | C | N | O | S | 0 | 0 |
| | | | 861 | 540 | 177 | 138 | 6 | | |

- Molecule 44 is a protein called Large ribosomal subunit protein eL43.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 44 | Bp | 91 | Total | C | N | O | S | 0 | 0 |
| | | | 706 | 445 | 134 | 120 | 7 | | |

- Molecule 45 is a protein called 60S ribosomal protein L28.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 45 | Br | 124 | Total | C | N | O | S | 0 | 0 |
| | | | 1007 | 624 | 213 | 167 | 3 | | |

- Molecule 46 is a RNA chain called 18S rRNA.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 46 | A2 | 1697 | Total | C | N | O | P | 0 | 0 |
| | | | 36242 | 16199 | 6484 | 11862 | 1697 | | |

There are 3 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
|---|---|---|---|---|---|
| A2 | 1206 | B8N | U | conflict | GB KT445934.2 |
| A2 | 1295 | 4AC | C | conflict | GB KT445934.2 |
| A2 | 1796 | 4AC | C | conflict | GB KT445934.2 |

- Molecule 47 is a protein called Ribosomal protein eS1.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 47 | Aa | 213 | Total | C | N | O | S | 0 | 0 |
| | | | 1730 | 1098 | 309 | 309 | 14 | | |

- Molecule 48 is a protein called 40S ribosomal protein S27.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 48 | AA | 83 | Total | C | N | O | S | 0 | 0 |
| | | | 657 | 410 | 125 | 115 | 7 | | |

- Molecule 49 is a protein called 40S ribosomal protein S28.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 49 | AB | 61 | Total | C | N | O | S | 0 | 0 |
| | | | 476 | 290 | 93 | 91 | 2 | | |

- Molecule 50 is a protein called 40S ribosomal protein S2.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 50 | Ab | 219 | Total | C | N | O | S | 0 | 0 |
| | | | 1698 | 1099 | 291 | 299 | 9 | | |

- Molecule 51 is a protein called Ubiquitin.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 51 | AC | 63 | Total | C | N | O | S | 0 | 0 |
| | | | 516 | 325 | 98 | 86 | 7 | | |

- Molecule 52 is a protein called DNA-(apurinic or apyrimidinic site) lyase.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 52 | Ac | 225 | Total | C | N | O | S | 0 | 0 |
| | | | 1752 | 1117 | 315 | 313 | 7 | | |

- Molecule 53 is a protein called Small ribosomal subunit protein eS4.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 53 | Ad | 262 | Total | C | N | O | S | 0 | 0 |
| | | | 2076 | 1324 | 387 | 357 | 8 | | |

- Molecule 54 is a protein called Ribosomal protein eS30.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 54 | AD | 57 | Total | C | N | O | S | 0 | 0 |
| | | | 452 | 279 | 99 | 73 | 1 | | |

- Molecule 55 is a protein called 40S ribosomal protein S26.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 55 | AE | 99 | Total | C | N | O | S | 0 | 0 |
| | | | 793 | 492 | 165 | 131 | 5 | | |

- Molecule 56 is a protein called Ribosomal protein S5.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 56 | Ae | 191 | Total | C | N | O | S | 0 | 0 |
| | | | 1508 | 943 | 286 | 272 | 7 | | |

- Molecule 57 is a protein called Small ribosomal subunit protein eS6.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 57 | Af | 227 | Total | C | N | O | S | 0 | 0 |
| | | | 1838 | 1144 | 367 | 320 | 7 | | |

- Molecule 58 is a protein called Small ribosomal subunit protein RACK1.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 58 | AF | 311 | Total | C | N | O | S | 0 | 0 |
| | | | 2420 | 1526 | 422 | 460 | 12 | | |

- Molecule 59 is a protein called 40S ribosomal protein S7.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 59 | Ag | 187 | Total | C | N | O | S | 0 | 0 |
| | | | 1500 | 956 | 276 | 267 | 1 | | |

- Molecule 60 is a protein called 40S ribosomal protein S29.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 60 | AG | 55 | Total | C | N | O | S | 0 | 0 |
| | | | 459 | 286 | 94 | 74 | 5 | | |

- Molecule 61 is a protein called 40S ribosomal protein S8.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 61 | Ah | 203 | Total | C | N | O | S | 1 | 0 |
| | | | 1669 | 1050 | 328 | 286 | 5 | | |

- Molecule 62 is a protein called 40S ribosomal protein S9.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 62 | Ai | 179 | Total | C | N | O | S | 0 | 0 |
| | | | 1495 | 953 | 299 | 241 | 2 | | |

- Molecule 63 is a protein called Ribosomal protein S10.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 63 | Aj | 96 | Total | C | N | O | S | 0 | 0 |
| | | | 812 | 532 | 143 | 131 | 6 | | |

- Molecule 64 is a protein called 40S ribosomal protein S11.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 64 | Ak | 150 | Total | C | N | O | S | 0 | 0 |
| | | | 1218 | 773 | 229 | 210 | 6 | | |

- Molecule 65 is a protein called Small ribosomal subunit protein eS12.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 65 | Al | 111 | Total | C | N | O | S | 0 | 0 |
| | | | 860 | 540 | 151 | 161 | 8 | | |

- Molecule 66 is a protein called Small ribosomal subunit protein uS15.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 66 | Am | 150 | Total | C | N | O | S | 0 | 0 |
| | | | 1208 | 773 | 229 | 205 | 1 | | |

- Molecule 67 is a protein called Ribosomal protein S14.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 67 | An | 136 | Total | C | N | O | S | 0 | 0 |
| | | | 1016 | 621 | 199 | 190 | 6 | | |

There is a discrepancy between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
|---|---|---|---|---|---|
| An | 138 | IAS | ASP | conflict | UNP Q5ZHW8 |

- Molecule 68 is a protein called Small ribosomal subunit protein uS19.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 68 | Ao | 128 | Total | C | N | O | S | 0 | 0 |
| | | | 1050 | 666 | 198 | 179 | 7 | | |

- Molecule 69 is a protein called Small ribosomal subunit protein eS17.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 69 | Aq | 133 | Total | C | N | O | S | 0 | 0 |
| | | | 1073 | 673 | 200 | 196 | 4 | | |

- Molecule 70 is a protein called 40S ribosomal protein S18.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 70 | Ar | 144 | Total | C | N | O | S | 0 | 0 |
| | | | 1191 | 748 | 241 | 201 | 1 | | |

- Molecule 71 is a protein called Ribosomal protein eS19.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 71 | As | 143 | Total | C | N | O | S | 0 | 0 |
| | | | 1115 | 698 | 216 | 199 | 2 | | |

- Molecule 72 is a protein called 40S ribosomal protein S20.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 72 | At | 103 | Total | C | N | O | S | 0 | 0 |
| | | | 815 | 511 | 154 | 146 | 4 | | |

- Molecule 73 is a protein called Ribosomal protein eS21.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 73 | Au | 83 | Total | C | N | O | S | 0 | 0 |
| | | | 640 | 394 | 118 | 124 | 4 | | |

- Molecule 74 is a protein called 40S ribosomal protein S15a.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 74 | Av | 129 | Total | C | N | O | S | 0 | 0 |
| | | | 1035 | 659 | 193 | 177 | 6 | | |

- Molecule 75 is a protein called Ribosomal protein uS12.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 75 | Aw | 142 | Total | C | N | O | S | 0 | 0 |
| | | | 1104 | 696 | 220 | 185 | 3 | | |

- Molecule 76 is a protein called 40S ribosomal protein S24.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 76 | Ax | 125 | Total | C | N | O | S | 0 | 0 |
| | | | 1015 | 642 | 199 | 169 | 5 | | |

- Molecule 77 is a protein called 40S ribosomal protein S25.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 77 | Ay | 70 | Total | C | N | O | S | 0 | 0 |
| | | | 555 | 357 | 101 | 96 | 1 | | |

- Molecule 78 is a protein called Small ribosomal subunit protein uS2.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 78 | AZ | 206 | Total | C | N | O | S | 0 | 0 |
| | | | 1626 | 1036 | 287 | 295 | 8 | | |

- Molecule 79 is a protein called Ribosomal protein S16.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 79 | Ap | 141 | Total | C | N | O | S | 0 | 0 |
| | | | 1123 | 715 | 212 | 193 | 3 | | |

- Molecule 80 is a RNA chain called Phe tRNA.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 80 | V | 76 | Total | C | N | O | P | 0 | 0 |
| | | | 1628 | 727 | 302 | 524 | 75 | | |

- Molecule 81 is a protein called SERPINE1 mRNA binding protein 1.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|
| 81 | S | 42 | Total 325 | C 190 | N 69 | O 66 | 0 | 0 |

- Molecule 82 is a protein called Elongation factor 2.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 82 | A | 857 | Total 6690 | C 4244 | N 1151 | O 1249 | S 46 | 0 | 0 |

- Molecule 83 is a protein called Large ribosomal subunit protein uL10.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 83 | Bs | 199 | Total 1527 | C 972 | N 266 | O 279 | S 10 | 0 | 0 |

- Molecule 84 is a protein called 60S ribosomal protein L12.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 84 | Bt | 152 | Total 1135 | C 704 | N 210 | O 217 | S 4 | 0 | 0 |

- Molecule 85 is a protein called Ribosomal protein.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 85 | Bv | 215 | Total 1722 | C 1107 | N 303 | O 305 | S 7 | 0 | 0 |

- Molecule 86 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

| Mol | Chain | Residues | Atoms | | AltConf |
|---|---|---|---|---|---|
| 86 | B5 | 337 | Total 337 | Mg 337 | 0 |
| 86 | B8 | 8 | Total 8 | Mg 8 | 0 |
| 86 | B7 | 6 | Total 6 | Mg 6 | 0 |
| 86 | BA | 3 | Total 3 | Mg 3 | 0 |
| 86 | BB | 1 | Total 1 | Mg 1 | 0 |
| 86 | BH | 1 | Total 1 | Mg 1 | 0 |

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| Mol | Chain | Residues | Atoms | AltConf |
|---|---|---|---|---|
| 86 | BI | 1 | Total Mg<br>1 1 | 0 |
| 86 | BN | 2 | Total Mg<br>2 2 | 0 |
| 86 | BP | 2 | Total Mg<br>2 2 | 0 |
| 86 | BV | 1 | Total Mg<br>1 1 | 0 |
| 86 | Ba | 1 | Total Mg<br>1 1 | 0 |
| 86 | Bb | 2 | Total Mg<br>2 2 | 0 |
| 86 | Be | 2 | Total Mg<br>2 2 | 0 |
| 86 | Bf | 1 | Total Mg<br>1 1 | 0 |
| 86 | Bg | 1 | Total Mg<br>1 1 | 0 |
| 86 | Bo | 1 | Total Mg<br>1 1 | 0 |
| 86 | A2 | 116 | Total Mg<br>116 116 | 0 |
| 86 | AG | 1 | Total Mg<br>1 1 | 0 |
| 86 | Ak | 1 | Total Mg<br>1 1 | 0 |
| 86 | An | 1 | Total Mg<br>1 1 | 0 |
| 86 | As | 1 | Total Mg<br>1 1 | 0 |
| 86 | At | 1 | Total Mg<br>1 1 | 0 |
| 86 | A | 1 | Total Mg<br>1 1 | 0 |

- Molecule 87 is ZINC ION (three-letter code: ZN) (formula: Zn).

| Mol | Chain | Residues | Atoms | AltConf |
|---|---|---|---|---|
| 87 | Bg | 1 | Total Zn<br>1 1 | 0 |
| 87 | Bj | 1 | Total Zn<br>1 1 | 0 |

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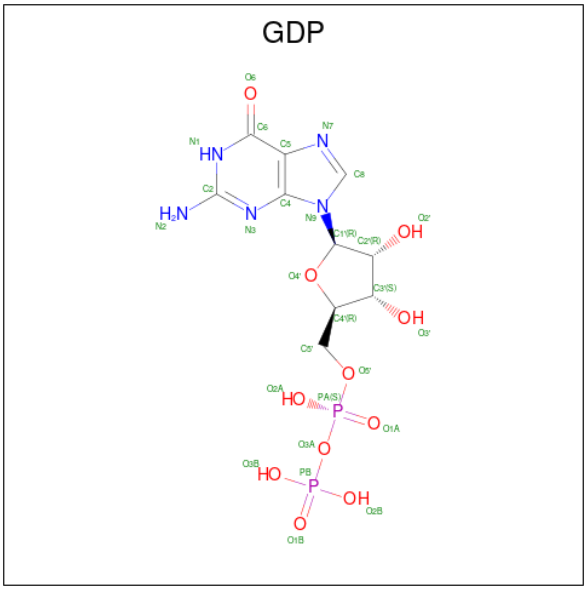
| Mol | Chain | Residues | Atoms | AltConf |
|---|---|---|---|---|
| 87 | Bm | 1 | Total Zn<br>1 1 | 0 |
| 87 | Bo | 1 | Total Zn<br>1 1 | 0 |
| 87 | Bp | 1 | Total Zn<br>1 1 | 0 |
| 87 | AC | 1 | Total Zn<br>1 1 | 0 |
| 87 | AE | 1 | Total Zn<br>1 1 | 0 |
| 87 | AG | 1 | Total Zn<br>1 1 | 0 |

- Molecule 88 is GUANOSINE-5'-DIPHOSPHATE (three-letter code: GDP) (formula: $C_{10}H_{15}N_5O_{11}P_2$).




| Mol | Chain | Residues | Atoms | AltConf |
|---|---|---|---|---|
| 88 | A | 1 | Total C N O P<br>28 10 5 11 2 | 0 |

- Molecule 89 is water.

| Mol | Chain | Residues | Atoms | AltConf |
|---|---|---|---|---|
| 89 | B5 | 2982 | Total O<br>2982 2982 | 0 |
| 89 | B8 | 81 | Total O<br>81 81 | 0 |

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| Mol | Chain | Residues | Atoms | AltConf |
|---|---|---|---|---|
| 89 | B7 | 69 | Total O<br>69 69 | 0 |
| 89 | Az | 1 | Total O<br>1 1 | 0 |
| 89 | BA | 18 | Total O<br>18 18 | 0 |
| 89 | BB | 21 | Total O<br>21 21 | 0 |
| 89 | BC | 30 | Total O<br>30 30 | 0 |
| 89 | BD | 25 | Total O<br>25 25 | 0 |
| 89 | BE | 10 | Total O<br>10 10 | 0 |
| 89 | BF | 9 | Total O<br>9 9 | 0 |
| 89 | BG | 1 | Total O<br>1 1 | 0 |
| 89 | BH | 11 | Total O<br>11 11 | 0 |
| 89 | BI | 21 | Total O<br>21 21 | 0 |
| 89 | BL | 24 | Total O<br>24 24 | 0 |
| 89 | BM | 10 | Total O<br>10 10 | 0 |
| 89 | BN | 32 | Total O<br>32 32 | 0 |
| 89 | BO | 24 | Total O<br>24 24 | 0 |
| 89 | BP | 22 | Total O<br>22 22 | 0 |
| 89 | BQ | 28 | Total O<br>28 28 | 0 |
| 89 | BR | 8 | Total O<br>8 8 | 0 |
| 89 | BS | 14 | Total O<br>14 14 | 0 |
| 89 | BT | 16 | Total O<br>16 16 | 0 |
| 89 | BV | 7 | Total O<br>7 7 | 0 |

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| Mol | Chain | Residues | Atoms | AltConf |
|---|---|---|---|---|
| 89 | BW | 3 | Total O<br>3 3 | 0 |
| 89 | BX | 6 | Total O<br>6 6 | 0 |
| 89 | BY | 10 | Total O<br>10 10 | 0 |
| 89 | Ba | 25 | Total O<br>25 25 | 0 |
| 89 | Bb | 7 | Total O<br>7 7 | 0 |
| 89 | Bc | 1 | Total O<br>1 1 | 0 |
| 89 | Bd | 5 | Total O<br>5 5 | 0 |
| 89 | Be | 29 | Total O<br>29 29 | 0 |
| 89 | Bf | 24 | Total O<br>24 24 | 0 |
| 89 | Bg | 14 | Total O<br>14 14 | 0 |
| 89 | Bh | 7 | Total O<br>7 7 | 0 |
| 89 | Bi | 12 | Total O<br>12 12 | 0 |
| 89 | Bj | 9 | Total O<br>9 9 | 0 |
| 89 | Bl | 4 | Total O<br>4 4 | 0 |
| 89 | Bm | 12 | Total O<br>12 12 | 0 |
| 89 | Bo | 15 | Total O<br>15 15 | 0 |
| 89 | Bp | 9 | Total O<br>9 9 | 0 |
| 89 | Br | 7 | Total O<br>7 7 | 0 |
| 89 | A2 | 197 | Total O<br>197 197 | 0 |
| 89 | Ab | 8 | Total O<br>8 8 | 0 |
| 89 | Ad | 1 | Total O<br>1 1 | 0 |

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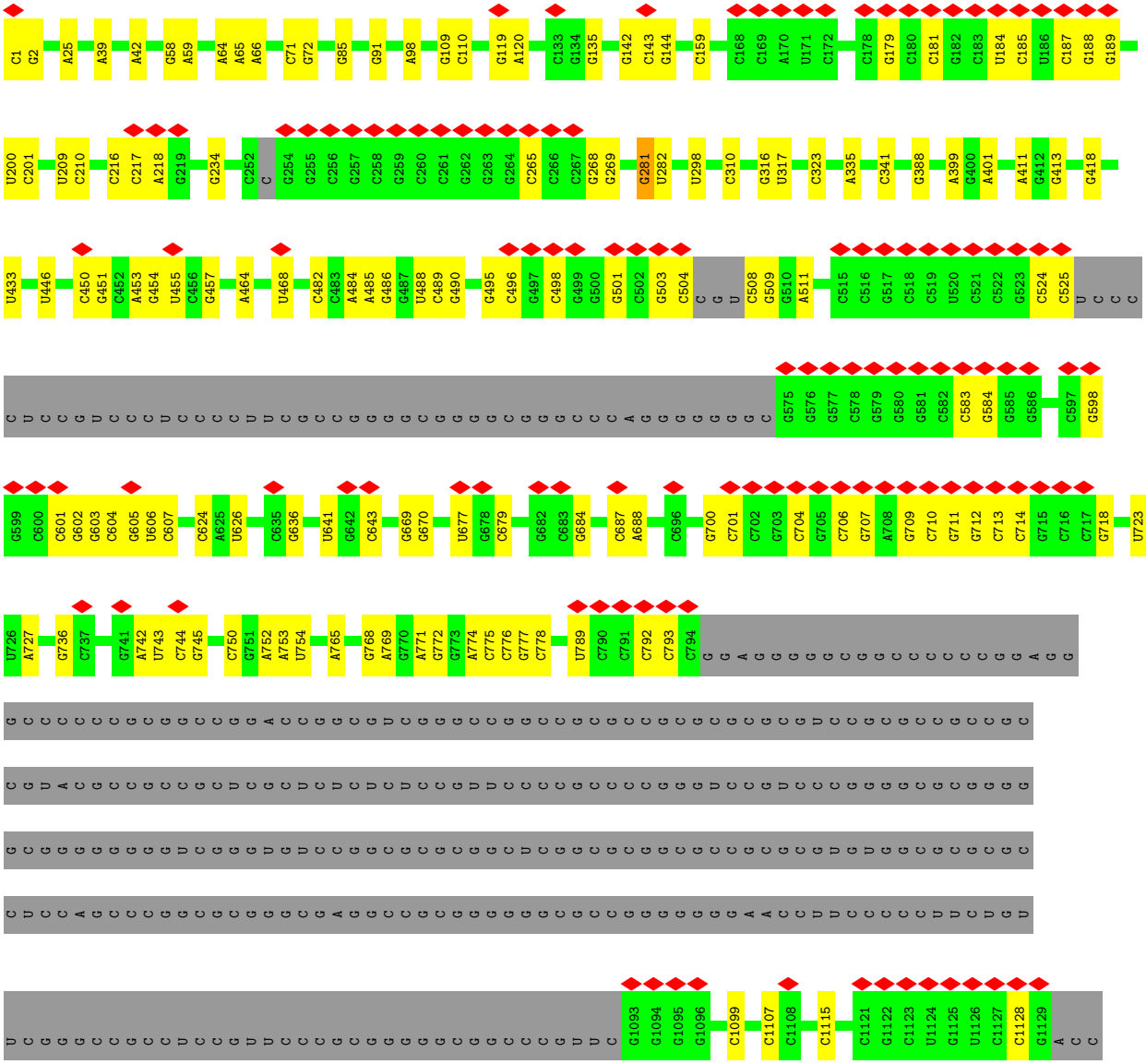
| Mol | Chain | Residues | Atoms | AltConf |
|---|---|---|---|---|
| 89 | AE | 2 | Total O<br>2 2 | 0 |
| 89 | Ae | 1 | Total O<br>1 1 | 0 |
| 89 | AG | 1 | Total O<br>1 1 | 0 |
| 89 | Ak | 1 | Total O<br>1 1 | 0 |
| 89 | Am | 1 | Total O<br>1 1 | 0 |
| 89 | An | 1 | Total O<br>1 1 | 0 |
| 89 | Ar | 2 | Total O<br>2 2 | 0 |
| 89 | As | 1 | Total O<br>1 1 | 0 |
| 89 | Au | 1 | Total O<br>1 1 | 0 |
| 89 | Av | 2 | Total O<br>2 2 | 0 |
| 89 | Ax | 1 | Total O<br>1 1 | 0 |
| 89 | AZ | 1 | Total O<br>1 1 | 0 |
| 89 | V | 9 | Total O<br>9 9 | 0 |
| 89 | A | 2 | Total O<br>2 2 | 0 |

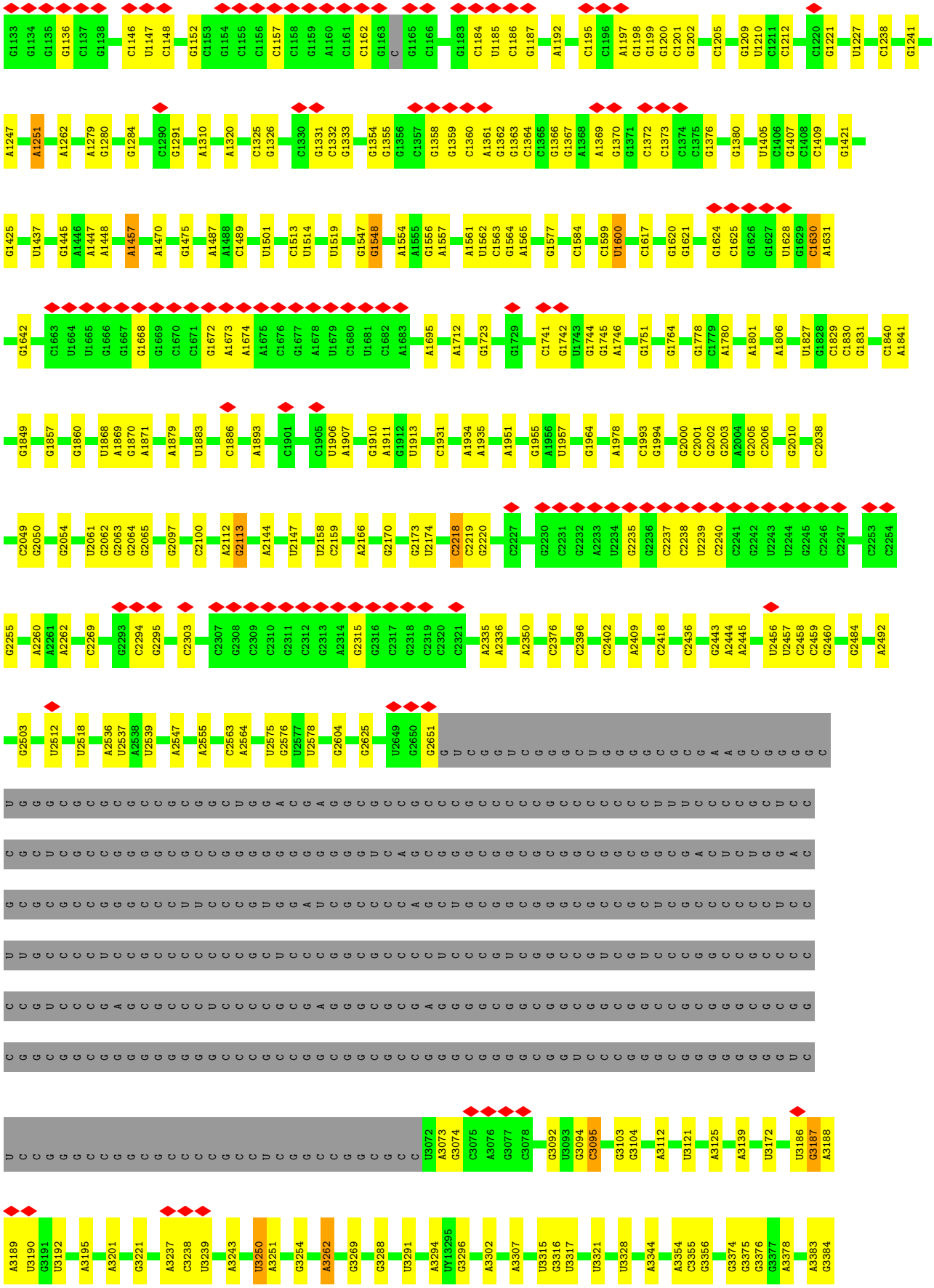
# 3 Residue-property plots (i)

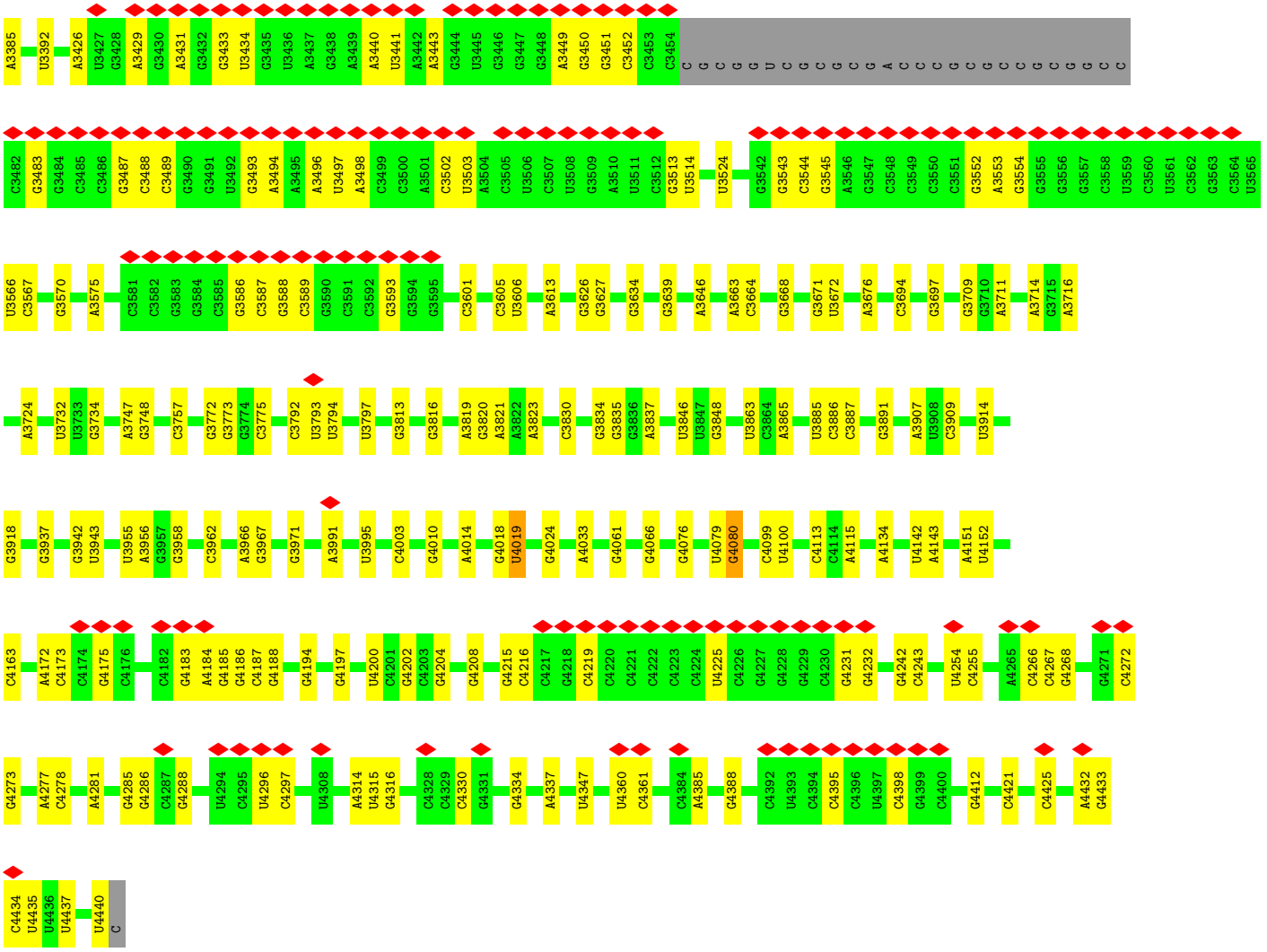
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion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

- Molecule 1: 28S rRNA

Chain B5:

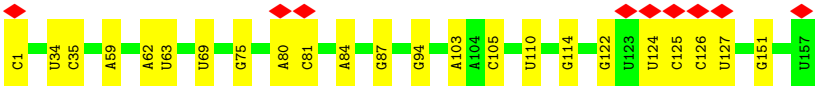






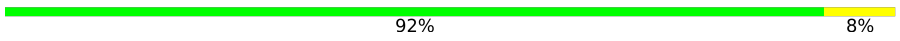
• Molecule 2: 5.8S rRNA

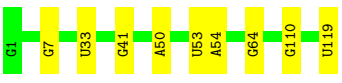
Chain B8:



• Molecule 3: 5S rRNA

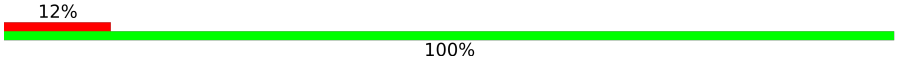
Chain B7:

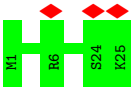


• Molecule 4: 60S ribosomal protein L41

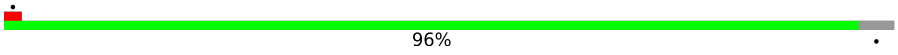
Chain Az:

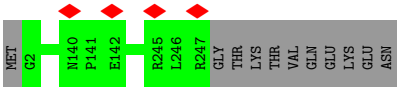





• Molecule 5: 60S ribosomal protein L8

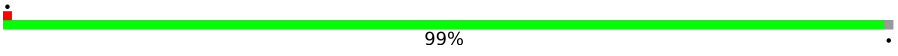
Chain BA:

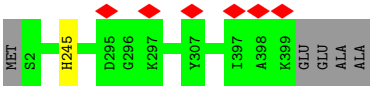



• Molecule 6: Ribosomal protein uL3

Chain BB:



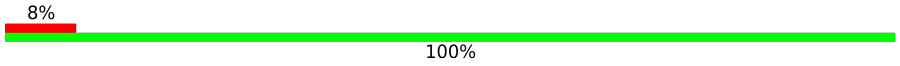



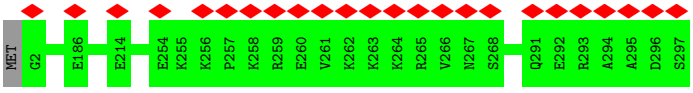

• Molecule 7: 60S ribosomal protein L4 C-terminal domain-containing protein

Chain BC:

• Molecule 8: Large ribosomal subunit protein uL18

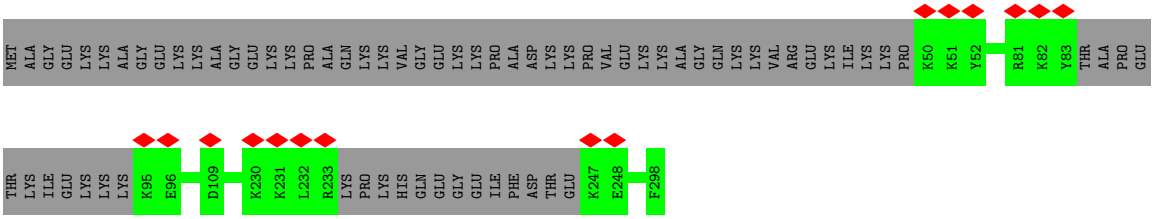
Chain BD:



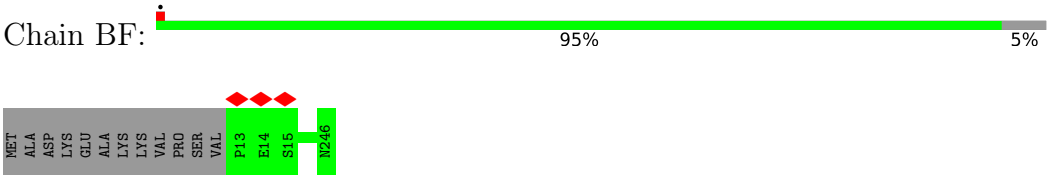

• Molecule 9: 60S ribosomal protein L6

Chain BE:



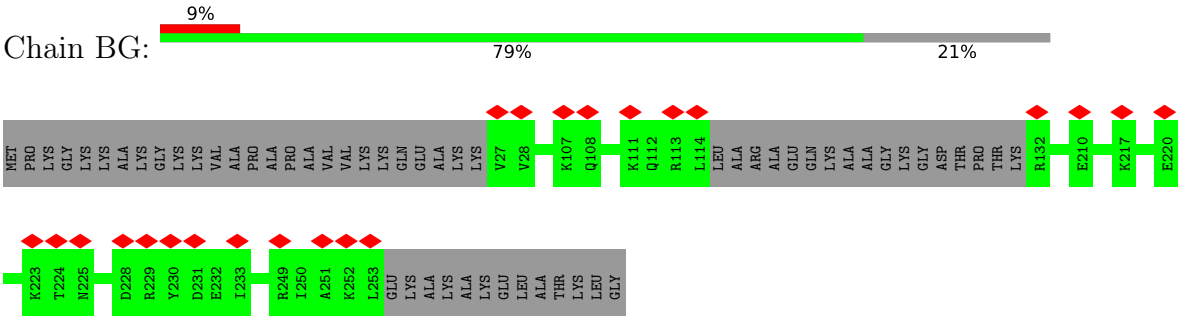

• Molecule 10: Large ribosomal subunit protein uL30

Chain BF:



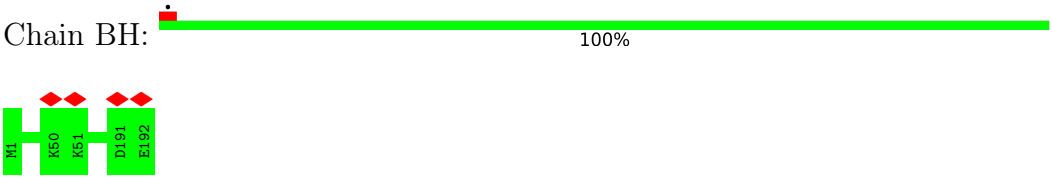

• Molecule 11: Large ribosomal subunit protein eL8

Chain BG:



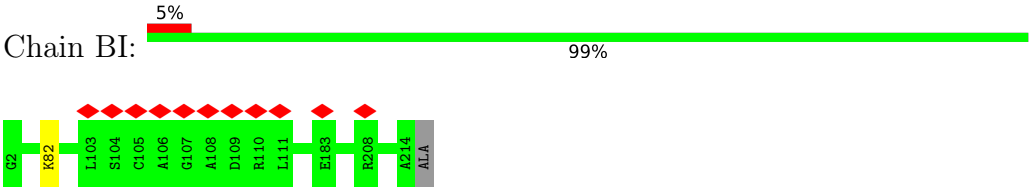

• Molecule 12: 60S ribosomal protein L9

Chain BH:



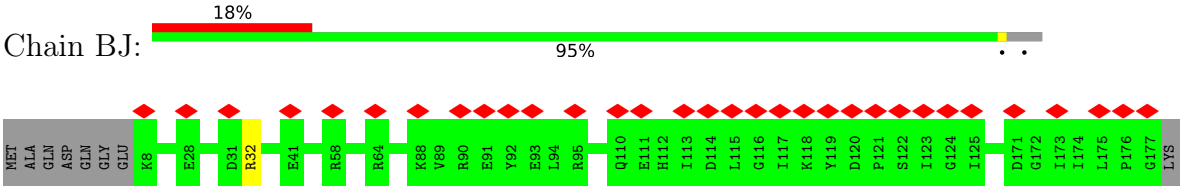

• Molecule 13: Ribosomal protein uL16,Large ribosomal subunit protein uL16,Large ribosomal subunit protein uL16

Chain BI:



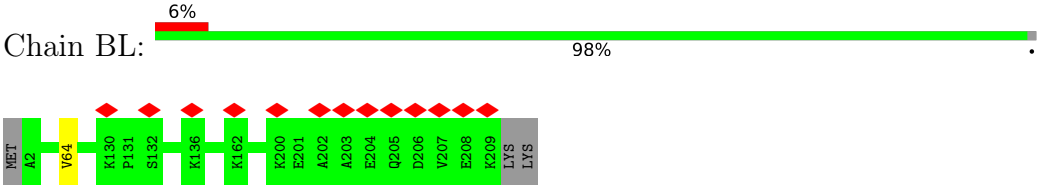

• Molecule 14: 60S ribosomal protein L11

Chain BJ:



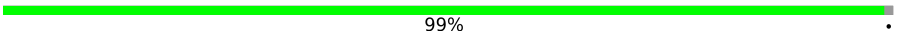

• Molecule 15: Large ribosomal subunit protein eL13

Chain BL:



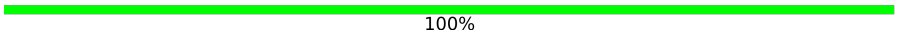

• Molecule 16: 60S ribosomal protein L14

Chain BM:



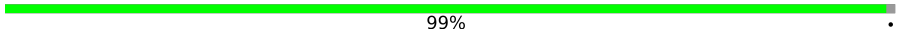
• Molecule 17: Ribosomal protein L15

Chain BN:



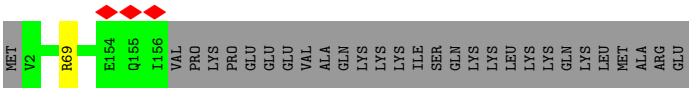
• Molecule 18: Ribosomal protein uL13

Chain BO:



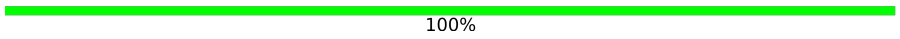
• Molecule 19: 60S ribosomal protein L17

Chain BP:




• Molecule 20: Ribosomal protein eL18

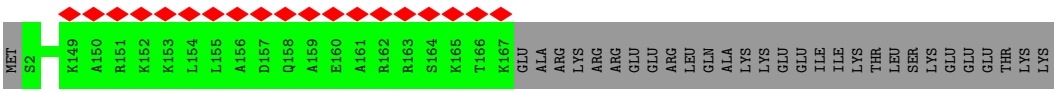
Chain BQ:




There are no outlier residues recorded for this chain.

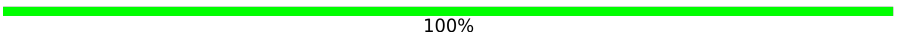
• Molecule 21: Ribosomal protein L19

Chain BR:




• Molecule 22: Ribosomal protein eL20

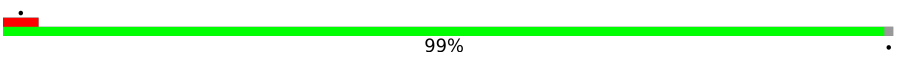
Chain BS:

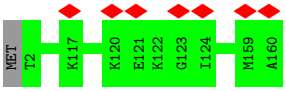



There are no outlier residues recorded for this chain.

• Molecule 23: 60S ribosomal protein L21

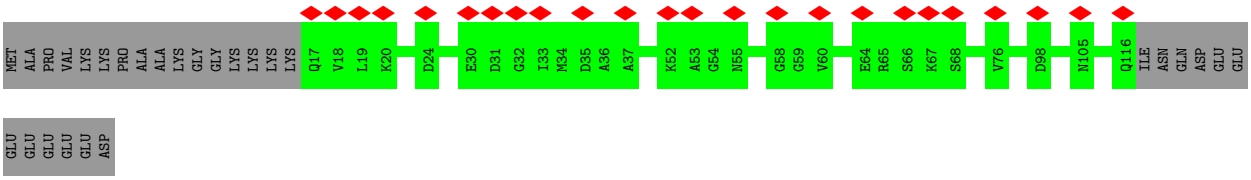
Chain BT:





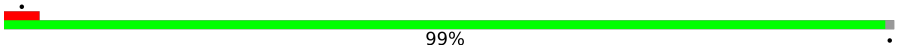

• Molecule 24: Large ribosomal subunit protein eL22

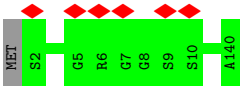
Chain BU:




• Molecule 25: Ribosomal protei uL14

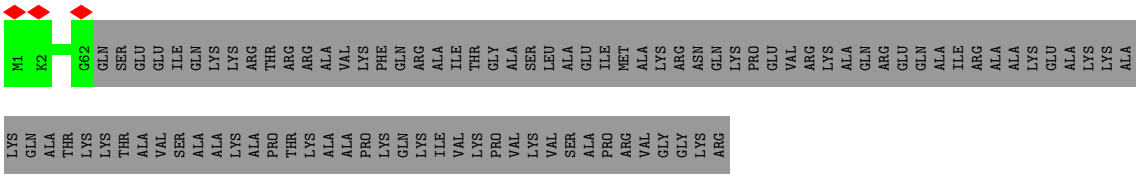
Chain BV:



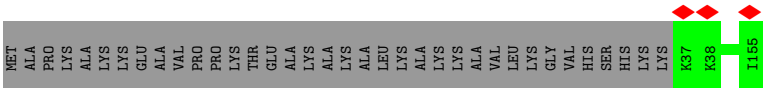

• Molecule 26: Ribosomal protein L24

Chain BW:



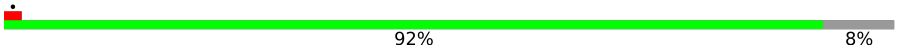

• Molecule 27: Ribosomal protein uL23

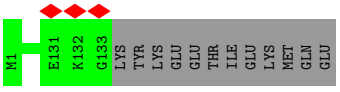
Chain BX:




• Molecule 28: Ribosomal protein L26 like 1

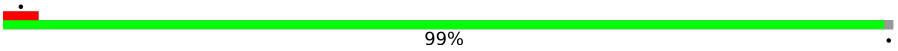
Chain BY:

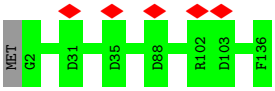



• Molecule 29: Large ribosomal subunit protein eL27

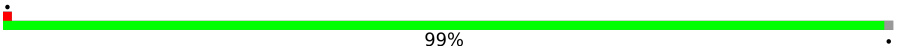
Chain BZ:

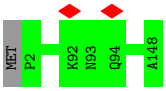





• Molecule 30: Ribosomal protein uL15

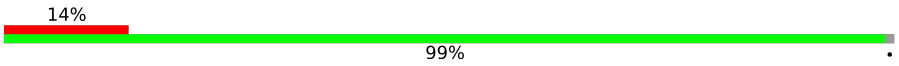
Chain Ba:

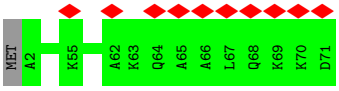



• Molecule 31: 60S ribosomal protein L29

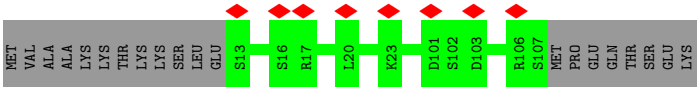
Chain Bb:



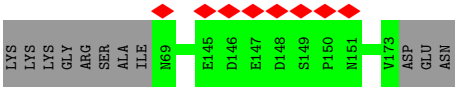

• Molecule 32: Large ribosomal subunit protein eL30

Chain Bc:



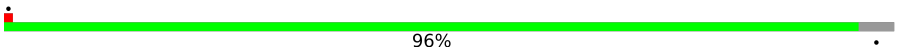

• Molecule 33: 60S ribosomal protein L31

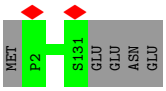
Chain Bd:




• Molecule 34: Ribosomal protein L32

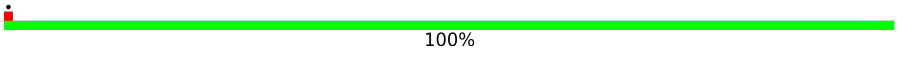
Chain Be:



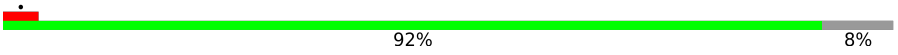

• Molecule 35: Ribosomal protein eL33

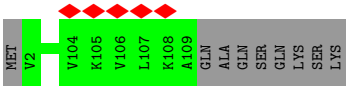
Chain Bf:



• Molecule 36: 60S ribosomal protein L34

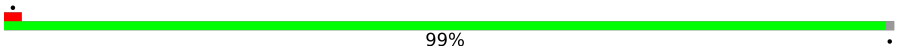
Chain Bg:



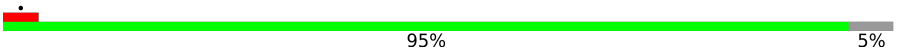

• Molecule 37: Large ribosomal subunit protein uL29

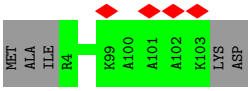
Chain Bh:



• Molecule 38: Large ribosomal subunit protein eL36

Chain Bi:



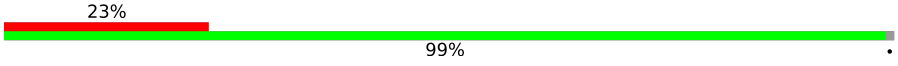



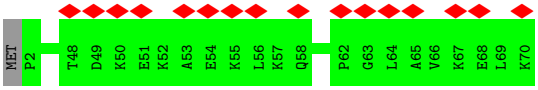

• Molecule 39: Ribosomal protein L37

Chain Bj:

• Molecule 40: 60S ribosomal protein L38

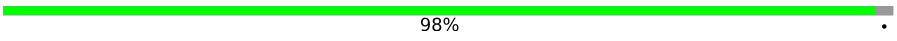
Chain Bk:



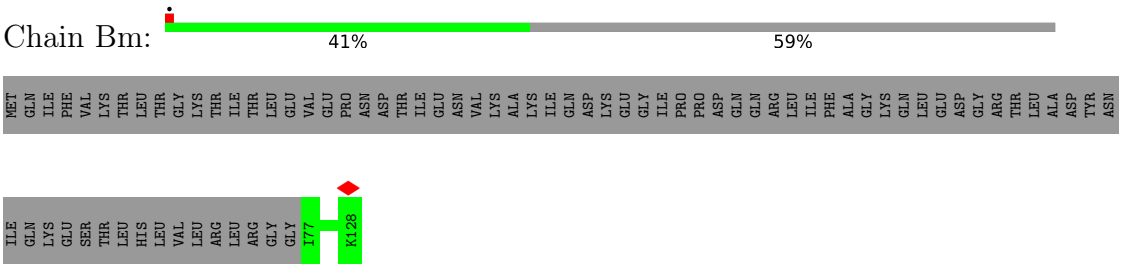

• Molecule 41: Large ribosomal subunit protein eL39

Chain Bl:



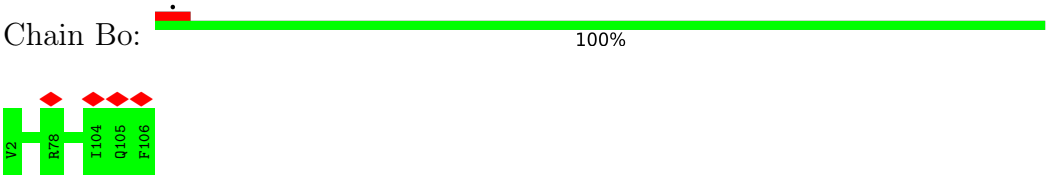
• Molecule 42: Ubiquitin-60S ribosomal protein L40

Chain Bm:



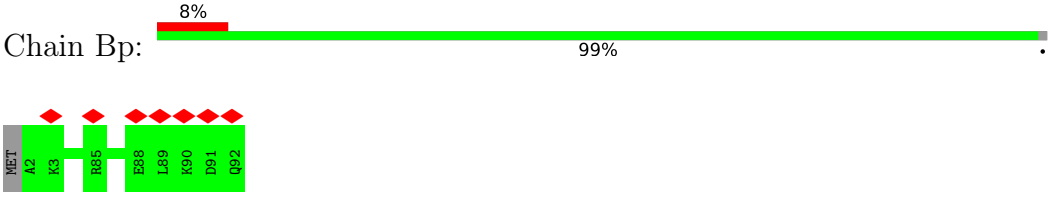

• Molecule 43: Ribosomal protein L36a like

Chain Bo:



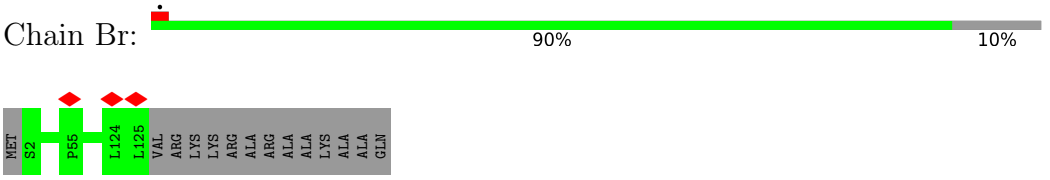

• Molecule 44: Large ribosomal subunit protein eL43

Chain Bp:



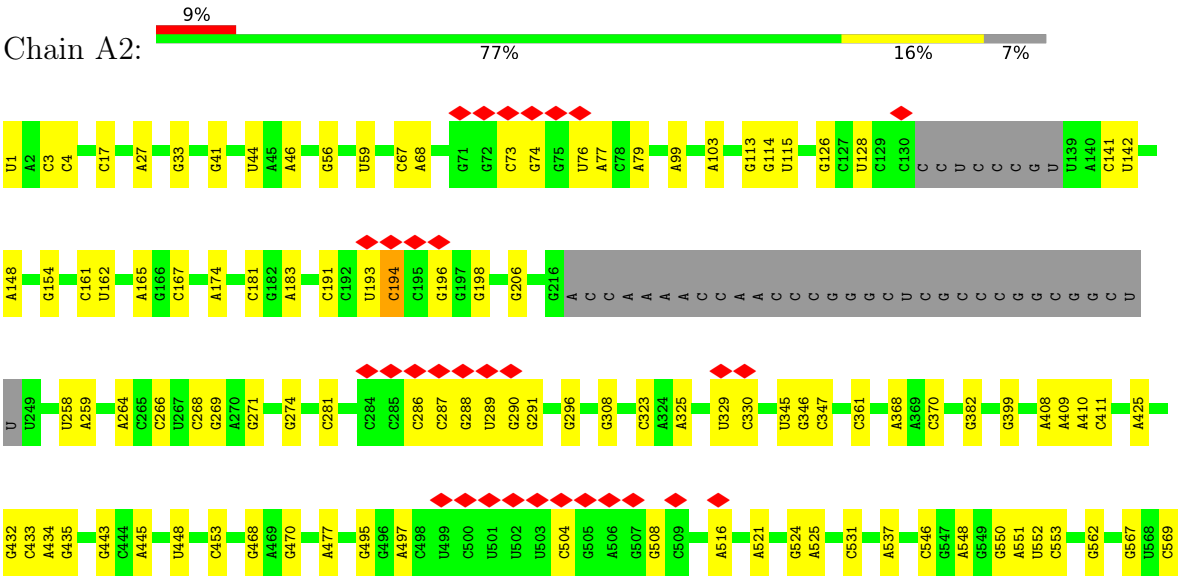

• Molecule 45: 60S ribosomal protein L28

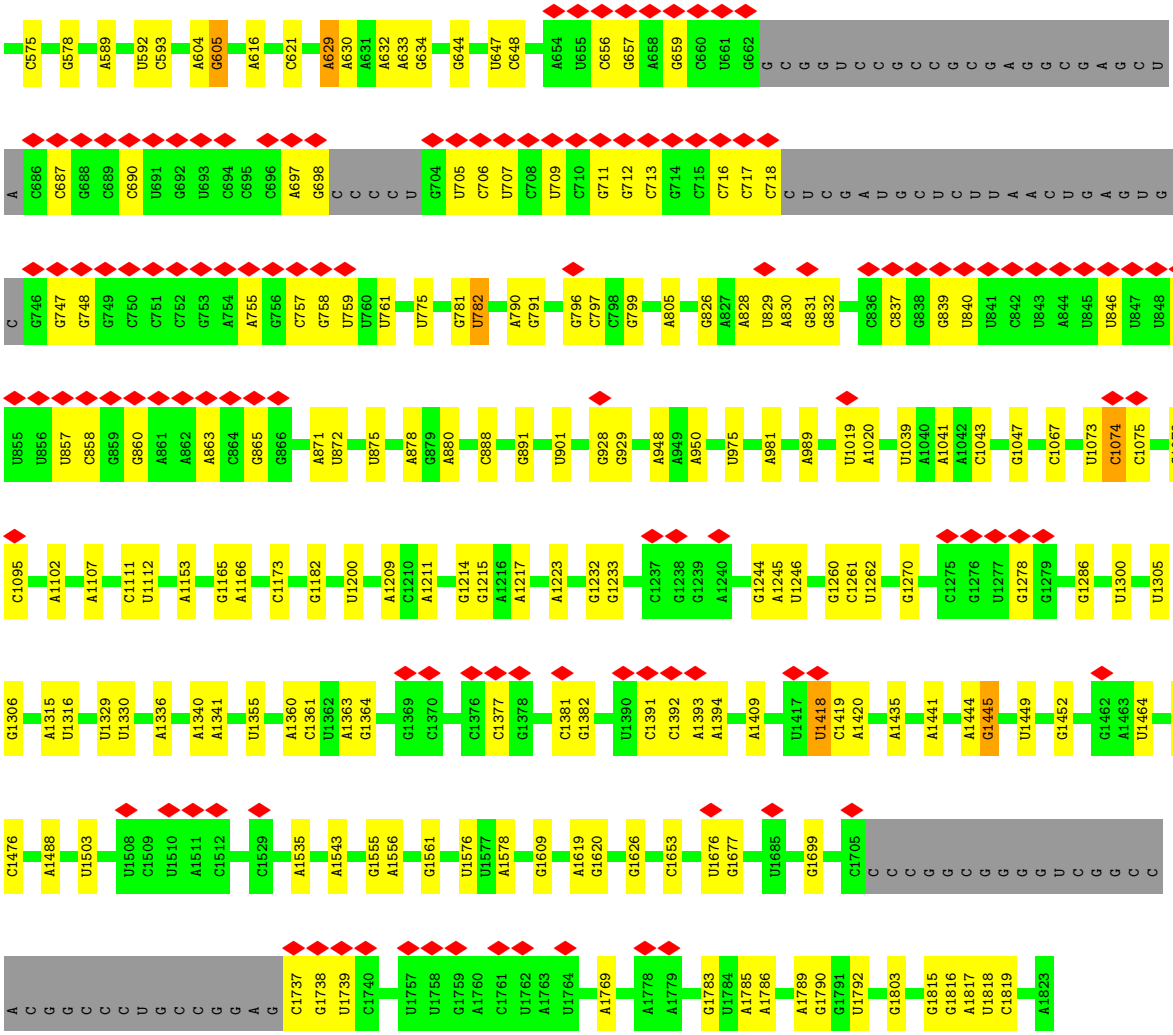
Chain Br:



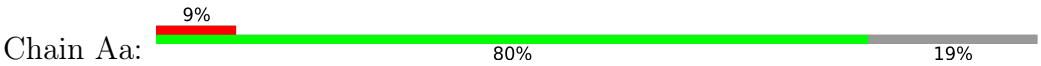

• Molecule 46: 18S rRNA

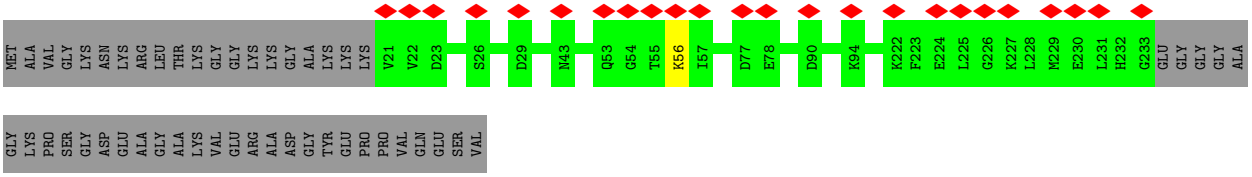
Chain A2:



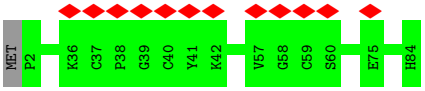


• Molecule 47: Ribosomal protein eS1



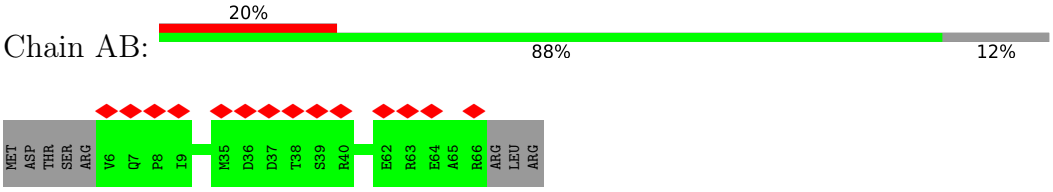



• Molecule 48: 40S ribosomal protein S27



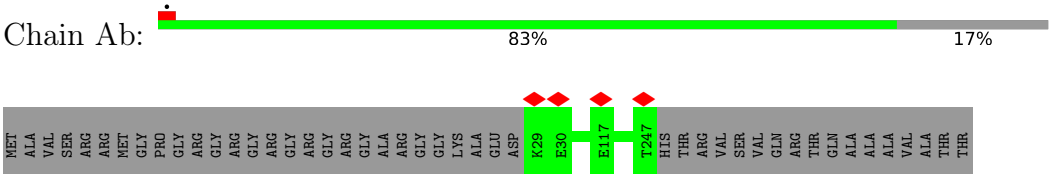
• Molecule 49: 40S ribosomal protein S28

Chain AB:



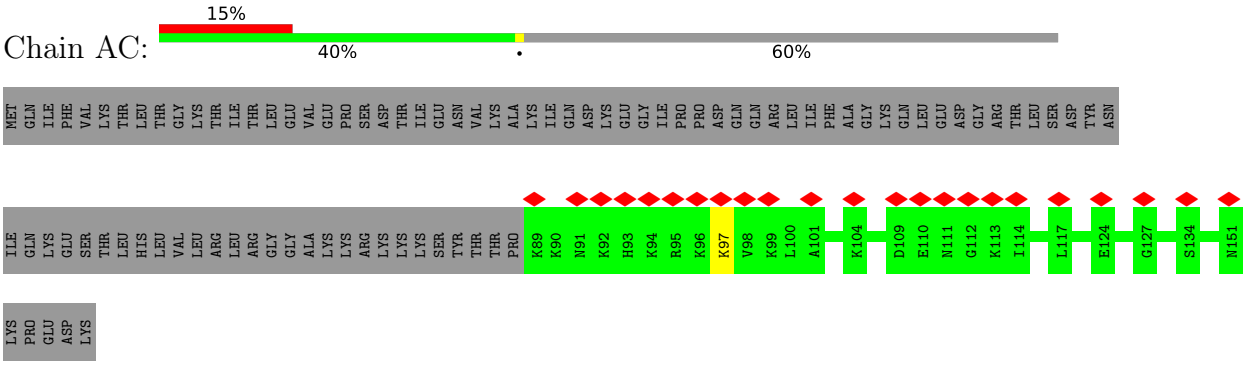

• Molecule 50: 40S ribosomal protein S2

Chain Ab:



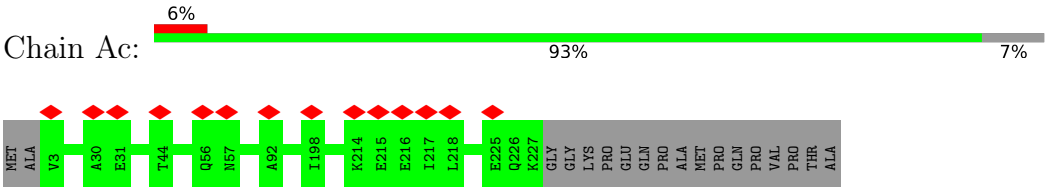

• Molecule 51: Ubiquitin

Chain AC:



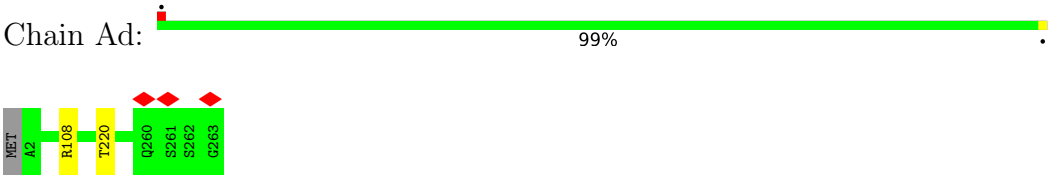

• Molecule 52: DNA-(apurinic or apyrimidinic site) lyase

Chain Ac:



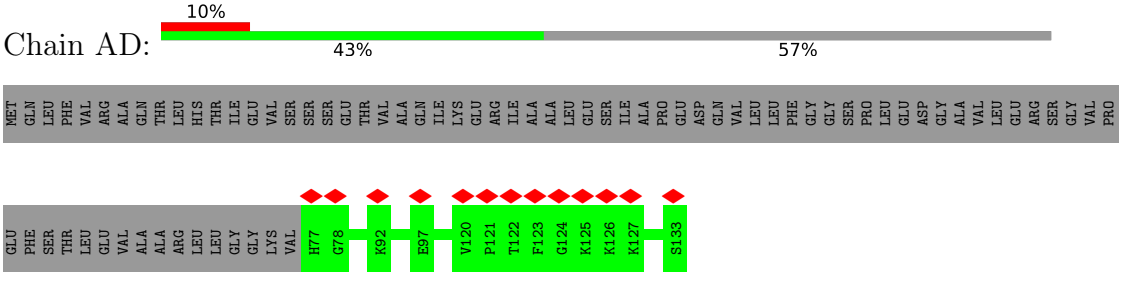

• Molecule 53: Small ribosomal subunit protein eS4

Chain Ad:



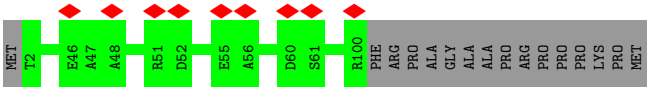

• Molecule 54: Ribosomal protein eS30

Chain AD:



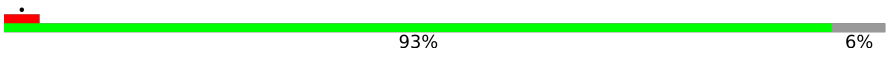
• Molecule 55: 40S ribosomal protein S26

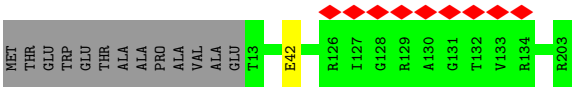
Chain AE:




• Molecule 56: Ribosomal protein S5

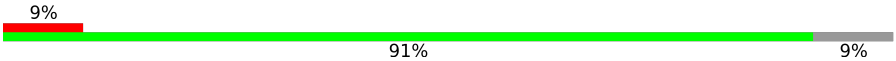
Chain Ae:

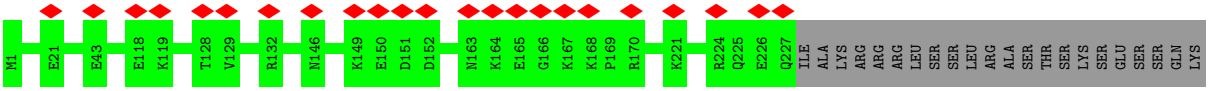



• Molecule 57: Small ribosomal subunit protein eS6

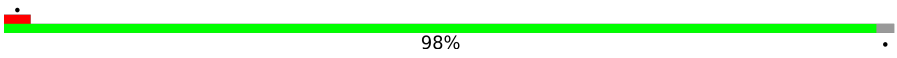
Chain Af:

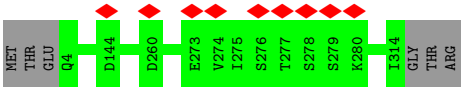



• Molecule 58: Small ribosomal subunit protein RACK1

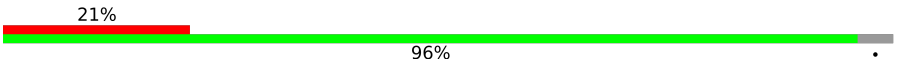
Chain AF:

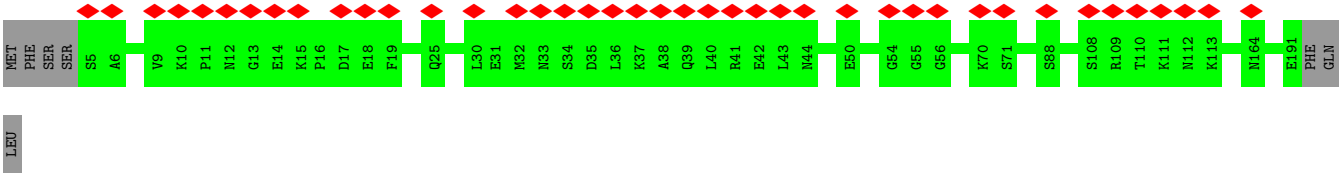



• Molecule 59: 40S ribosomal protein S7

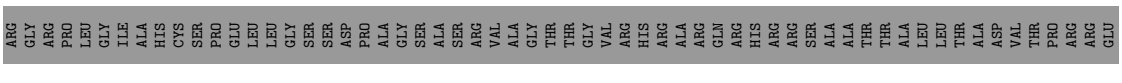
Chain Ag:

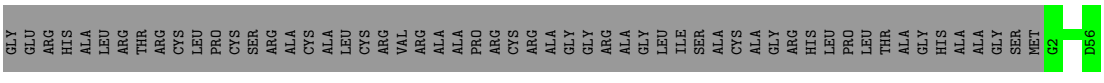



• Molecule 60: 40S ribosomal protein S29

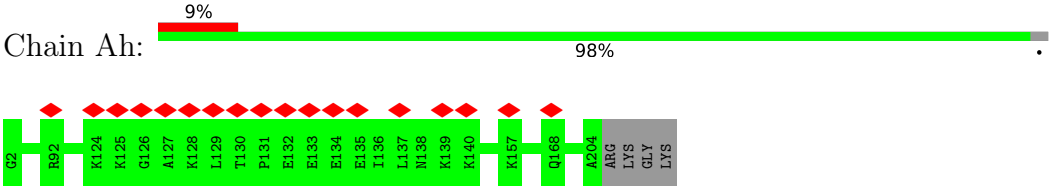
Chain AG:



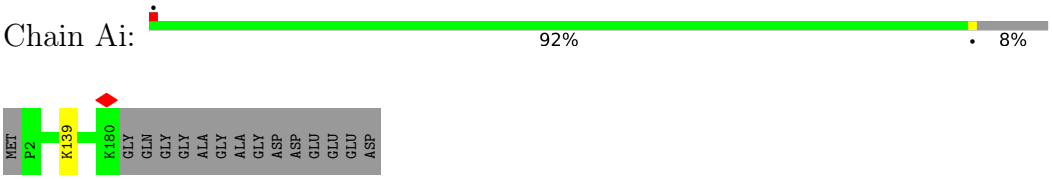
• Molecule 61: 40S ribosomal protein S8

Chain Ah:



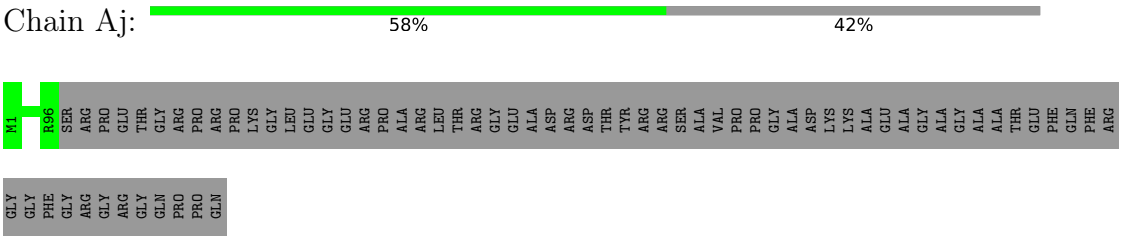

• Molecule 62: 40S ribosomal protein S9

Chain Ai:



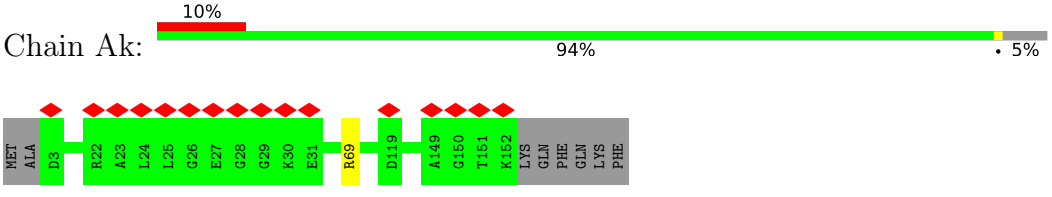

• Molecule 63: Ribosomal protein S10

Chain Aj:



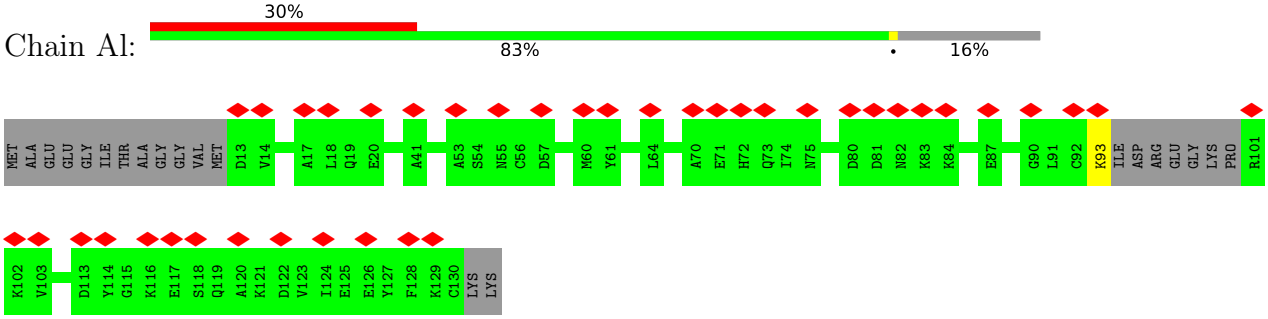

• Molecule 64: 40S ribosomal protein S11

Chain Ak:



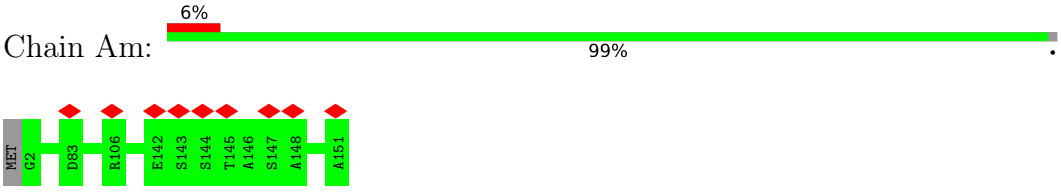

• Molecule 65: Small ribosomal subunit protein eS12

Chain Al:

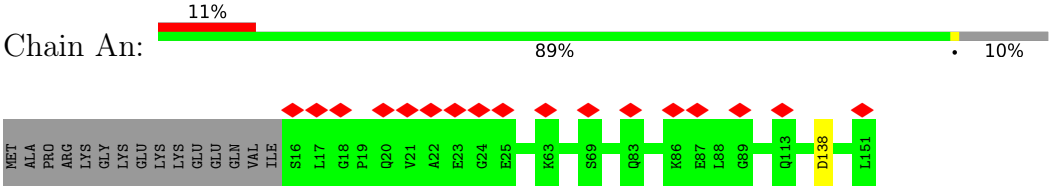



• Molecule 66: Small ribosomal subunit protein uS15

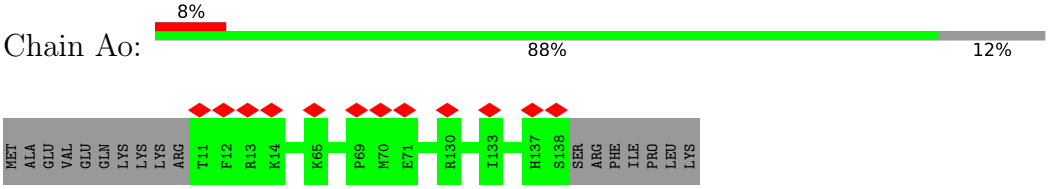
Chain Am:



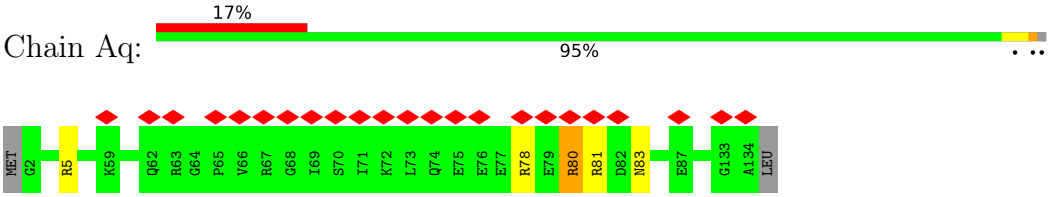
• Molecule 67: Ribosomal protein S14



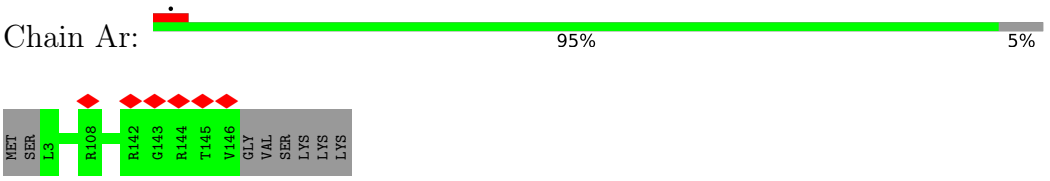

• Molecule 68: Small ribosomal subunit protein uS19



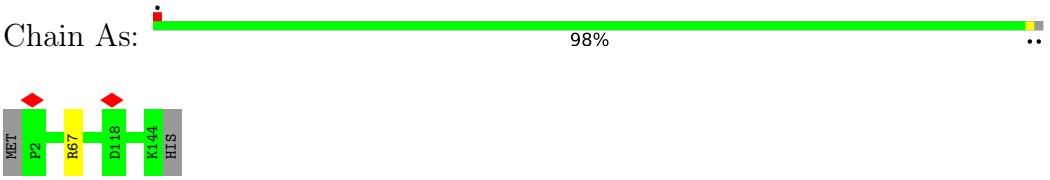

• Molecule 69: Small ribosomal subunit protein eS17



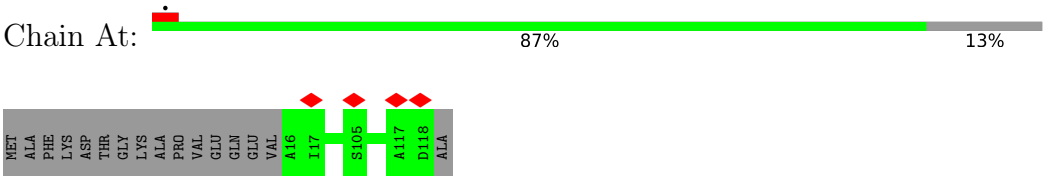

• Molecule 70: 40S ribosomal protein S18




• Molecule 71: Ribosomal protein eS19



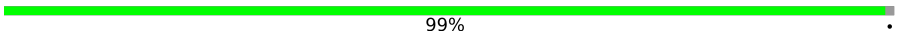

• Molecule 72: 40S ribosomal protein S20




• Molecule 73: Ribosomal protein eS21

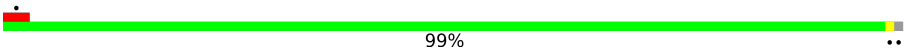
• Molecule 74: 40S ribosomal protein S15a

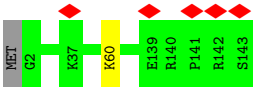
Chain Av:



• Molecule 75: Ribosomal protein uS12

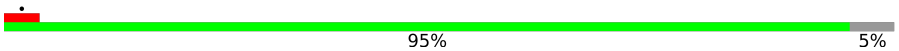
Chain Aw:

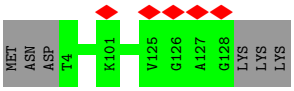



• Molecule 76: 40S ribosomal protein S24

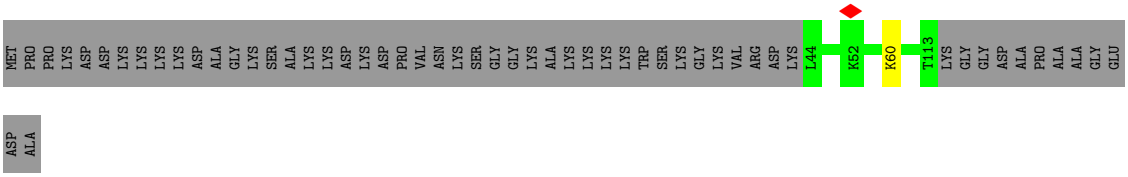
Chain Ax:




• Molecule 77: 40S ribosomal protein S25

Chain Ay:

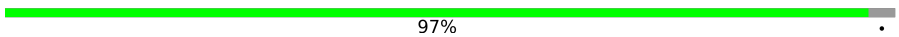



• Molecule 78: Small ribosomal subunit protein uS2

Chain AZ:

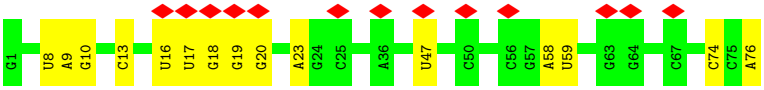
• Molecule 79: Ribosomal protein S16

Chain Ap:



• Molecule 80: Phe tRNA

Chain V:

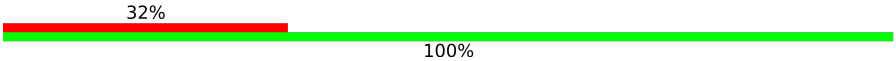


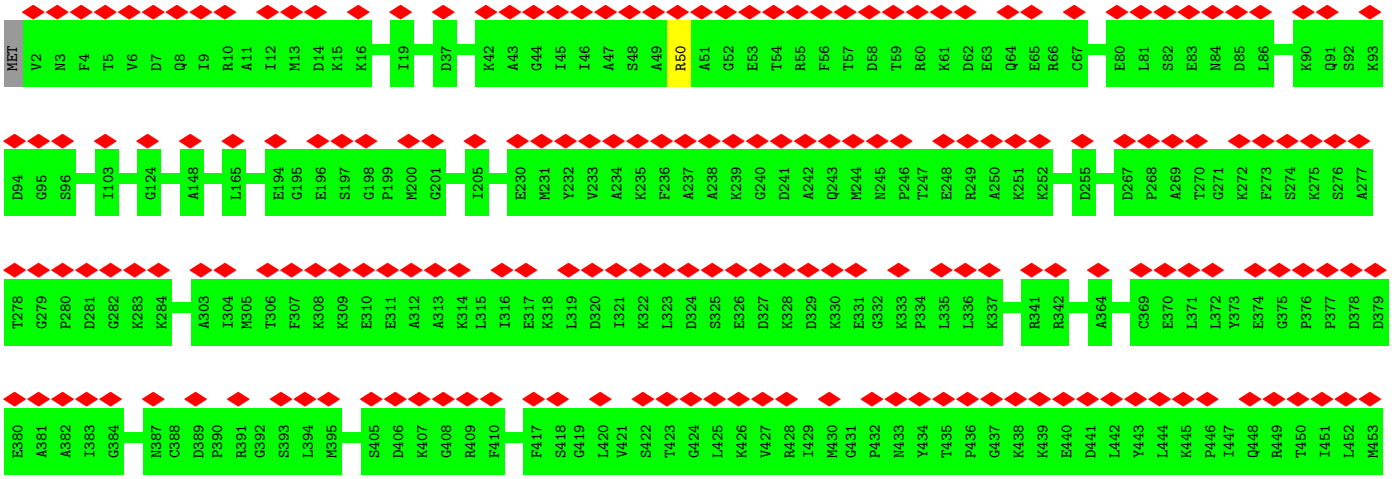

• Molecule 81: SERPINE1 mRNA binding protein 1

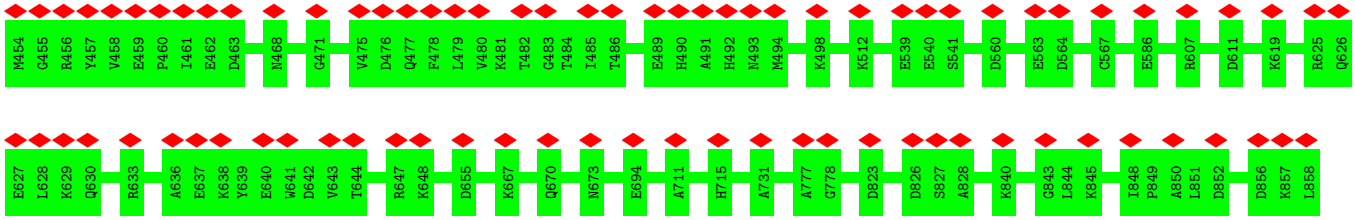
Chain S:

• Molecule 82: Elongation factor 2

Chain A:

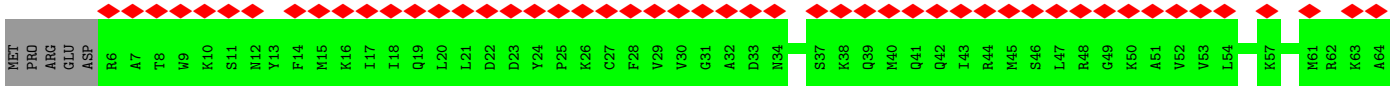


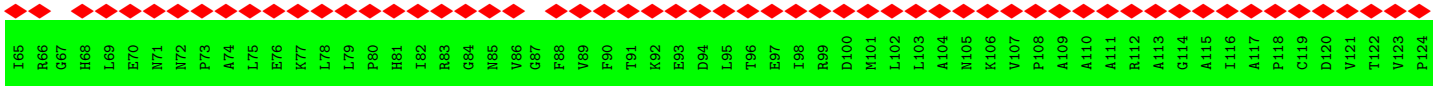



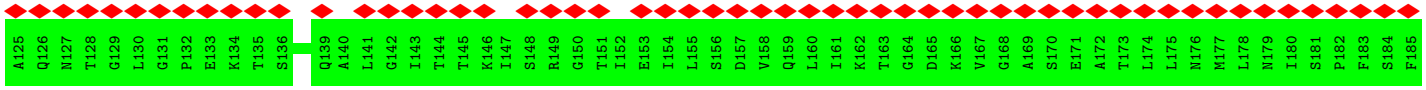


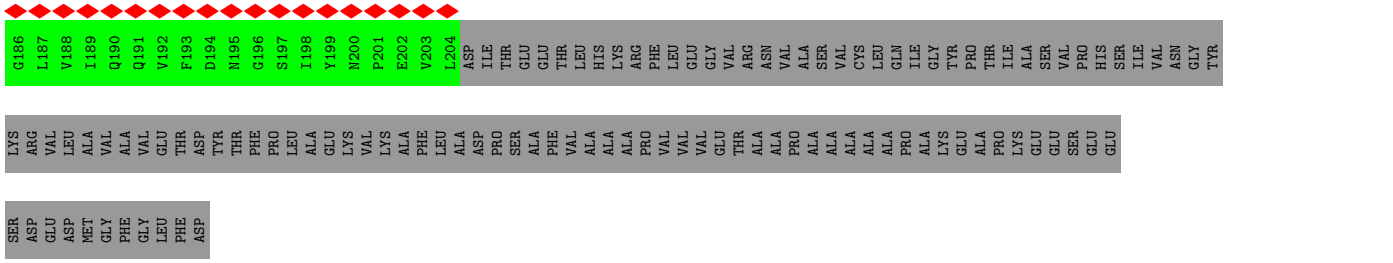

• Molecule 83: Large ribosomal subunit protein uL10

Chain Bs:



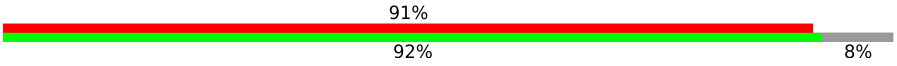



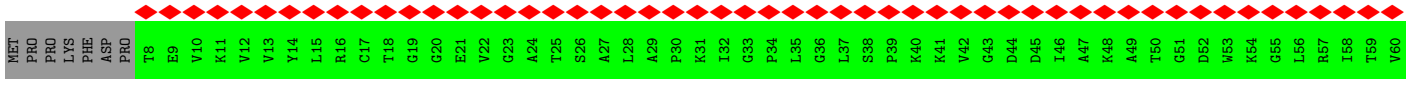



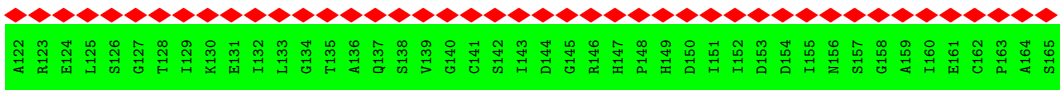




• Molecule 84: 60S ribosomal protein L12

Chain Bt:

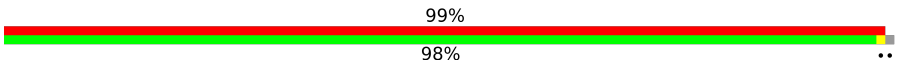


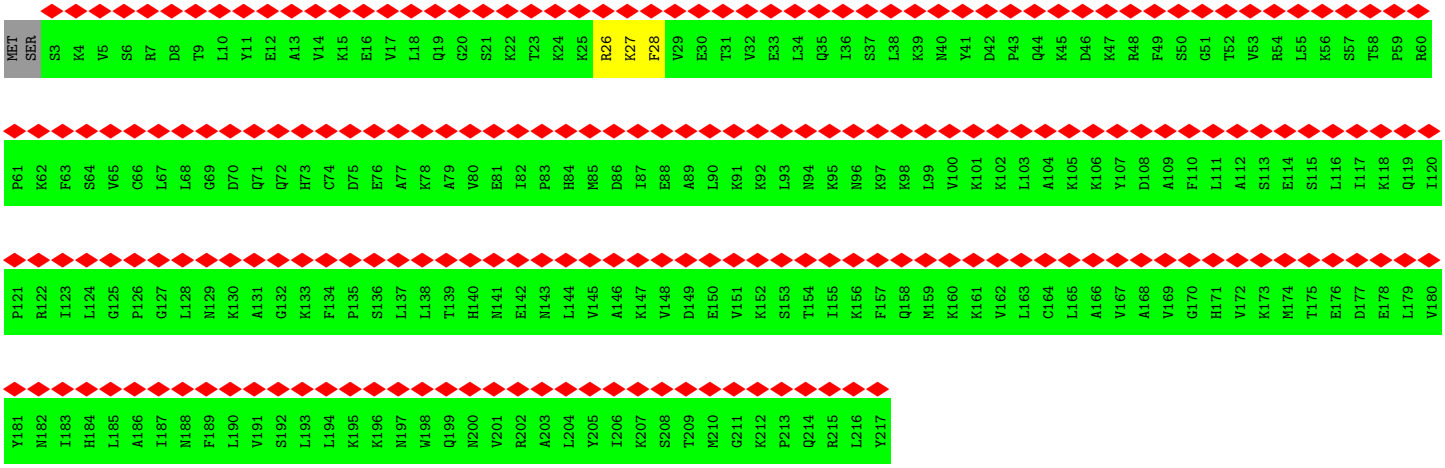






• Molecule 85: Ribosomal protein

Chain Bv:




MET SER S3 K4 V5 S6 R7 D8 T9 L10 Y11 E12 A13 V14 K15 E16 V17 L18 Q19 G20 S21 K22 T23 K24 K25 R26 K27 F28 V29 E30 T31 V32 E33 L34 Q35 I36 S37 L38 K39 N40 Y41 D42 P43 Q44 K45 D46 K47 R48 F49 S50 Q51 T52 V53 R54 L55 K56 S57 T58 P59 R60
P61 K62 F63 S64 V65 C66 L67 L68 G69 D70 Q71 Q72 H73 C74 D75 E76 A77 K78 A79 V80 E81 I82 P83 H84 M85 D86 I87 E88 A89 L90 K91 K92 L93 N94 K95 N96 K97 K98 L99 V100 K101 K102 L103 A104 K105 K106 Y107 D108 A109 F110 L111 A112 S113 E114 S115 L116 I117 K118 Q119 I120
P121 R122 I123 L124 G125 P126 G127 L128 N129 K130 A131 G132 K133 F134 P135 S136 L137 L138 T139 H140 N141 E142 N143 L144 V145 A146 K147 V148 D149 E150 V151 K152 S153 T154 I155 K156 F157 Q158 M159 K160 K161 V162 L163 C164 L165 A166 V167 A168 V169 G170 H171 V172 K173 M174 T175 E176 D177 E178 L179 V180
Y181 N182 I183 H184 L185 A186 I187 N188 F189 L190 V191 S192 L193 L194 K195 K196 N197 W198 Q199 N200 V201 R202 A203 L204 Y205 I206 K207 S208 T209 M210 G211 K212 P213 Q214 R215 L216 Y217

# 4 Experimental information (i)

| Property | Value | Source |
|---|---|---|
| EM reconstruction method | SINGLE PARTICLE | Depositor |
| Imposed symmetry | POINT, Not provided | |
| Number of particles used | 100204 | Depositor |
| Resolution determination method | FSC 3 SIGMA CUT-OFF | Depositor |
| CTF correction method | PHASE FLIPPING AND AMPLITUDE CORRECTION | Depositor |
| Microscope | FEI TITAN KRIOS | Depositor |
| Voltage (kV) | 300 | Depositor |
| Electron dose ($e^-/Å^2$) | 40 | Depositor |
| Minimum defocus (nm) | 300 | Depositor |
| Maximum defocus (nm) | 1500 | Depositor |
| Magnification | 96000 | Depositor |
| Image detector | FEI FALCON IV (4k x 4k) | Depositor |
| Maximum map value | 35.598 | Depositor |
| Minimum map value | -17.913 | Depositor |
| Average map value | -0.001 | Depositor |
| Map value standard deviation | 1.080 | Depositor |
| Recommended contour level | 3.0 | Depositor |
| Map size (Å) | 465.74, 465.74, 465.74 | wwPDB |
| Map dimensions | 580, 580, 580 | wwPDB |
| Map angles (°) | 90.0, 90.0, 90.0 | wwPDB |
| Pixel spacing (Å) | 0.803, 0.803, 0.803 | Depositor |

# 5 Model quality

## 5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: 6MZ, OMG, 5MC, DDE, OMU, HIC, 1MA, ZN, OMC, 4AC, UY1, MLZ, MG, A2M, B8N, SAC, AME, GDP, PSU, MA6, UR3, NMM, IAS

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 | B5 | 0.38 | 1/85039 (0.0%) | 0.79 | 29/132680 (0.0%) |
| 2 | B8 | 0.40 | 1/3656 (0.0%) | 0.74 | 1/5693 (0.0%) |
| 3 | B7 | 0.36 | 0/2832 | 0.77 | 0/4413 |
| 4 | Az | 0.22 | 0/240 | 0.68 | 0/305 |
| 5 | BA | 0.28 | 0/1926 | 0.57 | 0/2582 |
| 6 | BB | 0.29 | 0/3264 | 0.53 | 0/4363 |
| 7 | BC | 0.27 | 0/2942 | 0.53 | 0/3950 |
| 8 | BD | 0.28 | 0/2431 | 0.50 | 0/3255 |
| 9 | BE | 0.27 | 0/1854 | 0.52 | 0/2477 |
| 10 | BF | 0.27 | 0/1975 | 0.52 | 0/2634 |
| 11 | BG | 0.26 | 0/1736 | 0.51 | 0/2342 |
| 12 | BH | 0.27 | 0/1552 | 0.52 | 0/2086 |
| 13 | BI | 0.27 | 0/1751 | 0.54 | 0/2342 |
| 14 | BJ | 0.27 | 0/1385 | 0.54 | 0/1852 |
| 15 | BL | 0.26 | 0/1723 | 0.55 | 0/2302 |
| 16 | BM | 0.26 | 0/1097 | 0.50 | 0/1460 |
| 17 | BN | 0.27 | 0/1745 | 0.56 | 0/2337 |
| 18 | BO | 0.27 | 0/1674 | 0.52 | 0/2239 |
| 19 | BP | 0.27 | 0/1285 | 0.51 | 0/1723 |
| 20 | BQ | 0.28 | 0/1526 | 0.59 | 0/2038 |
| 21 | BR | 0.24 | 0/1394 | 0.54 | 0/1845 |
| 22 | BS | 0.29 | 0/1502 | 0.55 | 0/2016 |
| 23 | BT | 0.28 | 0/1327 | 0.50 | 0/1771 |
| 24 | BU | 0.25 | 0/831 | 0.49 | 0/1115 |
| 25 | BV | 0.28 | 0/1047 | 0.53 | 0/1402 |
| 26 | BW | 0.28 | 0/532 | 0.51 | 0/708 |
| 27 | BX | 0.26 | 0/993 | 0.51 | 0/1334 |
| 28 | BY | 0.28 | 0/1123 | 0.56 | 0/1493 |
| 29 | BZ | 0.28 | 0/1130 | 0.51 | 0/1507 |
| 30 | Ba | 0.28 | 0/1209 | 0.52 | 0/1615 |
| 31 | Bb | 0.26 | 0/593 | 0.49 | 0/782 |

| Mol | Chain | Bond lengths | | Bond angles | |
|---|---|---|---|---|---|
| | | RMSZ | #\|Z\| >5 | RMSZ | #\|Z\| >5 |
| 32 | Bc | 0.27 | 0/748 | 0.47 | 0/1004 |
| 33 | Bd | 0.26 | 0/882 | 0.55 | 0/1187 |
| 34 | Be | 0.27 | 0/1093 | 0.54 | 0/1457 |
| 35 | Bf | 0.29 | 0/905 | 0.57 | 0/1211 |
| 36 | Bg | 0.26 | 0/870 | 0.57 | 0/1159 |
| 37 | Bh | 0.27 | 0/1034 | 0.52 | 0/1365 |
| 38 | Bi | 0.26 | 0/832 | 0.55 | 0/1100 |
| 39 | Bj | 0.28 | 0/718 | 0.58 | 0/948 |
| 40 | Bk | 0.26 | 0/575 | 0.49 | 0/761 |
| 41 | Bl | 0.25 | 0/452 | 0.54 | 0/596 |
| 42 | Bm | 0.26 | 0/435 | 0.54 | 0/575 |
| 43 | Bo | 0.28 | 0/864 | 0.52 | 0/1139 |
| 44 | Bp | 0.26 | 0/716 | 0.51 | 0/950 |
| 45 | Br | 0.26 | 0/1024 | 0.57 | 0/1374 |
| 46 | A2 | 0.36 | 1/39536 (0.0%) | 0.78 | 12/61603 (0.0%) |
| 47 | Aa | 0.27 | 0/1757 | 0.50 | 0/2352 |
| 48 | AA | 0.28 | 0/670 | 0.53 | 0/897 |
| 49 | AB | 0.28 | 0/478 | 0.62 | 0/641 |
| 50 | Ab | 0.28 | 0/1734 | 0.48 | 0/2342 |
| 51 | AC | 0.29 | 0/526 | 0.55 | 0/696 |
| 52 | Ac | 0.28 | 0/1780 | 0.52 | 0/2396 |
| 53 | Ad | 0.32 | 0/2118 | 0.55 | 0/2848 |
| 54 | AD | 0.26 | 0/458 | 0.54 | 0/602 |
| 55 | AE | 0.26 | 0/806 | 0.56 | 0/1080 |
| 56 | Ae | 0.29 | 0/1530 | 0.53 | 0/2059 |
| 57 | Af | 0.27 | 0/1861 | 0.55 | 0/2481 |
| 58 | AF | 0.28 | 0/2477 | 0.52 | 0/3372 |
| 59 | Ag | 0.26 | 0/1522 | 0.51 | 0/2039 |
| 60 | AG | 0.29 | 0/470 | 0.54 | 0/623 |
| 61 | Ah | 0.29 | 0/1702 | 0.55 | 0/2273 |
| 62 | Ai | 0.33 | 0/1520 | 0.56 | 0/2030 |
| 63 | Aj | 0.29 | 0/836 | 0.48 | 0/1128 |
| 64 | Ak | 0.31 | 0/1239 | 0.55 | 0/1657 |
| 65 | Al | 0.25 | 0/868 | 0.48 | 0/1165 |
| 66 | Am | 0.26 | 0/1232 | 0.50 | 0/1656 |
| 67 | An | 0.27 | 0/1020 | 0.56 | 0/1366 |
| 68 | Ao | 0.30 | 0/1071 | 0.53 | 0/1432 |
| 69 | Aq | 0.27 | 0/1087 | 0.52 | 0/1459 |
| 70 | Ar | 0.28 | 0/1209 | 0.58 | 0/1620 |
| 71 | As | 0.28 | 0/1120 | 0.48 | 0/1499 |
| 72 | At | 0.26 | 0/825 | 0.57 | 0/1108 |
| 73 | Au | 0.27 | 0/635 | 0.51 | 0/851 |
| 74 | Av | 0.30 | 0/1052 | 0.54 | 0/1408 |

| Mol | Chain | Bond lengths | | Bond angles | |
|---|---|---|---|---|---|
| | | RMSZ | #\|Z\| >5 | RMSZ | #\|Z\| >5 |
| 75 | Aw | 0.30 | 0/1122 | 0.54 | 0/1498 |
| 76 | Ax | 0.30 | 0/1032 | 0.54 | 0/1371 |
| 77 | Ay | 0.29 | 0/561 | 0.52 | 0/755 |
| 78 | AZ | 0.29 | 0/1654 | 0.50 | 0/2249 |
| 79 | Ap | 0.29 | 0/1141 | 0.55 | 0/1527 |
| 80 | V | 0.25 | 0/1822 | 0.76 | 0/2841 |
| 81 | S | 0.25 | 0/331 | 0.55 | 0/436 |
| 82 | A | 0.26 | 0/6798 | 0.51 | 0/9181 |
| 83 | Bs | 0.25 | 0/1551 | 0.50 | 0/2094 |
| 84 | Bt | 0.24 | 0/1149 | 0.54 | 0/1549 |
| 85 | Bv | 0.25 | 0/1749 | 0.54 | 0/2344 |
| All | All | 0.33 | 3/236511 (0.0%) | 0.69 | 42/346015 (0.0%) |

All (3) bond length outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed(Å) | Ideal(Å) |
|---|---|---|---|---|---|---|---|
| 46 | A2 | 1 | U | OP3-P | -10.88 | 1.48 | 1.61 |
| 2 | B8 | 1 | C | OP3-P | -10.59 | 1.48 | 1.61 |
| 1 | B5 | 1 | C | OP3-P | -10.56 | 1.48 | 1.61 |

The worst 5 of 42 bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed($^o$) | Ideal($^o$) |
|---|---|---|---|---|---|---|---|
| 46 | A2 | 194 | C | C2-N1-C1' | 9.27 | 129.00 | 118.80 |
| 1 | B5 | 3250 | U | C2-N1-C1' | 8.71 | 128.15 | 117.70 |
| 1 | B5 | 3095 | C | C2-N1-C1' | 8.69 | 128.36 | 118.80 |
| 46 | A2 | 194 | C | N1-C2-O2 | 8.54 | 124.02 | 118.90 |
| 1 | B5 | 3095 | C | N1-C2-O2 | 8.36 | 123.92 | 118.90 |

There are no chirality outliers.

There are no planarity outliers.

## 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 | Az | 23/25 (92%) | 23 (100%) | 0 | 0 | 100 | 100 |
| 5 | BA | 244/257 (95%) | 235 (96%) | 9 (4%) | 0 | 100 | 100 |
| 6 | BB | 395/403 (98%) | 387 (98%) | 8 (2%) | 0 | 100 | 100 |
| 7 | BC | 359/421 (85%) | 354 (99%) | 5 (1%) | 0 | 100 | 100 |
| 8 | BD | 294/297 (99%) | 282 (96%) | 12 (4%) | 0 | 100 | 100 |
| 9 | BE | 219/298 (74%) | 211 (96%) | 8 (4%) | 0 | 100 | 100 |
| 10 | BF | 232/246 (94%) | 225 (97%) | 7 (3%) | 0 | 100 | 100 |
| 11 | BG | 206/266 (77%) | 198 (96%) | 8 (4%) | 0 | 100 | 100 |
| 12 | BH | 190/192 (99%) | 188 (99%) | 2 (1%) | 0 | 100 | 100 |
| 13 | BI | 211/214 (99%) | 207 (98%) | 4 (2%) | 0 | 100 | 100 |
| 14 | BJ | 168/178 (94%) | 164 (98%) | 4 (2%) | 0 | 100 | 100 |
| 15 | BL | 206/211 (98%) | 200 (97%) | 5 (2%) | 1 (0%) | 29 | 41 |
| 16 | BM | 128/131 (98%) | 126 (98%) | 2 (2%) | 0 | 100 | 100 |
| 17 | BN | 201/204 (98%) | 197 (98%) | 4 (2%) | 0 | 100 | 100 |
| 18 | BO | 199/203 (98%) | 196 (98%) | 3 (2%) | 0 | 100 | 100 |
| 19 | BP | 153/184 (83%) | 150 (98%) | 3 (2%) | 0 | 100 | 100 |
| 20 | BQ | 185/187 (99%) | 183 (99%) | 2 (1%) | 0 | 100 | 100 |
| 21 | BR | 164/196 (84%) | 164 (100%) | 0 | 0 | 100 | 100 |
| 22 | BS | 174/176 (99%) | 170 (98%) | 4 (2%) | 0 | 100 | 100 |
| 23 | BT | 157/160 (98%) | 154 (98%) | 3 (2%) | 0 | 100 | 100 |
| 24 | BU | 98/128 (77%) | 97 (99%) | 1 (1%) | 0 | 100 | 100 |
| 25 | BV | 137/140 (98%) | 136 (99%) | 1 (1%) | 0 | 100 | 100 |
| 26 | BW | 60/157 (38%) | 59 (98%) | 1 (2%) | 0 | 100 | 100 |
| 27 | BX | 117/155 (76%) | 114 (97%) | 3 (3%) | 0 | 100 | 100 |
| 28 | BY | 131/145 (90%) | 130 (99%) | 1 (1%) | 0 | 100 | 100 |

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| Mol | Chain | Analysed | Favoured | Allowed | Outliers | Percentiles | |
|---|---|---|---|---|---|---|---|
| 29 | BZ | 133/136 (98%) | 129 (97%) | 4 (3%) | 0 | 100 | 100 |
| 30 | Ba | 145/148 (98%) | 140 (97%) | 5 (3%) | 0 | 100 | 100 |
| 31 | Bb | 68/71 (96%) | 68 (100%) | 0 | 0 | 100 | 100 |
| 32 | Bc | 93/115 (81%) | 93 (100%) | 0 | 0 | 100 | 100 |
| 33 | Bd | 103/176 (58%) | 101 (98%) | 2 (2%) | 0 | 100 | 100 |
| 34 | Be | 128/135 (95%) | 128 (100%) | 0 | 0 | 100 | 100 |
| 35 | Bf | 108/110 (98%) | 108 (100%) | 0 | 0 | 100 | 100 |
| 36 | Bg | 106/117 (91%) | 105 (99%) | 1 (1%) | 0 | 100 | 100 |
| 37 | Bh | 121/123 (98%) | 120 (99%) | 1 (1%) | 0 | 100 | 100 |
| 38 | Bi | 98/105 (93%) | 98 (100%) | 0 | 0 | 100 | 100 |
| 39 | Bj | 84/97 (87%) | 84 (100%) | 0 | 0 | 100 | 100 |
| 40 | Bk | 67/70 (96%) | 66 (98%) | 1 (2%) | 0 | 100 | 100 |
| 41 | Bl | 48/51 (94%) | 46 (96%) | 2 (4%) | 0 | 100 | 100 |
| 42 | Bm | 50/128 (39%) | 50 (100%) | 0 | 0 | 100 | 100 |
| 43 | Bo | 102/105 (97%) | 99 (97%) | 3 (3%) | 0 | 100 | 100 |
| 44 | Bp | 89/92 (97%) | 86 (97%) | 3 (3%) | 0 | 100 | 100 |
| 45 | Br | 122/138 (88%) | 119 (98%) | 3 (2%) | 0 | 100 | 100 |
| 47 | Aa | 211/264 (80%) | 204 (97%) | 7 (3%) | 0 | 100 | 100 |
| 48 | AA | 81/84 (96%) | 77 (95%) | 4 (5%) | 0 | 100 | 100 |
| 49 | AB | 59/69 (86%) | 58 (98%) | 1 (2%) | 0 | 100 | 100 |
| 50 | Ab | 217/264 (82%) | 216 (100%) | 1 (0%) | 0 | 100 | 100 |
| 51 | AC | 61/156 (39%) | 58 (95%) | 3 (5%) | 0 | 100 | 100 |
| 52 | Ac | 223/243 (92%) | 216 (97%) | 7 (3%) | 0 | 100 | 100 |
| 53 | Ad | 260/263 (99%) | 256 (98%) | 4 (2%) | 0 | 100 | 100 |
| 54 | AD | 55/133 (41%) | 55 (100%) | 0 | 0 | 100 | 100 |
| 55 | AE | 97/115 (84%) | 97 (100%) | 0 | 0 | 100 | 100 |
| 56 | Ae | 189/204 (93%) | 180 (95%) | 8 (4%) | 1 (0%) | 29 | 41 |
| 57 | Af | 225/249 (90%) | 221 (98%) | 4 (2%) | 0 | 100 | 100 |
| 58 | AF | 309/317 (98%) | 290 (94%) | 19 (6%) | 0 | 100 | 100 |
| 59 | Ag | 185/194 (95%) | 173 (94%) | 12 (6%) | 0 | 100 | 100 |
| 60 | AG | 53/171 (31%) | 53 (100%) | 0 | 0 | 100 | 100 |

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| Mol | Chain | Analysed | Favoured | Allowed | Outliers | Percentiles | |
|---|---|---|---|---|---|---|---|
| 61 | Ah | 202/207 (98%) | 194 (96%) | 8 (4%) | 0 | 100 | 100 |
| 62 | Ai | 177/194 (91%) | 175 (99%) | 2 (1%) | 0 | 100 | 100 |
| 63 | Aj | 94/165 (57%) | 92 (98%) | 2 (2%) | 0 | 100 | 100 |
| 64 | Ak | 148/158 (94%) | 141 (95%) | 7 (5%) | 0 | 100 | 100 |
| 65 | Al | 107/132 (81%) | 96 (90%) | 11 (10%) | 0 | 100 | 100 |
| 66 | Am | 148/151 (98%) | 146 (99%) | 2 (1%) | 0 | 100 | 100 |
| 67 | An | 132/151 (87%) | 128 (97%) | 4 (3%) | 0 | 100 | 100 |
| 68 | Ao | 126/145 (87%) | 121 (96%) | 5 (4%) | 0 | 100 | 100 |
| 69 | Aq | 131/135 (97%) | 122 (93%) | 7 (5%) | 2 (2%) | 10 | 14 |
| 70 | Ar | 142/152 (93%) | 132 (93%) | 10 (7%) | 0 | 100 | 100 |
| 71 | As | 140/145 (97%) | 137 (98%) | 3 (2%) | 0 | 100 | 100 |
| 72 | At | 101/119 (85%) | 94 (93%) | 7 (7%) | 0 | 100 | 100 |
| 73 | Au | 81/83 (98%) | 80 (99%) | 1 (1%) | 0 | 100 | 100 |
| 74 | Av | 127/130 (98%) | 125 (98%) | 2 (2%) | 0 | 100 | 100 |
| 75 | Aw | 140/143 (98%) | 137 (98%) | 3 (2%) | 0 | 100 | 100 |
| 76 | Ax | 123/131 (94%) | 123 (100%) | 0 | 0 | 100 | 100 |
| 77 | Ay | 68/125 (54%) | 66 (97%) | 2 (3%) | 0 | 100 | 100 |
| 78 | AZ | 204/296 (69%) | 201 (98%) | 3 (2%) | 0 | 100 | 100 |
| 79 | Ap | 139/146 (95%) | 134 (96%) | 5 (4%) | 0 | 100 | 100 |
| 81 | S | 40/404 (10%) | 37 (92%) | 3 (8%) | 0 | 100 | 100 |
| 82 | A | 854/858 (100%) | 813 (95%) | 41 (5%) | 0 | 100 | 100 |
| 83 | Bs | 197/316 (62%) | 194 (98%) | 3 (2%) | 0 | 100 | 100 |
| 84 | Bt | 148/165 (90%) | 132 (89%) | 16 (11%) | 0 | 100 | 100 |
| 85 | Bv | 213/217 (98%) | 192 (90%) | 20 (9%) | 1 (0%) | 29 | 41 |
| All | All | 12523/14685 (85%) | 12156 (97%) | 362 (3%) | 5 (0%) | 100 | 100 |

All (5) Ramachandran outliers are listed below:

| Mol | Chain | Res | Type |
|---|---|---|---|
| 15 | BL | 64 | VAL |
| 56 | Ae | 42 | GLU |
| 69 | Aq | 80 | ARG |
| 85 | Bv | 28 | PHE |
| 69 | Aq | 81 | 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 | Az | 24/24 (100%) | 24 (100%) | 0 | 100 | 100 |
| 5 | BA | 189/199 (95%) | 189 (100%) | 0 | 100 | 100 |
| 6 | BB | 346/349 (99%) | 346 (100%) | 0 | 100 | 100 |
| 7 | BC | 305/338 (90%) | 305 (100%) | 0 | 100 | 100 |
| 8 | BD | 248/249 (100%) | 248 (100%) | 0 | 100 | 100 |
| 9 | BE | 196/256 (77%) | 196 (100%) | 0 | 100 | 100 |
| 10 | BF | 201/211 (95%) | 201 (100%) | 0 | 100 | 100 |
| 11 | BG | 186/225 (83%) | 186 (100%) | 0 | 100 | 100 |
| 12 | BH | 171/171 (100%) | 171 (100%) | 0 | 100 | 100 |
| 13 | BI | 178/178 (100%) | 177 (99%) | 1 (1%) | 86 | 94 |
| 14 | BJ | 142/148 (96%) | 141 (99%) | 1 (1%) | 84 | 92 |
| 15 | BL | 175/178 (98%) | 175 (100%) | 0 | 100 | 100 |
| 16 | BM | 112/113 (99%) | 112 (100%) | 0 | 100 | 100 |
| 17 | BN | 171/172 (99%) | 171 (100%) | 0 | 100 | 100 |
| 18 | BO | 172/173 (99%) | 172 (100%) | 0 | 100 | 100 |
| 19 | BP | 136/163 (83%) | 135 (99%) | 1 (1%) | 84 | 92 |
| 20 | BQ | 159/159 (100%) | 159 (100%) | 0 | 100 | 100 |
| 21 | BR | 147/175 (84%) | 147 (100%) | 0 | 100 | 100 |
| 22 | BS | 157/157 (100%) | 157 (100%) | 0 | 100 | 100 |
| 23 | BT | 139/140 (99%) | 139 (100%) | 0 | 100 | 100 |
| 24 | BU | 90/113 (80%) | 90 (100%) | 0 | 100 | 100 |
| 25 | BV | 106/107 (99%) | 106 (100%) | 0 | 100 | 100 |
| 26 | BW | 54/127 (42%) | 54 (100%) | 0 | 100 | 100 |
| 27 | BX | 107/134 (80%) | 107 (100%) | 0 | 100 | 100 |
| 28 | BY | 123/135 (91%) | 123 (100%) | 0 | 100 | 100 |
| 29 | BZ | 117/118 (99%) | 117 (100%) | 0 | 100 | 100 |

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| Mol | Chain | Analysed | Rotameric | Outliers | Percentiles | |
|---|---|---|---|---|---|---|
| 30 | Ba | 121/122 (99%) | 121 (100%) | 0 | 100 | 100 |
| 31 | Bb | 61/62 (98%) | 61 (100%) | 0 | 100 | 100 |
| 32 | Bc | 80/98 (82%) | 80 (100%) | 0 | 100 | 100 |
| 33 | Bd | 95/148 (64%) | 95 (100%) | 0 | 100 | 100 |
| 34 | Be | 118/123 (96%) | 118 (100%) | 0 | 100 | 100 |
| 35 | Bf | 89/89 (100%) | 89 (100%) | 0 | 100 | 100 |
| 36 | Bg | 93/101 (92%) | 93 (100%) | 0 | 100 | 100 |
| 37 | Bh | 110/110 (100%) | 110 (100%) | 0 | 100 | 100 |
| 38 | Bi | 85/89 (96%) | 85 (100%) | 0 | 100 | 100 |
| 39 | Bj | 73/80 (91%) | 73 (100%) | 0 | 100 | 100 |
| 40 | Bk | 64/65 (98%) | 64 (100%) | 0 | 100 | 100 |
| 41 | Bl | 47/48 (98%) | 47 (100%) | 0 | 100 | 100 |
| 42 | Bm | 48/115 (42%) | 48 (100%) | 0 | 100 | 100 |
| 43 | Bo | 92/92 (100%) | 92 (100%) | 0 | 100 | 100 |
| 44 | Bp | 74/75 (99%) | 74 (100%) | 0 | 100 | 100 |
| 45 | Br | 109/118 (92%) | 109 (100%) | 0 | 100 | 100 |
| 47 | Aa | 194/228 (85%) | 193 (100%) | 1 (0%) | 88 | 95 |
| 48 | AA | 75/76 (99%) | 75 (100%) | 0 | 100 | 100 |
| 49 | AB | 54/62 (87%) | 54 (100%) | 0 | 100 | 100 |
| 50 | Ab | 185/214 (86%) | 185 (100%) | 0 | 100 | 100 |
| 51 | AC | 56/140 (40%) | 55 (98%) | 1 (2%) | 59 | 76 |
| 52 | Ac | 189/202 (94%) | 189 (100%) | 0 | 100 | 100 |
| 53 | Ad | 223/224 (100%) | 221 (99%) | 2 (1%) | 78 | 90 |
| 54 | AD | 46/108 (43%) | 46 (100%) | 0 | 100 | 100 |
| 55 | AE | 87/99 (88%) | 87 (100%) | 0 | 100 | 100 |
| 56 | Ae | 161/170 (95%) | 161 (100%) | 0 | 100 | 100 |
| 57 | Af | 199/219 (91%) | 199 (100%) | 0 | 100 | 100 |
| 58 | AF | 270/275 (98%) | 270 (100%) | 0 | 100 | 100 |
| 59 | Ag | 167/174 (96%) | 167 (100%) | 0 | 100 | 100 |
| 60 | AG | 48/130 (37%) | 48 (100%) | 0 | 100 | 100 |
| 61 | Ah | 176/178 (99%) | 176 (100%) | 0 | 100 | 100 |

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| Mol | Chain | Analysed | Rotameric | Outliers | Percentiles |
|---|---|---|---|---|---|
| 62 | Ai | 160/168 (95%) | 159 (99%) | 1 (1%) | 86 94 |
| 63 | Aj | 88/136 (65%) | 88 (100%) | 0 | 100 100 |
| 64 | Ak | 133/140 (95%) | 132 (99%) | 1 (1%) | 81 91 |
| 65 | Al | 94/109 (86%) | 93 (99%) | 1 (1%) | 73 87 |
| 66 | Am | 130/131 (99%) | 130 (100%) | 0 | 100 100 |
| 67 | An | 105/118 (89%) | 105 (100%) | 0 | 100 100 |
| 68 | Ao | 114/130 (88%) | 114 (100%) | 0 | 100 100 |
| 69 | Aq | 119/121 (98%) | 115 (97%) | 4 (3%) | 37 56 |
| 70 | Ar | 125/132 (95%) | 125 (100%) | 0 | 100 100 |
| 71 | As | 112/114 (98%) | 112 (100%) | 0 | 100 100 |
| 72 | At | 94/106 (89%) | 94 (100%) | 0 | 100 100 |
| 73 | Au | 68/68 (100%) | 68 (100%) | 0 | 100 100 |
| 74 | Av | 112/113 (99%) | 112 (100%) | 0 | 100 100 |
| 75 | Aw | 114/115 (99%) | 113 (99%) | 1 (1%) | 78 90 |
| 76 | Ax | 107/113 (95%) | 107 (100%) | 0 | 100 100 |
| 77 | Ay | 61/102 (60%) | 60 (98%) | 1 (2%) | 62 79 |
| 78 | AZ | 171/245 (70%) | 171 (100%) | 0 | 100 100 |
| 79 | Ap | 116/119 (98%) | 116 (100%) | 0 | 100 100 |
| 81 | S | 33/312 (11%) | 33 (100%) | 0 | 100 100 |
| 82 | A | 729/730 (100%) | 728 (100%) | 1 (0%) | 93 98 |
| 83 | Bs | 167/259 (64%) | 167 (100%) | 0 | 100 100 |
| 84 | Bt | 124/137 (90%) | 124 (100%) | 0 | 100 100 |
| 85 | Bv | 194/196 (99%) | 192 (99%) | 2 (1%) | 76 88 |
| All | All | 10910/12460 (88%) | 10891 (100%) | 19 (0%) | 93 97 |

5 of 19 residues with a non-rotameric sidechain are listed below:

| Mol | Chain | Res | Type |
|---|---|---|---|
| 75 | Aw | 60 | LYS |
| 85 | Bv | 26 | ARG |
| 85 | Bv | 27 | LYS |
| 82 | A | 50 | ARG |
| 64 | Ak | 69 | ARG |

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 13 such sidechains are listed below:

| Mol | Chain | Res | Type |
|---|---|---|---|
| 49 | AB | 29 | GLN |
| 49 | AB | 45 | ASN |
| 85 | Bv | 171 | HIS |
| 83 | Bs | 68 | HIS |
| 83 | Bs | 159 | GLN |

### 5.3.3 RNA (i)

| Mol | Chain | Analysed | Backbone Outliers | Pucker Outliers |
|---|---|---|---|---|
| 1 | B5 | 3630/4441 (81%) | 562 (15%) | 30 (0%) |
| 2 | B8 | 156/157 (99%) | 19 (12%) | 0 |
| 3 | B7 | 118/119 (99%) | 9 (7%) | 0 |
| 46 | A2 | 1685/1823 (92%) | 277 (16%) | 4 (0%) |
| 80 | V | 75/76 (98%) | 13 (17%) | 2 (2%) |
| All | All | 5664/6616 (85%) | 880 (15%) | 36 (0%) |

5 of 880 RNA backbone outliers are listed below:

| Mol | Chain | Res | Type |
|---|---|---|---|
| 1 | B5 | 2 | G |
| 1 | B5 | 25 | A |
| 1 | B5 | 39 | A |
| 1 | B5 | 42 | A |
| 1 | B5 | 58 | G |

5 of 36 RNA pucker outliers are listed below:

| Mol | Chain | Res | Type |
|---|---|---|---|
| 1 | B5 | 4142 | U |
| 80 | V | 58 | A |
| 1 | B5 | 4432 | A |
| 46 | A2 | 1418 | U |
| 1 | B5 | 1197 | A |

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

145 non-standard protein/DNA/RNA residues are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul

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

| Mol | Type | Chain | Res | Link | Bond lengths | | | Bond angles | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Counts | RMSZ | $\#\|Z\| > 2$ | Counts | RMSZ | $\#\|Z\| > 2$ |
| 1 | PSU | B5 | 4019 | 1 | 18,21,22 | 0.75 | 1 (5%) | 22,30,33 | 0.55 | 0 |
| 46 | PSU | A2 | 1039 | 46 | 18,21,22 | 0.66 | 1 (5%) | 22,30,33 | 0.66 | 0 |
| 46 | OMG | A2 | 1286 | 46 | 18,26,27 | 0.92 | 1 (5%) | 19,38,41 | 0.63 | 0 |
| 46 | PSU | A2 | 93 | 46 | 18,21,22 | 0.52 | 0 | 22,30,33 | 0.56 | 0 |
| 1 | PSU | B5 | 1769 | 1 | 18,21,22 | 0.50 | 0 | 22,30,33 | 0.59 | 0 |
| 46 | 6MZ | A2 | 1786 | 86,46 | 18,25,26 | 0.71 | 0 | 16,36,39 | 0.83 | 1 (6%) |
| 1 | OMG | B5 | 2173 | 1 | 18,26,27 | 0.97 | 2 (11%) | 19,38,41 | 0.57 | 0 |
| 1 | A2M | B5 | 4014 | 1 | 18,25,26 | 0.65 | 0 | 18,36,39 | 0.70 | 1 (5%) |
| 1 | OMC | B5 | 3899 | 1 | 19,22,23 | 0.30 | 0 | 26,31,34 | 0.40 | 0 |
| 46 | A2M | A2 | 989 | 46 | 18,25,26 | 0.65 | 0 | 18,36,39 | 0.80 | 1 (5%) |
| 1 | OMU | B5 | 4063 | 1 | 19,22,23 | 0.33 | 0 | 26,31,34 | 0.67 | 0 |
| 1 | OMG | B5 | 3639 | 1 | 18,26,27 | 0.99 | 3 (16%) | 19,38,41 | 0.60 | 0 |
| 46 | PSU | A2 | 647 | 46 | 18,21,22 | 1.50 | 5 (27%) | 22,30,33 | 2.11 | 5 (22%) |
| 1 | PSU | B5 | 3742 | 1 | 18,21,22 | 0.53 | 0 | 22,30,33 | 0.57 | 0 |
| 46 | 4AC | A2 | 1295 | 46 | 21,24,25 | 0.34 | 0 | 29,34,37 | 0.41 | 0 |
| 1 | OMG | B5 | 1241 | 86,1 | 18,26,27 | 1.03 | 3 (16%) | 19,38,41 | 0.71 | 0 |
| 2 | PSU | B8 | 55 | 2 | 18,21,22 | 0.49 | 0 | 22,30,33 | 0.60 | 0 |
| 1 | PSU | B5 | 4071 | 1 | 18,21,22 | 0.53 | 0 | 22,30,33 | 0.56 | 0 |
| 1 | PSU | B5 | 3736 | 1 | 18,21,22 | 0.53 | 0 | 22,30,33 | 0.57 | 0 |
| 1 | A2M | B5 | 2564 | 1 | 18,25,26 | 0.66 | 0 | 18,36,39 | 0.70 | 1 (5%) |
| 1 | OMC | B5 | 3285 | 1 | 19,22,23 | 0.31 | 0 | 26,31,34 | 0.37 | 0 |
| 1 | OMU | B5 | 3749 | 1 | 19,22,23 | 0.31 | 0 | 26,31,34 | 0.48 | 0 |
| 46 | OMU | A2 | 171 | 46 | 19,22,23 | 0.27 | 0 | 26,31,34 | 0.63 | 0 |
| 1 | PSU | B5 | 1652 | 1 | 18,21,22 | 0.48 | 0 | 22,30,33 | 0.58 | 0 |
| 1 | PSU | B5 | 3739 | 1 | 18,21,22 | 0.47 | 0 | 22,30,33 | 0.62 | 0 |
| 1 | OMG | B5 | 3221 | 1 | 18,26,27 | 0.96 | 3 (16%) | 19,38,41 | 0.63 | 0 |
| 1 | OMC | B5 | 3364 | 1 | 19,22,23 | 0.34 | 0 | 26,31,34 | 0.46 | 0 |
| 46 | PSU | A2 | 1132 | 86,46 | 18,21,22 | 0.50 | 0 | 22,30,33 | 0.59 | 0 |
| 46 | PSU | A2 | 258 | 46 | 18,21,22 | 0.53 | 0 | 22,30,33 | 0.61 | 0 |
| 1 | OMG | B5 | 3104 | 1 | 18,26,27 | 0.96 | 3 (16%) | 19,38,41 | 0.67 | 0 |
| 2 | PSU | B8 | 69 | 86,2 | 18,21,22 | 0.54 | 0 | 22,30,33 | 0.63 | 1 (4%) |
| 1 | PSU | B5 | 3874 | 1 | 18,21,22 | 0.50 | 0 | 22,30,33 | 0.61 | 0 |
| 46 | OMG | A2 | 1445 | 86,46 | 18,26,27 | 0.95 | 2 (11%) | 19,38,41 | 0.57 | 0 |

| Mol | Type | Chain | Res | Link | Bond lengths | | | Bond angles | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Counts | RMSZ | $\#\|Z\|>2$ | Counts | RMSZ | $\#\|Z\|>2$ |
| 1 | 1MA | B5 | 1247 | 86,1 | 16,25,26 | 0.84 | 1 (6%) | 18,37,40 | 0.62 | 0 |
| 43 | MLZ | Bo | 53 | 43 | 8,9,10 | 0.70 | 0 | 4,9,11 | 0.57 | 0 |
| 46 | OMU | A2 | 121 | 46 | 19,22,23 | 0.31 | 0 | 26,31,34 | 0.49 | 0 |
| 46 | OMU | A2 | 389 | 46 | 19,22,23 | 0.28 | 0 | 26,31,34 | 0.46 | 0 |
| 78 | SAC | AZ | 2 | 78 | 7,8,9 | 0.96 | 0 | 8,9,11 | 0.80 | 0 |
| 1 | OMU | B5 | 3402 | 1 | 19,22,23 | 0.33 | 0 | 26,31,34 | 0.53 | 0 |
| 1 | A2M | B5 | 3201 | 1 | 18,25,26 | 0.66 | 0 | 18,36,39 | 0.72 | 1 (5%) |
| 1 | A2M | B5 | 3966 | 86,1 | 18,25,26 | 0.67 | 0 | 18,36,39 | 0.87 | 1 (5%) |
| 73 | AME | Au | 1 | 73 | 9,10,11 | 0.48 | 0 | 9,11,13 | 0.82 | 1 (11%) |
| 1 | PSU | B5 | 3397 | 86,1 | 18,21,22 | 0.51 | 0 | 22,30,33 | 0.59 | 0 |
| 1 | OMC | B5 | 3346 | 1 | 19,22,23 | 0.30 | 0 | 26,31,34 | 0.41 | 0 |
| 6 | HIC | BB | 245 | 6 | 8,11,12 | 1.59 | 2 (25%) | 6,14,16 | 1.03 | 0 |
| 46 | OMC | A2 | 478 | 46 | 19,22,23 | 0.31 | 0 | 26,31,34 | 0.39 | 0 |
| 1 | PSU | B5 | 3995 | 1 | 18,21,22 | 0.50 | 0 | 22,30,33 | 0.64 | 0 |
| 46 | OMG | A2 | 470 | 86,46 | 18,26,27 | 0.97 | 3 (16%) | 19,38,41 | 0.63 | 0 |
| 1 | OMC | B5 | 1265 | 1 | 19,22,23 | 0.29 | 0 | 26,31,34 | 0.45 | 0 |
| 1 | OMG | B5 | 3376 | 1 | 18,26,27 | 1.00 | 3 (16%) | 19,38,41 | 0.68 | 0 |
| 46 | PSU | A2 | 642 | 46 | 18,21,22 | 0.52 | 0 | 22,30,33 | 0.62 | 0 |
| 1 | OMU | B5 | 3670 | 1 | 19,22,23 | 0.33 | 0 | 26,31,34 | 0.46 | 0 |
| 1 | PSU | B5 | 3172 | 1 | 18,21,22 | 0.48 | 0 | 22,30,33 | 0.63 | 0 |
| 1 | PSU | B5 | 1606 | 86,1 | 18,21,22 | 0.52 | 0 | 22,30,33 | 0.61 | 0 |
| 1 | A2M | B5 | 3302 | 1 | 18,25,26 | 0.66 | 0 | 18,36,39 | 0.78 | 1 (5%) |
| 1 | OMG | B5 | 1548 | 86,1 | 18,26,27 | 0.98 | 2 (11%) | 19,38,41 | 0.63 | 0 |
| 1 | OMG | B5 | 3835 | 1 | 18,26,27 | 0.93 | 3 (16%) | 19,38,41 | 0.57 | 0 |
| 1 | OMG | B5 | 4061 | 1 | 18,26,27 | 0.93 | 3 (16%) | 19,38,41 | 0.67 | 0 |
| 1 | OMG | B5 | 3942 | 1 | 18,26,27 | 0.98 | 3 (16%) | 19,38,41 | 0.63 | 0 |
| 1 | PSU | B5 | 3116 | 1 | 18,21,22 | 0.51 | 0 | 22,30,33 | 0.57 | 0 |
| 46 | PSU | A2 | 821 | 46 | 18,21,22 | 0.54 | 0 | 22,30,33 | 0.54 | 0 |
| 1 | PSU | B5 | 2257 | 1 | 18,21,22 | 0.47 | 0 | 22,30,33 | 0.61 | 0 |
| 1 | OMU | B5 | 3941 | 86,1 | 19,22,23 | 0.30 | 0 | 26,31,34 | 0.44 | 0 |
| 46 | A2M | A2 | 1341 | 46 | 18,25,26 | 0.66 | 0 | 18,36,39 | 0.82 | 1 (5%) |
| 46 | PSU | A2 | 774 | 46 | 18,21,22 | 0.53 | 0 | 22,30,33 | 0.55 | 0 |
| 1 | A2M | B5 | 3344 | 1 | 18,25,26 | 0.66 | 0 | 18,36,39 | 0.74 | 1 (5%) |
| 1 | 5MC | B5 | 3890 | 86,1 | 18,22,23 | 0.36 | 0 | 26,32,35 | 0.65 | 0 |
| 1 | OMG | B5 | 2625 | 1 | 18,26,27 | 0.94 | 2 (11%) | 19,38,41 | 0.58 | 0 |
| 46 | MA6 | A2 | 1805 | 46 | 18,26,27 | 0.75 | 0 | 19,38,41 | 0.73 | 0 |
| 1 | OMC | B5 | 2553 | 1 | 19,22,23 | 0.30 | 0 | 26,31,34 | 0.39 | 0 |
| 1 | OMC | B5 | 2610 | 1 | 19,22,23 | 0.28 | 0 | 26,31,34 | 0.34 | 0 |
| 1 | A2M | B5 | 1447 | 1 | 18,25,26 | 0.65 | 0 | 18,36,39 | 0.76 | 1 (5%) |

| Mol | Type | Chain | Res | Link | Bond lengths | | | Bond angles | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Counts | RMSZ | $\#\|Z\|>2$ | Counts | RMSZ | $\#\|Z\|>2$ |
| 1 | A2M | B5 | 1251 | 1 | 18,25,26 | 0.64 | 0 | 18,36,39 | 0.74 | 1 (5%) |
| 46 | PSU | A2 | 775 | 46 | 18,21,22 | 0.54 | 0 | 22,30,33 | 0.61 | 0 |
| 1 | OMC | B5 | 3979 | 86,1 | 19,22,23 | 0.31 | 0 | 26,31,34 | 0.44 | 0 |
| 1 | A2M | B5 | 2112 | 86,1 | 18,25,26 | 0.65 | 0 | 18,36,39 | 0.72 | 1 (5%) |
| 1 | PSU | B5 | 1771 | 1 | 18,21,22 | 0.47 | 0 | 22,30,33 | 0.58 | 0 |
| 1 | PSU | B5 | 3900 | 1 | 18,21,22 | 0.53 | 0 | 22,30,33 | 0.58 | 0 |
| 46 | A2M | A2 | 27 | 86,46 | 18,25,26 | 0.66 | 0 | 18,36,39 | 0.74 | 1 (5%) |
| 46 | A2M | A2 | 165 | 46 | 18,25,26 | 0.66 | 0 | 18,36,39 | 0.90 | 2 (11%) |
| 46 | A2M | A2 | 551 | 46 | 18,25,26 | 0.65 | 0 | 18,36,39 | 0.78 | 1 (5%) |
| 1 | OMC | B5 | 3178 | 86,1 | 19,22,23 | 0.26 | 0 | 26,31,34 | 0.50 | 0 |
| 1 | PSU | B5 | 1600 | 86,1 | 18,21,22 | 0.85 | 1 (5%) | 22,30,33 | 0.62 | 0 |
| 1 | PSU | B5 | 4116 | 1 | 18,21,22 | 0.52 | 0 | 22,30,33 | 0.57 | 0 |
| 1 | PSU | B5 | 4372 | 86,1 | 18,21,22 | 0.50 | 0 | 22,30,33 | 0.57 | 0 |
| 46 | PSU | A2 | 610 | 46 | 18,21,22 | 0.49 | 0 | 22,30,33 | 0.61 | 0 |
| 1 | PSU | B5 | 3885 | 1 | 18,21,22 | 0.45 | 0 | 22,30,33 | 0.89 | 0 |
| 46 | MA6 | A2 | 1804 | 46 | 18,26,27 | 0.75 | 0 | 19,38,41 | 0.71 | 0 |
| 46 | OMG | A2 | 605 | 46 | 18,26,27 | 0.94 | 2 (11%) | 19,38,41 | 0.72 | 0 |
| 1 | PSU | B5 | 3114 | 86,1 | 18,21,22 | 0.47 | 0 | 22,30,33 | 0.59 | 0 |
| 1 | A2M | B5 | 3307 | 1 | 18,25,26 | 0.66 | 0 | 18,36,39 | 0.78 | 1 (5%) |
| 46 | PSU | A2 | 109 | 86,46 | 18,21,22 | 0.54 | 0 | 22,30,33 | 0.56 | 0 |
| 1 | OMU | B5 | 2586 | 1 | 19,22,23 | 0.33 | 0 | 26,31,34 | 0.55 | 0 |
| 1 | OMG | B5 | 1445 | 1 | 18,26,27 | 0.95 | 3 (16%) | 19,38,41 | 0.63 | 0 |
| 2 | OMG | B8 | 75 | 2 | 18,26,27 | 0.96 | 3 (16%) | 19,38,41 | 0.62 | 0 |
| 1 | A2M | B5 | 401 | 1 | 18,25,26 | 0.65 | 0 | 18,36,39 | 0.71 | 1 (5%) |
| 1 | A2M | B5 | 1457 | 86,1 | 18,25,26 | 0.67 | 0 | 18,36,39 | 0.82 | 1 (5%) |
| 1 | OMC | B5 | 3318 | 1 | 19,22,23 | 0.30 | 0 | 26,31,34 | 0.40 | 0 |
| 46 | A2M | A2 | 99 | 86,46 | 18,25,26 | 0.65 | 0 | 18,36,39 | 0.77 | 1 (5%) |
| 46 | A2M | A2 | 445 | 46 | 18,25,26 | 0.64 | 0 | 18,36,39 | 0.72 | 1 (5%) |
| 1 | A2M | B5 | 2536 | 1 | 18,25,26 | 0.66 | 0 | 18,36,39 | 0.89 | 1 (5%) |
| 1 | OMG | B5 | 4066 | 1 | 18,26,27 | 0.96 | 3 (16%) | 19,38,41 | 0.70 | 0 |
| 1 | PSU | B5 | 3975 | 1 | 18,21,22 | 0.56 | 0 | 22,30,33 | 0.55 | 0 |
| 1 | PSU | B5 | 1700 | 1 | 18,21,22 | 0.46 | 0 | 22,30,33 | 0.68 | 0 |
| 1 | OMG | B5 | 3937 | 1 | 18,26,27 | 1.00 | 3 (16%) | 19,38,41 | 0.60 | 0 |
| 67 | IAS | An | 138 | 67 | 6,7,8 | 1.04 | 0 | 6,8,10 | 1.29 | 1 (16%) |
| 1 | PSU | B5 | 3796 | 1 | 18,21,22 | 0.50 | 0 | 22,30,33 | 0.56 | 0 |
| 1 | A2M | B5 | 1780 | 86,1 | 18,25,26 | 0.65 | 0 | 18,36,39 | 0.88 | 1 (5%) |
| 1 | PSU | B5 | 3866 | 1 | 18,21,22 | 0.52 | 0 | 22,30,33 | 0.56 | 0 |
| 1 | OMC | B5 | 2171 | 86,1 | 19,22,23 | 0.31 | 0 | 26,31,34 | 0.45 | 0 |

| Mol | Type | Chain | Res | Link | Bond lengths | | | Bond angles | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Counts | RMSZ | $\#\|Z\|>2$ | Counts | RMSZ | $\#\|Z\|>2$ |
| 1 | OMG | B5 | 4080 | 1 | 18,26,27 | 0.98 | 2 (11%) | 19,38,41 | 0.62 | 0 |
| 1 | PSU | B5 | 4132 | 1 | 18,21,22 | 0.52 | 0 | 22,30,33 | 0.62 | 0 |
| 1 | A2M | B5 | 3262 | 1 | 18,25,26 | 0.64 | 0 | 18,36,39 | 0.85 | 1 (5%) |
| 46 | OMU | A2 | 315 | 46 | 19,22,23 | 0.32 | 0 | 26,31,34 | 0.58 | 0 |
| 46 | OMG | A2 | 562 | 46 | 18,26,27 | 0.97 | 3 (16%) | 19,38,41 | 0.59 | 0 |
| 1 | OMG | B5 | 2113 | 1 | 18,26,27 | 0.93 | 3 (16%) | 19,38,41 | 0.64 | 0 |
| 46 | OMU | A2 | 1284 | 86,46 | 19,22,23 | 0.24 | 0 | 26,31,34 | 0.48 | 0 |
| 71 | NMM | As | 67 | 71 | 9,11,12 | 1.56 | 1 (11%) | 6,12,14 | 4.10 | 2 (33%) |
| 46 | OMC | A2 | 1658 | 46 | 19,22,23 | 0.27 | 0 | 26,31,34 | 0.43 | 0 |
| 1 | OMG | B5 | 3269 | 1 | 18,26,27 | 0.94 | 2 (11%) | 19,38,41 | 0.58 | 0 |
| 46 | B8N | A2 | 1206 | 46 | 24,29,30 | 0.57 | 0 | 29,42,45 | 0.64 | 0 |
| 1 | A2M | B5 | 3195 | 1 | 18,25,26 | 0.67 | 0 | 18,36,39 | 0.75 | 1 (5%) |
| 1 | OMG | B5 | 3671 | 1 | 18,26,27 | 0.94 | 2 (11%) | 19,38,41 | 0.74 | 0 |
| 1 | UY1 | B5 | 3295 | 86,1 | 19,22,23 | 0.49 | 0 | 22,31,34 | 0.56 | 0 |
| 1 | PSU | B5 | 3804 | 1 | 18,21,22 | 0.49 | 0 | 22,30,33 | 0.61 | 0 |
| 1 | A2M | B5 | 399 | 1 | 18,25,26 | 0.65 | 0 | 18,36,39 | 0.74 | 1 (5%) |
| 1 | PSU | B5 | 3964 | 86,1 | 18,21,22 | 0.53 | 0 | 22,30,33 | 0.59 | 0 |
| 46 | A2M | A2 | 629 | 86,46 | 18,25,26 | 0.63 | 0 | 18,36,39 | 0.79 | 1 (5%) |
| 1 | OMG | B5 | 3813 | 1 | 18,26,27 | 0.95 | 3 (16%) | 19,38,41 | 0.60 | 0 |
| 46 | OMU | A2 | 116 | 46 | 19,22,23 | 0.28 | 0 | 26,31,34 | 0.42 | 0 |
| 1 | PSU | B5 | 4343 | 86,1 | 18,21,22 | 0.50 | 0 | 22,30,33 | 0.57 | 0 |
| 46 | PSU | A2 | 782 | 46 | 18,21,22 | 0.63 | 1 (5%) | 22,30,33 | 0.67 | 1 (4%) |
| 1 | OMC | B5 | 2100 | 1 | 19,22,23 | 0.34 | 0 | 26,31,34 | 0.42 | 0 |
| 46 | 4AC | A2 | 1796 | 46 | 21,24,25 | 0.30 | 0 | 29,34,37 | 0.30 | 0 |
| 1 | 5MC | B5 | 3259 | 86,1 | 18,22,23 | 0.31 | 0 | 26,32,35 | 0.42 | 0 |
| 1 | PSU | B5 | 1690 | 1 | 18,21,22 | 0.49 | 0 | 22,30,33 | 0.58 | 0 |
| 1 | OMC | B5 | 1790 | 86,1 | 19,22,23 | 0.30 | 0 | 26,31,34 | 0.63 | 0 |
| 1 | PSU | B5 | 3846 | 1 | 18,21,22 | 0.56 | 0 | 22,30,33 | 0.61 | 1 (4%) |
| 1 | 6MZ | B5 | 3663 | 1 | 18,25,26 | 0.72 | 0 | 16,36,39 | 0.71 | 1 (6%) |
| 46 | OMG | A2 | 644 | 46 | 18,26,27 | 0.96 | 3 (16%) | 19,38,41 | 0.68 | 0 |
| 1 | PSU | B5 | 4022 | 1 | 18,21,22 | 0.53 | 0 | 22,30,33 | 0.59 | 0 |
| 82 | DDE | A | 715 | 82 | 14,20,21 | 0.48 | 0 | 14,28,30 | 0.57 | 0 |
| 1 | PSU | B5 | 3755 | 1 | 18,21,22 | 0.49 | 0 | 22,30,33 | 0.58 | 0 |
| 1 | UR3 | B5 | 3973 | 1 | 19,22,23 | 0.31 | 0 | 26,32,35 | 0.30 | 0 |
| 1 | PSU | B5 | 3192 | 1 | 18,21,22 | 0.55 | 0 | 22,30,33 | 0.59 | 0 |

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns.

'-' means no outliers of that kind were identified.

| Mol | Type | Chain | Res | Link | Chirals | Torsions | Rings |
|---|---|---|---|---|---|---|---|
| 1 | PSU | B5 | 4019 | 1 | - | 2/7/25/26 | 0/2/2/2 |
| 46 | PSU | A2 | 1039 | 46 | - | 1/7/25/26 | 0/2/2/2 |
| 46 | OMG | A2 | 1286 | 46 | - | 0/5/27/28 | 0/3/3/3 |
| 46 | PSU | A2 | 93 | 46 | - | 0/7/25/26 | 0/2/2/2 |
| 1 | PSU | B5 | 1769 | 1 | - | 0/7/25/26 | 0/2/2/2 |
| 46 | 6MZ | A2 | 1786 | 86,46 | - | 0/5/27/28 | 0/3/3/3 |
| 1 | OMG | B5 | 2173 | 1 | - | 0/5/27/28 | 0/3/3/3 |
| 1 | A2M | B5 | 4014 | 1 | - | 0/5/27/28 | 0/3/3/3 |
| 1 | OMC | B5 | 3899 | 1 | - | 0/9/27/28 | 0/2/2/2 |
| 46 | A2M | A2 | 989 | 46 | - | 0/5/27/28 | 0/3/3/3 |
| 1 | OMU | B5 | 4063 | 1 | - | 0/9/27/28 | 0/2/2/2 |
| 1 | OMG | B5 | 3639 | 1 | - | 1/5/27/28 | 0/3/3/3 |
| 46 | PSU | A2 | 647 | 46 | - | 0/7/25/26 | 0/2/2/2 |
| 1 | PSU | B5 | 3742 | 1 | - | 0/7/25/26 | 0/2/2/2 |
| 46 | 4AC | A2 | 1295 | 46 | - | 2/11/29/30 | 0/2/2/2 |
| 1 | OMG | B5 | 1241 | 86,1 | - | 0/5/27/28 | 0/3/3/3 |
| 2 | PSU | B8 | 55 | 2 | - | 0/7/25/26 | 0/2/2/2 |
| 1 | PSU | B5 | 4071 | 1 | - | 0/7/25/26 | 0/2/2/2 |
| 1 | PSU | B5 | 3736 | 1 | - | 0/7/25/26 | 0/2/2/2 |
| 1 | A2M | B5 | 2564 | 1 | - | 0/5/27/28 | 0/3/3/3 |
| 1 | OMC | B5 | 3285 | 1 | - | 0/9/27/28 | 0/2/2/2 |
| 1 | OMU | B5 | 3749 | 1 | - | 0/9/27/28 | 0/2/2/2 |
| 46 | OMU | A2 | 171 | 46 | - | 0/9/27/28 | 0/2/2/2 |
| 1 | PSU | B5 | 1652 | 1 | - | 0/7/25/26 | 0/2/2/2 |
| 1 | PSU | B5 | 3739 | 1 | - | 0/7/25/26 | 0/2/2/2 |
| 1 | OMG | B5 | 3221 | 1 | - | 0/5/27/28 | 0/3/3/3 |
| 1 | OMC | B5 | 3364 | 1 | - | 0/9/27/28 | 0/2/2/2 |
| 46 | PSU | A2 | 1132 | 86,46 | - | 0/7/25/26 | 0/2/2/2 |
| 46 | PSU | A2 | 258 | 46 | - | 2/7/25/26 | 0/2/2/2 |
| 1 | OMG | B5 | 3104 | 1 | - | 0/5/27/28 | 0/3/3/3 |
| 2 | PSU | B8 | 69 | 86,2 | - | 0/7/25/26 | 0/2/2/2 |
| 1 | PSU | B5 | 3874 | 1 | - | 0/7/25/26 | 0/2/2/2 |
| 46 | OMG | A2 | 1445 | 86,46 | - | 1/5/27/28 | 0/3/3/3 |
| 1 | 1MA | B5 | 1247 | 86,1 | - | 0/3/25/26 | 0/3/3/3 |
| 43 | MLZ | Bo | 53 | 43 | - | 1/7/8/10 | - |
| 46 | OMU | A2 | 121 | 46 | - | 0/9/27/28 | 0/2/2/2 |
| 46 | OMU | A2 | 389 | 46 | - | 4/9/27/28 | 0/2/2/2 |
| 78 | SAC | AZ | 2 | 78 | - | 4/7/8/10 | - |
| 1 | OMU | B5 | 3402 | 1 | - | 0/9/27/28 | 0/2/2/2 |
| 1 | A2M | B5 | 3201 | 1 | - | 1/5/27/28 | 0/3/3/3 |
| 1 | A2M | B5 | 3966 | 86,1 | - | 0/5/27/28 | 0/3/3/3 |

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| Mol | Type | Chain | Res | Link | Chirals | Torsions | Rings |
|---|---|---|---|---|---|---|---|
| 73 | AME | Au | 1 | 73 | - | 2/9/10/12 | - |
| 1 | PSU | B5 | 3397 | 86,1 | - | 0/7/25/26 | 0/2/2/2 |
| 1 | OMC | B5 | 3346 | 1 | - | 0/9/27/28 | 0/2/2/2 |
| 6 | HIC | BB | 245 | 6 | - | 0/5/6/8 | 0/1/1/1 |
| 46 | OMC | A2 | 478 | 46 | - | 0/9/27/28 | 0/2/2/2 |
| 1 | PSU | B5 | 3995 | 1 | - | 0/7/25/26 | 0/2/2/2 |
| 46 | OMG | A2 | 470 | 86,46 | - | 1/5/27/28 | 0/3/3/3 |
| 1 | OMC | B5 | 1265 | 1 | - | 0/9/27/28 | 0/2/2/2 |
| 1 | OMG | B5 | 3376 | 1 | - | 0/5/27/28 | 0/3/3/3 |
| 46 | PSU | A2 | 642 | 46 | - | 0/7/25/26 | 0/2/2/2 |
| 1 | OMU | B5 | 3670 | 1 | - | 0/9/27/28 | 0/2/2/2 |
| 1 | PSU | B5 | 3172 | 1 | - | 0/7/25/26 | 0/2/2/2 |
| 1 | PSU | B5 | 1606 | 86,1 | - | 0/7/25/26 | 0/2/2/2 |
| 1 | A2M | B5 | 3302 | 1 | - | 0/5/27/28 | 0/3/3/3 |
| 1 | OMG | B5 | 1548 | 86,1 | - | 1/5/27/28 | 0/3/3/3 |
| 1 | OMG | B5 | 3835 | 1 | - | 0/5/27/28 | 0/3/3/3 |
| 1 | OMG | B5 | 4061 | 1 | - | 0/5/27/28 | 0/3/3/3 |
| 1 | OMG | B5 | 3942 | 1 | - | 0/5/27/28 | 0/3/3/3 |
| 1 | PSU | B5 | 3116 | 1 | - | 0/7/25/26 | 0/2/2/2 |
| 46 | PSU | A2 | 821 | 46 | - | 0/7/25/26 | 0/2/2/2 |
| 1 | PSU | B5 | 2257 | 1 | - | 0/7/25/26 | 0/2/2/2 |
| 1 | OMU | B5 | 3941 | 86,1 | - | 0/9/27/28 | 0/2/2/2 |
| 46 | A2M | A2 | 1341 | 46 | - | 0/5/27/28 | 0/3/3/3 |
| 46 | PSU | A2 | 774 | 46 | - | 0/7/25/26 | 0/2/2/2 |
| 1 | A2M | B5 | 3344 | 1 | - | 1/5/27/28 | 0/3/3/3 |
| 1 | 5MC | B5 | 3890 | 86,1 | - | 3/7/25/26 | 0/2/2/2 |
| 1 | OMG | B5 | 2625 | 1 | - | 0/5/27/28 | 0/3/3/3 |
| 46 | MA6 | A2 | 1805 | 46 | - | 1/7/29/30 | 0/3/3/3 |
| 1 | OMC | B5 | 2553 | 1 | - | 0/9/27/28 | 0/2/2/2 |
| 1 | OMC | B5 | 2610 | 1 | - | 0/9/27/28 | 0/2/2/2 |
| 1 | A2M | B5 | 1447 | 1 | - | 0/5/27/28 | 0/3/3/3 |
| 1 | A2M | B5 | 1251 | 1 | - | 0/5/27/28 | 0/3/3/3 |
| 46 | PSU | A2 | 775 | 46 | - | 2/7/25/26 | 0/2/2/2 |
| 1 | OMC | B5 | 3979 | 86,1 | - | 0/9/27/28 | 0/2/2/2 |
| 1 | A2M | B5 | 2112 | 86,1 | - | 1/5/27/28 | 0/3/3/3 |
| 1 | PSU | B5 | 1771 | 1 | - | 0/7/25/26 | 0/2/2/2 |
| 1 | PSU | B5 | 3900 | 1 | - | 0/7/25/26 | 0/2/2/2 |
| 46 | A2M | A2 | 27 | 86,46 | - | 0/5/27/28 | 0/3/3/3 |
| 46 | A2M | A2 | 165 | 46 | - | 0/5/27/28 | 0/3/3/3 |
| 46 | A2M | A2 | 551 | 46 | - | 0/5/27/28 | 0/3/3/3 |
| 1 | OMC | B5 | 3178 | 86,1 | - | 4/9/27/28 | 0/2/2/2 |

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| Mol | Type | Chain | Res | Link | Chirals | Torsions | Rings |
|---|---|---|---|---|---|---|---|
| 1 | PSU | B5 | 1600 | 86,1 | - | 0/7/25/26 | 0/2/2/2 |
| 1 | PSU | B5 | 4116 | 1 | - | 0/7/25/26 | 0/2/2/2 |
| 1 | PSU | B5 | 4372 | 86,1 | - | 0/7/25/26 | 0/2/2/2 |
| 46 | PSU | A2 | 610 | 46 | - | 0/7/25/26 | 0/2/2/2 |
| 1 | PSU | B5 | 3885 | 1 | - | 0/7/25/26 | 0/2/2/2 |
| 46 | MA6 | A2 | 1804 | 46 | - | 0/7/29/30 | 0/3/3/3 |
| 46 | OMG | A2 | 605 | 46 | - | 3/5/27/28 | 0/3/3/3 |
| 1 | PSU | B5 | 3114 | 86,1 | - | 0/7/25/26 | 0/2/2/2 |
| 1 | A2M | B5 | 3307 | 1 | - | 0/5/27/28 | 0/3/3/3 |
| 46 | PSU | A2 | 109 | 86,46 | - | 0/7/25/26 | 0/2/2/2 |
| 1 | OMU | B5 | 2586 | 1 | - | 0/9/27/28 | 0/2/2/2 |
| 1 | OMG | B5 | 1445 | 1 | - | 0/5/27/28 | 0/3/3/3 |
| 2 | OMG | B8 | 75 | 2 | - | 0/5/27/28 | 0/3/3/3 |
| 1 | A2M | B5 | 401 | 1 | - | 0/5/27/28 | 0/3/3/3 |
| 1 | A2M | B5 | 1457 | 86,1 | - | 2/5/27/28 | 0/3/3/3 |
| 1 | OMC | B5 | 3318 | 1 | - | 0/9/27/28 | 0/2/2/2 |
| 46 | A2M | A2 | 99 | 86,46 | - | 0/5/27/28 | 0/3/3/3 |
| 46 | A2M | A2 | 445 | 46 | - | 0/5/27/28 | 0/3/3/3 |
| 1 | A2M | B5 | 2536 | 1 | - | 1/5/27/28 | 0/3/3/3 |
| 1 | OMG | B5 | 4066 | 1 | - | 0/5/27/28 | 0/3/3/3 |
| 1 | PSU | B5 | 3975 | 1 | - | 0/7/25/26 | 0/2/2/2 |
| 1 | PSU | B5 | 1700 | 1 | - | 1/7/25/26 | 0/2/2/2 |
| 1 | OMG | B5 | 3937 | 1 | - | 1/5/27/28 | 0/3/3/3 |
| 67 | IAS | An | 138 | 67 | - | 2/7/7/8 | - |
| 1 | PSU | B5 | 3796 | 1 | - | 0/7/25/26 | 0/2/2/2 |
| 1 | A2M | B5 | 1780 | 86,1 | - | 0/5/27/28 | 0/3/3/3 |
| 1 | PSU | B5 | 3866 | 1 | - | 0/7/25/26 | 0/2/2/2 |
| 1 | OMC | B5 | 2171 | 86,1 | - | 2/9/27/28 | 0/2/2/2 |
| 1 | OMG | B5 | 4080 | 1 | - | 0/5/27/28 | 0/3/3/3 |
| 1 | PSU | B5 | 4132 | 1 | - | 0/7/25/26 | 0/2/2/2 |
| 1 | A2M | B5 | 3262 | 1 | - | 1/5/27/28 | 0/3/3/3 |
| 46 | OMU | A2 | 315 | 46 | - | 0/9/27/28 | 0/2/2/2 |
| 46 | OMG | A2 | 562 | 46 | - | 0/5/27/28 | 0/3/3/3 |
| 1 | OMG | B5 | 2113 | 1 | - | 2/5/27/28 | 0/3/3/3 |
| 46 | OMU | A2 | 1284 | 86,46 | - | 0/9/27/28 | 0/2/2/2 |
| 71 | NMM | As | 67 | 71 | - | 4/9/11/13 | - |
| 46 | OMC | A2 | 1658 | 46 | - | 0/9/27/28 | 0/2/2/2 |
| 1 | OMG | B5 | 3269 | 1 | - | 0/5/27/28 | 0/3/3/3 |
| 46 | B8N | A2 | 1206 | 46 | - | 3/16/34/35 | 0/2/2/2 |
| 1 | A2M | B5 | 3195 | 1 | - | 0/5/27/28 | 0/3/3/3 |
| 1 | OMG | B5 | 3671 | 1 | - | 1/5/27/28 | 0/3/3/3 |

*Continued on next page...*

*Continued from previous page...*

| Mol | Type | Chain | Res | Link | Chirals | Torsions | Rings |
|---|---|---|---|---|---|---|---|
| 1 | UY1 | B5 | 3295 | 86,1 | - | 2/9/27/28 | 0/2/2/2 |
| 1 | PSU | B5 | 3804 | 1 | - | 0/7/25/26 | 0/2/2/2 |
| 1 | A2M | B5 | 399 | 1 | - | 1/5/27/28 | 0/3/3/3 |
| 1 | PSU | B5 | 3964 | 86,1 | - | 2/7/25/26 | 0/2/2/2 |
| 46 | A2M | A2 | 629 | 86,46 | - | 3/5/27/28 | 0/3/3/3 |
| 1 | OMG | B5 | 3813 | 1 | - | 2/5/27/28 | 0/3/3/3 |
| 46 | OMU | A2 | 116 | 46 | - | 0/9/27/28 | 0/2/2/2 |
| 1 | PSU | B5 | 4343 | 86,1 | - | 0/7/25/26 | 0/2/2/2 |
| 46 | PSU | A2 | 782 | 46 | - | 0/7/25/26 | 0/2/2/2 |
| 1 | OMC | B5 | 2100 | 1 | - | 3/9/27/28 | 0/2/2/2 |
| 46 | 4AC | A2 | 1796 | 46 | - | 0/11/29/30 | 0/2/2/2 |
| 1 | 5MC | B5 | 3259 | 86,1 | - | 0/7/25/26 | 0/2/2/2 |
| 1 | PSU | B5 | 1690 | 1 | - | 0/7/25/26 | 0/2/2/2 |
| 1 | OMC | B5 | 1790 | 86,1 | - | 0/9/27/28 | 0/2/2/2 |
| 1 | PSU | B5 | 3846 | 1 | - | 0/7/25/26 | 0/2/2/2 |
| 1 | 6MZ | B5 | 3663 | 1 | - | 0/5/27/28 | 0/3/3/3 |
| 46 | OMG | A2 | 644 | 46 | - | 1/5/27/28 | 0/3/3/3 |
| 1 | PSU | B5 | 4022 | 1 | - | 0/7/25/26 | 0/2/2/2 |
| 82 | DDE | A | 715 | 82 | - | 6/20/21/23 | 0/1/1/1 |
| 1 | PSU | B5 | 3755 | 1 | - | 0/7/25/26 | 0/2/2/2 |
| 1 | UR3 | B5 | 3973 | 1 | - | 0/7/25/26 | 0/2/2/2 |
| 1 | PSU | B5 | 3192 | 1 | - | 2/7/25/26 | 0/2/2/2 |

The worst 5 of 81 bond length outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed(Å) | Ideal(Å) |
|---|---|---|---|---|---|---|---|
| 71 | As | 67 | NMM | CZ-NH2 | 4.16 | 1.44 | 1.34 |
| 6 | BB | 245 | HIC | CD2-CG | 3.40 | 1.41 | 1.36 |
| 46 | A2 | 647 | PSU | C4-N3 | -3.24 | 1.32 | 1.38 |
| 1 | B5 | 1600 | PSU | O4'-C1' | -3.21 | 1.39 | 1.43 |
| 1 | B5 | 1241 | OMG | C5-C6 | -2.53 | 1.42 | 1.47 |

The worst 5 of 40 bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed($^o$) | Ideal($^o$) |
|---|---|---|---|---|---|---|---|
| 71 | As | 67 | NMM | NE-CZ-NH2 | -8.97 | 111.26 | 119.48 |
| 46 | A2 | 647 | PSU | N1-C2-N3 | 6.48 | 122.47 | 115.13 |
| 46 | A2 | 647 | PSU | C4-N3-C2 | -4.44 | 119.95 | 126.34 |
| 71 | As | 67 | NMM | NE-CZ-NH1 | 4.25 | 128.22 | 120.26 |
| 46 | A2 | 647 | PSU | O2-C2-N1 | -3.64 | 118.78 | 122.79 |

There are no chirality outliers.

5 of 80 torsion outliers are listed below:

| Mol | Chain | Res | Type | Atoms |
|---|---|---|---|---|
| 1 | B5 | 399 | A2M | C1'-C2'-O2'-CM' |
| 1 | B5 | 2536 | A2M | C1'-C2'-O2'-CM' |
| 1 | B5 | 3178 | OMC | C2'-C1'-N1-C6 |
| 1 | B5 | 3192 | PSU | C3'-C4'-C5'-O5' |
| 1 | B5 | 3201 | A2M | C1'-C2'-O2'-CM' |

There are no ring outliers.

No monomer is involved in short contacts.

## 5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

## 5.6 Ligand geometry (i)

Of 501 ligands modelled in this entry, 500 are monoatomic - leaving 1 for Mogul analysis.

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

| Mol | Type | Chain | Res | Link | Bond lengths | | | Bond angles | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Counts | RMSZ | $\#\|Z\| > 2$ | Counts | RMSZ | $\#\|Z\| > 2$ |
| 88 | GDP | A | 901 | - | 24,30,30 | 0.87 | 1 (4%) | 30,47,47 | 0.89 | 1 (3%) |

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

| Mol | Type | Chain | Res | Link | Chirals | Torsions | Rings |
|---|---|---|---|---|---|---|---|
| 88 | GDP | A | 901 | - | - | 1/12/32/32 | 0/3/3/3 |

All (1) bond length outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed(Å) | Ideal(Å) |
|---|---|---|---|---|---|---|---|
| 88 | A | 901 | GDP | C5-C6 | -2.11 | 1.43 | 1.47 |

All (1) bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed($^o$) | Ideal($^o$) |
|---|---|---|---|---|---|---|---|
| 88 | A | 901 | GDP | PA-O3A-PB | 3.35 | 144.33 | 132.83 |

There are no chirality outliers.

All (1) torsion outliers are listed below:

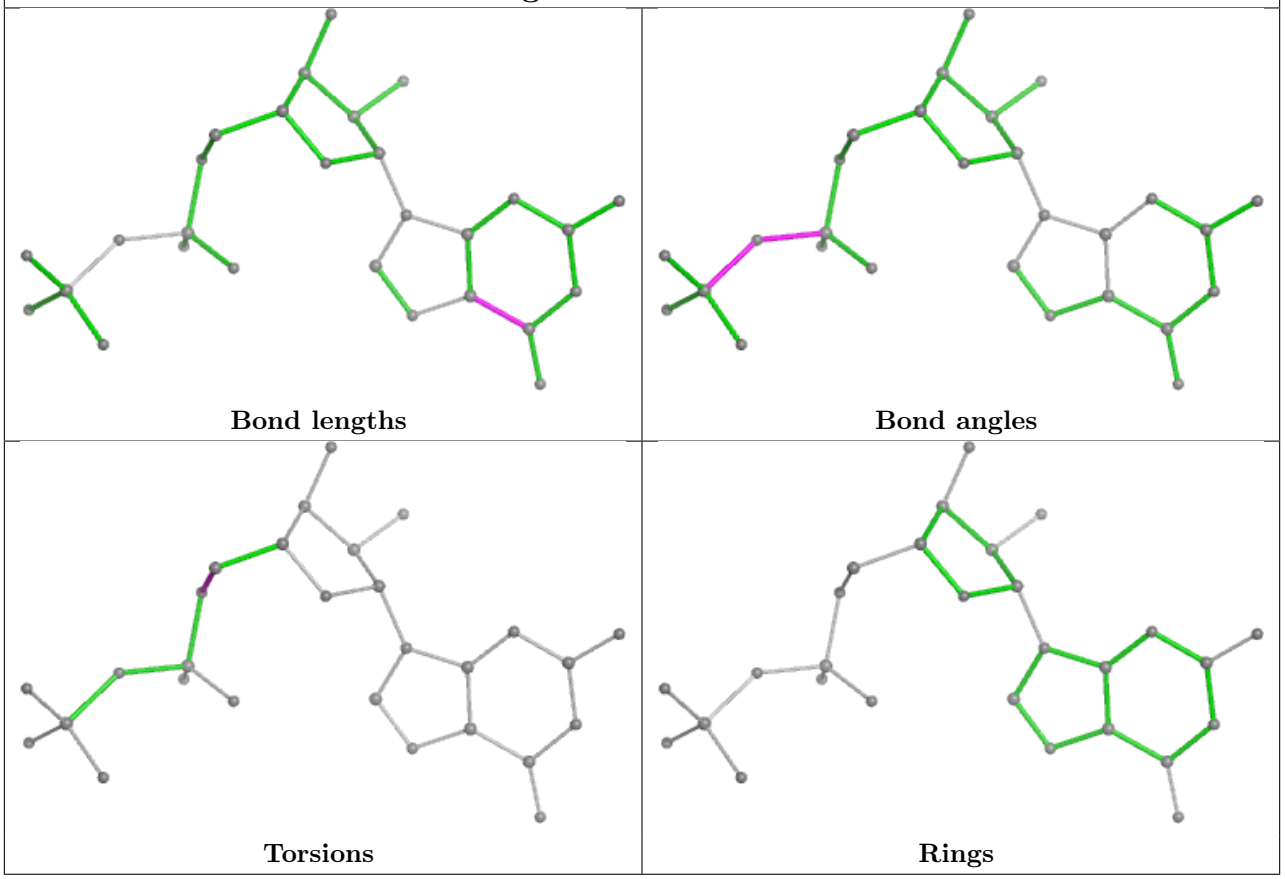
| Mol | Chain | Res | Type | Atoms |
|---|---|---|---|---|
| 88 | A | 901 | GDP | C4'-C5'-O5'-PA |

There are no ring outliers.

No monomer is involved in short contacts.

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

**Ligand GDP A 901**




## 5.7 Other polymers (i)

There are no such residues in this entry.

## 5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

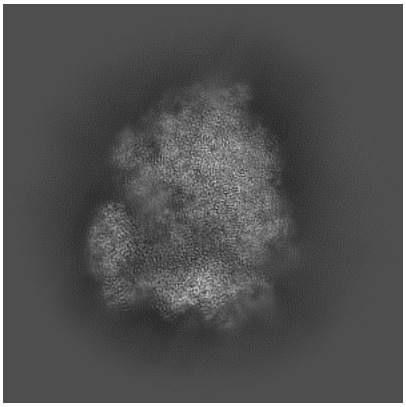
# 6 Map visualisation

This section contains visualisations of the EMDB entry EMD-18169. These allow visual inspection of the internal detail of the map and identification of artifacts.

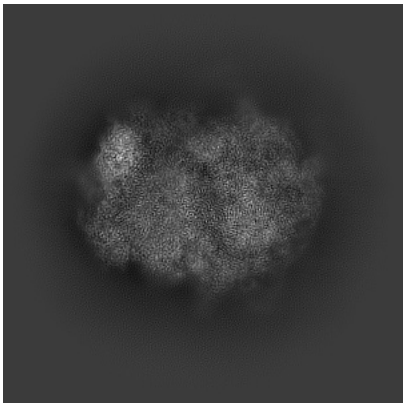
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

## 6.1 Orthogonal projections

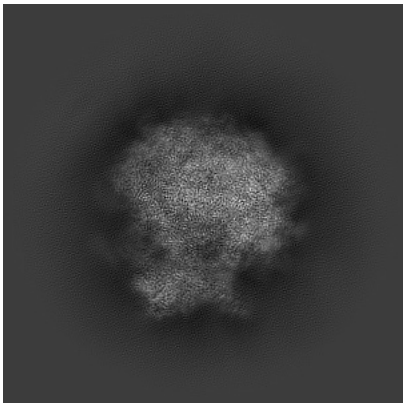
### 6.1.1 Primary map



X



Y

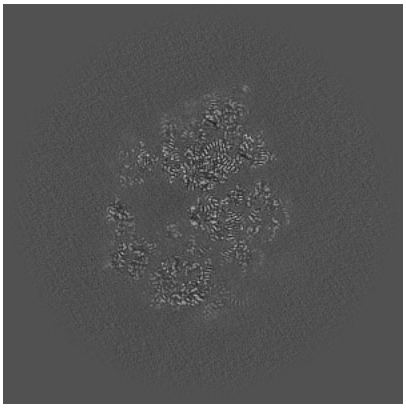


Z

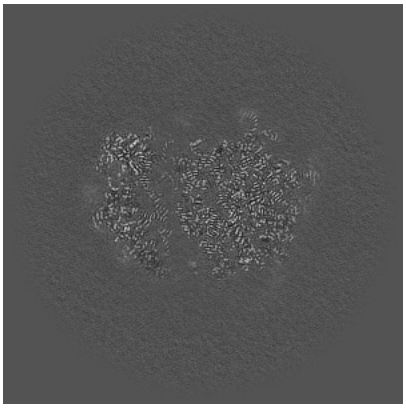
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices

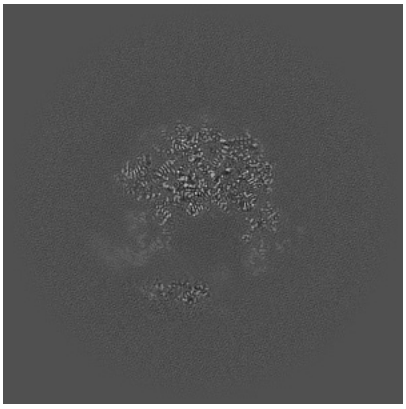
### 6.2.1 Primary map



X Index: 290



Y Index: 290

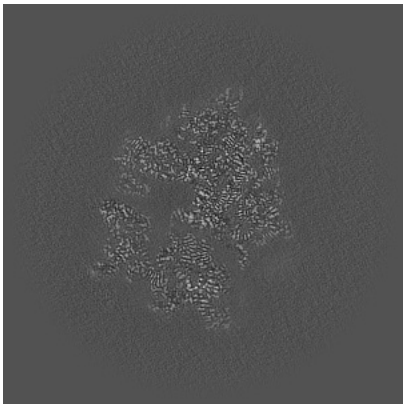


Z Index: 290

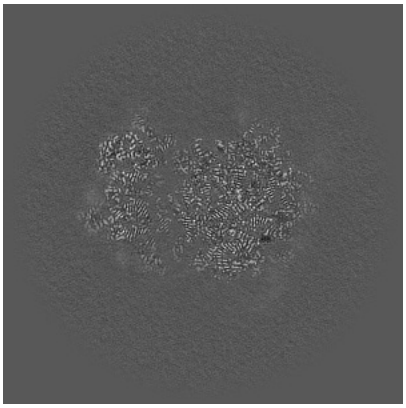
The images above show central slices of the map in three orthogonal directions.

## 6.3 Largest variance slices (i)

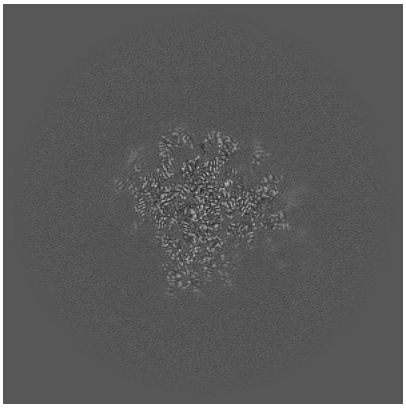
### 6.3.1 Primary map



X Index: 270



Y Index: 298

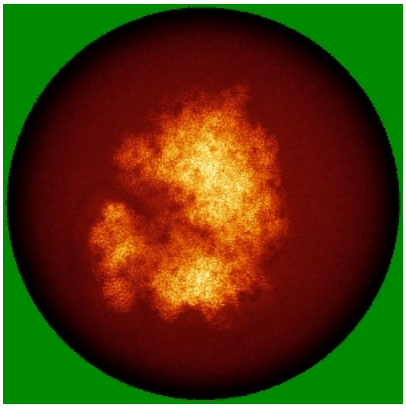


Z Index: 348

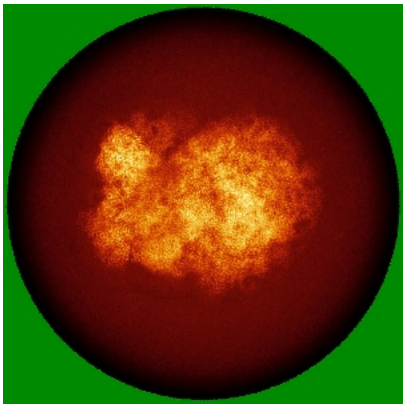
The images above show the largest variance slices of the map in three orthogonal directions.

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

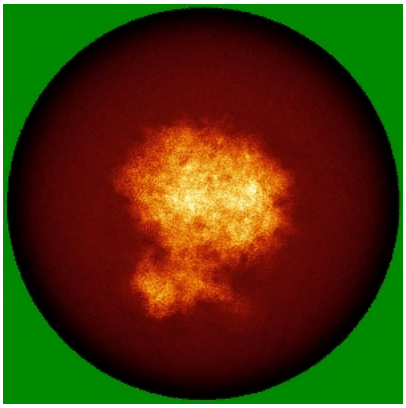
### 6.4.1 Primary map



X



Y

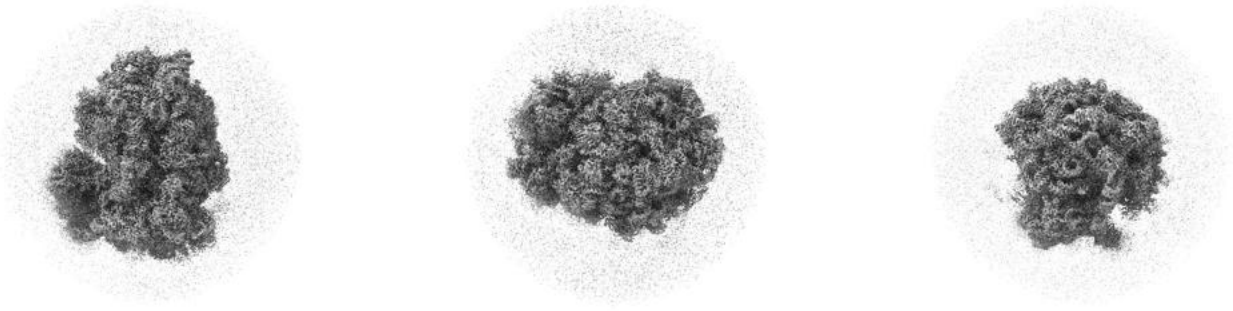


Z

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

## 6.5 Orthogonal surface views (i)

### 6.5.1 Primary map



X Y Z

The images above show the 3D surface view of the map at the recommended contour level 3.0. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

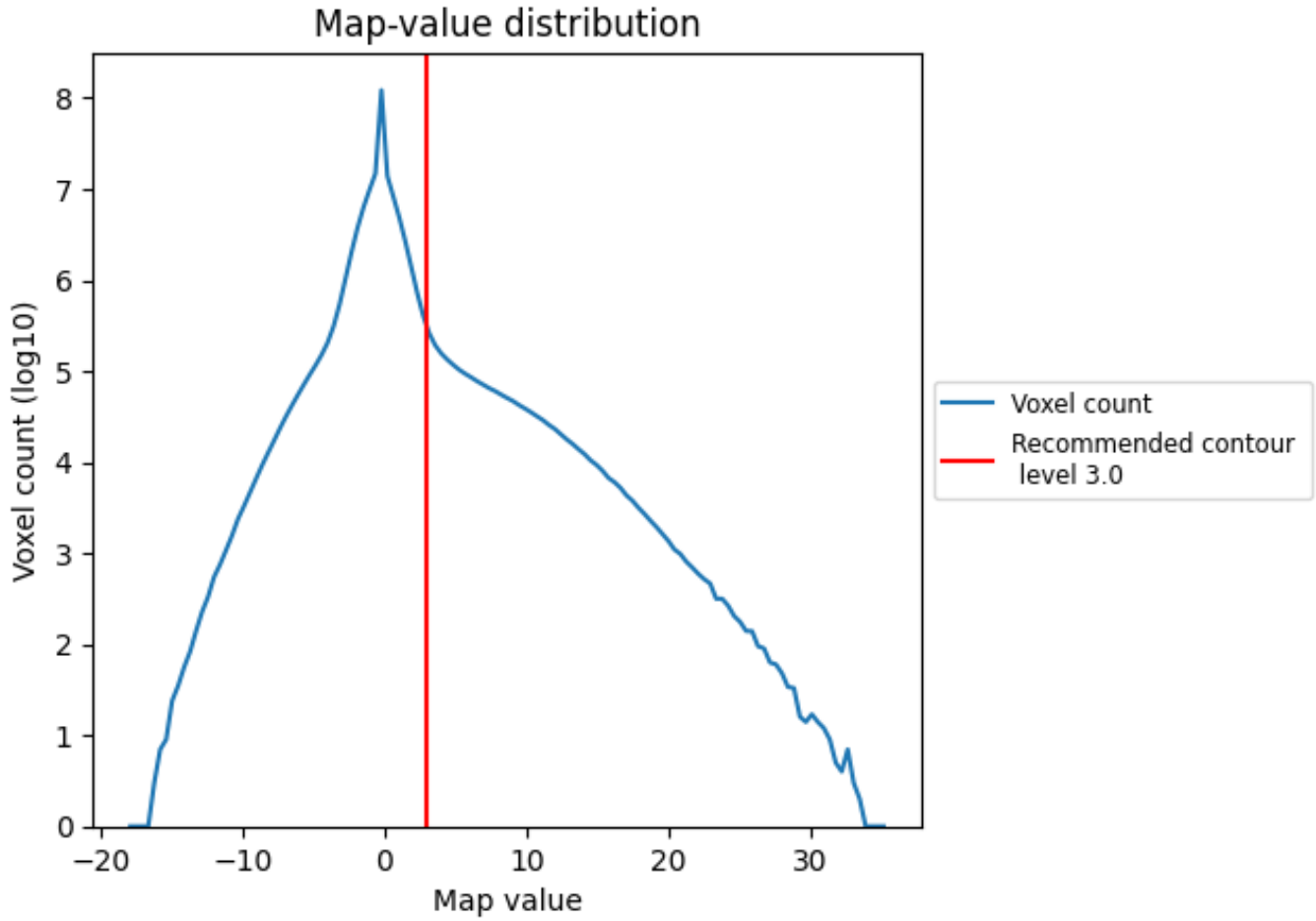
## 6.6 Mask visualisation (i)

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

# 7 Map analysis

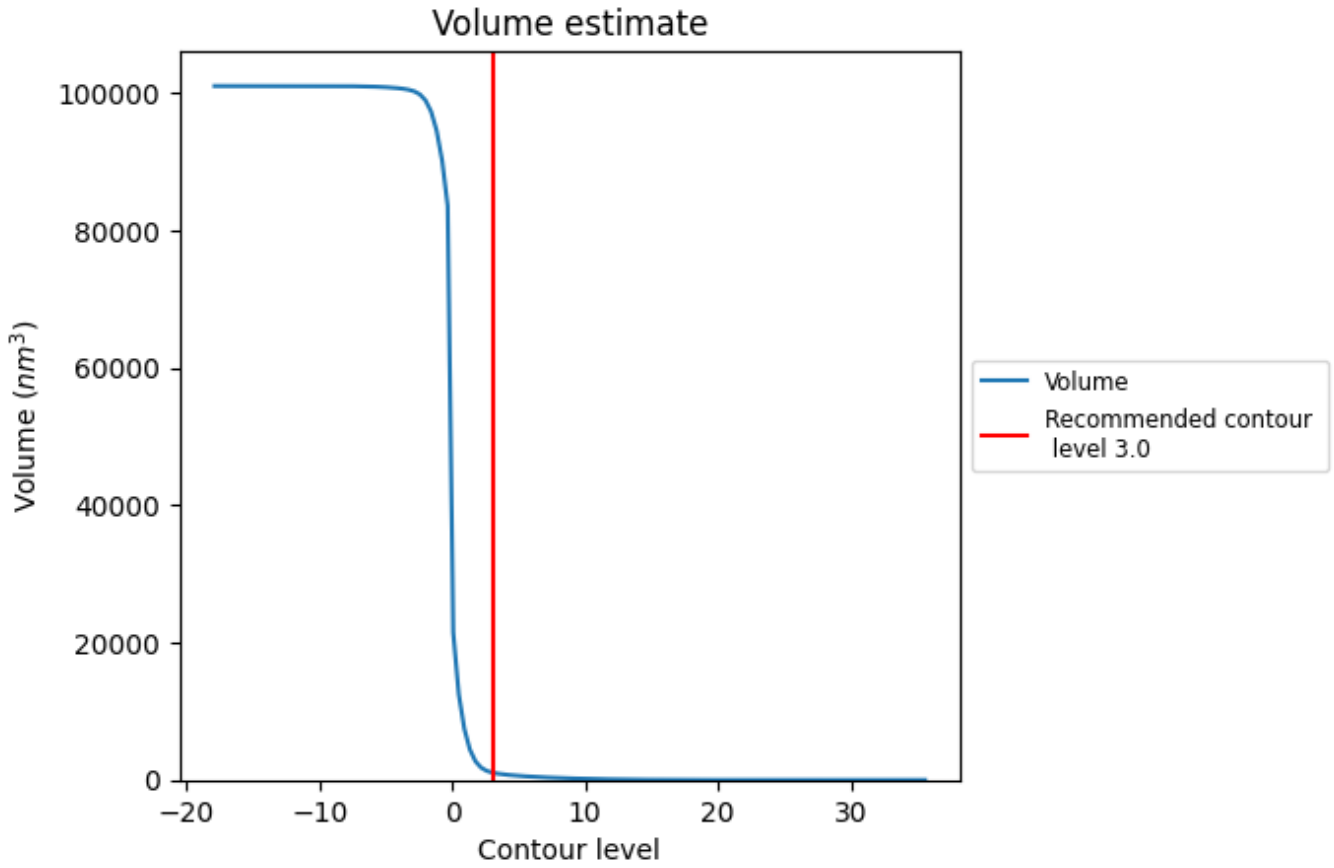
This section contains the results of statistical analysis of the map.

## 7.1 Map-value distribution




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

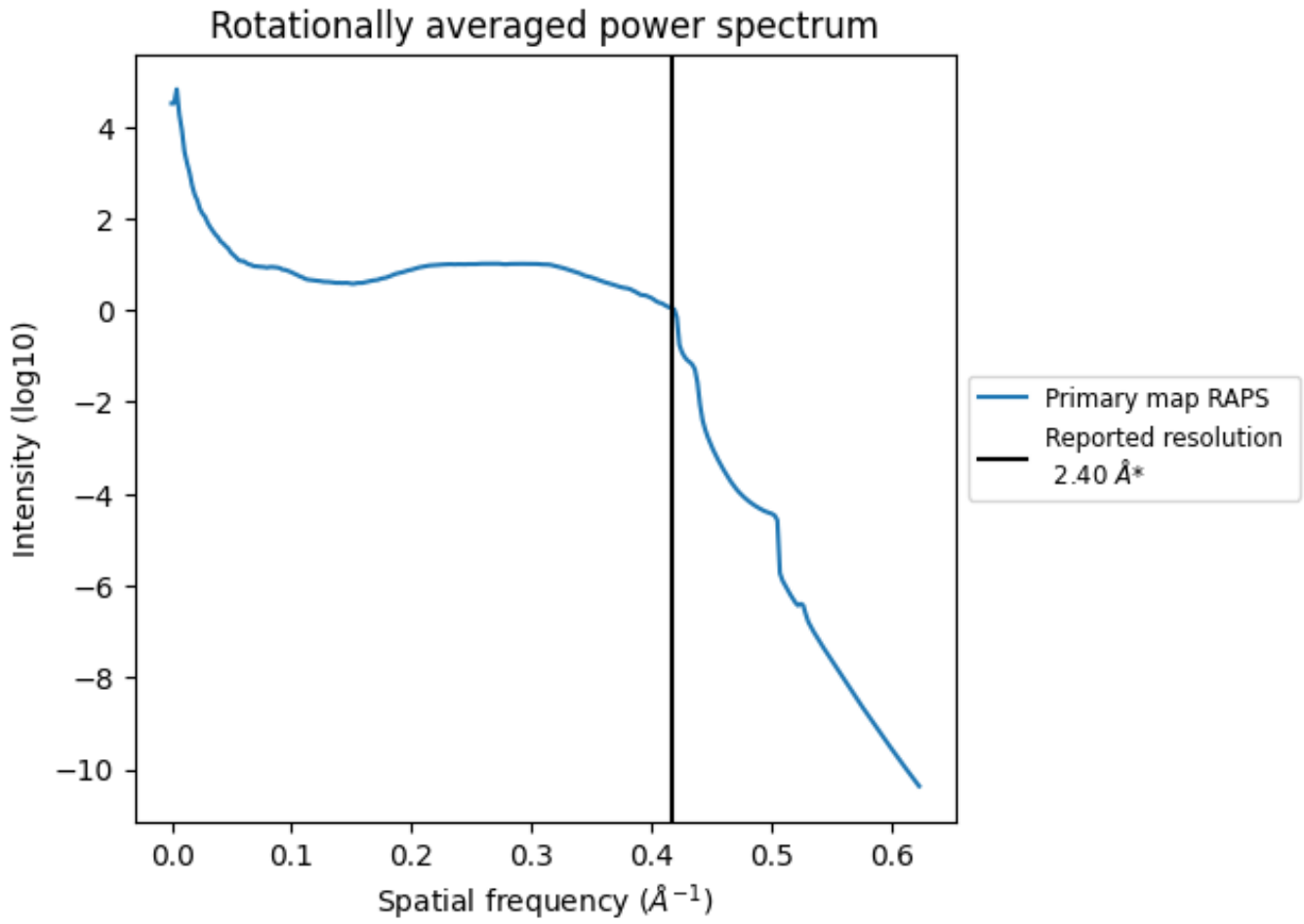
## 7.2 Volume estimate (i)




The volume at the recommended contour level is 1075 $nm^3$; this corresponds to an approximate mass of 971 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 0.417 Å$^{-1}$

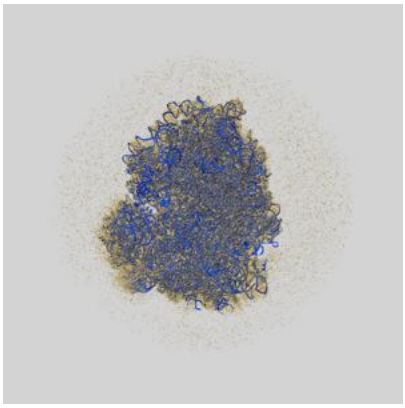
# 8 Fourier-Shell correlation (i)

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

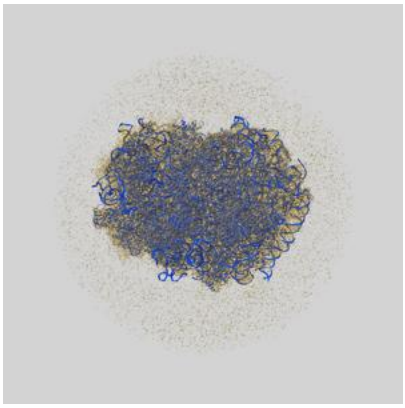
# 9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-18169 and PDB model 8Q87. Per-residue inclusion information can be found in section 3 on page 25.

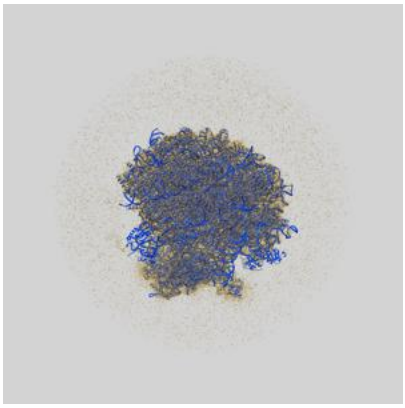
## 9.1 Map-model overlay



X



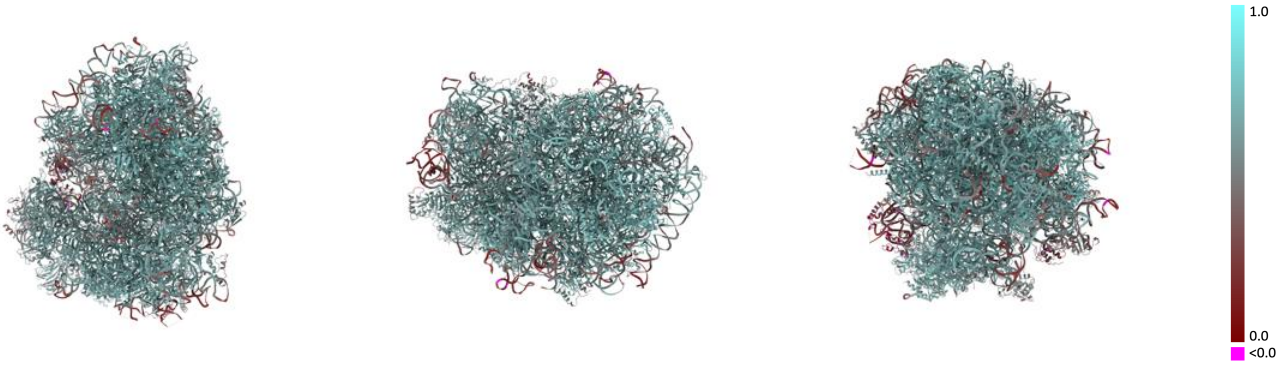
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 3.0 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.

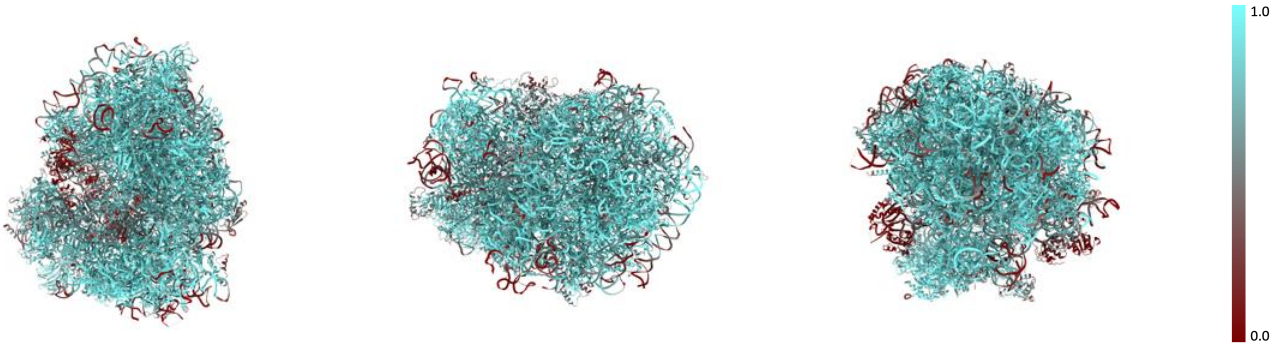
## 9.2 Q-score mapped to coordinate model (i)




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.

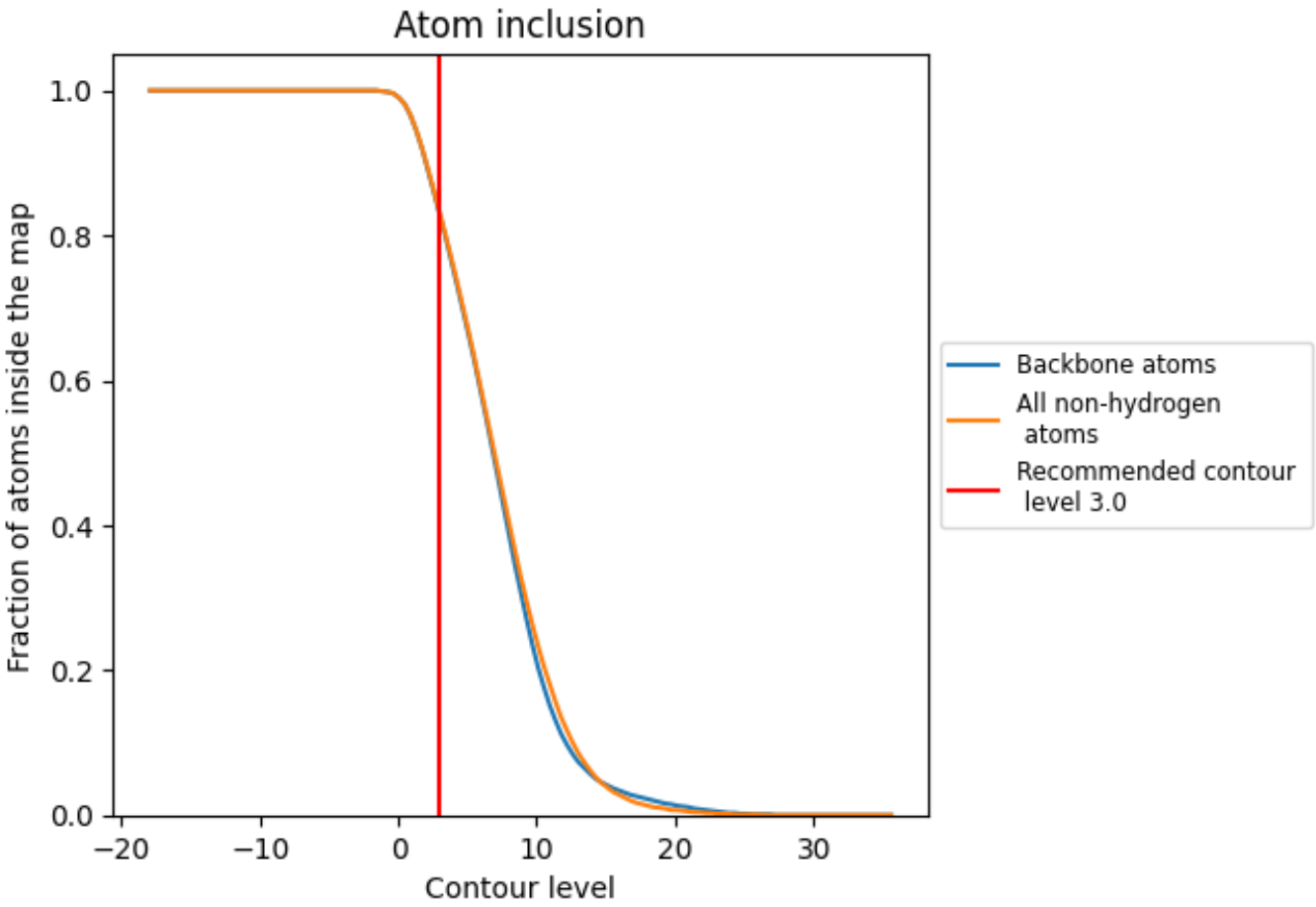
## 9.3 Atom inclusion mapped to coordinate model (i)




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 (3.0).

## 9.4 Atom inclusion (i)




At the recommended contour level, 83% of all backbone atoms, 83% of all non-hydrogen atoms, are inside the map.

## 9.5 Map-model fit summary (i)

The table lists the average atom inclusion at the recommended contour level (3.0) and Q-score for the entire model and for each chain.

| Chain | Atom inclusion | Q-score |
|---|---|---|
| All | 0.8320 | 0.6210 |
| A | 0.5550 | 0.5490 |
| A2 | 0.8430 | 0.6100 |
| AA | 0.7770 | 0.5950 |
| AB | 0.6130 | 0.5490 |
| AC | 0.5290 | 0.4900 |
| AD | 0.6680 | 0.5920 |
| AE | 0.7950 | 0.6360 |
| AF | 0.8910 | 0.6120 |
| AG | 0.9460 | 0.6720 |
| AZ | 0.9240 | 0.6550 |
| Aa | 0.7530 | 0.5970 |
| Ab | 0.9070 | 0.6600 |
| Ac | 0.8050 | 0.6120 |
| Ad | 0.9730 | 0.6610 |
| Ae | 0.8900 | 0.6330 |
| Af | 0.7970 | 0.5950 |
| Ag | 0.6480 | 0.5430 |
| Ah | 0.8140 | 0.6110 |
| Ai | 0.9560 | 0.6540 |
| Aj | 0.9380 | 0.6270 |
| Ak | 0.8510 | 0.6340 |
| Al | 0.5210 | 0.4410 |
| Am | 0.8190 | 0.6330 |
| An | 0.7150 | 0.6000 |
| Ao | 0.8360 | 0.6320 |
| Ap | 0.9520 | 0.6600 |
| Aq | 0.7090 | 0.5810 |
| Ar | 0.8930 | 0.6360 |
| As | 0.9510 | 0.6630 |
| At | 0.8530 | 0.5940 |
| Au | 0.9390 | 0.6510 |
| Av | 0.9770 | 0.6730 |
| Aw | 0.8600 | 0.6540 |
| Ax | 0.9240 | 0.6420 |

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| Chain | Atom inclusion | Q-score |
|---|---|---|
| Ay | 0.9150 | 0.6300 |
| Az | 0.7250 | 0.6440 |
| B5 | 0.8480 | 0.6160 |
| B7 | 0.9710 | 0.6670 |
| B8 | 0.8960 | 0.6430 |
| BA | 0.9500 | 0.6980 |
| BB | 0.9380 | 0.6910 |
| BC | 0.9400 | 0.6880 |
| BD | 0.8500 | 0.6400 |
| BE | 0.8610 | 0.6510 |
| BF | 0.9430 | 0.6940 |
| BG | 0.7900 | 0.6220 |
| BH | 0.9170 | 0.6810 |
| BI | 0.8870 | 0.6640 |
| BJ | 0.6850 | 0.5990 |
| BL | 0.8750 | 0.6540 |
| BM | 0.9460 | 0.6900 |
| BN | 0.9930 | 0.7100 |
| BO | 0.9520 | 0.6890 |
| BP | 0.9350 | 0.6860 |
| BQ | 0.9700 | 0.7020 |
| BR | 0.8430 | 0.6510 |
| BS | 0.9710 | 0.6970 |
| BT | 0.8890 | 0.6670 |
| BU | 0.5960 | 0.5680 |
| BV | 0.8720 | 0.6810 |
| BW | 0.8760 | 0.6750 |
| BX | 0.8990 | 0.6610 |
| BY | 0.9050 | 0.6640 |
| BZ | 0.8600 | 0.6500 |
| Ba | 0.9590 | 0.7010 |
| Bb | 0.7950 | 0.6340 |
| Bc | 0.8290 | 0.6570 |
| Bd | 0.8780 | 0.6650 |
| Be | 0.9620 | 0.6960 |
| Bf | 0.9650 | 0.7040 |
| Bg | 0.9220 | 0.6730 |
| Bh | 0.8900 | 0.6600 |
| Bi | 0.8690 | 0.6590 |
| Bj | 0.9780 | 0.7000 |
| Bk | 0.6550 | 0.5910 |
| Bl | 0.9050 | 0.6660 |

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| Chain | Atom inclusion | Q-score |
|---|---|---|
| Bm | 0.9380 | 0.6810 |
| Bo | 0.8970 | 0.6760 |
| Bp | 0.8640 | 0.6760 |
| Br | 0.9360 | 0.6780 |
| Bs | 0.1530 | 0.4360 |
| Bt | 0.0510 | 0.2570 |
| Bv | 0.0170 | 0.2360 |
| S | 0.6620 | 0.6280 |
| V | 0.6090 | 0.5160 |