# Full wwPDB EM Validation Report

Apr 21, 2025 – 02:03 PM EDT

| | | |
|---|---|---|
| PDB ID | : | 9B0N / pdb_00009b0n |
| EMDB ID | : | EMD-44047 |
| Title | : | In situ human Post-eEF1A-AT-P state 80S ribosome |
| Authors | : | Wei, Z.; Yong, X. |
| Deposited on | : | 2024-03-12 |
| Resolution | : | 2.92 Å(reported) |

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

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

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

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

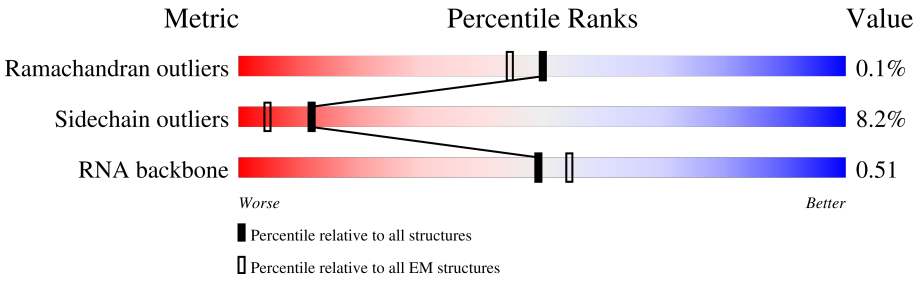
| | | |
|---|---|---|
| EMDB validation analysis | : | 0.0.1.dev117 |
| Mogul | : | 2022.3.0, CSD as543be (2022) |
| MolProbity | : | 4.02b-467 |
| Percentile statistics | : | 20231227.v01 (using entries in the PDB archive December 27th 2023) |
| MapQ | : | 1.9.13 |
| Ideal geometry (proteins) | : | Engh & Huber (2001) |
| Ideal geometry (DNA, RNA) | : | Parkinson et al. (1996) |
| Validation Pipeline (wwPDB-VP) | : | 2.42 |

# 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 2.92 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 | 207382 | 16835 |
| Sidechain outliers | 206894 | 16415 |
| RNA backbone | 6643 | 2191 |

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 | AT | 77 | 22% 42% 53% |
| 2 | CF | 441 | 72% 96% |
| 3 | LW | 118 | 19% 91% 9% |
| 4 | SE | 262 | 93% 7% |
| 5 | SI | 206 | 6% 92% 8% |
| 6 | SL | 153 | 10% 92% 8% |
| 7 | SX | 141 | 94% 6% |
| 8 | SG | 237 | 14% 90% 10% |

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| Mol | Chain | Length | Quality of chain |
|---|---|---|---|
| 9 | SJ | 185 | 6% 92% 8% |
| 10 | SY | 131 | 8% 88% 12% |
| 11 | Se | 58 | 16% 95% 5% |
| 12 | SA | 221 | 5% 91% 9% |
| 13 | SB | 214 | 91% 9% |
| 14 | SH | 186 | 13% 93% 6% |
| 15 | SV | 83 | 80% 20% |
| 16 | Sa | 102 | 5% 83% 16% |
| 17 | SC | 222 | 90% 10% |
| 18 | SN | 150 | 96% |
| 19 | SO | 140 | 8% 92% 8% |
| 20 | SW | 129 | 95% 5% |
| 21 | Sb | 83 | 5% 90% 10% |
| 22 | L5 | 3740 | 76% 23% |
| 23 | L7 | 120 | 88% 12% |
| 24 | L8 | 156 | 81% 19% |
| 25 | LA | 248 | 95% 5% |
| 26 | LB | 402 | 95% 5% |
| 27 | LC | 368 | 95% 5% |
| 28 | LD | 293 | 95% 5% |
| 29 | LE | 236 | 9% 93% 7% |
| 30 | LF | 225 | 95% |
| 31 | LG | 241 | 9% 95% 5% |
| 32 | LH | 190 | 89% 11% |
| 33 | LI | 202 | 91% 9% |

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| Mol | Chain | Length | Quality of chain |
|---|---|---|---|
| 34 | LJ | 176 | 7% 90% 10% |
| 35 | LL | 210 | 5% 97% |
| 36 | LM | 139 | 94% 6% |
| 37 | LN | 203 | 97% |
| 38 | LO | 201 | 94% 6% |
| 39 | LP | 153 | 92% 8% |
| 40 | LQ | 187 | 95% 5% |
| 41 | LR | 187 | 8% 91% 8% |
| 42 | LS | 175 | 90% 10% |
| 43 | LT | 159 | 90% 10% |
| 44 | LU | 101 | 86% 14% |
| 45 | LV | 131 | 94% 6% |
| 46 | LX | 120 | 93% 7% |
| 47 | LY | 134 | 93% 7% |
| 48 | LZ | 135 | 92% 8% |
| 49 | La | 147 | 95% 5% |
| 50 | Lb | 109 | 7% 94% 6% |
| 51 | Lc | 98 | 5% 94% 6% |
| 52 | Ld | 107 | 6% 93% 7% |
| 53 | Le | 128 | 95% 5% |
| 54 | Lf | 109 | 95% 5% |
| 55 | Lg | 114 | 92% 8% |
| 56 | Lh | 122 | 93% 7% |
| 57 | Li | 102 | 89% 11% |
| 58 | Lj | 86 | 95% 5% |

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| Mol | Chain | Length | Quality of chain |
|---|---|---|---|
| 59 | Lk | 69 | 93% 7% |
| 60 | Ll | 50 | 90% 10% |
| 61 | Lm | 52 | 96% |
| 62 | Ln | 24 | 88% 12% |
| 63 | Lo | 105 | 92% 8% |
| 64 | Lp | 91 | 97% |
| 65 | Lr | 125 | 97% |
| 66 | SR | 135 | 7% 85% 15% |
| 67 | SD | 227 | 10% 90% 10% |
| 68 | SF | 189 | 22% 95% 5% |
| 69 | SK | 98 | 15% 89% 10% |
| 70 | SP | 121 | 14% 93% 7% |
| 71 | SQ | 144 | 7% 87% 13% |
| 72 | SS | 145 | 10% 94% 6% |
| 73 | ST | 143 | 6% 93% 7% |
| 74 | SU | 104 | 11% 88% 12% |
| 75 | Sc | 64 | 25% 92% 8% |
| 76 | Sd | 55 | 91% 9% |
| 77 | Sg | 313 | 22% 89% 11% |
| 78 | SM | 122 | 61% 92% 8% |
| 79 | SZ | 75 | 44% 91% 9% |
| 80 | Sf | 67 | 39% 93% 7% |
| 81 | S2 | 1740 | 75% 24% |
| 82 | Pt | 76 | 78% 22% |
| 83 | Lz | 217 | 100% 93% 7% |

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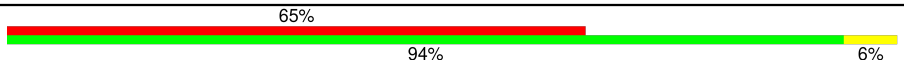
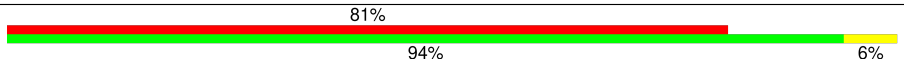
| Mol | Chain | Length | Quality of chain |
|---|---|---|---|
| 84 | Ls | 196 |   |
| 85 | Lt | 141 |   |

# 2 Entry composition

There are 87 unique types of molecules in this entry. The entry contains 226164 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 A/T site tRNA.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| | | | Total | C | N | O | P | | |
| 1 | AT | 76 | 1616 | 723 | 291 | 527 | 75 | 0 | 0 |

- Molecule 2 is a protein called Elongation factor 1-alpha 1.

| Mol | Chain | Residues | Atoms | | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Total | C | N | O | P | S | | |
| 2 | CF | 441 | 3383 | 2148 | 581 | 636 | 1 | 17 | 0 | 0 |

- Molecule 3 is a protein called 60S ribosomal protein L24.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| | | | Total | C | N | O | S | | |
| 3 | LW | 118 | 965 | 604 | 199 | 158 | 4 | 0 | 0 |

- Molecule 4 is a protein called Small ribosomal subunit protein eS4, X isoform.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| | | | Total | C | N | O | S | | |
| 4 | SE | 262 | 2076 | 1324 | 386 | 358 | 8 | 0 | 0 |

- Molecule 5 is a protein called 40S ribosomal protein S8.

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

- Molecule 6 is a protein called 40S ribosomal protein S11.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| | | | Total | C | N | O | S | | |
| 6 | SL | 153 | 1247 | 793 | 234 | 214 | 6 | 0 | 0 |

- Molecule 7 is a protein called 40S ribosomal protein S23.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 7 | SX | 141 | Total | C | N | O | S | 0 | 0 |
| | | | 1098 | 693 | 219 | 183 | 3 | | |

- Molecule 8 is a protein called 40S ribosomal protein S6.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 8 | SG | 237 | Total | C | N | O | S | 0 | 0 |
| | | | 1923 | 1200 | 387 | 329 | 7 | | |

- Molecule 9 is a protein called 40S ribosomal protein S9.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 9 | SJ | 185 | Total | C | N | O | S | 0 | 0 |
| | | | 1525 | 969 | 306 | 248 | 2 | | |

- Molecule 10 is a protein called 40S ribosomal protein S24.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 10 | SY | 131 | Total | C | N | O | S | 0 | 0 |
| | | | 1065 | 673 | 209 | 178 | 5 | | |

- Molecule 11 is a protein called Small ribosomal subunit protein eS30.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 11 | Se | 58 | Total | C | N | O | S | 0 | 0 |
| | | | 459 | 284 | 100 | 74 | 1 | | |

- Molecule 12 is a protein called 40S ribosomal protein SA.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 12 | SA | 221 | Total | C | N | O | S | 0 | 0 |
| | | | 1741 | 1106 | 305 | 322 | 8 | | |

- Molecule 13 is a protein called 40S ribosomal protein S3a.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 13 | SB | 214 | Total | C | N | O | S | 0 | 0 |
| | | | 1738 | 1103 | 310 | 311 | 14 | | |

- Molecule 14 is a protein called 40S ribosomal protein S7.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 14 | SH | 186 | Total | C | N | O | S | 0 | 0 |
| | | | 1497 | 956 | 274 | 266 | 1 | | |

- Molecule 15 is a protein called 40S ribosomal protein S21.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 15 | SV | 83 | Total | C | N | O | S | 0 | 0 |
| | | | 636 | 393 | 117 | 121 | 5 | | |

- Molecule 16 is a protein called 40S ribosomal protein S26.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 16 | Sa | 102 | Total | C | N | O | S | 0 | 0 |
| | | | 821 | 512 | 171 | 133 | 5 | | |

- Molecule 17 is a protein called 40S ribosomal protein S2.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 17 | SC | 222 | Total | C | N | O | S | 0 | 0 |
| | | | 1725 | 1115 | 298 | 302 | 10 | | |

- Molecule 18 is a protein called 40S ribosomal protein S13.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 18 | SN | 150 | Total | C | N | O | S | 0 | 0 |
| | | | 1208 | 773 | 229 | 205 | 1 | | |

- Molecule 19 is a protein called Small ribosomal subunit protein uS11.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 19 | SO | 140 | Total | C | N | O | S | 0 | 0 |
| | | | 1049 | 642 | 204 | 197 | 6 | | |

- Molecule 20 is a protein called 40S ribosomal protein S15a.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 20 | SW | 129 | Total | C | N | O | S | 0 | 0 |
| | | | 1034 | 659 | 193 | 176 | 6 | | |

- Molecule 21 is a protein called Small ribosomal subunit protein eS27.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 21 | Sb | 83 | Total | C | N | O | S | 0 | 0 |
| | | | 651 | 408 | 121 | 115 | 7 | | |

- Molecule 22 is a RNA chain called 28S rRNA.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 22 | L5 | 3740 | Total | C | N | O | P | 0 | 0 |
| | | | 79860 | 35549 | 14585 | 25987 | 3739 | | |

- Molecule 23 is a RNA chain called 5S rRNA.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 23 | L7 | 120 | Total | C | N | O | P | 0 | 0 |
| | | | 2561 | 1141 | 456 | 844 | 120 | | |

- Molecule 24 is a RNA chain called 5.8S rRNA.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 24 | L8 | 156 | Total | C | N | O | P | 0 | 0 |
| | | | 3314 | 1480 | 585 | 1094 | 155 | | |

- Molecule 25 is a protein called 60S ribosomal protein L8.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 25 | LA | 248 | Total | C | N | O | S | 0 | 0 |
| | | | 1898 | 1189 | 389 | 314 | 6 | | |

- Molecule 26 is a protein called Large ribosomal subunit protein uL3.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 26 | LB | 402 | Total | C | N | O | S | 0 | 0 |
| | | | 3238 | 2060 | 608 | 556 | 14 | | |

- Molecule 27 is a protein called 60S ribosomal protein L4.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 27 | LC | 368 | Total | C | N | O | S | 0 | 0 |
| | | | 2927 | 1840 | 583 | 489 | 15 | | |

- Molecule 28 is a protein called Large ribosomal subunit protein uL18.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 28 | LD | 293 | Total | C | N | O | S | 0 | 0 |
| | | | 2382 | 1507 | 434 | 427 | 14 | | |

- Molecule 29 is a protein called 60S ribosomal protein L6.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 29 | LE | 236 | Total | C | N | O | S | 0 | 0 |
| | | | 1904 | 1222 | 361 | 317 | 4 | | |

- Molecule 30 is a protein called 60S ribosomal protein L7.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 30 | LF | 225 | Total | C | N | O | S | 0 | 0 |
| | | | 1870 | 1202 | 358 | 301 | 9 | | |

- Molecule 31 is a protein called 60S ribosomal protein L7a.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 31 | LG | 241 | Total | C | N | O | S | 0 | 0 |
| | | | 1927 | 1228 | 371 | 324 | 4 | | |

- Molecule 32 is a protein called 60S ribosomal protein L9.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 32 | LH | 190 | Total | C | N | O | S | 0 | 0 |
| | | | 1518 | 956 | 284 | 272 | 6 | | |

- Molecule 33 is a protein called 60S ribosomal protein L10-like.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 33 | LI | 202 | Total | C | N | O | S | 0 | 0 |
| | | | 1634 | 1037 | 314 | 269 | 14 | | |

- Molecule 34 is a protein called 60S ribosomal protein L11.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 34 | LJ | 176 | Total | C | N | O | S | 0 | 0 |
| | | | 1410 | 888 | 263 | 253 | 6 | | |

- Molecule 35 is a protein called Large ribosomal subunit protein eL13.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 35 | LL | 210 | Total | C | N | O | S | 0 | 0 |
| | | | 1701 | 1064 | 352 | 281 | 4 | | |

- Molecule 36 is a protein called 60S ribosomal protein L14.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 36 | LM | 139 | Total | C | N | O | S | 0 | 0 |
| | | | 1138 | 730 | 218 | 183 | 7 | | |

- Molecule 37 is a protein called 60S ribosomal protein L15.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 37 | LN | 203 | Total | C | N | O | S | 0 | 0 |
| | | | 1701 | 1072 | 359 | 266 | 4 | | |

- Molecule 38 is a protein called 60S ribosomal protein L13a.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 38 | LO | 201 | Total | C | N | O | S | 0 | 0 |
| | | | 1650 | 1063 | 321 | 261 | 5 | | |

- Molecule 39 is a protein called 60S ribosomal protein L17.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 39 | LP | 153 | Total | C | N | O | S | 0 | 0 |
| | | | 1242 | 776 | 241 | 216 | 9 | | |

- Molecule 40 is a protein called 60S ribosomal protein L18.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 40 | LQ | 187 | Total | C | N | O | S | 0 | 0 |
| | | | 1513 | 944 | 314 | 250 | 5 | | |

- Molecule 41 is a protein called 60S ribosomal protein L19.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 41 | LR | 187 | Total | C | N | O | S | 0 | 0 |
| | | | 1566 | 971 | 336 | 250 | 9 | | |

- Molecule 42 is a protein called 60S ribosomal protein L18a.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 42 | LS | 175 | Total | C | N | O | S | 0 | 0 |
| | | | 1453 | 925 | 283 | 235 | 10 | | |

- Molecule 43 is a protein called 60S ribosomal protein L21.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 43 | LT | 159 | Total | C | N | O | S | 0 | 0 |
| | | | 1298 | 823 | 252 | 217 | 6 | | |

- Molecule 44 is a protein called Heparin-binding protein HBp15.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 44 | LU | 101 | Total | C | N | O | S | 0 | 0 |
| | | | 825 | 529 | 144 | 150 | 2 | | |

- Molecule 45 is a protein called 60S ribosomal protein L23.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 45 | LV | 131 | Total | C | N | O | S | 0 | 0 |
| | | | 979 | 618 | 184 | 172 | 5 | | |

- Molecule 46 is a protein called 60S ribosomal protein L23a.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 46 | LX | 120 | Total | C | N | O | S | 0 | 0 |
| | | | 985 | 630 | 185 | 169 | 1 | | |

- Molecule 47 is a protein called 60S ribosomal protein L26.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 47 | LY | 134 | Total | C | N | O | S | 0 | 0 |
| | | | 1115 | 700 | 226 | 186 | 3 | | |

- Molecule 48 is a protein called 60S ribosomal protein L27.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 48 | LZ | 135 | Total | C | N | O | S | 0 | 0 |
| | | | 1107 | 714 | 208 | 182 | 3 | | |

- Molecule 49 is a protein called 60S ribosomal protein L27a.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 49 | La | 147 | Total | C | N | O | S | 0 | 0 |
| | | | 1162 | 736 | 237 | 186 | 3 | | |

- Molecule 50 is a protein called 60S ribosomal protein L29.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 50 | Lb | 109 | Total | C | N | O | S | 0 | 0 |
| | | | 876 | 546 | 189 | 137 | 4 | | |

- Molecule 51 is a protein called 60S ribosomal protein L30.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 51 | Lc | 98 | Total | C | N | O | S | 0 | 0 |
| | | | 764 | 485 | 135 | 138 | 6 | | |

- Molecule 52 is a protein called 60S ribosomal protein L31.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 52 | Ld | 107 | Total | C | N | O | S | 0 | 0 |
| | | | 888 | 560 | 171 | 155 | 2 | | |

- Molecule 53 is a protein called 60S ribosomal protein L32.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 53 | Le | 128 | Total | C | N | O | S | 0 | 0 |
| | | | 1053 | 667 | 216 | 165 | 5 | | |

- Molecule 54 is a protein called 60S ribosomal protein L35a.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 54 | Lf | 109 | Total | C | N | O | S | 0 | 0 |
| | | | 876 | 555 | 174 | 144 | 3 | | |

- Molecule 55 is a protein called 60S ribosomal protein L34.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 55 | Lg | 114 | Total | C | N | O | S | 0 | 0 |
| | | | 906 | 566 | 187 | 147 | 6 | | |

- Molecule 56 is a protein called 60S ribosomal protein L35.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 56 | Lh | 122 | Total | C | N | O | S | 0 | 0 |
| | | | 1015 | 641 | 205 | 168 | 1 | | |

- Molecule 57 is a protein called 60S ribosomal protein L36.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 57 | Li | 102 | Total | C | N | O | S | 0 | 0 |
| | | | 832 | 521 | 177 | 129 | 5 | | |

- Molecule 58 is a protein called 60S ribosomal protein L37.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 58 | Lj | 86 | Total | C | N | O | S | 0 | 0 |
| | | | 705 | 434 | 155 | 111 | 5 | | |

- Molecule 59 is a protein called 60S ribosomal protein L38.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 59 | Lk | 69 | Total | C | N | O | S | 0 | 0 |
| | | | 569 | 366 | 103 | 99 | 1 | | |

- Molecule 60 is a protein called 60S ribosomal protein L39.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 60 | Ll | 50 | Total | C | N | O | S | 0 | 0 |
| | | | 444 | 281 | 98 | 64 | 1 | | |

- Molecule 61 is a protein called Large ribosomal subunit protein eL40.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 61 | Lm | 52 | Total | C | N | O | S | 0 | 0 |
| | | | 429 | 266 | 90 | 67 | 6 | | |

- Molecule 62 is a protein called 60S ribosomal protein L41.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 62 | Ln | 24 | Total | C | N | O | S | 0 | 0 |
| | | | 230 | 139 | 62 | 26 | 3 | | |

- Molecule 63 is a protein called 60S ribosomal protein L36a.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 63 | Lo | 105 | Total | C | N | O | S | 0 | 0 |
| | | | 862 | 542 | 175 | 139 | 6 | | |

- Molecule 64 is a protein called 60S ribosomal protein L37a.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 64 | Lp | 91 | Total | C | N | O | S | 0 | 0 |
| | | | 708 | 445 | 136 | 120 | 7 | | |

- Molecule 65 is a protein called 60S ribosomal protein L28.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 65 | Lr | 125 | Total | C | N | O | S | 0 | 0 |
| | | | 1002 | 622 | 207 | 168 | 5 | | |

- Molecule 66 is a protein called 40S ribosomal protein S17.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 66 | SR | 135 | Total | C | N | O | S | 0 | 0 |
| | | | 1090 | 685 | 202 | 198 | 5 | | |

- Molecule 67 is a protein called Small ribosomal subunit protein uS3.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 67 | SD | 227 | Total | C | N | O | S | 0 | 0 |
| | | | 1765 | 1125 | 317 | 315 | 8 | | |

- Molecule 68 is a protein called 40S ribosomal protein S5.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 68 | SF | 189 | Total | C | N | O | S | 0 | 0 |
| | | | 1495 | 934 | 284 | 270 | 7 | | |

- Molecule 69 is a protein called 40S ribosomal protein S10.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 69 | SK | 98 | Total | C | N | O | S | 0 | 0 |
| | | | 827 | 539 | 148 | 134 | 6 | | |

- Molecule 70 is a protein called Small ribosomal subunit protein uS19.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 70 | SP | 121 | Total | C | N | O | S | 0 | 0 |
| | | | 985 | 623 | 185 | 170 | 7 | | |

- Molecule 71 is a protein called Small ribosomal subunit protein uS9.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 71 | SQ | 144 | Total | C | N | O | S | 0 | 0 |
| | | | 1142 | 726 | 216 | 197 | 3 | | |

- Molecule 72 is a protein called 40S ribosomal protein S18.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 72 | SS | 145 | Total | C | N | O | S | 0 | 0 |
| | | | 1198 | 751 | 242 | 203 | 2 | | |

- Molecule 73 is a protein called 40S ribosomal protein S19.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 73 | ST | 143 | Total | C | N | O | S | 0 | 0 |
| | | | 1112 | 697 | 214 | 198 | 3 | | |

- Molecule 74 is a protein called 40S ribosomal protein S20.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 74 | SU | 104 | Total | C | N | O | S | 0 | 0 |
| | | | 821 | 514 | 155 | 148 | 4 | | |

- Molecule 75 is a protein called 40S ribosomal protein S28.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 75 | Sc | 64 | Total | C | N | O | S | 0 | 0 |
| | | | 506 | 308 | 102 | 94 | 2 | | |

- Molecule 76 is a protein called 40S ribosomal protein S29.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 76 | Sd | 55 | Total | C | N | O | S | 0 | 0 |
| | | | 459 | 286 | 94 | 74 | 5 | | |

- Molecule 77 is a protein called Receptor of activated protein C kinase 1.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 77 | Sg | 313 | Total | C | N | O | S | 0 | 0 |
| | | | 2436 | 1535 | 424 | 465 | 12 | | |

- Molecule 78 is a protein called Small ribosomal subunit protein eS12.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 78 | SM | 122 | Total | C | N | O | S | 0 | 0 |
| | | | 940 | 590 | 164 | 177 | 9 | | |

- Molecule 79 is a protein called Small ribosomal subunit protein eS25.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 79 | SZ | 75 | Total | C | N | O | S | 0 | 0 |
| | | | 598 | 382 | 111 | 104 | 1 | | |

- Molecule 80 is a protein called Ubiquitin-40S ribosomal protein S27a.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 80 | Sf | 67 | Total | C | N | O | S | 0 | 0 |
| | | | 548 | 346 | 102 | 93 | 7 | | |

- Molecule 81 is a RNA chain called 18S rRNA.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 81 | S2 | 1740 | Total | C | N | O | P | 0 | 0 |
| | | | 36898 | 16459 | 6599 | 12101 | 1739 | | |

- Molecule 82 is a RNA chain called P site tRNA.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 82 | Pt | 76 | Total | C | N | O | P | 0 | 0 |
| | | | 1620 | 725 | 296 | 524 | 75 | | |

- Molecule 83 is a protein called 60S ribosomal protein L10a.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 83 | Lz | 217 | Total | C | N | O | S | 0 | 0 |
| | | | 1741 | 1113 | 312 | 307 | 9 | | |

- Molecule 84 is a protein called 60S acidic ribosomal protein P0.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 84 | Ls | 196 | Total 1496 | C 952 | N 259 | O 276 | S 9 | 0 | 0 |

- Molecule 85 is a protein called 60S ribosomal protein L12.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 85 | Lt | 141 | Total 1046 | C 652 | N 191 | O 199 | S 4 | 0 | 0 |

- Molecule 86 is MAGNESIUM ION (CCD ID: MG) (formula: Mg) (labeled as "Ligand of Interest" by depositor).

| Mol | Chain | Residues | Atoms | | AltConf |
|---|---|---|---|---|---|
| 86 | SG | 1 | Total 1 | Mg 1 | 0 |
| 86 | L5 | 214 | Total 214 | Mg 214 | 0 |
| 86 | L7 | 3 | Total 3 | Mg 3 | 0 |
| 86 | L8 | 4 | Total 4 | Mg 4 | 0 |
| 86 | LA | 1 | Total 1 | Mg 1 | 0 |
| 86 | LI | 1 | Total 1 | Mg 1 | 0 |
| 86 | LP | 1 | Total 1 | Mg 1 | 0 |
| 86 | LV | 1 | Total 1 | Mg 1 | 0 |
| 86 | Le | 1 | Total 1 | Mg 1 | 0 |
| 86 | S2 | 28 | Total 28 | Mg 28 | 0 |

- Molecule 87 is ZINC ION (CCD ID: ZN) (formula: Zn) (labeled as "Ligand of Interest" by depositor).

| Mol | Chain | Residues | Atoms | | AltConf |
|---|---|---|---|---|---|
| 87 | Sa | 1 | Total 1 | Zn 1 | 0 |
| 87 | Lg | 1 | Total 1 | Zn 1 | 0 |

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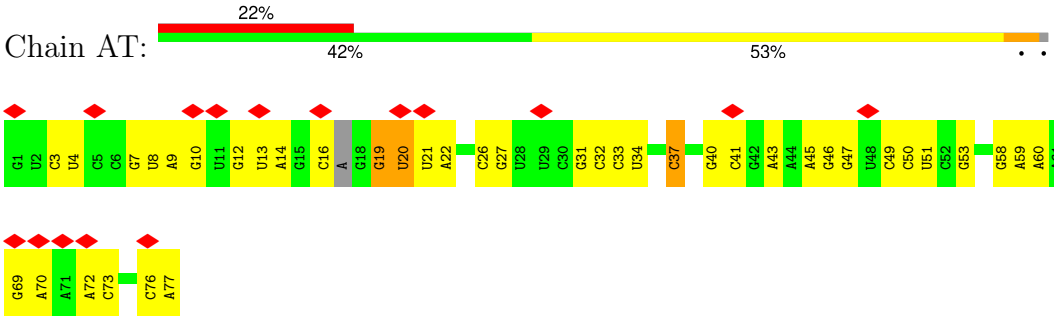
| Mol | Chain | Residues | Atoms | AltConf |
|---|---|---|---|---|
| 87 | Lj | 1 | Total Zn<br>1 1 | 0 |
| 87 | Lm | 1 | Total Zn<br>1 1 | 0 |
| 87 | Lo | 1 | Total Zn<br>1 1 | 0 |
| 87 | Lp | 1 | Total Zn<br>1 1 | 0 |

# 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.

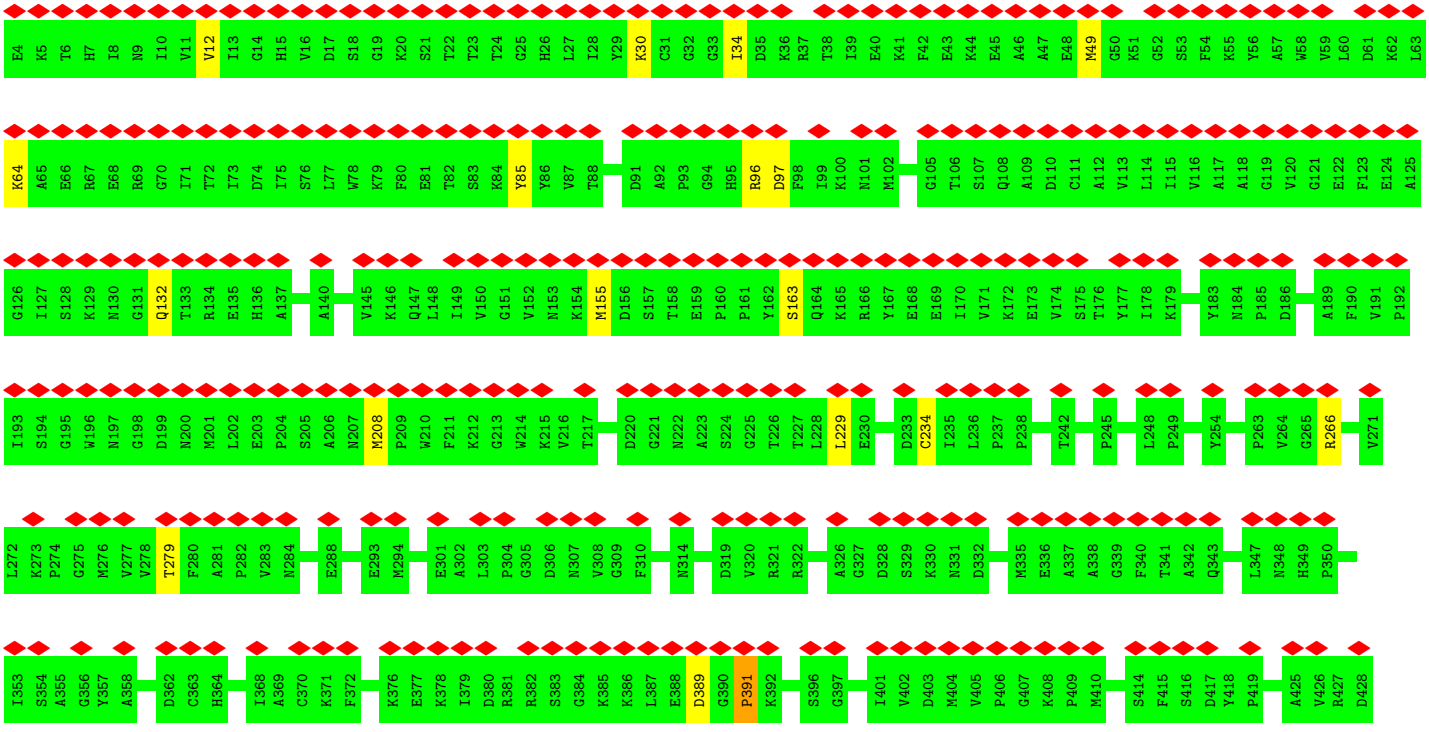
• Molecule 1: A/T site tRNA

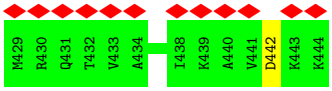
Chain AT:




• Molecule 2: Elongation factor 1-alpha 1

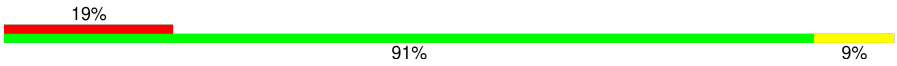
Chain CF:

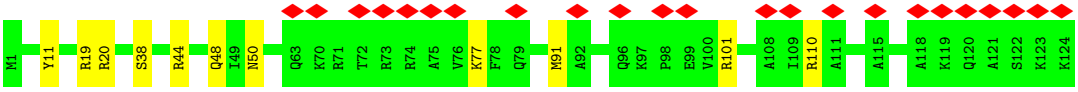






• Molecule 3: 60S ribosomal protein L24

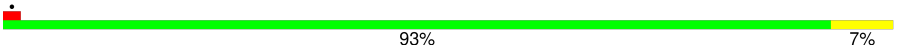
Chain LW:




• Molecule 4: Small ribosomal subunit protein eS4, X isoform

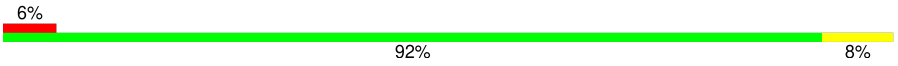
Chain SE:

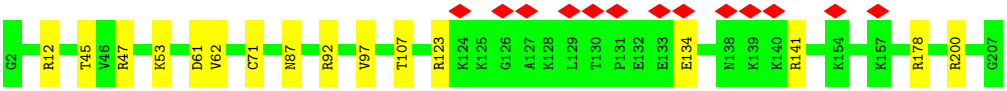




• Molecule 5: 40S ribosomal protein S8

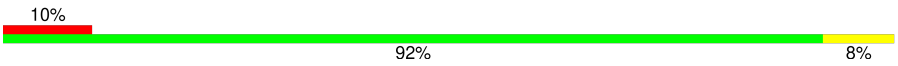
Chain SI:

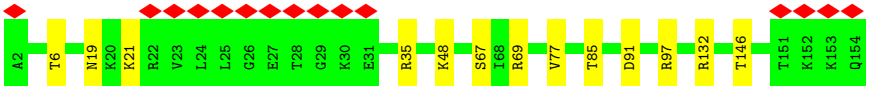



• Molecule 6: 40S ribosomal protein S11

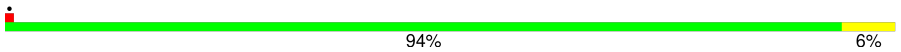
Chain SL:

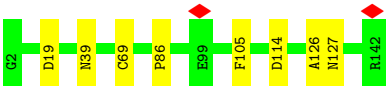



• Molecule 7: 40S ribosomal protein S23

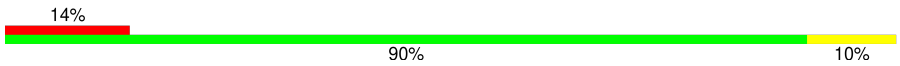
Chain SX:

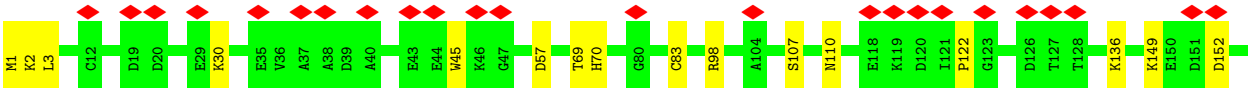


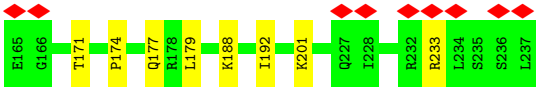




• Molecule 8: 40S ribosomal protein S6

Chain SG:

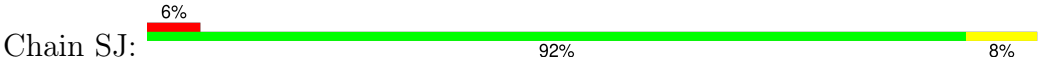


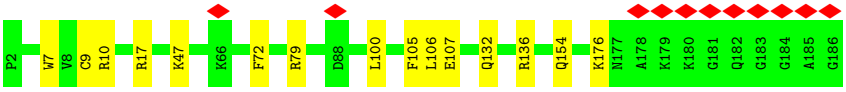






• Molecule 9: 40S ribosomal protein S9

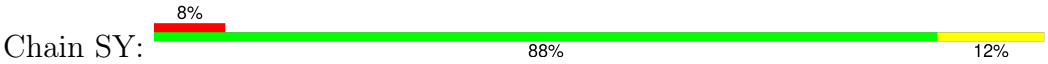
Chain SJ:

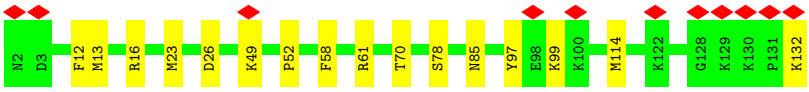



• Molecule 10: 40S ribosomal protein S24

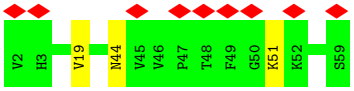
Chain SY:



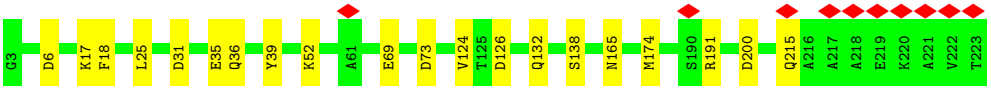

• Molecule 11: Small ribosomal subunit protein eS30

Chain Se:

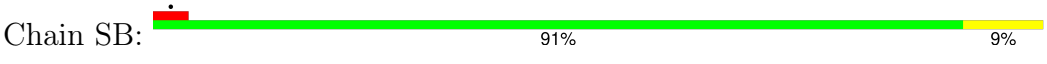

• Molecule 12: 40S ribosomal protein SA

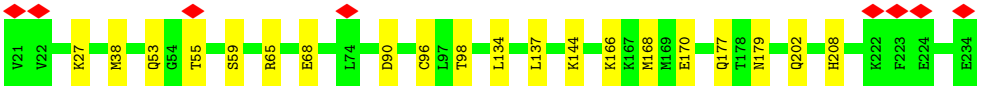
Chain SA:


• Molecule 13: 40S ribosomal protein S3a

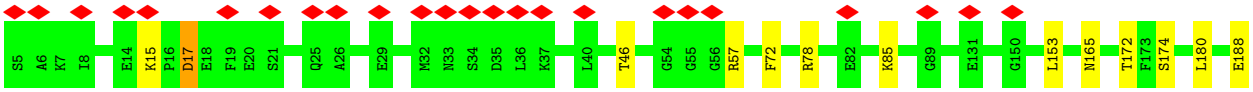
Chain SB:



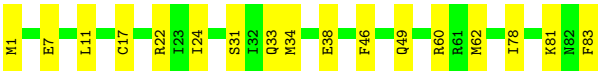

• Molecule 14: 40S ribosomal protein S7

Chain SH:

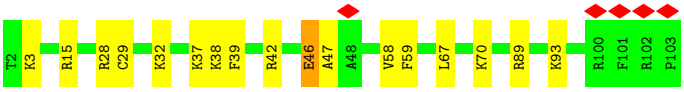

• Molecule 15: 40S ribosomal protein S21

Chain SV:

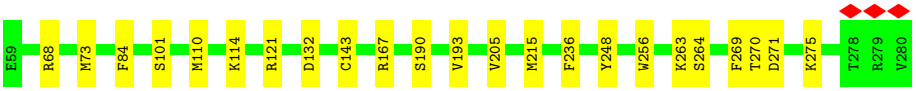

• Molecule 16: 40S ribosomal protein S26

Chain Sa:

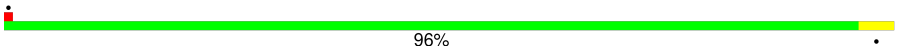

• Molecule 17: 40S ribosomal protein S2

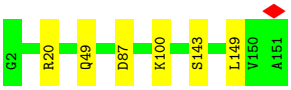
Chain SC:


• Molecule 18: 40S ribosomal protein S13

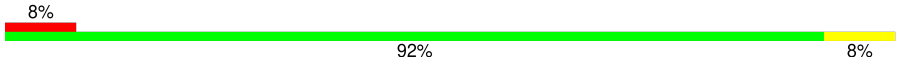
Chain SN:

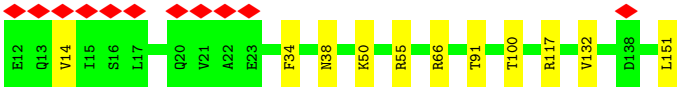



• Molecule 19: Small ribosomal subunit protein uS11

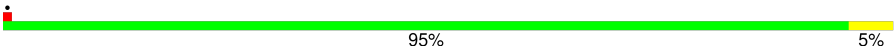
Chain SO:




• Molecule 20: 40S ribosomal protein S15a

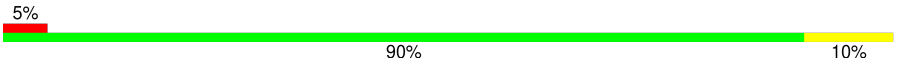
Chain SW:

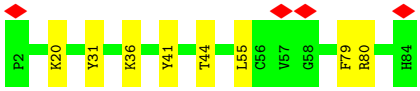




• Molecule 21: Small ribosomal subunit protein eS27

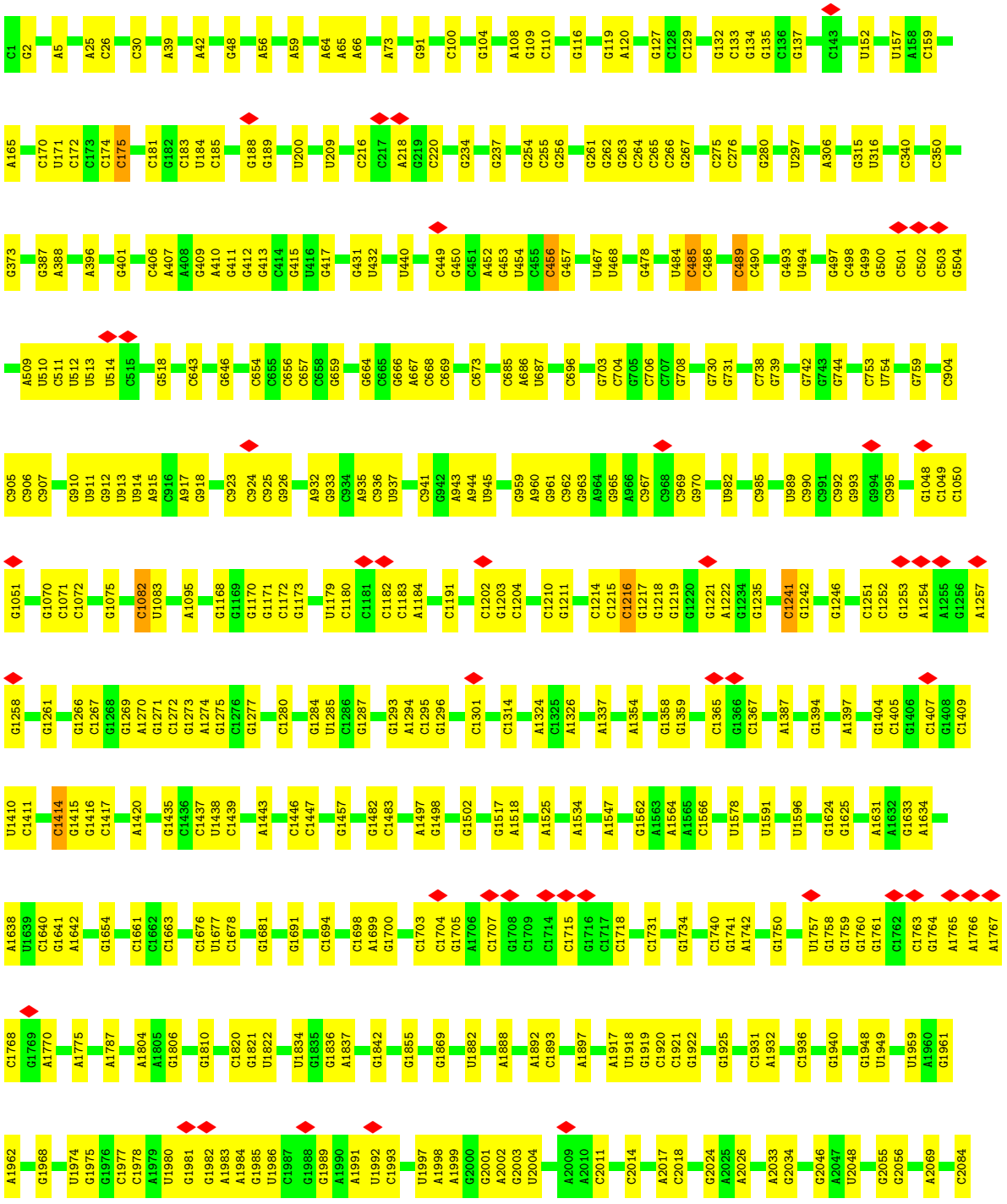
Chain Sb:

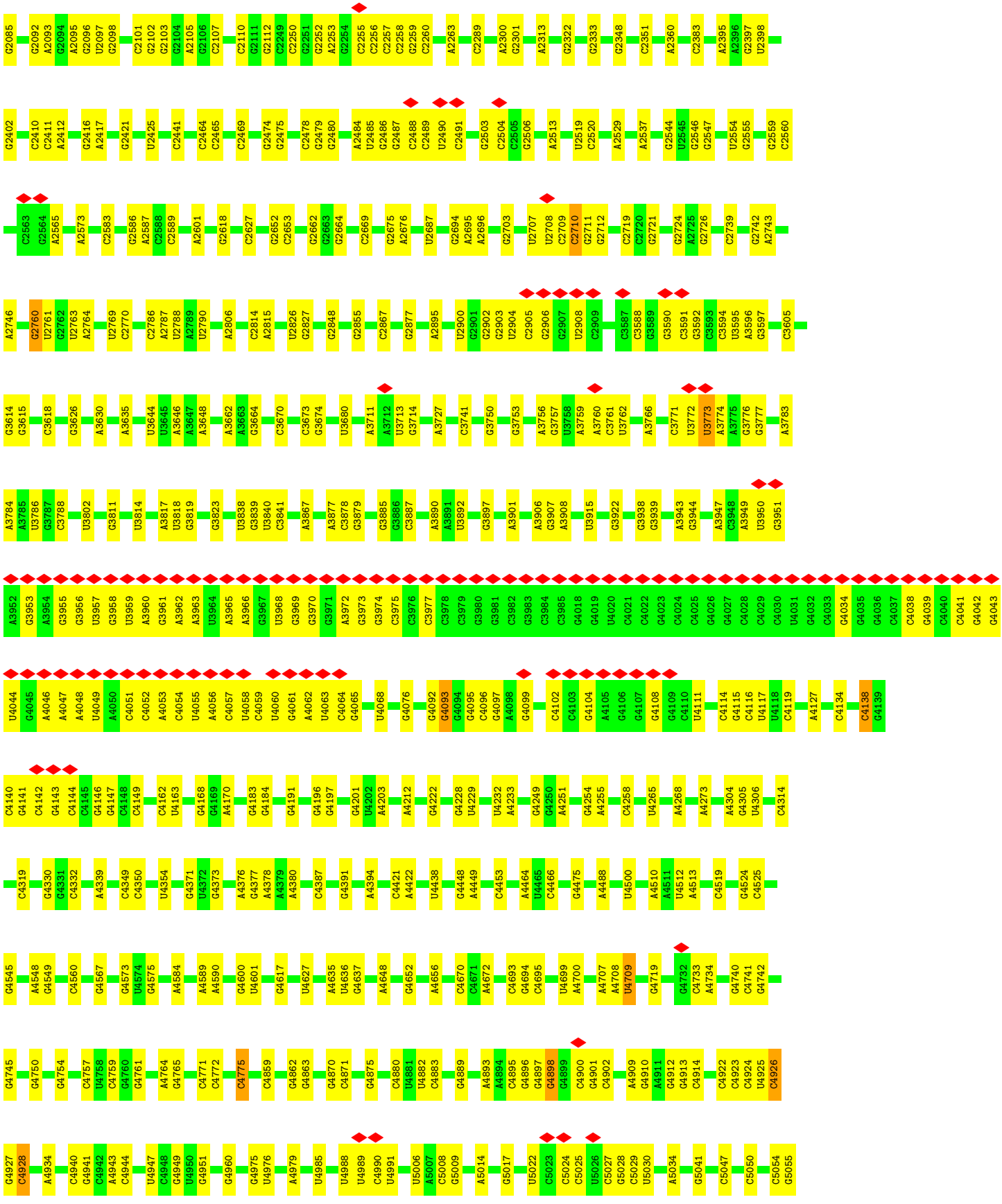



• Molecule 22: 28S rRNA

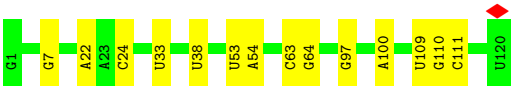
Chain L5:



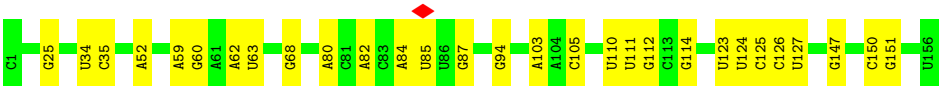

• Molecule 23: 5S rRNA

Chain L7:

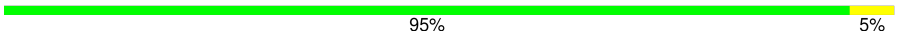

• Molecule 24: 5.8S rRNA

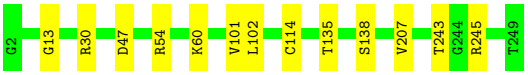
Chain L8:


• Molecule 25: 60S ribosomal protein L8

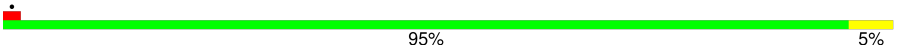
Chain LA:

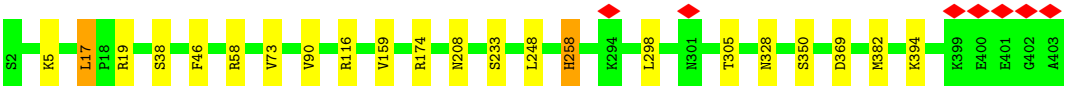



• Molecule 26: Large ribosomal subunit protein uL3

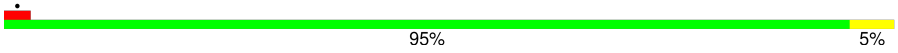
Chain LB:

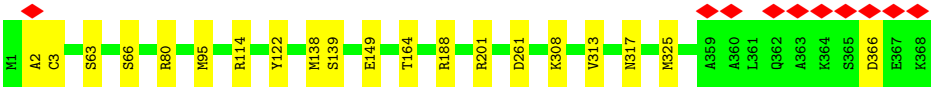



• Molecule 27: 60S ribosomal protein L4

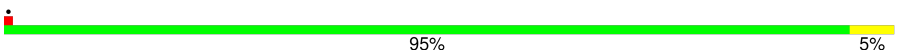
Chain LC:

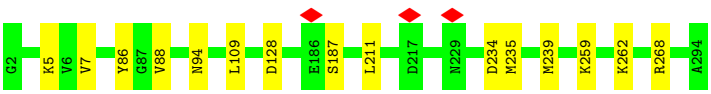



• Molecule 28: Large ribosomal subunit protein uL18

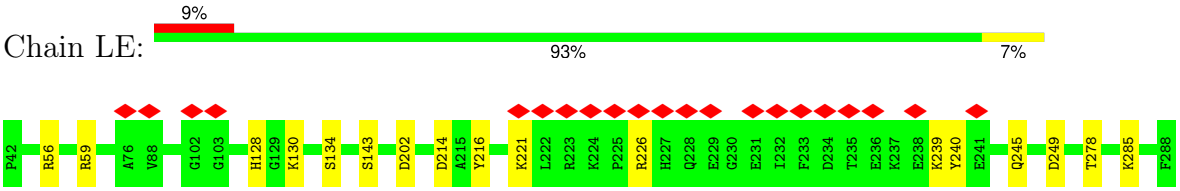
Chain LD:



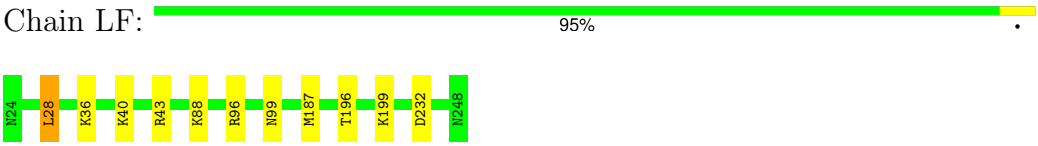

• Molecule 29: 60S ribosomal protein L6

Chain LE:



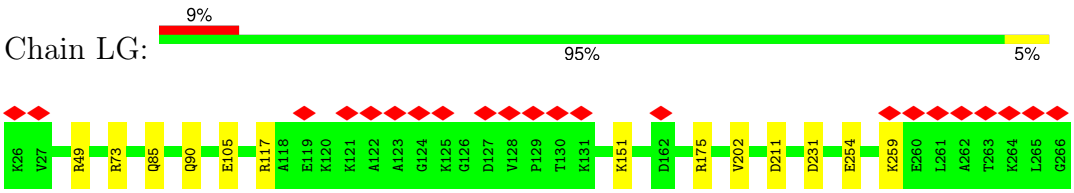

• Molecule 30: 60S ribosomal protein L7

Chain LF:



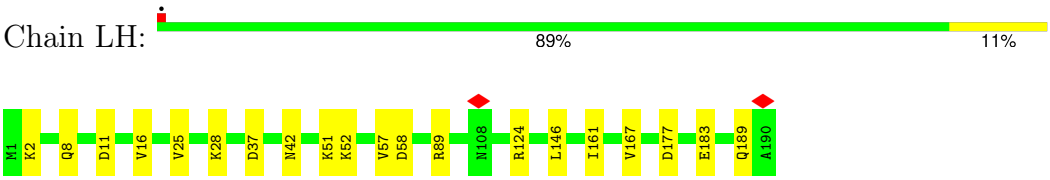

• Molecule 31: 60S ribosomal protein L7a

Chain LG:



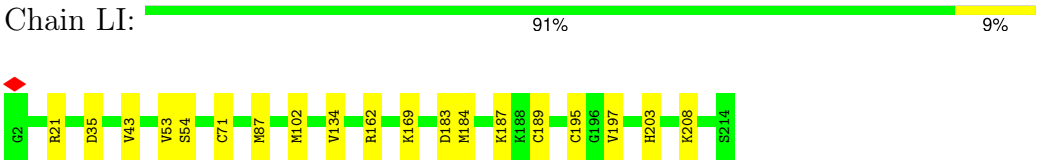

• Molecule 32: 60S ribosomal protein L9

Chain LH:



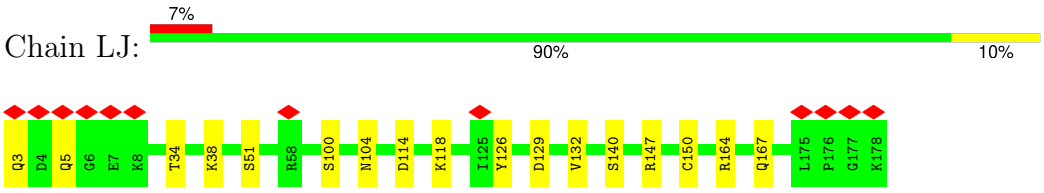

• Molecule 33: 60S ribosomal protein L10-like

Chain LI:



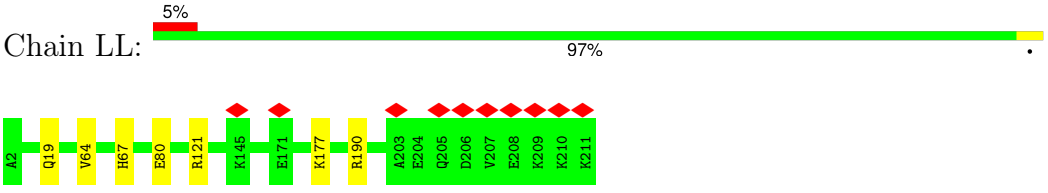

• Molecule 34: 60S ribosomal protein L11

Chain LJ:



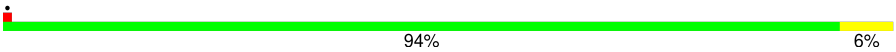

• Molecule 35: Large ribosomal subunit protein eL13

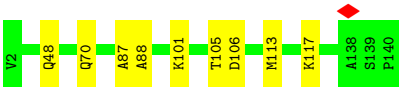
Chain LL:



• Molecule 36: 60S ribosomal protein L14

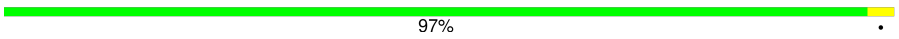
Chain LM:

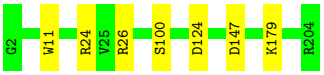



• Molecule 37: 60S ribosomal protein L15

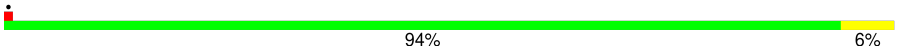
Chain LN:

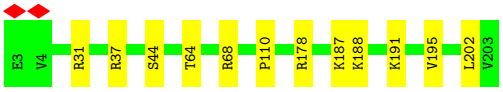



• Molecule 38: 60S ribosomal protein L13a

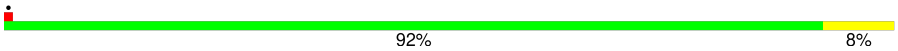
Chain LO:




• Molecule 39: 60S ribosomal protein L17

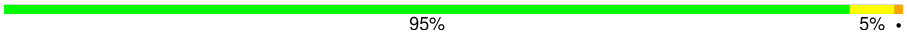
Chain LP:





• Molecule 40: 60S ribosomal protein L18

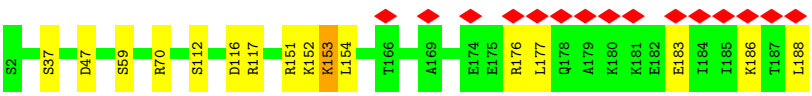
Chain LQ:





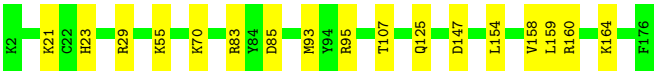
• Molecule 41: 60S ribosomal protein L19

Chain LR:

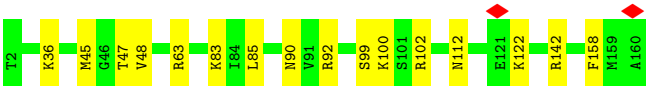




• Molecule 42: 60S ribosomal protein L18a

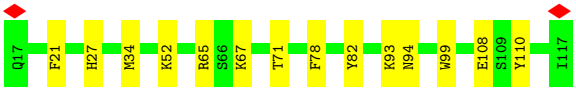
Chain LS:



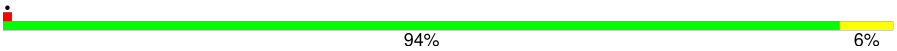

• Molecule 43: 60S ribosomal protein L21

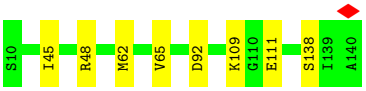




• Molecule 44: Heparin-binding protein HBp15

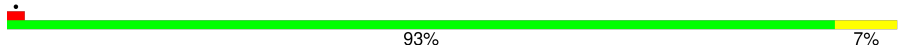



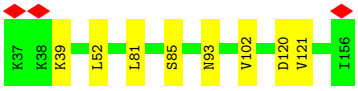

• Molecule 45: 60S ribosomal protein L23



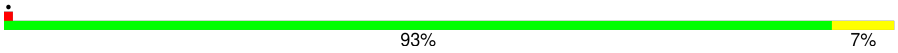



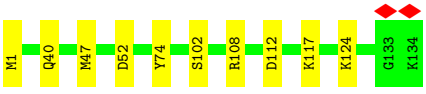

• Molecule 46: 60S ribosomal protein L23a



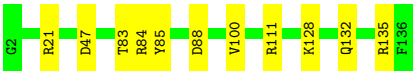




• Molecule 47: 60S ribosomal protein L26



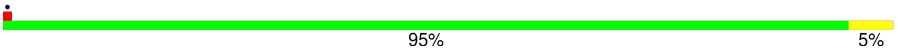



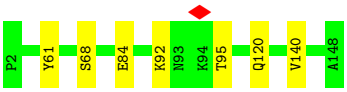

• Molecule 48: 60S ribosomal protein L27


• Molecule 49: 60S ribosomal protein L27a

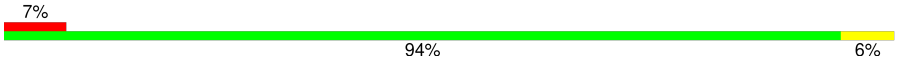
Chain La:

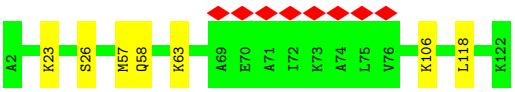



• Molecule 50: 60S ribosomal protein L29

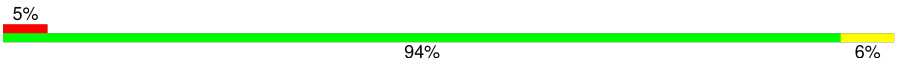
Chain Lb:

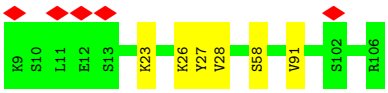



• Molecule 51: 60S ribosomal protein L30

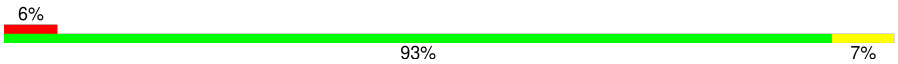
Chain Lc:

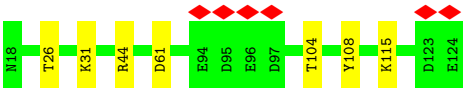



• Molecule 52: 60S ribosomal protein L31

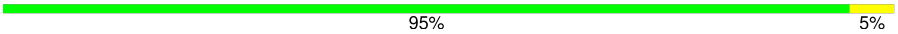
Chain Ld:

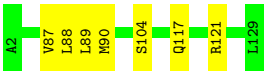



• Molecule 53: 60S ribosomal protein L32

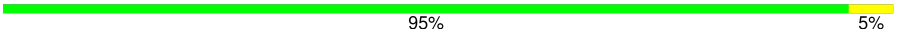
Chain Le:

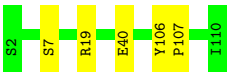



• Molecule 54: 60S ribosomal protein L35a

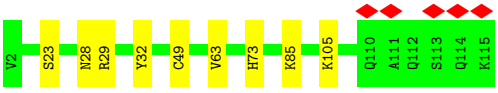
Chain Lf:



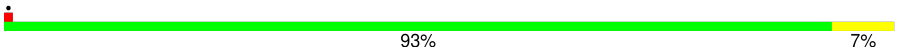

• Molecule 55: 60S ribosomal protein L34

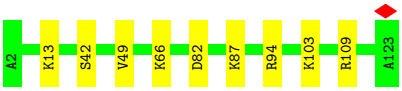
Chain Lg:

• Molecule 56: 60S ribosomal protein L35

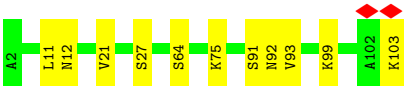
Chain Lh:



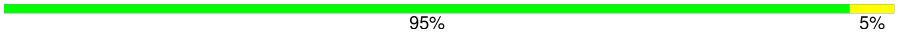

• Molecule 57: 60S ribosomal protein L36

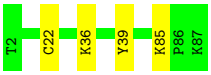
Chain Li:


• Molecule 58: 60S ribosomal protein L37

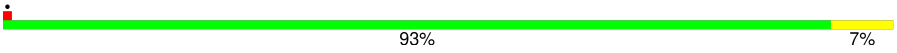
Chain Lj:

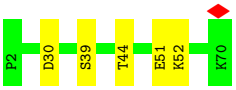



• Molecule 59: 60S ribosomal protein L38

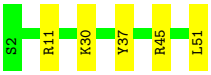
Chain Lk:



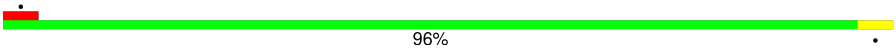

• Molecule 60: 60S ribosomal protein L39

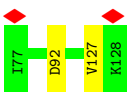
Chain Ll:


• Molecule 61: Large ribosomal subunit protein eL40

Chain Lm:



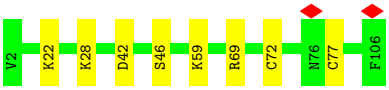




• Molecule 62: 60S ribosomal protein L41

Chain Ln:

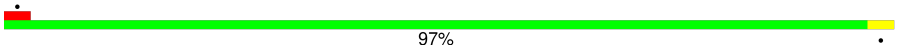

• Molecule 63: 60S ribosomal protein L36a

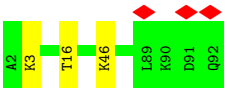
Chain Lo:


• Molecule 64: 60S ribosomal protein L37a

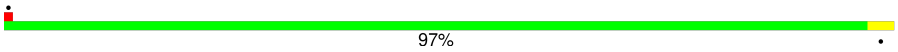
Chain Lp:




• Molecule 65: 60S ribosomal protein L28

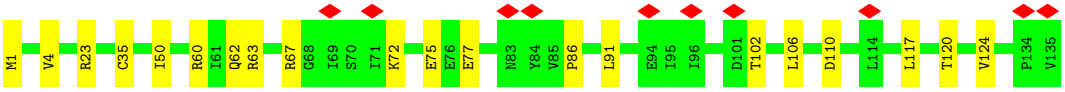
Chain Lr:





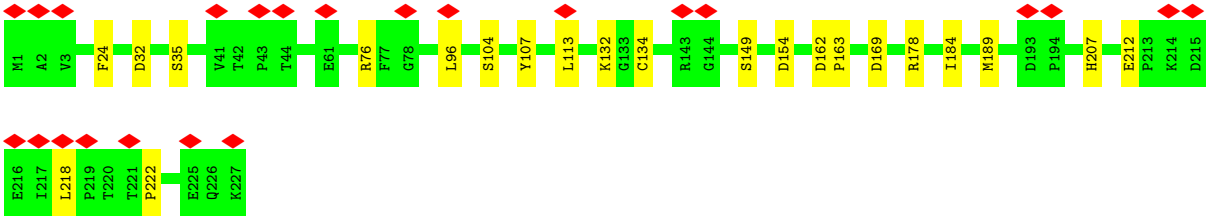
• Molecule 66: 40S ribosomal protein S17

Chain SR:

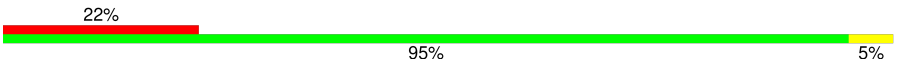

• Molecule 67: Small ribosomal subunit protein uS3

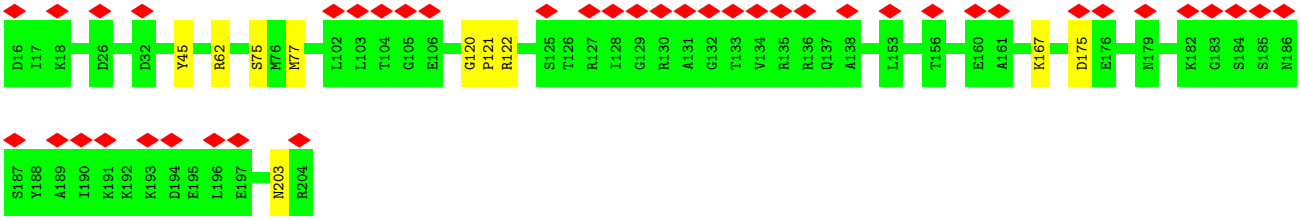
Chain SD:

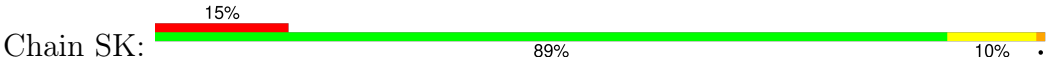

• Molecule 68: 40S ribosomal protein S5

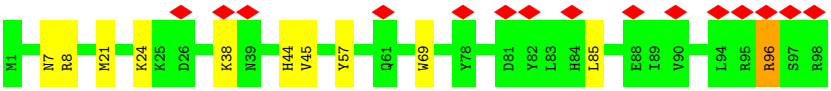
Chain SF:



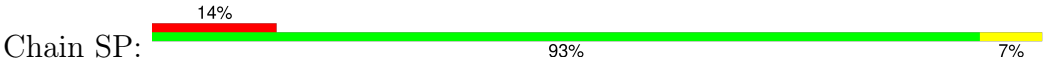


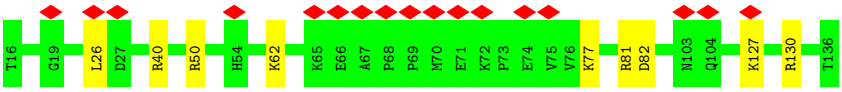

• Molecule 69: 40S ribosomal protein S10



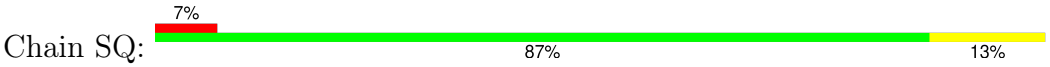



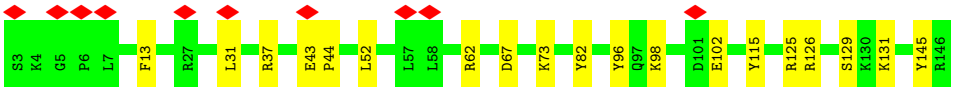

• Molecule 70: Small ribosomal subunit protein uS19



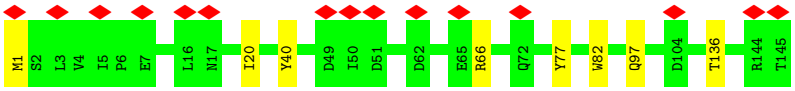




• Molecule 71: Small ribosomal subunit protein uS9

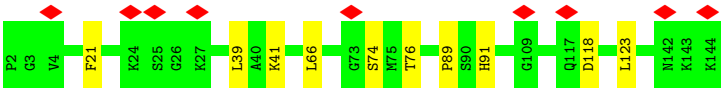


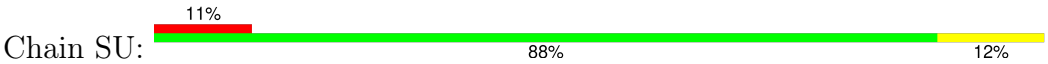

• Molecule 72: 40S ribosomal protein S18

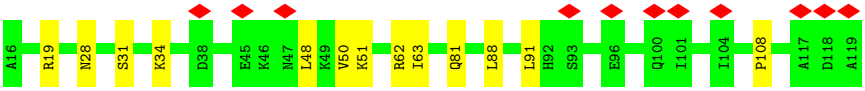




• Molecule 73: 40S ribosomal protein S19

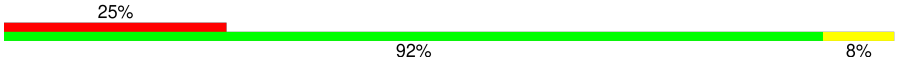

• Molecule 74: 40S ribosomal protein S20

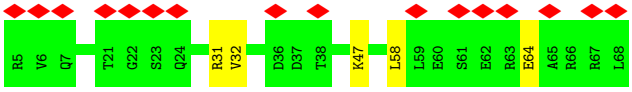





• Molecule 75: 40S ribosomal protein S28

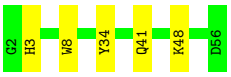
Chain Sc:



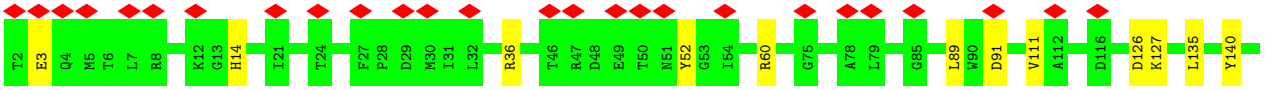

• Molecule 76: 40S ribosomal protein S29

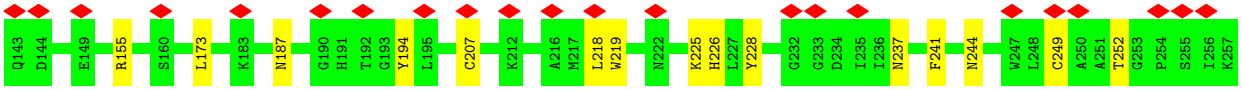
Chain Sd:

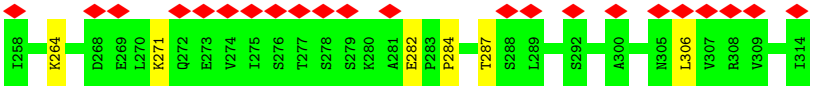




• Molecule 77: Receptor of activated protein C kinase 1

Chain Sg:

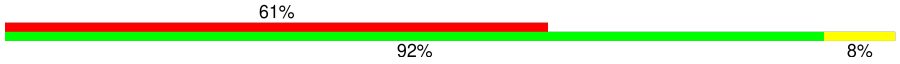



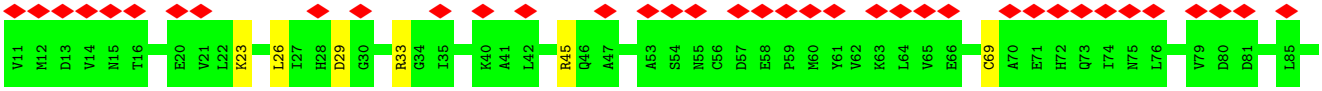



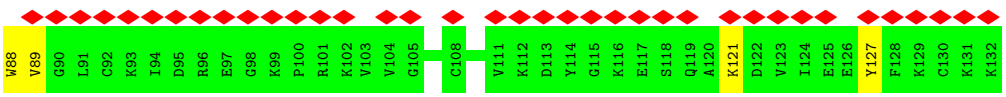




• Molecule 78: Small ribosomal subunit protein eS12

Chain SM:

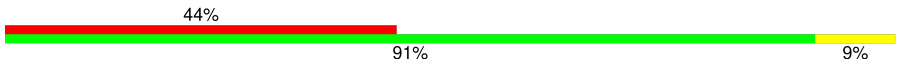


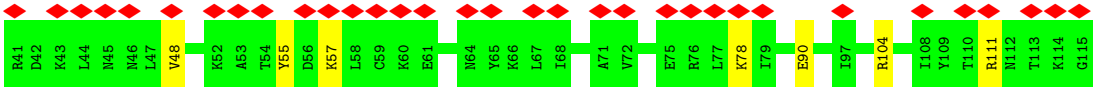




• Molecule 79: Small ribosomal subunit protein eS25

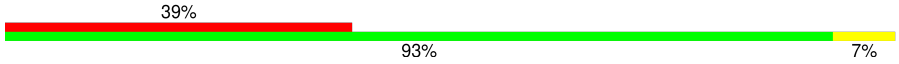
Chain SZ:

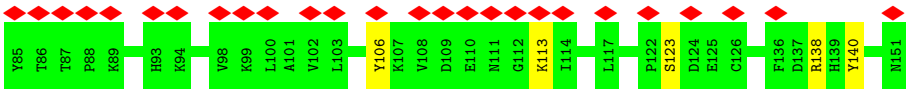





• Molecule 80: Ubiquitin-40S ribosomal protein S27a

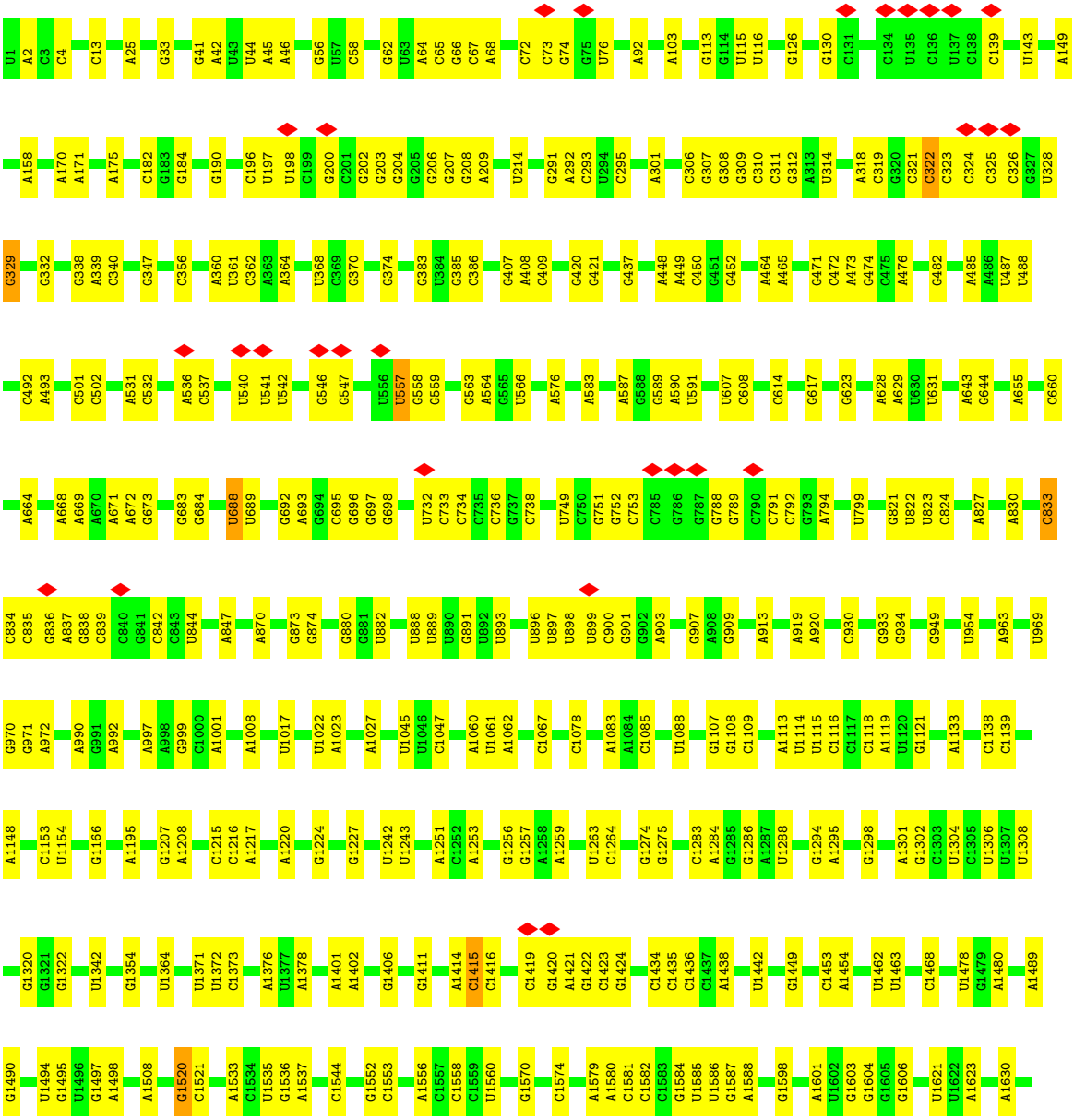
Chain Sf:

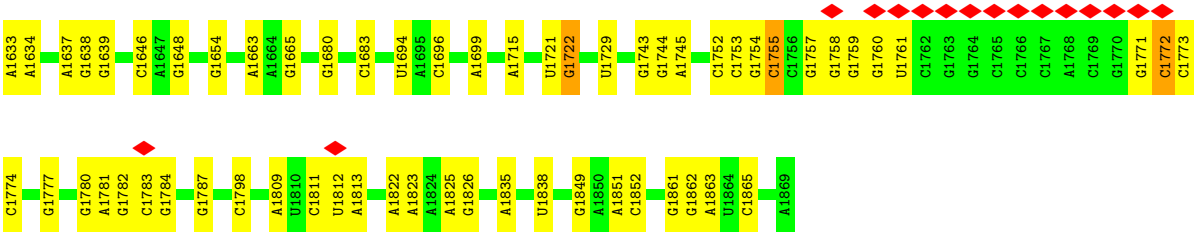



• Molecule 81: 18S rRNA

Chain S2:



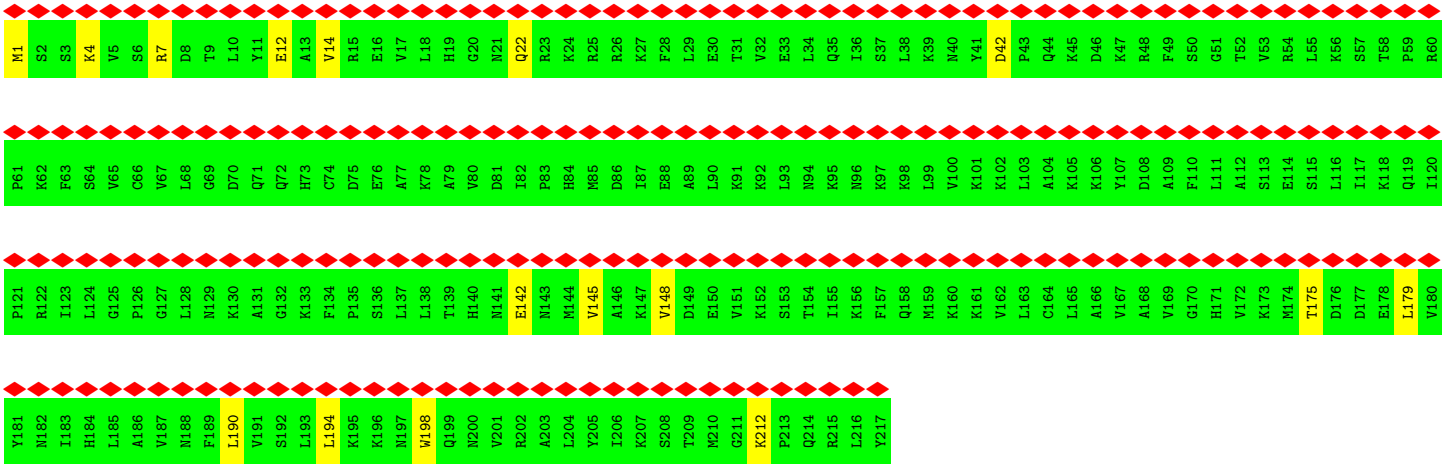

• Molecule 82: P site tRNA

Chain Pt:



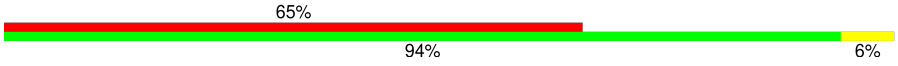
• Molecule 83: 60S ribosomal protein L10a

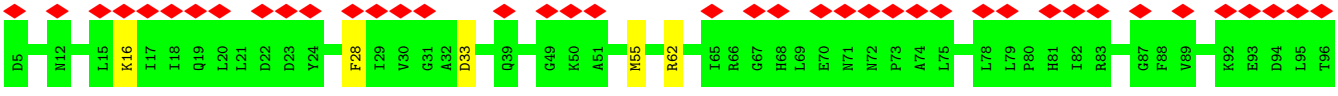
Chain Lz:

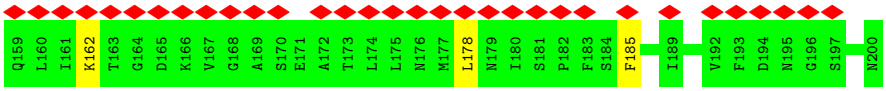

• Molecule 84: 60S acidic ribosomal protein P0

Chain Ls:



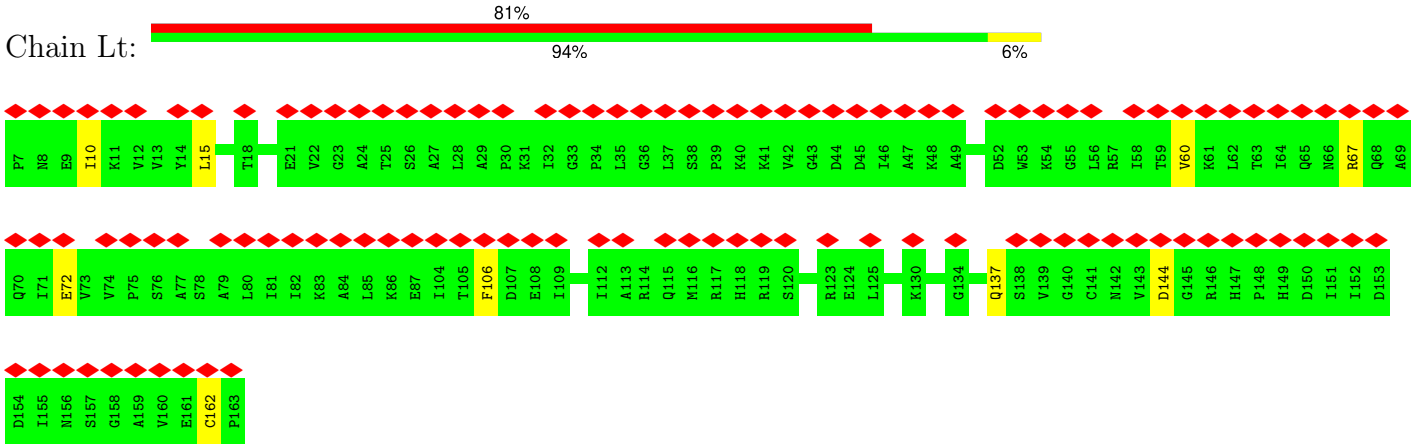








• Molecule 85: 60S ribosomal protein L12

Chain Lt:


81%
94%
6%
P7 N8 E9 I10 K11 V12 V13 Y14 L15 T18 E21 V22 G23 A24 T25 S26 A27 L28 A29 P30 K31 I32 G33 P34 L35 G36 L37 S38 P39 K40 K41 V42 G43 D44 D45 I46 A47 K48 A49 D52 W53 K54 G55 L56 R57 I58 T59 V60 K61 L62 T63 I64 Q65 N66 R67 Q68 A69
Q70 I71 E72 V73 V74 P75 S76 A77 S78 A79 L80 I81 I82 K83 A84 L85 K86 E87 I104 T105 F106 D107 E108 I109 I112 A113 R114 Q115 M116 R117 H118 R119 S120 R123 E124 L125 K130 G134 Q137 S138 V139 G140 C141 N142 V143 D144 G145 R146 H147 P148 H149 D150 I151 I152 D153
D154 I155 N156 S157 G158 A159 V160 E161 C162 P163

# 4 Experimental information (i)

| Property | Value | Source |
|---|---|---|
| EM reconstruction method | SINGLE PARTICLE | Depositor |
| Imposed symmetry | POINT, Not provided | |
| Number of particles used | 60393 | Depositor |
| Resolution determination method | FSC 0.143 CUT-OFF | Depositor |
| CTF correction method | NONE | Depositor |
| Microscope | FEI TITAN KRIOS | Depositor |
| Voltage (kV) | 300 | Depositor |
| Electron dose ($e^-/Å^2$) | 50 | Depositor |
| Minimum defocus (nm) | 1200 | Depositor |
| Maximum defocus (nm) | 2500 | Depositor |
| Magnification | Not provided | |
| Image detector | GATAN K3 (6k x 4k) | Depositor |
| Maximum map value | 0.183 | Depositor |
| Minimum map value | -0.077 | Depositor |
| Average map value | 0.001 | Depositor |
| Map value standard deviation | 0.007 | Depositor |
| Recommended contour level | 0.0202 | Depositor |
| Map size (Å) | 546.816, 546.816, 546.816 | wwPDB |
| Map dimensions | 512, 512, 512 | wwPDB |
| Map angles (°) | 90.0, 90.0, 90.0 | wwPDB |
| Pixel spacing (Å) | 1.068, 1.068, 1.068 | Depositor |

# 5 Model quality

## 5.1 Standard geometry

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

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

| Mol | Chain | Bond lengths | | Bond angles | |
|---|---|---|---|---|---|
| | | RMSZ | #$\|Z\|$ >5 | RMSZ | #$\|Z\|$ >5 |
| 1 | AT | 0.24 | 0/1805 | 0.88 | 4/2809 (0.1%) |
| 2 | CF | 0.35 | 1/3442 (0.0%) | 0.64 | 5/4656 (0.1%) |
| 3 | LW | 0.29 | 0/979 | 0.61 | 0/1295 |
| 4 | SE | 0.35 | 2/2118 (0.1%) | 0.66 | 3/2849 (0.1%) |
| 5 | SI | 0.26 | 0/1715 | 0.61 | 0/2287 |
| 6 | SL | 0.28 | 0/1268 | 0.59 | 0/1696 |
| 7 | SX | 0.26 | 0/1116 | 0.56 | 0/1490 |
| 8 | SG | 0.33 | 1/1946 (0.1%) | 0.73 | 4/2590 (0.2%) |
| 9 | SJ | 0.27 | 0/1550 | 0.64 | 1/2069 (0.0%) |
| 10 | SY | 0.35 | 1/1083 (0.1%) | 0.68 | 1/1438 (0.1%) |
| 11 | Se | 0.25 | 0/465 | 0.58 | 0/612 |
| 12 | SA | 0.29 | 0/1778 | 0.65 | 1/2416 (0.0%) |
| 13 | SB | 0.26 | 0/1765 | 0.53 | 0/2362 |
| 14 | SH | 0.28 | 0/1519 | 0.64 | 1/2033 (0.0%) |
| 15 | SV | 0.29 | 0/643 | 0.65 | 0/860 |
| 16 | Sa | 0.29 | 0/836 | 0.62 | 1/1121 (0.1%) |
| 17 | SC | 0.27 | 0/1762 | 0.54 | 0/2381 |
| 18 | SN | 0.27 | 0/1232 | 0.57 | 0/1656 |
| 19 | SO | 0.27 | 0/1062 | 0.62 | 1/1425 (0.1%) |
| 20 | SW | 0.28 | 0/1051 | 0.60 | 0/1406 |
| 21 | Sb | 0.26 | 0/665 | 0.54 | 0/891 |
| 22 | L5 | 0.34 | 0/89311 | 0.82 | 63/139283 (0.0%) |
| 23 | L7 | 0.32 | 0/2861 | 0.77 | 0/4459 |
| 24 | L8 | 0.34 | 0/3701 | 0.77 | 0/5766 |
| 25 | LA | 0.30 | 0/1936 | 0.61 | 0/2596 |
| 26 | LB | 0.28 | 0/3306 | 0.55 | 1/4424 (0.0%) |
| 27 | LC | 0.27 | 0/2981 | 0.58 | 1/4002 (0.0%) |
| 28 | LD | 0.28 | 0/2428 | 0.55 | 0/3252 |
| 29 | LE | 0.27 | 0/1942 | 0.60 | 0/2606 |
| 30 | LF | 0.29 | 0/1905 | 0.57 | 1/2539 (0.0%) |
| 31 | LG | 0.28 | 0/1960 | 0.54 | 0/2637 |
| 32 | LH | 0.28 | 0/1537 | 0.60 | 1/2066 (0.0%) |

| Mol | Chain | Bond lengths | | Bond angles | |
|---|---|---|---|---|---|
| | | RMSZ | #\|Z\| >5 | RMSZ | #\|Z\| >5 |
| 33 | LI | 0.29 | 0/1673 | 0.56 | 0/2233 |
| 34 | LJ | 0.28 | 0/1433 | 0.59 | 0/1915 |
| 35 | LL | 0.27 | 0/1732 | 0.59 | 0/2315 |
| 36 | LM | 0.28 | 0/1161 | 0.55 | 0/1554 |
| 37 | LN | 0.28 | 0/1746 | 0.62 | 1/2338 (0.0%) |
| 38 | LO | 0.29 | 0/1682 | 0.54 | 0/2250 |
| 39 | LP | 0.28 | 0/1268 | 0.53 | 0/1701 |
| 40 | LQ | 0.29 | 0/1537 | 0.64 | 1/2052 (0.0%) |
| 41 | LR | 0.72 | 1/1582 (0.1%) | 1.33 | 5/2091 (0.2%) |
| 42 | LS | 0.29 | 0/1493 | 0.56 | 0/2003 |
| 43 | LT | 0.30 | 0/1326 | 0.57 | 0/1770 |
| 44 | LU | 0.30 | 0/839 | 0.57 | 0/1126 |
| 45 | LV | 0.29 | 0/993 | 0.54 | 0/1332 |
| 46 | LX | 0.27 | 0/1002 | 0.55 | 0/1345 |
| 47 | LY | 0.28 | 0/1132 | 0.58 | 0/1504 |
| 48 | LZ | 0.29 | 0/1130 | 0.56 | 0/1507 |
| 49 | La | 0.27 | 0/1191 | 0.51 | 0/1591 |
| 50 | Lb | 0.26 | 0/889 | 0.65 | 1/1175 (0.1%) |
| 51 | Lc | 0.29 | 0/774 | 0.59 | 0/1038 |
| 52 | Ld | 0.27 | 0/903 | 0.61 | 0/1216 |
| 53 | Le | 0.28 | 0/1071 | 0.55 | 0/1429 |
| 54 | Lf | 0.28 | 0/895 | 0.59 | 0/1198 |
| 55 | Lg | 0.28 | 0/916 | 0.59 | 0/1220 |
| 56 | Lh | 0.26 | 0/1023 | 0.54 | 0/1351 |
| 57 | Li | 0.28 | 0/843 | 0.61 | 0/1115 |
| 58 | Lj | 0.27 | 0/720 | 0.63 | 0/952 |
| 59 | Lk | 0.29 | 0/575 | 0.58 | 1/761 (0.1%) |
| 60 | Ll | 0.25 | 0/454 | 0.57 | 0/599 |
| 61 | Lm | 0.27 | 0/435 | 0.67 | 1/575 (0.2%) |
| 62 | Ln | 0.24 | 0/231 | 0.71 | 0/294 |
| 63 | Lo | 0.28 | 0/876 | 0.60 | 0/1156 |
| 64 | Lp | 0.28 | 0/718 | 0.52 | 0/953 |
| 65 | Lr | 0.27 | 0/1017 | 0.60 | 0/1364 |
| 66 | SR | 0.39 | 1/1105 (0.1%) | 0.79 | 3/1484 (0.2%) |
| 67 | SD | 0.28 | 0/1793 | 0.63 | 3/2414 (0.1%) |
| 68 | SF | 0.82 | 2/1516 (0.1%) | 1.01 | 6/2037 (0.3%) |
| 69 | SK | 0.28 | 0/851 | 0.63 | 0/1147 |
| 70 | SP | 0.27 | 0/1003 | 0.62 | 1/1342 (0.1%) |
| 71 | SQ | 0.27 | 0/1160 | 0.65 | 0/1553 |
| 72 | SS | 0.26 | 0/1216 | 0.61 | 0/1628 |
| 73 | ST | 0.49 | 2/1131 (0.2%) | 0.93 | 4/1515 (0.3%) |
| 74 | SU | 0.24 | 0/831 | 0.66 | 1/1115 (0.1%) |
| 75 | Sc | 0.29 | 0/508 | 0.75 | 0/680 |

| Mol | Chain | Bond lengths | | Bond angles | |
|---|---|---|---|---|---|
| | | RMSZ | #\|Z\| >5 | RMSZ | #\|Z\| >5 |
| 76 | Sd | 0.28 | 0/470 | 0.61 | 0/623 |
| 77 | Sg | 0.26 | 0/2493 | 0.59 | 1/3394 (0.0%) |
| 78 | SM | 0.27 | 0/950 | 0.51 | 0/1275 |
| 79 | SZ | 0.26 | 0/604 | 0.64 | 0/810 |
| 80 | Sf | 0.25 | 0/560 | 0.59 | 0/745 |
| 81 | S2 | 0.26 | 0/41242 | 0.82 | 43/64255 (0.1%) |
| 82 | Pt | 0.22 | 0/1812 | 0.77 | 0/2823 |
| 83 | Lz | 0.26 | 0/1769 | 0.57 | 1/2371 (0.0%) |
| 84 | Ls | 0.26 | 0/1519 | 0.57 | 0/2052 |
| 85 | Lt | 0.25 | 0/1058 | 0.55 | 0/1430 |
| All | All | 0.31 | 11/242519 (0.0%) | 0.75 | 162/355688 (0.0%) |

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

| Mol | Chain | #Chirality outliers | #Planarity outliers |
|---|---|---|---|
| 7 | SX | 0 | 2 |
| 14 | SH | 0 | 1 |
| 25 | LA | 0 | 1 |
| 26 | LB | 0 | 2 |
| 36 | LM | 0 | 1 |
| 38 | LO | 0 | 1 |
| 41 | LR | 0 | 2 |
| 54 | Lf | 0 | 1 |
| 58 | Lj | 0 | 1 |
| 70 | SP | 0 | 1 |
| 71 | SQ | 0 | 1 |
| 79 | SZ | 0 | 1 |
| All | All | 0 | 15 |

All (11) bond length outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed(Å) | Ideal(Å) |
|---|---|---|---|---|---|---|---|
| 41 | LR | 153 | LYS | C-N | -26.32 | 0.73 | 1.34 |
| 68 | SF | 121 | PRO | CB-CG | 21.51 | 2.57 | 1.50 |
| 68 | SF | 121 | PRO | CG-CD | -19.83 | 0.85 | 1.50 |
| 2 | CF | 391 | PRO | CG-CD | -12.88 | 1.08 | 1.50 |
| 73 | ST | 89 | PRO | CB-CG | -9.97 | 1.00 | 1.50 |
| 73 | ST | 89 | PRO | CG-CD | -9.15 | 1.20 | 1.50 |
| 4 | SE | 116 | PRO | CG-CD | -8.56 | 1.22 | 1.50 |

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| Mol | Chain | Res | Type | Atoms | Z | Observed(Å) | Ideal(Å) |
|---|---|---|---|---|---|---|---|
| 66 | SR | 86 | PRO | CG-CD | -7.88 | 1.24 | 1.50 |
| 10 | SY | 85 | ASN | CA-CB | 5.54 | 1.67 | 1.53 |
| 8 | SG | 174 | PRO | CG-CD | -5.09 | 1.33 | 1.50 |
| 4 | SE | 116 | PRO | N-CD | 5.08 | 1.54 | 1.47 |

All (162) bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed($^o$) | Ideal($^o$) |
|---|---|---|---|---|---|---|---|
| 41 | LR | 153 | LYS | O-C-N | -42.83 | 54.17 | 122.70 |
| 68 | SF | 121 | PRO | CB-CG-CD | -24.49 | 10.99 | 106.50 |
| 41 | LR | 153 | LYS | C-N-CA | 22.17 | 177.12 | 121.70 |
| 41 | LR | 153 | LYS | CA-C-N | 21.54 | 164.58 | 117.20 |
| 73 | ST | 89 | PRO | N-CD-CG | -18.11 | 76.03 | 103.20 |
| 2 | CF | 391 | PRO | N-CD-CG | -17.21 | 77.39 | 103.20 |
| 2 | CF | 391 | PRO | CA-CB-CG | -16.47 | 72.71 | 104.00 |
| 73 | ST | 89 | PRO | CA-CB-CG | -15.77 | 74.05 | 104.00 |
| 68 | SF | 121 | PRO | CA-N-CD | -15.51 | 89.79 | 111.50 |
| 68 | SF | 121 | PRO | CA-CB-CG | -15.36 | 74.82 | 104.00 |
| 8 | SG | 174 | PRO | CA-N-CD | -13.33 | 92.84 | 111.50 |
| 73 | ST | 89 | PRO | CB-CG-CD | 13.10 | 157.58 | 106.50 |
| 66 | SR | 86 | PRO | N-CD-CG | -11.95 | 85.27 | 103.20 |
| 4 | SE | 116 | PRO | CA-N-CD | -11.90 | 94.85 | 111.50 |
| 4 | SE | 116 | PRO | N-CD-CG | -11.87 | 85.39 | 103.20 |
| 68 | SF | 121 | PRO | N-CA-CB | -10.95 | 90.16 | 103.30 |
| 22 | L5 | 174 | C | N3-C2-O2 | -10.13 | 114.81 | 121.90 |
| 2 | CF | 391 | PRO | N-CA-CB | -10.05 | 91.24 | 103.30 |
| 68 | SF | 120 | GLY | C-N-CD | 10.02 | 149.44 | 128.40 |
| 22 | L5 | 485 | C | C2-N1-C1' | 9.73 | 129.50 | 118.80 |
| 81 | S2 | 322 | C | N3-C2-O2 | -9.14 | 115.50 | 121.90 |
| 81 | S2 | 1772 | C | N1-C2-O2 | 9.05 | 124.33 | 118.90 |
| 66 | SR | 86 | PRO | CA-N-CD | -8.57 | 99.51 | 111.50 |
| 22 | L5 | 3773 | U | N3-C2-O2 | -8.49 | 116.25 | 122.20 |
| 81 | S2 | 356 | C | N1-C2-O2 | 8.49 | 123.99 | 118.90 |
| 22 | L5 | 2710 | C | C2-N1-C1' | 8.44 | 128.08 | 118.80 |
| 81 | S2 | 1772 | C | N3-C2-O2 | -8.37 | 116.04 | 121.90 |
| 81 | S2 | 356 | C | C2-N1-C1' | 8.33 | 127.96 | 118.80 |
| 81 | S2 | 1453 | C | C2-N1-C1' | 8.32 | 127.95 | 118.80 |
| 22 | L5 | 2710 | C | N1-C2-O2 | 8.22 | 123.83 | 118.90 |
| 22 | L5 | 456 | C | N3-C2-O2 | -8.19 | 116.17 | 121.90 |
| 40 | LQ | 4 | ASP | CB-CG-OD1 | 8.16 | 125.65 | 118.30 |
| 22 | L5 | 654 | C | N1-C2-O2 | 8.01 | 123.70 | 118.90 |
| 41 | LR | 47 | ASP | CB-CG-OD2 | 7.97 | 125.48 | 118.30 |

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| Mol | Chain | Res | Type | Atoms | Z | Observed($^o$) | Ideal($^o$) |
|---|---|---|---|---|---|---|---|
| 8 | SG | 174 | PRO | N-CD-CG | -7.96 | 91.26 | 103.20 |
| 22 | L5 | 3741 | C | N3-C2-O2 | -7.94 | 116.34 | 121.90 |
| 77 | Sg | 284 | PRO | CA-N-CD | -7.94 | 100.38 | 111.50 |
| 81 | S2 | 1722 | G | N3-C4-N9 | 7.49 | 130.49 | 126.00 |
| 22 | L5 | 1414 | C | N1-C2-O2 | 7.49 | 123.39 | 118.90 |
| 22 | L5 | 4138 | C | N3-C2-O2 | -7.49 | 116.66 | 121.90 |
| 22 | L5 | 1252 | C | N3-C2-O2 | -7.44 | 116.69 | 121.90 |
| 81 | S2 | 1453 | C | N1-C2-O2 | 7.43 | 123.36 | 118.90 |
| 22 | L5 | 485 | C | C6-N1-C1' | -7.39 | 111.94 | 120.80 |
| 22 | L5 | 456 | C | O4'-C1'-N1 | 7.31 | 114.05 | 108.20 |
| 68 | SF | 121 | PRO | N-CD-CG | -7.29 | 92.27 | 103.20 |
| 22 | L5 | 175 | C | N3-C2-O2 | -7.28 | 116.81 | 121.90 |
| 22 | L5 | 490 | C | N3-C2-O2 | -7.25 | 116.82 | 121.90 |
| 22 | L5 | 1082 | C | O4'-C1'-N1 | 7.24 | 113.99 | 108.20 |
| 37 | LN | 147 | ASP | CB-CG-OD1 | 7.16 | 124.75 | 118.30 |
| 22 | L5 | 3773 | U | N1-C2-O2 | 7.15 | 127.80 | 122.80 |
| 22 | L5 | 129 | C | N3-C2-O2 | -7.09 | 116.94 | 121.90 |
| 81 | S2 | 1416 | C | N3-C2-O2 | -7.04 | 116.98 | 121.90 |
| 50 | Lb | 118 | LEU | CA-CB-CG | 7.03 | 131.48 | 115.30 |
| 81 | S2 | 501 | C | C2-N1-C1' | 6.96 | 126.46 | 118.80 |
| 14 | SH | 17 | ASP | CB-CG-OD1 | 6.82 | 124.44 | 118.30 |
| 22 | L5 | 2710 | C | N3-C2-O2 | -6.79 | 117.14 | 121.90 |
| 81 | S2 | 356 | C | N3-C2-O2 | -6.79 | 117.14 | 121.90 |
| 81 | S2 | 557 | U | N3-C2-O2 | -6.79 | 117.45 | 122.20 |
| 22 | L5 | 3741 | C | N1-C2-O2 | 6.70 | 122.92 | 118.90 |
| 22 | L5 | 1082 | C | N3-C2-O2 | -6.67 | 117.23 | 121.90 |
| 67 | SD | 222 | PRO | CA-N-CD | -6.49 | 102.42 | 111.50 |
| 12 | SA | 126 | ASP | CB-CG-OD1 | 6.45 | 124.11 | 118.30 |
| 22 | L5 | 1414 | C | N3-C2-O2 | -6.44 | 117.39 | 121.90 |
| 22 | L5 | 174 | C | N1-C2-O2 | 6.43 | 122.76 | 118.90 |
| 83 | Lz | 194 | LEU | CA-CB-CG | 6.35 | 129.90 | 115.30 |
| 22 | L5 | 654 | C | C2-N1-C1' | 6.30 | 125.73 | 118.80 |
| 22 | L5 | 925 | C | N1-C2-O2 | 6.25 | 122.65 | 118.90 |
| 81 | S2 | 501 | C | N1-C2-O2 | 6.25 | 122.65 | 118.90 |
| 22 | L5 | 4709 | U | C2-N1-C1' | 6.24 | 125.19 | 117.70 |
| 10 | SY | 52 | PRO | CA-N-CD | -6.20 | 102.82 | 111.50 |
| 73 | ST | 89 | PRO | CA-N-CD | -6.18 | 102.84 | 111.50 |
| 22 | L5 | 3773 | U | O4'-C1'-N1 | 6.14 | 113.11 | 108.20 |
| 22 | L5 | 4147 | G | C5-C6-O6 | 6.14 | 132.28 | 128.60 |
| 81 | S2 | 1694 | U | C2-N1-C1' | 6.09 | 125.01 | 117.70 |
| 81 | S2 | 1811 | C | N3-C2-O2 | -6.05 | 117.67 | 121.90 |
| 81 | S2 | 557 | U | N1-C2-O2 | 6.04 | 127.03 | 122.80 |

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| Mol | Chain | Res | Type | Atoms | Z | Observed($^o$) | Ideal($^o$) |
|---|---|---|---|---|---|---|---|
| 22 | L5 | 925 | C | N3-C2-O2 | -6.00 | 117.70 | 121.90 |
| 81 | S2 | 1722 | G | N3-C4-C5 | -5.98 | 125.61 | 128.60 |
| 22 | L5 | 1251 | C | N1-C2-O2 | 5.98 | 122.49 | 118.90 |
| 22 | L5 | 489 | C | N1-C2-O2 | 5.95 | 122.47 | 118.90 |
| 61 | Lm | 92 | ASP | CB-CG-OD1 | 5.94 | 123.65 | 118.30 |
| 22 | L5 | 1191 | C | N3-C2-O2 | -5.94 | 117.74 | 121.90 |
| 81 | S2 | 1772 | C | C2-N1-C1' | 5.90 | 125.29 | 118.80 |
| 81 | S2 | 833 | C | N1-C2-O2 | 5.89 | 122.44 | 118.90 |
| 81 | S2 | 1453 | C | C6-N1-C1' | -5.89 | 113.73 | 120.80 |
| 81 | S2 | 1755 | C | N1-C2-O2 | 5.87 | 122.42 | 118.90 |
| 81 | S2 | 1722 | G | C4-N9-C1' | 5.85 | 134.11 | 126.50 |
| 22 | L5 | 100 | C | C2-N1-C1' | 5.85 | 125.23 | 118.80 |
| 22 | L5 | 2710 | C | C6-N1-C1' | -5.83 | 113.80 | 120.80 |
| 22 | L5 | 4093 | G | O4'-C1'-N9 | 5.83 | 112.86 | 108.20 |
| 81 | S2 | 293 | C | N1-C2-O2 | 5.80 | 122.38 | 118.90 |
| 70 | SP | 82 | ASP | CB-CG-OD2 | 5.77 | 123.50 | 118.30 |
| 81 | S2 | 329 | G | N1-C2-N2 | -5.77 | 111.01 | 116.20 |
| 81 | S2 | 1022 | U | C2-N1-C1' | 5.77 | 124.62 | 117.70 |
| 74 | SU | 48 | LEU | CA-CB-CG | 5.76 | 128.55 | 115.30 |
| 81 | S2 | 356 | C | C6-N1-C1' | -5.76 | 113.89 | 120.80 |
| 19 | SO | 14 | VAL | C-N-CA | 5.74 | 136.06 | 121.70 |
| 22 | L5 | 4147 | G | N1-C6-O6 | -5.68 | 116.49 | 119.90 |
| 66 | SR | 86 | PRO | CA-CB-CG | -5.66 | 93.25 | 104.00 |
| 1 | AT | 19 | G | O4'-C1'-N9 | -5.64 | 103.69 | 108.20 |
| 22 | L5 | 4928 | C | N1-C2-O2 | 5.63 | 122.28 | 118.90 |
| 32 | LH | 177 | ASP | CB-CG-OD2 | 5.62 | 123.36 | 118.30 |
| 22 | L5 | 654 | C | C6-N1-C1' | -5.61 | 114.06 | 120.80 |
| 81 | S2 | 834 | C | N3-C2-O2 | -5.59 | 117.98 | 121.90 |
| 81 | S2 | 322 | C | N1-C2-O2 | 5.55 | 122.23 | 118.90 |
| 8 | SG | 3 | LEU | CA-CB-CG | 5.54 | 128.05 | 115.30 |
| 22 | L5 | 3773 | U | C2-N1-C1' | 5.53 | 124.34 | 117.70 |
| 81 | S2 | 356 | C | C6-N1-C2 | -5.52 | 118.09 | 120.30 |
| 81 | S2 | 1453 | C | N3-C2-O2 | -5.52 | 118.04 | 121.90 |
| 22 | L5 | 263 | G | C5-C6-O6 | 5.52 | 131.91 | 128.60 |
| 67 | SD | 218 | LEU | CA-CB-CG | 5.50 | 127.95 | 115.30 |
| 4 | SE | 116 | PRO | CA-CB-CG | -5.50 | 93.56 | 104.00 |
| 41 | LR | 177 | LEU | CA-CB-CG | 5.50 | 127.94 | 115.30 |
| 81 | S2 | 322 | C | C6-N1-C2 | -5.50 | 118.10 | 120.30 |
| 22 | L5 | 2710 | C | C6-N1-C2 | -5.49 | 118.10 | 120.30 |
| 22 | L5 | 664 | G | C5-C6-O6 | 5.49 | 131.89 | 128.60 |
| 22 | L5 | 4928 | C | C2-N1-C1' | 5.49 | 124.83 | 118.80 |
| 81 | S2 | 329 | G | N3-C2-N2 | 5.45 | 123.71 | 119.90 |

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| Mol | Chain | Res | Type | Atoms | Z | Observed($^o$) | Ideal($^o$) |
|---|---|---|---|---|---|---|---|
| 27 | LC | 2 | ALA | C-N-CA | 5.42 | 135.24 | 121.70 |
| 81 | S2 | 1415 | C | N1-C2-O2 | 5.41 | 122.15 | 118.90 |
| 22 | L5 | 485 | C | N1-C2-O2 | 5.39 | 122.13 | 118.90 |
| 81 | S2 | 1722 | G | C8-N9-C1' | -5.39 | 120.00 | 127.00 |
| 81 | S2 | 1416 | C | C6-N1-C2 | -5.36 | 118.16 | 120.30 |
| 30 | LF | 28 | LEU | CA-CB-CG | 5.36 | 127.63 | 115.30 |
| 8 | SG | 122 | PRO | N-CD-CG | -5.36 | 95.16 | 103.20 |
| 1 | AT | 37 | C | N1-C2-O2 | 5.36 | 122.11 | 118.90 |
| 22 | L5 | 417 | G | O4'-C1'-N9 | 5.34 | 112.47 | 108.20 |
| 59 | Lk | 30 | ASP | CB-CG-OD1 | 5.34 | 123.10 | 118.30 |
| 22 | L5 | 664 | G | N1-C6-O6 | -5.28 | 116.73 | 119.90 |
| 1 | AT | 20 | U | N3-C2-O2 | -5.24 | 118.53 | 122.20 |
| 22 | L5 | 1414 | C | C2-N1-C1' | 5.24 | 124.57 | 118.80 |
| 1 | AT | 20 | U | C2-N1-C1' | 5.24 | 123.99 | 117.70 |
| 16 | Sa | 46 | GLU | CA-CB-CG | 5.24 | 124.92 | 113.40 |
| 22 | L5 | 1241 | C | N1-C2-O2 | 5.23 | 122.04 | 118.90 |
| 22 | L5 | 1216 | C | C2-N1-C1' | 5.23 | 124.55 | 118.80 |
| 81 | S2 | 834 | C | C6-N1-C2 | -5.21 | 118.21 | 120.30 |
| 22 | L5 | 456 | C | N1-C2-O2 | 5.21 | 122.03 | 118.90 |
| 9 | SJ | 106 | LEU | CA-CB-CG | 5.20 | 127.25 | 115.30 |
| 22 | L5 | 174 | C | C6-N1-C2 | -5.19 | 118.22 | 120.30 |
| 22 | L5 | 4926 | C | C2-N1-C1' | 5.16 | 124.48 | 118.80 |
| 22 | L5 | 1241 | C | C2-N1-C1' | 5.16 | 124.48 | 118.80 |
| 22 | L5 | 4709 | U | C5-C4-O4 | -5.16 | 122.81 | 125.90 |
| 22 | L5 | 2410 | C | C2-N1-C1' | 5.15 | 124.47 | 118.80 |
| 81 | S2 | 321 | C | N1-C2-O2 | 5.15 | 121.99 | 118.90 |
| 2 | CF | 229 | LEU | CA-CB-CG | 5.14 | 127.13 | 115.30 |
| 81 | S2 | 1453 | C | C5-C6-N1 | 5.14 | 123.57 | 121.00 |
| 2 | CF | 391 | PRO | CA-N-CD | -5.13 | 104.31 | 111.50 |
| 22 | L5 | 485 | C | C5-C6-N1 | 5.12 | 123.56 | 121.00 |
| 22 | L5 | 963 | G | C4-N9-C1' | 5.12 | 133.15 | 126.50 |
| 22 | L5 | 4775 | C | C2-N1-C1' | 5.11 | 124.42 | 118.80 |
| 81 | S2 | 1139 | C | N1-C2-O2 | 5.10 | 121.96 | 118.90 |
| 81 | S2 | 293 | C | C2-N1-C1' | 5.10 | 124.41 | 118.80 |
| 81 | S2 | 1078 | C | N1-C2-O2 | 5.10 | 121.96 | 118.90 |
| 26 | LB | 369 | ASP | CB-CG-OD1 | 5.08 | 122.88 | 118.30 |
| 22 | L5 | 2760 | G | P-O3'-C3' | 5.08 | 125.79 | 119.70 |
| 81 | S2 | 1520 | G | N3-C4-N9 | 5.06 | 129.04 | 126.00 |
| 22 | L5 | 4898 | G | C5-C6-O6 | 5.04 | 131.63 | 128.60 |
| 22 | L5 | 262 | G | N1-C2-N2 | -5.03 | 111.67 | 116.20 |
| 81 | S2 | 688 | U | P-O3'-C3' | 5.02 | 125.73 | 119.70 |
| 67 | SD | 162 | ASP | CB-CG-OD2 | 5.02 | 122.82 | 118.30 |

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| Mol | Chain | Res | Type | Atoms | Z | Observed($^o$) | Ideal($^o$) |
|---|---|---|---|---|---|---|---|
| 22 | L5 | 2257 | C | C2-N1-C1' | 5.01 | 124.31 | 118.80 |
| 22 | L5 | 1082 | C | P-O3'-C3' | 5.00 | 125.70 | 119.70 |

There are no chirality outliers.

All (15) planarity outliers are listed below:

| Mol | Chain | Res | Type | Group |
|---|---|---|---|---|
| 25 | LA | 13 | GLY | Peptide |
| 26 | LB | 17 | LEU | Peptide |
| 26 | LB | 258 | HIS | Peptide |
| 36 | LM | 87 | ALA | Peptide |
| 38 | LO | 110 | PRO | Peptide |
| 41 | LR | 153 | LYS | Peptide,Mainchain |
| 54 | Lf | 106 | TYR | Peptide |
| 58 | Lj | 39 | TYR | Peptide |
| 14 | SH | 15 | LYS | Peptide |
| 70 | SP | 127 | LYS | Peptide |
| 71 | SQ | 43 | GLU | Peptide |
| 7 | SX | 126 | ALA | Peptide |
| 7 | SX | 86 | PRO | Peptide |
| 79 | SZ | 78 | LYS | Peptide |

## 5.2 Too-close contacts

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

## 5.3 Torsion angles

### 5.3.1 Protein backbone

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

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

| Mol | Chain | Analysed | Favoured | Allowed | Outliers | Percentiles | |
|---|---|---|---|---|---|---|---|
| 2 | CF | 438/441 (99%) | 430 (98%) | 8 (2%) | 0 | 100 | 100 |
| 3 | LW | 114/118 (97%) | 110 (96%) | 4 (4%) | 0 | 100 | 100 |

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| Mol | Chain | Analysed | Favoured | Allowed | Outliers | Percentiles | |
|---|---|---|---|---|---|---|---|
| 4 | SE | 260/262 (99%) | 235 (90%) | 25 (10%) | 0 | 100 | 100 |
| 5 | SI | 204/206 (99%) | 194 (95%) | 10 (5%) | 0 | 100 | 100 |
| 6 | SL | 151/153 (99%) | 144 (95%) | 7 (5%) | 0 | 100 | 100 |
| 7 | SX | 139/141 (99%) | 126 (91%) | 12 (9%) | 1 (1%) | 19 | 47 |
| 8 | SG | 235/237 (99%) | 211 (90%) | 24 (10%) | 0 | 100 | 100 |
| 9 | SJ | 183/185 (99%) | 170 (93%) | 13 (7%) | 0 | 100 | 100 |
| 10 | SY | 129/131 (98%) | 121 (94%) | 8 (6%) | 0 | 100 | 100 |
| 11 | Se | 56/58 (97%) | 52 (93%) | 4 (7%) | 0 | 100 | 100 |
| 12 | SA | 219/221 (99%) | 203 (93%) | 16 (7%) | 0 | 100 | 100 |
| 13 | SB | 212/214 (99%) | 203 (96%) | 9 (4%) | 0 | 100 | 100 |
| 14 | SH | 182/186 (98%) | 163 (90%) | 19 (10%) | 0 | 100 | 100 |
| 15 | SV | 81/83 (98%) | 73 (90%) | 8 (10%) | 0 | 100 | 100 |
| 16 | Sa | 100/102 (98%) | 92 (92%) | 7 (7%) | 1 (1%) | 13 | 38 |
| 17 | SC | 220/222 (99%) | 205 (93%) | 15 (7%) | 0 | 100 | 100 |
| 18 | SN | 148/150 (99%) | 142 (96%) | 6 (4%) | 0 | 100 | 100 |
| 19 | SO | 138/140 (99%) | 122 (88%) | 16 (12%) | 0 | 100 | 100 |
| 20 | SW | 127/129 (98%) | 119 (94%) | 8 (6%) | 0 | 100 | 100 |
| 21 | Sb | 81/83 (98%) | 73 (90%) | 8 (10%) | 0 | 100 | 100 |
| 25 | LA | 246/248 (99%) | 222 (90%) | 24 (10%) | 0 | 100 | 100 |
| 26 | LB | 400/402 (100%) | 373 (93%) | 27 (7%) | 0 | 100 | 100 |
| 27 | LC | 366/368 (100%) | 342 (93%) | 24 (7%) | 0 | 100 | 100 |
| 28 | LD | 291/293 (99%) | 279 (96%) | 12 (4%) | 0 | 100 | 100 |
| 29 | LE | 232/236 (98%) | 206 (89%) | 26 (11%) | 0 | 100 | 100 |
| 30 | LF | 223/225 (99%) | 213 (96%) | 10 (4%) | 0 | 100 | 100 |
| 31 | LG | 239/241 (99%) | 224 (94%) | 15 (6%) | 0 | 100 | 100 |
| 32 | LH | 188/190 (99%) | 175 (93%) | 13 (7%) | 0 | 100 | 100 |
| 33 | LI | 198/202 (98%) | 185 (93%) | 13 (7%) | 0 | 100 | 100 |
| 34 | LJ | 174/176 (99%) | 163 (94%) | 11 (6%) | 0 | 100 | 100 |
| 35 | LL | 208/210 (99%) | 191 (92%) | 17 (8%) | 0 | 100 | 100 |
| 36 | LM | 137/139 (99%) | 128 (93%) | 8 (6%) | 1 (1%) | 19 | 47 |
| 37 | LN | 201/203 (99%) | 189 (94%) | 11 (6%) | 1 (0%) | 25 | 55 |

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| Mol | Chain | Analysed | Favoured | Allowed | Outliers | Percentiles | |
|---|---|---|---|---|---|---|---|
| 38 | LO | 199/201 (99%) | 194 (98%) | 5 (2%) | 0 | 100 | 100 |
| 39 | LP | 151/153 (99%) | 141 (93%) | 10 (7%) | 0 | 100 | 100 |
| 40 | LQ | 185/187 (99%) | 180 (97%) | 5 (3%) | 0 | 100 | 100 |
| 41 | LR | 185/187 (99%) | 178 (96%) | 6 (3%) | 1 (0%) | 25 | 55 |
| 42 | LS | 173/175 (99%) | 161 (93%) | 12 (7%) | 0 | 100 | 100 |
| 43 | LT | 157/159 (99%) | 147 (94%) | 10 (6%) | 0 | 100 | 100 |
| 44 | LU | 99/101 (98%) | 85 (86%) | 14 (14%) | 0 | 100 | 100 |
| 45 | LV | 129/131 (98%) | 124 (96%) | 5 (4%) | 0 | 100 | 100 |
| 46 | LX | 118/120 (98%) | 114 (97%) | 4 (3%) | 0 | 100 | 100 |
| 47 | LY | 132/134 (98%) | 126 (96%) | 6 (4%) | 0 | 100 | 100 |
| 48 | LZ | 133/135 (98%) | 119 (90%) | 14 (10%) | 0 | 100 | 100 |
| 49 | La | 145/147 (99%) | 138 (95%) | 7 (5%) | 0 | 100 | 100 |
| 50 | Lb | 105/109 (96%) | 97 (92%) | 8 (8%) | 0 | 100 | 100 |
| 51 | Lc | 96/98 (98%) | 90 (94%) | 6 (6%) | 0 | 100 | 100 |
| 52 | Ld | 105/107 (98%) | 99 (94%) | 6 (6%) | 0 | 100 | 100 |
| 53 | Le | 126/128 (98%) | 121 (96%) | 5 (4%) | 0 | 100 | 100 |
| 54 | Lf | 107/109 (98%) | 99 (92%) | 7 (6%) | 1 (1%) | 14 | 41 |
| 55 | Lg | 112/114 (98%) | 112 (100%) | 0 | 0 | 100 | 100 |
| 56 | Lh | 120/122 (98%) | 118 (98%) | 2 (2%) | 0 | 100 | 100 |
| 57 | Li | 100/102 (98%) | 97 (97%) | 3 (3%) | 0 | 100 | 100 |
| 58 | Lj | 84/86 (98%) | 77 (92%) | 7 (8%) | 0 | 100 | 100 |
| 59 | Lk | 67/69 (97%) | 65 (97%) | 2 (3%) | 0 | 100 | 100 |
| 60 | Ll | 48/50 (96%) | 47 (98%) | 1 (2%) | 0 | 100 | 100 |
| 61 | Lm | 50/52 (96%) | 50 (100%) | 0 | 0 | 100 | 100 |
| 62 | Ln | 22/24 (92%) | 22 (100%) | 0 | 0 | 100 | 100 |
| 63 | Lo | 103/105 (98%) | 98 (95%) | 5 (5%) | 0 | 100 | 100 |
| 64 | Lp | 89/91 (98%) | 86 (97%) | 3 (3%) | 0 | 100 | 100 |
| 65 | Lr | 123/125 (98%) | 116 (94%) | 7 (6%) | 0 | 100 | 100 |
| 66 | SR | 133/135 (98%) | 118 (89%) | 14 (10%) | 1 (1%) | 16 | 44 |
| 67 | SD | 225/227 (99%) | 206 (92%) | 19 (8%) | 0 | 100 | 100 |
| 68 | SF | 187/189 (99%) | 165 (88%) | 22 (12%) | 0 | 100 | 100 |

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| Mol | Chain | Analysed | Favoured | Allowed | Outliers | Percentiles |
|---|---|---|---|---|---|---|
| 69 | SK | 96/98 (98%) | 83 (86%) | 12 (12%) | 1 (1%) | 13 38 |
| 70 | SP | 119/121 (98%) | 112 (94%) | 7 (6%) | 0 | 100 100 |
| 71 | SQ | 142/144 (99%) | 126 (89%) | 15 (11%) | 1 (1%) | 19 47 |
| 72 | SS | 143/145 (99%) | 137 (96%) | 6 (4%) | 0 | 100 100 |
| 73 | ST | 141/143 (99%) | 129 (92%) | 10 (7%) | 2 (1%) | 9 30 |
| 74 | SU | 102/104 (98%) | 96 (94%) | 6 (6%) | 0 | 100 100 |
| 75 | Sc | 62/64 (97%) | 53 (86%) | 9 (14%) | 0 | 100 100 |
| 76 | Sd | 53/55 (96%) | 51 (96%) | 2 (4%) | 0 | 100 100 |
| 77 | Sg | 311/313 (99%) | 275 (88%) | 36 (12%) | 0 | 100 100 |
| 78 | SM | 120/122 (98%) | 108 (90%) | 12 (10%) | 0 | 100 100 |
| 79 | SZ | 73/75 (97%) | 60 (82%) | 13 (18%) | 0 | 100 100 |
| 80 | Sf | 65/67 (97%) | 56 (86%) | 9 (14%) | 0 | 100 100 |
| 83 | Lz | 215/217 (99%) | 173 (80%) | 42 (20%) | 0 | 100 100 |
| 84 | Ls | 194/196 (99%) | 187 (96%) | 7 (4%) | 0 | 100 100 |
| 85 | Lt | 137/141 (97%) | 111 (81%) | 25 (18%) | 1 (1%) | 19 47 |
| All | All | 12301/12472 (99%) | 11425 (93%) | 864 (7%) | 12 (0%) | 50 76 |

All (12) Ramachandran outliers are listed below:

| Mol | Chain | Res | Type |
|---|---|---|---|
| 41 | LR | 154 | LEU |
| 73 | ST | 39 | LEU |
| 7 | SX | 127 | ASN |
| 16 | Sa | 47 | ALA |
| 36 | LM | 88 | ALA |
| 66 | SR | 124 | VAL |
| 37 | LN | 124 | ASP |
| 85 | Lt | 144 | ASP |
| 73 | ST | 41 | LYS |
| 69 | SK | 96 | ARG |
| 54 | Lf | 107 | PRO |
| 71 | SQ | 44 | PRO |

### 5.3.2 Protein sidechains (i)

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

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

| Mol | Chain | Analysed | Rotameric | Outliers | Percentiles |
|---|---|---|---|---|---|
| 2 | CF | 365/366 (100%) | 348 (95%) | 17 (5%) | 22 53 |
| 3 | LW | 97/97 (100%) | 86 (89%) | 11 (11%) | 4 15 |
| 4 | SE | 224/224 (100%) | 206 (92%) | 18 (8%) | 10 29 |
| 5 | SI | 178/178 (100%) | 162 (91%) | 16 (9%) | 8 24 |
| 6 | SL | 137/137 (100%) | 124 (90%) | 13 (10%) | 7 21 |
| 7 | SX | 113/113 (100%) | 108 (96%) | 5 (4%) | 24 55 |
| 8 | SG | 207/207 (100%) | 186 (90%) | 21 (10%) | 6 19 |
| 9 | SJ | 161/161 (100%) | 147 (91%) | 14 (9%) | 8 25 |
| 10 | SY | 113/113 (100%) | 99 (88%) | 14 (12%) | 4 11 |
| 11 | Se | 47/47 (100%) | 44 (94%) | 3 (6%) | 14 40 |
| 12 | SA | 183/183 (100%) | 164 (90%) | 19 (10%) | 5 18 |
| 13 | SB | 195/195 (100%) | 175 (90%) | 20 (10%) | 6 18 |
| 14 | SH | 166/166 (100%) | 154 (93%) | 12 (7%) | 12 33 |
| 15 | SV | 67/67 (100%) | 50 (75%) | 17 (25%) | 0 1 |
| 16 | Sa | 89/89 (100%) | 73 (82%) | 16 (18%) | 1 4 |
| 17 | SC | 188/188 (100%) | 165 (88%) | 23 (12%) | 4 12 |
| 18 | SN | 130/130 (100%) | 124 (95%) | 6 (5%) | 23 54 |
| 19 | SO | 110/110 (100%) | 100 (91%) | 10 (9%) | 7 23 |
| 20 | SW | 112/112 (100%) | 106 (95%) | 6 (5%) | 18 47 |
| 21 | Sb | 75/75 (100%) | 67 (89%) | 8 (11%) | 5 16 |
| 25 | LA | 190/190 (100%) | 178 (94%) | 12 (6%) | 15 40 |
| 26 | LB | 348/348 (100%) | 327 (94%) | 21 (6%) | 16 42 |
| 27 | LC | 306/306 (100%) | 287 (94%) | 19 (6%) | 15 41 |
| 28 | LD | 246/247 (100%) | 231 (94%) | 15 (6%) | 15 42 |
| 29 | LE | 209/209 (100%) | 192 (92%) | 17 (8%) | 9 28 |
| 30 | LF | 194/194 (100%) | 183 (94%) | 11 (6%) | 17 45 |

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| Mol | Chain | Analysed | Rotameric | Outliers | Percentiles |
|---|---|---|---|---|---|
| 31 | LG | 203/205 (99%) | 190 (94%) | 13 (6%) | 14 40 |
| 32 | LH | 169/169 (100%) | 150 (89%) | 19 (11%) | 5 15 |
| 33 | LI | 172/172 (100%) | 153 (89%) | 19 (11%) | 5 16 |
| 34 | LJ | 148/148 (100%) | 131 (88%) | 17 (12%) | 4 14 |
| 35 | LL | 176/176 (100%) | 169 (96%) | 7 (4%) | 27 59 |
| 36 | LM | 118/118 (100%) | 111 (94%) | 7 (6%) | 16 43 |
| 37 | LN | 171/171 (100%) | 166 (97%) | 5 (3%) | 37 70 |
| 38 | LO | 173/173 (100%) | 162 (94%) | 11 (6%) | 14 40 |
| 39 | LP | 134/134 (100%) | 121 (90%) | 13 (10%) | 6 21 |
| 40 | LQ | 164/164 (100%) | 154 (94%) | 10 (6%) | 15 42 |
| 41 | LR | 166/166 (100%) | 154 (93%) | 12 (7%) | 12 33 |
| 42 | LS | 156/156 (100%) | 139 (89%) | 17 (11%) | 5 16 |
| 43 | LT | 139/139 (100%) | 123 (88%) | 16 (12%) | 4 14 |
| 44 | LU | 91/91 (100%) | 77 (85%) | 14 (15%) | 2 7 |
| 45 | LV | 101/101 (100%) | 93 (92%) | 8 (8%) | 10 29 |
| 46 | LX | 108/108 (100%) | 100 (93%) | 8 (7%) | 11 32 |
| 47 | LY | 124/124 (100%) | 114 (92%) | 10 (8%) | 9 28 |
| 48 | LZ | 117/117 (100%) | 106 (91%) | 11 (9%) | 7 22 |
| 49 | La | 120/120 (100%) | 113 (94%) | 7 (6%) | 17 44 |
| 50 | Lb | 88/90 (98%) | 82 (93%) | 6 (7%) | 13 36 |
| 51 | Lc | 83/83 (100%) | 77 (93%) | 6 (7%) | 12 33 |
| 52 | Ld | 98/98 (100%) | 91 (93%) | 7 (7%) | 12 34 |
| 53 | Le | 114/114 (100%) | 107 (94%) | 7 (6%) | 15 42 |
| 54 | Lf | 88/88 (100%) | 85 (97%) | 3 (3%) | 32 65 |
| 55 | Lg | 98/98 (100%) | 89 (91%) | 9 (9%) | 7 23 |
| 56 | Lh | 109/109 (100%) | 100 (92%) | 9 (8%) | 9 27 |
| 57 | Li | 86/86 (100%) | 75 (87%) | 11 (13%) | 3 11 |
| 58 | Lj | 73/73 (100%) | 70 (96%) | 3 (4%) | 26 58 |
| 59 | Lk | 64/64 (100%) | 60 (94%) | 4 (6%) | 15 40 |
| 60 | Ll | 47/47 (100%) | 42 (89%) | 5 (11%) | 5 17 |
| 61 | Lm | 48/48 (100%) | 47 (98%) | 1 (2%) | 48 77 |

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| Mol | Chain | Analysed | Rotameric | Outliers | Percentiles |
|---|---|---|---|---|---|
| 62 | Ln | 23/23 (100%) | 20 (87%) | 3 (13%) | 3 10 |
| 63 | Lo | 93/93 (100%) | 85 (91%) | 8 (9%) | 8 26 |
| 64 | Lp | 74/74 (100%) | 71 (96%) | 3 (4%) | 26 58 |
| 65 | Lr | 109/109 (100%) | 105 (96%) | 4 (4%) | 29 62 |
| 66 | SR | 122/122 (100%) | 104 (85%) | 18 (15%) | 2 7 |
| 67 | SD | 190/190 (100%) | 171 (90%) | 19 (10%) | 6 19 |
| 68 | SF | 159/159 (100%) | 151 (95%) | 8 (5%) | 20 50 |
| 69 | SK | 89/89 (100%) | 78 (88%) | 11 (12%) | 4 11 |
| 70 | SP | 107/107 (100%) | 100 (94%) | 7 (6%) | 14 39 |
| 71 | SQ | 119/119 (100%) | 102 (86%) | 17 (14%) | 2 8 |
| 72 | SS | 126/126 (100%) | 118 (94%) | 8 (6%) | 15 40 |
| 73 | ST | 113/113 (100%) | 106 (94%) | 7 (6%) | 15 41 |
| 74 | SU | 94/94 (100%) | 82 (87%) | 12 (13%) | 3 11 |
| 75 | Sc | 57/57 (100%) | 52 (91%) | 5 (9%) | 8 25 |
| 76 | Sd | 48/48 (100%) | 43 (90%) | 5 (10%) | 5 18 |
| 77 | Sg | 272/272 (100%) | 240 (88%) | 32 (12%) | 4 13 |
| 78 | SM | 102/104 (98%) | 92 (90%) | 10 (10%) | 6 20 |
| 79 | SZ | 66/66 (100%) | 60 (91%) | 6 (9%) | 7 23 |
| 80 | Sf | 60/60 (100%) | 55 (92%) | 5 (8%) | 9 27 |
| 83 | Lz | 195/196 (100%) | 180 (92%) | 15 (8%) | 10 30 |
| 84 | Ls | 162/164 (99%) | 151 (93%) | 11 (7%) | 13 36 |
| 85 | Lt | 112/115 (97%) | 104 (93%) | 8 (7%) | 12 34 |
| All | All | 10688/10702 (100%) | 9807 (92%) | 881 (8%) | 12 27 |

All (881) residues with a non-rotameric sidechain are listed below:

| Mol | Chain | Res | Type |
|---|---|---|---|
| 2 | CF | 12 | VAL |
| 2 | CF | 30 | LYS |
| 2 | CF | 34 | ILE |
| 2 | CF | 49 | MET |
| 2 | CF | 64 | LYS |
| 2 | CF | 85 | TYR |
| 2 | CF | 96 | ARG |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 2 | CF | 97 | ASP |
| 2 | CF | 132 | GLN |
| 2 | CF | 155 | MET |
| 2 | CF | 208 | MET |
| 2 | CF | 234 | CYS |
| 2 | CF | 266 | ARG |
| 2 | CF | 279 | THR |
| 2 | CF | 389 | ASP |
| 2 | CF | 391 | PRO |
| 2 | CF | 442 | ASP |
| 3 | LW | 11 | TYR |
| 3 | LW | 19 | ARG |
| 3 | LW | 20 | ARG |
| 3 | LW | 38 | SER |
| 3 | LW | 44 | ARG |
| 3 | LW | 48 | GLN |
| 3 | LW | 50 | ASN |
| 3 | LW | 77 | LYS |
| 3 | LW | 91 | MET |
| 3 | LW | 101 | ARG |
| 3 | LW | 110 | ARG |
| 4 | SE | 8 | HIS |
| 4 | SE | 17 | HIS |
| 4 | SE | 19 | MET |
| 4 | SE | 37 | LYS |
| 4 | SE | 62 | LYS |
| 4 | SE | 69 | PHE |
| 4 | SE | 108 | ARG |
| 4 | SE | 117 | GLU |
| 4 | SE | 121 | TYR |
| 4 | SE | 126 | VAL |
| 4 | SE | 133 | THR |
| 4 | SE | 161 | GLN |
| 4 | SE | 197 | ASN |
| 4 | SE | 198 | ARG |
| 4 | SE | 217 | SER |
| 4 | SE | 221 | ARG |
| 4 | SE | 237 | SER |
| 4 | SE | 240 | ARG |
| 5 | SI | 12 | ARG |
| 5 | SI | 45 | THR |
| 5 | SI | 47 | ARG |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 5 | SI | 53 | LYS |
| 5 | SI | 61 | ASP |
| 5 | SI | 62 | VAL |
| 5 | SI | 71 | CYS |
| 5 | SI | 87 | ASN |
| 5 | SI | 92 | ARG |
| 5 | SI | 97 | VAL |
| 5 | SI | 107 | THR |
| 5 | SI | 123 | ARG |
| 5 | SI | 134 | GLU |
| 5 | SI | 141 | ARG |
| 5 | SI | 178 | ARG |
| 5 | SI | 200 | ARG |
| 6 | SL | 6 | THR |
| 6 | SL | 19 | ASN |
| 6 | SL | 21 | LYS |
| 6 | SL | 35 | ARG |
| 6 | SL | 48 | LYS |
| 6 | SL | 67 | SER |
| 6 | SL | 69 | ARG |
| 6 | SL | 77 | VAL |
| 6 | SL | 85 | THR |
| 6 | SL | 91 | ASP |
| 6 | SL | 97 | ARG |
| 6 | SL | 132 | ARG |
| 6 | SL | 146 | THR |
| 7 | SX | 19 | ASP |
| 7 | SX | 39 | ASN |
| 7 | SX | 69 | CYS |
| 7 | SX | 105 | PHE |
| 7 | SX | 114 | ASP |
| 8 | SG | 1 | MET |
| 8 | SG | 2 | LYS |
| 8 | SG | 30 | LYS |
| 8 | SG | 45 | TRP |
| 8 | SG | 57 | ASP |
| 8 | SG | 69 | THR |
| 8 | SG | 70 | HIS |
| 8 | SG | 83 | CYS |
| 8 | SG | 98 | ARG |
| 8 | SG | 107 | SER |
| 8 | SG | 110 | ASN |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 8 | SG | 136 | LYS |
| 8 | SG | 149 | LYS |
| 8 | SG | 152 | ASP |
| 8 | SG | 171 | THR |
| 8 | SG | 177 | GLN |
| 8 | SG | 179 | LEU |
| 8 | SG | 188 | LYS |
| 8 | SG | 192 | ILE |
| 8 | SG | 201 | LYS |
| 8 | SG | 233 | ARG |
| 9 | SJ | 7 | TRP |
| 9 | SJ | 9 | CYS |
| 9 | SJ | 10 | ARG |
| 9 | SJ | 17 | ARG |
| 9 | SJ | 47 | LYS |
| 9 | SJ | 72 | PHE |
| 9 | SJ | 79 | ARG |
| 9 | SJ | 100 | LEU |
| 9 | SJ | 105 | PHE |
| 9 | SJ | 107 | GLU |
| 9 | SJ | 132 | GLN |
| 9 | SJ | 136 | ARG |
| 9 | SJ | 154 | GLN |
| 9 | SJ | 176 | LYS |
| 10 | SY | 12 | PHE |
| 10 | SY | 13 | MET |
| 10 | SY | 16 | ARG |
| 10 | SY | 23 | MET |
| 10 | SY | 26 | ASP |
| 10 | SY | 49 | LYS |
| 10 | SY | 58 | PHE |
| 10 | SY | 61 | ARG |
| 10 | SY | 70 | THR |
| 10 | SY | 78 | SER |
| 10 | SY | 97 | TYR |
| 10 | SY | 99 | LYS |
| 10 | SY | 114 | MET |
| 10 | SY | 132 | LYS |
| 11 | Se | 19 | VAL |
| 11 | Se | 44 | ASN |
| 11 | Se | 51 | LYS |
| 12 | SA | 6 | ASP |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 12 | SA | 17 | LYS |
| 12 | SA | 18 | PHE |
| 12 | SA | 25 | LEU |
| 12 | SA | 31 | ASP |
| 12 | SA | 35 | GLU |
| 12 | SA | 36 | GLN |
| 12 | SA | 39 | TYR |
| 12 | SA | 52 | LYS |
| 12 | SA | 69 | GLU |
| 12 | SA | 73 | ASP |
| 12 | SA | 124 | VAL |
| 12 | SA | 132 | GLN |
| 12 | SA | 138 | SER |
| 12 | SA | 165 | ASN |
| 12 | SA | 174 | MET |
| 12 | SA | 191 | ARG |
| 12 | SA | 200 | ASP |
| 12 | SA | 215 | GLN |
| 13 | SB | 27 | LYS |
| 13 | SB | 38 | MET |
| 13 | SB | 53 | GLN |
| 13 | SB | 55 | THR |
| 13 | SB | 59 | SER |
| 13 | SB | 65 | ARG |
| 13 | SB | 68 | GLU |
| 13 | SB | 90 | ASP |
| 13 | SB | 96 | CYS |
| 13 | SB | 98 | THR |
| 13 | SB | 134 | LEU |
| 13 | SB | 137 | LEU |
| 13 | SB | 144 | LYS |
| 13 | SB | 166 | LYS |
| 13 | SB | 168 | MET |
| 13 | SB | 170 | GLU |
| 13 | SB | 177 | GLN |
| 13 | SB | 179 | ASN |
| 13 | SB | 202 | GLN |
| 13 | SB | 208 | HIS |
| 14 | SH | 17 | ASP |
| 14 | SH | 46 | THR |
| 14 | SH | 57 | ARG |
| 14 | SH | 72 | PHE |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 14 | SH | 78 | ARG |
| 14 | SH | 85 | LYS |
| 14 | SH | 153 | LEU |
| 14 | SH | 165 | ASN |
| 14 | SH | 172 | THR |
| 14 | SH | 174 | SER |
| 14 | SH | 180 | LEU |
| 14 | SH | 188 | GLU |
| 15 | SV | 1 | MET |
| 15 | SV | 7 | GLU |
| 15 | SV | 11 | LEU |
| 15 | SV | 17 | CYS |
| 15 | SV | 22 | ARG |
| 15 | SV | 24 | ILE |
| 15 | SV | 31 | SER |
| 15 | SV | 33 | GLN |
| 15 | SV | 34 | MET |
| 15 | SV | 38 | GLU |
| 15 | SV | 46 | PHE |
| 15 | SV | 49 | GLN |
| 15 | SV | 60 | ARG |
| 15 | SV | 62 | MET |
| 15 | SV | 78 | ILE |
| 15 | SV | 81 | LYS |
| 15 | SV | 83 | PHE |
| 16 | Sa | 3 | LYS |
| 16 | Sa | 15 | ARG |
| 16 | Sa | 28 | ARG |
| 16 | Sa | 29 | CYS |
| 16 | Sa | 32 | LYS |
| 16 | Sa | 37 | LYS |
| 16 | Sa | 38 | LYS |
| 16 | Sa | 39 | PHE |
| 16 | Sa | 42 | ARG |
| 16 | Sa | 46 | GLU |
| 16 | Sa | 58 | VAL |
| 16 | Sa | 59 | PHE |
| 16 | Sa | 67 | LEU |
| 16 | Sa | 70 | LYS |
| 16 | Sa | 89 | ARG |
| 16 | Sa | 93 | LYS |
| 17 | SC | 68 | ARG |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 17 | SC | 73 | MET |
| 17 | SC | 84 | PHE |
| 17 | SC | 101 | SER |
| 17 | SC | 110 | MET |
| 17 | SC | 114 | LYS |
| 17 | SC | 121 | ARG |
| 17 | SC | 132 | ASP |
| 17 | SC | 143 | CYS |
| 17 | SC | 167 | ARG |
| 17 | SC | 190 | SER |
| 17 | SC | 193 | VAL |
| 17 | SC | 205 | VAL |
| 17 | SC | 215 | MET |
| 17 | SC | 236 | PHE |
| 17 | SC | 248 | TYR |
| 17 | SC | 256 | TRP |
| 17 | SC | 263 | LYS |
| 17 | SC | 264 | SER |
| 17 | SC | 269 | PHE |
| 17 | SC | 270 | THR |
| 17 | SC | 271 | ASP |
| 17 | SC | 275 | LYS |
| 18 | SN | 20 | ARG |
| 18 | SN | 49 | GLN |
| 18 | SN | 87 | ASP |
| 18 | SN | 100 | LYS |
| 18 | SN | 143 | SER |
| 18 | SN | 149 | LEU |
| 19 | SO | 34 | PHE |
| 19 | SO | 38 | ASN |
| 19 | SO | 50 | LYS |
| 19 | SO | 55 | ARG |
| 19 | SO | 66 | ARG |
| 19 | SO | 91 | THR |
| 19 | SO | 100 | THR |
| 19 | SO | 117 | ARG |
| 19 | SO | 132 | VAL |
| 19 | SO | 151 | LEU |
| 20 | SW | 26 | LEU |
| 20 | SW | 36 | ARG |
| 20 | SW | 42 | MET |
| 20 | SW | 64 | ASN |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 20 | SW | 104 | LEU |
| 20 | SW | 107 | SER |
| 21 | Sb | 20 | LYS |
| 21 | Sb | 31 | TYR |
| 21 | Sb | 36 | LYS |
| 21 | Sb | 41 | TYR |
| 21 | Sb | 44 | THR |
| 21 | Sb | 55 | LEU |
| 21 | Sb | 79 | PHE |
| 21 | Sb | 80 | ARG |
| 25 | LA | 30 | ARG |
| 25 | LA | 47 | ASP |
| 25 | LA | 54 | ARG |
| 25 | LA | 60 | LYS |
| 25 | LA | 101 | VAL |
| 25 | LA | 102 | LEU |
| 25 | LA | 114 | CYS |
| 25 | LA | 135 | THR |
| 25 | LA | 138 | SER |
| 25 | LA | 207 | VAL |
| 25 | LA | 243 | THR |
| 25 | LA | 245 | ARG |
| 26 | LB | 5 | LYS |
| 26 | LB | 17 | LEU |
| 26 | LB | 19 | ARG |
| 26 | LB | 38 | SER |
| 26 | LB | 46 | PHE |
| 26 | LB | 58 | ARG |
| 26 | LB | 73 | VAL |
| 26 | LB | 90 | VAL |
| 26 | LB | 116 | ARG |
| 26 | LB | 159 | VAL |
| 26 | LB | 174 | ARG |
| 26 | LB | 208 | ASN |
| 26 | LB | 233 | SER |
| 26 | LB | 248 | LEU |
| 26 | LB | 258 | HIS |
| 26 | LB | 298 | LEU |
| 26 | LB | 305 | THR |
| 26 | LB | 328 | ASN |
| 26 | LB | 350 | SER |
| 26 | LB | 382 | MET |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 26 | LB | 394 | LYS |
| 27 | LC | 3 | CYS |
| 27 | LC | 63 | SER |
| 27 | LC | 66 | SER |
| 27 | LC | 80 | ARG |
| 27 | LC | 95 | MET |
| 27 | LC | 114 | ARG |
| 27 | LC | 122 | TYR |
| 27 | LC | 138 | MET |
| 27 | LC | 139 | SER |
| 27 | LC | 149 | GLU |
| 27 | LC | 164 | THR |
| 27 | LC | 188 | ARG |
| 27 | LC | 201 | ARG |
| 27 | LC | 261 | ASP |
| 27 | LC | 308 | LYS |
| 27 | LC | 313 | VAL |
| 27 | LC | 317 | ASN |
| 27 | LC | 325 | MET |
| 27 | LC | 366 | ASP |
| 28 | LD | 5 | LYS |
| 28 | LD | 7 | VAL |
| 28 | LD | 86 | TYR |
| 28 | LD | 88 | VAL |
| 28 | LD | 94 | ASN |
| 28 | LD | 109 | LEU |
| 28 | LD | 128 | ASP |
| 28 | LD | 187 | SER |
| 28 | LD | 211 | LEU |
| 28 | LD | 234 | ASP |
| 28 | LD | 235 | MET |
| 28 | LD | 239 | MET |
| 28 | LD | 259 | LYS |
| 28 | LD | 262 | LYS |
| 28 | LD | 268 | ARG |
| 29 | LE | 56 | ARG |
| 29 | LE | 59 | ARG |
| 29 | LE | 128 | HIS |
| 29 | LE | 130 | LYS |
| 29 | LE | 134 | SER |
| 29 | LE | 143 | SER |
| 29 | LE | 202 | ASP |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 29 | LE | 214 | ASP |
| 29 | LE | 216 | TYR |
| 29 | LE | 221 | LYS |
| 29 | LE | 226 | ARG |
| 29 | LE | 239 | LYS |
| 29 | LE | 240 | TYR |
| 29 | LE | 245 | GLN |
| 29 | LE | 249 | ASP |
| 29 | LE | 278 | THR |
| 29 | LE | 285 | LYS |
| 30 | LF | 28 | LEU |
| 30 | LF | 36 | LYS |
| 30 | LF | 40 | LYS |
| 30 | LF | 43 | ARG |
| 30 | LF | 88 | LYS |
| 30 | LF | 96 | ARG |
| 30 | LF | 99 | ASN |
| 30 | LF | 187 | MET |
| 30 | LF | 196 | THR |
| 30 | LF | 199 | LYS |
| 30 | LF | 232 | ASP |
| 31 | LG | 49 | ARG |
| 31 | LG | 73 | ARG |
| 31 | LG | 85 | GLN |
| 31 | LG | 90 | GLN |
| 31 | LG | 105 | GLU |
| 31 | LG | 117 | ARG |
| 31 | LG | 151 | LYS |
| 31 | LG | 175 | ARG |
| 31 | LG | 202 | VAL |
| 31 | LG | 211 | ASP |
| 31 | LG | 231 | ASP |
| 31 | LG | 254 | GLU |
| 31 | LG | 259 | LYS |
| 32 | LH | 2 | LYS |
| 32 | LH | 8 | GLN |
| 32 | LH | 11 | ASP |
| 32 | LH | 16 | VAL |
| 32 | LH | 25 | VAL |
| 32 | LH | 28 | LYS |
| 32 | LH | 37 | ASP |
| 32 | LH | 42 | ASN |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 32 | LH | 51 | LYS |
| 32 | LH | 52 | LYS |
| 32 | LH | 57 | VAL |
| 32 | LH | 58 | ASP |
| 32 | LH | 89 | ARG |
| 32 | LH | 124 | ARG |
| 32 | LH | 146 | LEU |
| 32 | LH | 161 | ILE |
| 32 | LH | 167 | VAL |
| 32 | LH | 183 | GLU |
| 32 | LH | 189 | GLN |
| 33 | LI | 21 | ARG |
| 33 | LI | 35 | ASP |
| 33 | LI | 43 | VAL |
| 33 | LI | 53 | VAL |
| 33 | LI | 54 | SER |
| 33 | LI | 71 | CYS |
| 33 | LI | 87 | MET |
| 33 | LI | 102 | MET |
| 33 | LI | 134 | VAL |
| 33 | LI | 162 | ARG |
| 33 | LI | 169 | LYS |
| 33 | LI | 183 | ASP |
| 33 | LI | 184 | MET |
| 33 | LI | 187 | LYS |
| 33 | LI | 189 | CYS |
| 33 | LI | 195 | CYS |
| 33 | LI | 197 | VAL |
| 33 | LI | 203 | HIS |
| 33 | LI | 208 | LYS |
| 34 | LJ | 3 | GLN |
| 34 | LJ | 5 | GLN |
| 34 | LJ | 34 | THR |
| 34 | LJ | 38 | LYS |
| 34 | LJ | 51 | SER |
| 34 | LJ | 100 | SER |
| 34 | LJ | 104 | ASN |
| 34 | LJ | 114 | ASP |
| 34 | LJ | 118 | LYS |
| 34 | LJ | 126 | TYR |
| 34 | LJ | 129 | ASP |
| 34 | LJ | 132 | VAL |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 34 | LJ | 140 | SER |
| 34 | LJ | 147 | ARG |
| 34 | LJ | 150 | CYS |
| 34 | LJ | 164 | ARG |
| 34 | LJ | 167 | GLN |
| 35 | LL | 19 | GLN |
| 35 | LL | 64 | VAL |
| 35 | LL | 67 | HIS |
| 35 | LL | 80 | GLU |
| 35 | LL | 121 | ARG |
| 35 | LL | 177 | LYS |
| 35 | LL | 190 | ARG |
| 36 | LM | 48 | GLN |
| 36 | LM | 70 | GLN |
| 36 | LM | 101 | LYS |
| 36 | LM | 105 | THR |
| 36 | LM | 106 | ASP |
| 36 | LM | 113 | MET |
| 36 | LM | 117 | LYS |
| 37 | LN | 11 | TRP |
| 37 | LN | 24 | ARG |
| 37 | LN | 26 | ARG |
| 37 | LN | 100 | SER |
| 37 | LN | 179 | LYS |
| 38 | LO | 31 | ARG |
| 38 | LO | 37 | ARG |
| 38 | LO | 44 | SER |
| 38 | LO | 64 | THR |
| 38 | LO | 68 | ARG |
| 38 | LO | 178 | ARG |
| 38 | LO | 187 | LYS |
| 38 | LO | 188 | LYS |
| 38 | LO | 191 | LYS |
| 38 | LO | 195 | VAL |
| 38 | LO | 202 | LEU |
| 39 | LP | 10 | ASN |
| 39 | LP | 13 | LYS |
| 39 | LP | 14 | SER |
| 39 | LP | 18 | ARG |
| 39 | LP | 24 | VAL |
| 39 | LP | 50 | ASP |
| 39 | LP | 57 | CYS |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 39 | LP | 58 | VAL |
| 39 | LP | 69 | ARG |
| 39 | LP | 75 | GLN |
| 39 | LP | 116 | HIS |
| 39 | LP | 128 | ARG |
| 39 | LP | 148 | MET |
| 40 | LQ | 4 | ASP |
| 40 | LQ | 42 | THR |
| 40 | LQ | 76 | GLU |
| 40 | LQ | 85 | THR |
| 40 | LQ | 95 | VAL |
| 40 | LQ | 101 | CYS |
| 40 | LQ | 108 | ARG |
| 40 | LQ | 140 | SER |
| 40 | LQ | 150 | ARG |
| 40 | LQ | 168 | ARG |
| 41 | LR | 37 | SER |
| 41 | LR | 59 | SER |
| 41 | LR | 70 | ARG |
| 41 | LR | 112 | SER |
| 41 | LR | 116 | ASP |
| 41 | LR | 117 | ARG |
| 41 | LR | 151 | ARG |
| 41 | LR | 152 | LYS |
| 41 | LR | 176 | ARG |
| 41 | LR | 183 | GLU |
| 41 | LR | 186 | LYS |
| 41 | LR | 188 | LEU |
| 42 | LS | 21 | LYS |
| 42 | LS | 23 | HIS |
| 42 | LS | 29 | ARG |
| 42 | LS | 55 | LYS |
| 42 | LS | 70 | LYS |
| 42 | LS | 83 | ARG |
| 42 | LS | 85 | ASP |
| 42 | LS | 93 | MET |
| 42 | LS | 95 | ARG |
| 42 | LS | 107 | THR |
| 42 | LS | 125 | GLN |
| 42 | LS | 147 | ASP |
| 42 | LS | 154 | LEU |
| 42 | LS | 158 | VAL |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 42 | LS | 159 | LEU |
| 42 | LS | 160 | ARG |
| 42 | LS | 164 | LYS |
| 43 | LT | 36 | LYS |
| 43 | LT | 45 | MET |
| 43 | LT | 47 | THR |
| 43 | LT | 48 | VAL |
| 43 | LT | 63 | ARG |
| 43 | LT | 83 | LYS |
| 43 | LT | 85 | LEU |
| 43 | LT | 90 | ASN |
| 43 | LT | 92 | ARG |
| 43 | LT | 99 | SER |
| 43 | LT | 100 | LYS |
| 43 | LT | 102 | ARG |
| 43 | LT | 112 | ASN |
| 43 | LT | 122 | LYS |
| 43 | LT | 142 | ARG |
| 43 | LT | 158 | PHE |
| 44 | LU | 21 | PHE |
| 44 | LU | 27 | HIS |
| 44 | LU | 34 | MET |
| 44 | LU | 52 | LYS |
| 44 | LU | 65 | ARG |
| 44 | LU | 67 | LYS |
| 44 | LU | 71 | THR |
| 44 | LU | 78 | PHE |
| 44 | LU | 82 | TYR |
| 44 | LU | 93 | LYS |
| 44 | LU | 94 | ASN |
| 44 | LU | 99 | TRP |
| 44 | LU | 108 | GLU |
| 44 | LU | 110 | TYR |
| 45 | LV | 45 | ILE |
| 45 | LV | 48 | ARG |
| 45 | LV | 62 | MET |
| 45 | LV | 65 | VAL |
| 45 | LV | 92 | ASP |
| 45 | LV | 109 | LYS |
| 45 | LV | 111 | GLU |
| 45 | LV | 138 | SER |
| 46 | LX | 39 | LYS |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 46 | LX | 52 | LEU |
| 46 | LX | 81 | LEU |
| 46 | LX | 85 | SER |
| 46 | LX | 93 | ASN |
| 46 | LX | 102 | VAL |
| 46 | LX | 120 | ASP |
| 46 | LX | 121 | VAL |
| 47 | LY | 1 | MET |
| 47 | LY | 40 | GLN |
| 47 | LY | 47 | MET |
| 47 | LY | 52 | ASP |
| 47 | LY | 74 | TYR |
| 47 | LY | 102 | SER |
| 47 | LY | 108 | ARG |
| 47 | LY | 112 | ASP |
| 47 | LY | 117 | LYS |
| 47 | LY | 124 | LYS |
| 48 | LZ | 21 | ARG |
| 48 | LZ | 47 | ASP |
| 48 | LZ | 83 | THR |
| 48 | LZ | 84 | ARG |
| 48 | LZ | 85 | TYR |
| 48 | LZ | 88 | ASP |
| 48 | LZ | 100 | VAL |
| 48 | LZ | 111 | ARG |
| 48 | LZ | 128 | LYS |
| 48 | LZ | 132 | GLN |
| 48 | LZ | 135 | ARG |
| 49 | La | 61 | TYR |
| 49 | La | 68 | SER |
| 49 | La | 84 | GLU |
| 49 | La | 92 | LYS |
| 49 | La | 95 | THR |
| 49 | La | 120 | GLN |
| 49 | La | 140 | VAL |
| 50 | Lb | 23 | LYS |
| 50 | Lb | 26 | SER |
| 50 | Lb | 57 | MET |
| 50 | Lb | 58 | GLN |
| 50 | Lb | 63 | LYS |
| 50 | Lb | 106 | LYS |
| 51 | Lc | 23 | LYS |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 51 | Lc | 26 | LYS |
| 51 | Lc | 27 | TYR |
| 51 | Lc | 28 | VAL |
| 51 | Lc | 58 | SER |
| 51 | Lc | 91 | VAL |
| 52 | Ld | 26 | THR |
| 52 | Ld | 31 | LYS |
| 52 | Ld | 44 | ARG |
| 52 | Ld | 61 | ASP |
| 52 | Ld | 104 | THR |
| 52 | Ld | 108 | TYR |
| 52 | Ld | 115 | LYS |
| 53 | Le | 87 | VAL |
| 53 | Le | 88 | LEU |
| 53 | Le | 89 | LEU |
| 53 | Le | 90 | MET |
| 53 | Le | 104 | SER |
| 53 | Le | 117 | GLN |
| 53 | Le | 121 | ARG |
| 54 | Lf | 7 | SER |
| 54 | Lf | 19 | ARG |
| 54 | Lf | 40 | GLU |
| 55 | Lg | 23 | SER |
| 55 | Lg | 28 | ASN |
| 55 | Lg | 29 | ARG |
| 55 | Lg | 32 | TYR |
| 55 | Lg | 49 | CYS |
| 55 | Lg | 63 | VAL |
| 55 | Lg | 73 | HIS |
| 55 | Lg | 85 | LYS |
| 55 | Lg | 105 | LYS |
| 56 | Lh | 13 | LYS |
| 56 | Lh | 42 | SER |
| 56 | Lh | 49 | VAL |
| 56 | Lh | 66 | LYS |
| 56 | Lh | 82 | ASP |
| 56 | Lh | 87 | LYS |
| 56 | Lh | 94 | ARG |
| 56 | Lh | 103 | LYS |
| 56 | Lh | 109 | ARG |
| 57 | Li | 11 | LEU |
| 57 | Li | 12 | ASN |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 57 | Li | 21 | VAL |
| 57 | Li | 27 | SER |
| 57 | Li | 64 | SER |
| 57 | Li | 75 | LYS |
| 57 | Li | 91 | SER |
| 57 | Li | 92 | ASN |
| 57 | Li | 93 | VAL |
| 57 | Li | 99 | LYS |
| 57 | Li | 103 | LYS |
| 58 | Lj | 22 | CYS |
| 58 | Lj | 36 | LYS |
| 58 | Lj | 85 | LYS |
| 59 | Lk | 39 | SER |
| 59 | Lk | 44 | THR |
| 59 | Lk | 51 | GLU |
| 59 | Lk | 52 | LYS |
| 60 | Ll | 11 | ARG |
| 60 | Ll | 30 | LYS |
| 60 | Ll | 37 | TYR |
| 60 | Ll | 45 | ARG |
| 60 | Ll | 51 | LEU |
| 61 | Lm | 127 | VAL |
| 62 | Ln | 2 | ARG |
| 62 | Ln | 11 | ARG |
| 62 | Ln | 19 | LYS |
| 63 | Lo | 22 | LYS |
| 63 | Lo | 28 | LYS |
| 63 | Lo | 42 | ASP |
| 63 | Lo | 46 | SER |
| 63 | Lo | 59 | LYS |
| 63 | Lo | 69 | ARG |
| 63 | Lo | 72 | CYS |
| 63 | Lo | 77 | CYS |
| 64 | Lp | 3 | LYS |
| 64 | Lp | 16 | THR |
| 64 | Lp | 46 | LYS |
| 65 | Lr | 14 | SER |
| 65 | Lr | 15 | SER |
| 65 | Lr | 66 | ARG |
| 65 | Lr | 84 | LYS |
| 66 | SR | 1 | MET |
| 66 | SR | 4 | VAL |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 66 | SR | 23 | ARG |
| 66 | SR | 35 | CYS |
| 66 | SR | 50 | ILE |
| 66 | SR | 60 | ARG |
| 66 | SR | 62 | GLN |
| 66 | SR | 63 | ARG |
| 66 | SR | 67 | ARG |
| 66 | SR | 72 | LYS |
| 66 | SR | 75 | GLU |
| 66 | SR | 77 | GLU |
| 66 | SR | 91 | LEU |
| 66 | SR | 102 | THR |
| 66 | SR | 106 | LEU |
| 66 | SR | 110 | ASP |
| 66 | SR | 117 | LEU |
| 66 | SR | 120 | THR |
| 67 | SD | 24 | PHE |
| 67 | SD | 32 | ASP |
| 67 | SD | 35 | SER |
| 67 | SD | 76 | ARG |
| 67 | SD | 96 | LEU |
| 67 | SD | 104 | SER |
| 67 | SD | 107 | TYR |
| 67 | SD | 113 | LEU |
| 67 | SD | 132 | LYS |
| 67 | SD | 134 | CYS |
| 67 | SD | 149 | SER |
| 67 | SD | 154 | ASP |
| 67 | SD | 163 | PRO |
| 67 | SD | 169 | ASP |
| 67 | SD | 178 | ARG |
| 67 | SD | 184 | ILE |
| 67 | SD | 189 | MET |
| 67 | SD | 207 | HIS |
| 67 | SD | 212 | GLU |
| 68 | SF | 45 | TYR |
| 68 | SF | 62 | ARG |
| 68 | SF | 75 | SER |
| 68 | SF | 77 | MET |
| 68 | SF | 122 | ARG |
| 68 | SF | 167 | LYS |
| 68 | SF | 175 | ASP |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 68 | SF | 203 | ASN |
| 69 | SK | 7 | ASN |
| 69 | SK | 8 | ARG |
| 69 | SK | 21 | MET |
| 69 | SK | 24 | LYS |
| 69 | SK | 38 | LYS |
| 69 | SK | 44 | HIS |
| 69 | SK | 45 | VAL |
| 69 | SK | 57 | TYR |
| 69 | SK | 69 | TRP |
| 69 | SK | 85 | LEU |
| 69 | SK | 96 | ARG |
| 70 | SP | 26 | LEU |
| 70 | SP | 40 | ARG |
| 70 | SP | 50 | ARG |
| 70 | SP | 62 | LYS |
| 70 | SP | 77 | LYS |
| 70 | SP | 81 | ARG |
| 70 | SP | 130 | ARG |
| 71 | SQ | 13 | PHE |
| 71 | SQ | 31 | LEU |
| 71 | SQ | 37 | ARG |
| 71 | SQ | 52 | LEU |
| 71 | SQ | 62 | ARG |
| 71 | SQ | 67 | ASP |
| 71 | SQ | 73 | LYS |
| 71 | SQ | 82 | TYR |
| 71 | SQ | 96 | TYR |
| 71 | SQ | 98 | LYS |
| 71 | SQ | 102 | GLU |
| 71 | SQ | 115 | TYR |
| 71 | SQ | 125 | ARG |
| 71 | SQ | 126 | ARG |
| 71 | SQ | 129 | SER |
| 71 | SQ | 131 | LYS |
| 71 | SQ | 145 | TYR |
| 72 | SS | 1 | MET |
| 72 | SS | 20 | ILE |
| 72 | SS | 40 | TYR |
| 72 | SS | 66 | ARG |
| 72 | SS | 77 | TYR |
| 72 | SS | 82 | TRP |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 72 | SS | 97 | GLN |
| 72 | SS | 136 | THR |
| 73 | ST | 21 | PHE |
| 73 | ST | 66 | LEU |
| 73 | ST | 74 | SER |
| 73 | ST | 76 | THR |
| 73 | ST | 91 | HIS |
| 73 | ST | 118 | ASP |
| 73 | ST | 123 | LEU |
| 74 | SU | 19 | ARG |
| 74 | SU | 28 | ASN |
| 74 | SU | 31 | SER |
| 74 | SU | 34 | LYS |
| 74 | SU | 50 | VAL |
| 74 | SU | 51 | LYS |
| 74 | SU | 62 | ARG |
| 74 | SU | 63 | ILE |
| 74 | SU | 81 | GLN |
| 74 | SU | 88 | LEU |
| 74 | SU | 91 | LEU |
| 74 | SU | 108 | PRO |
| 75 | Sc | 31 | ARG |
| 75 | Sc | 32 | VAL |
| 75 | Sc | 47 | LYS |
| 75 | Sc | 58 | LEU |
| 75 | Sc | 64 | GLU |
| 76 | Sd | 3 | HIS |
| 76 | Sd | 8 | TRP |
| 76 | Sd | 34 | TYR |
| 76 | Sd | 41 | GLN |
| 76 | Sd | 48 | LYS |
| 77 | Sg | 3 | GLU |
| 77 | Sg | 14 | HIS |
| 77 | Sg | 36 | ARG |
| 77 | Sg | 52 | TYR |
| 77 | Sg | 60 | ARG |
| 77 | Sg | 89 | LEU |
| 77 | Sg | 91 | ASP |
| 77 | Sg | 111 | VAL |
| 77 | Sg | 126 | ASP |
| 77 | Sg | 127 | LYS |
| 77 | Sg | 135 | LEU |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 77 | Sg | 140 | TYR |
| 77 | Sg | 155 | ARG |
| 77 | Sg | 173 | LEU |
| 77 | Sg | 187 | ASN |
| 77 | Sg | 194 | TYR |
| 77 | Sg | 207 | CYS |
| 77 | Sg | 218 | LEU |
| 77 | Sg | 219 | TRP |
| 77 | Sg | 225 | LYS |
| 77 | Sg | 226 | HIS |
| 77 | Sg | 228 | TYR |
| 77 | Sg | 237 | ASN |
| 77 | Sg | 241 | PHE |
| 77 | Sg | 244 | ASN |
| 77 | Sg | 249 | CYS |
| 77 | Sg | 252 | THR |
| 77 | Sg | 264 | LYS |
| 77 | Sg | 271 | LYS |
| 77 | Sg | 282 | GLU |
| 77 | Sg | 287 | THR |
| 77 | Sg | 306 | LEU |
| 78 | SM | 23 | LYS |
| 78 | SM | 26 | LEU |
| 78 | SM | 29 | ASP |
| 78 | SM | 33 | ARG |
| 78 | SM | 45 | ARG |
| 78 | SM | 69 | CYS |
| 78 | SM | 88 | TRP |
| 78 | SM | 89 | VAL |
| 78 | SM | 121 | LYS |
| 78 | SM | 127 | TYR |
| 79 | SZ | 48 | VAL |
| 79 | SZ | 55 | TYR |
| 79 | SZ | 57 | LYS |
| 79 | SZ | 90 | GLU |
| 79 | SZ | 104 | ARG |
| 79 | SZ | 111 | ARG |
| 80 | Sf | 106 | TYR |
| 80 | Sf | 113 | LYS |
| 80 | Sf | 123 | SER |
| 80 | Sf | 138 | ARG |
| 80 | Sf | 140 | TYR |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 83 | Lz | 1 | MET |
| 83 | Lz | 4 | LYS |
| 83 | Lz | 7 | ARG |
| 83 | Lz | 12 | GLU |
| 83 | Lz | 14 | VAL |
| 83 | Lz | 22 | GLN |
| 83 | Lz | 42 | ASP |
| 83 | Lz | 142 | GLU |
| 83 | Lz | 145 | VAL |
| 83 | Lz | 148 | VAL |
| 83 | Lz | 175 | THR |
| 83 | Lz | 179 | LEU |
| 83 | Lz | 190 | LEU |
| 83 | Lz | 198 | TRP |
| 83 | Lz | 212 | LYS |
| 84 | Ls | 16 | LYS |
| 84 | Ls | 28 | PHE |
| 84 | Ls | 33 | ASP |
| 84 | Ls | 55 | MET |
| 84 | Ls | 62 | ARG |
| 84 | Ls | 101 | MET |
| 84 | Ls | 107 | VAL |
| 84 | Ls | 126 | GLN |
| 84 | Ls | 162 | LYS |
| 84 | Ls | 178 | LEU |
| 84 | Ls | 185 | PHE |
| 85 | Lt | 10 | ILE |
| 85 | Lt | 15 | LEU |
| 85 | Lt | 60 | VAL |
| 85 | Lt | 67 | ARG |
| 85 | Lt | 72 | GLU |
| 85 | Lt | 106 | PHE |
| 85 | Lt | 137 | GLN |
| 85 | Lt | 162 | CYS |

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (28) such sidechains are listed below:

| Mol | Chain | Res | Type |
|---|---|---|---|
| 3 | LW | 79 | GLN |
| 4 | SE | 98 | ASN |
| 6 | SL | 141 | ASN |
| 7 | SX | 63 | ASN |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 8 | SG | 56 | ASN |
| 8 | SG | 110 | ASN |
| 9 | SJ | 177 | ASN |
| 12 | SA | 50 | ASN |
| 12 | SA | 111 | GLN |
| 12 | SA | 141 | ASN |
| 14 | SH | 12 | ASN |
| 14 | SH | 91 | HIS |
| 19 | SO | 32 | HIS |
| 19 | SO | 43 | HIS |
| 25 | LA | 132 | ASN |
| 27 | LC | 317 | ASN |
| 30 | LF | 39 | GLN |
| 30 | LF | 131 | ASN |
| 33 | LI | 59 | GLN |
| 48 | LZ | 28 | ASN |
| 50 | Lb | 60 | ASN |
| 67 | SD | 159 | HIS |
| 67 | SD | 207 | HIS |
| 68 | SF | 107 | ASN |
| 78 | SM | 19 | GLN |
| 84 | Ls | 39 | GLN |
| 84 | Ls | 81 | HIS |
| 85 | Lt | 115 | GLN |

### 5.3.3 RNA

| Mol | Chain | Analysed | Backbone Outliers | Pucker Outliers |
|---|---|---|---|---|
| 1 | AT | 74/77 (96%) | 43 (58%) | 1 (1%) |
| 22 | L5 | 3703/3740 (99%) | 861 (23%) | 21 (0%) |
| 23 | L7 | 119/120 (99%) | 13 (10%) | 1 (0%) |
| 24 | L8 | 155/156 (99%) | 29 (18%) | 0 |
| 81 | S2 | 1715/1740 (98%) | 416 (24%) | 7 (0%) |
| 82 | Pt | 75/76 (98%) | 17 (22%) | 0 |
| All | All | 5841/5909 (98%) | 1379 (23%) | 30 (0%) |

All (1379) RNA backbone outliers are listed below:

| Mol | Chain | Res | Type |
|---|---|---|---|
| 1 | AT | 3 | C |
| 1 | AT | 4 | U |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 1 | AT | 8 | U |
| 1 | AT | 9 | A |
| 1 | AT | 10 | G |
| 1 | AT | 12 | G |
| 1 | AT | 13 | U |
| 1 | AT | 14 | A |
| 1 | AT | 16 | C |
| 1 | AT | 19 | G |
| 1 | AT | 20 | U |
| 1 | AT | 21 | U |
| 1 | AT | 22 | A |
| 1 | AT | 26 | C |
| 1 | AT | 27 | G |
| 1 | AT | 31 | G |
| 1 | AT | 32 | C |
| 1 | AT | 33 | C |
| 1 | AT | 34 | U |
| 1 | AT | 37 | C |
| 1 | AT | 40 | G |
| 1 | AT | 41 | C |
| 1 | AT | 43 | A |
| 1 | AT | 45 | A |
| 1 | AT | 46 | G |
| 1 | AT | 47 | G |
| 1 | AT | 49 | C |
| 1 | AT | 50 | C |
| 1 | AT | 51 | U |
| 1 | AT | 53 | G |
| 1 | AT | 58 | G |
| 1 | AT | 59 | A |
| 1 | AT | 60 | A |
| 1 | AT | 62 | C |
| 1 | AT | 64 | G |
| 1 | AT | 65 | G |
| 1 | AT | 68 | G |
| 1 | AT | 69 | G |
| 1 | AT | 70 | A |
| 1 | AT | 72 | A |
| 1 | AT | 73 | C |
| 1 | AT | 76 | C |
| 1 | AT | 77 | A |
| 22 | L5 | 2 | G |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 22 | L5 | 5 | A |
| 22 | L5 | 25 | A |
| 22 | L5 | 26 | C |
| 22 | L5 | 30 | C |
| 22 | L5 | 39 | A |
| 22 | L5 | 42 | A |
| 22 | L5 | 48 | G |
| 22 | L5 | 56 | A |
| 22 | L5 | 59 | A |
| 22 | L5 | 64 | A |
| 22 | L5 | 65 | A |
| 22 | L5 | 66 | A |
| 22 | L5 | 73 | A |
| 22 | L5 | 91 | G |
| 22 | L5 | 104 | G |
| 22 | L5 | 108 | A |
| 22 | L5 | 109 | G |
| 22 | L5 | 110 | C |
| 22 | L5 | 116 | G |
| 22 | L5 | 119 | G |
| 22 | L5 | 120 | A |
| 22 | L5 | 127 | G |
| 22 | L5 | 132 | G |
| 22 | L5 | 133 | C |
| 22 | L5 | 134 | G |
| 22 | L5 | 135 | G |
| 22 | L5 | 137 | G |
| 22 | L5 | 152 | U |
| 22 | L5 | 157 | U |
| 22 | L5 | 159 | C |
| 22 | L5 | 165 | A |
| 22 | L5 | 170 | C |
| 22 | L5 | 171 | U |
| 22 | L5 | 172 | C |
| 22 | L5 | 175 | C |
| 22 | L5 | 181 | C |
| 22 | L5 | 183 | C |
| 22 | L5 | 184 | U |
| 22 | L5 | 185 | C |
| 22 | L5 | 188 | G |
| 22 | L5 | 189 | G |
| 22 | L5 | 200 | U |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 22 | L5 | 209 | U |
| 22 | L5 | 216 | C |
| 22 | L5 | 218 | A |
| 22 | L5 | 220 | C |
| 22 | L5 | 234 | G |
| 22 | L5 | 237 | G |
| 22 | L5 | 254 | G |
| 22 | L5 | 255 | C |
| 22 | L5 | 256 | G |
| 22 | L5 | 261 | G |
| 22 | L5 | 264 | C |
| 22 | L5 | 265 | C |
| 22 | L5 | 266 | C |
| 22 | L5 | 267 | G |
| 22 | L5 | 275 | C |
| 22 | L5 | 276 | C |
| 22 | L5 | 280 | G |
| 22 | L5 | 297 | U |
| 22 | L5 | 306 | A |
| 22 | L5 | 315 | G |
| 22 | L5 | 316 | U |
| 22 | L5 | 340 | C |
| 22 | L5 | 350 | C |
| 22 | L5 | 373 | G |
| 22 | L5 | 387 | G |
| 22 | L5 | 388 | A |
| 22 | L5 | 396 | A |
| 22 | L5 | 401 | G |
| 22 | L5 | 407 | A |
| 22 | L5 | 409 | G |
| 22 | L5 | 410 | A |
| 22 | L5 | 411 | G |
| 22 | L5 | 412 | G |
| 22 | L5 | 413 | G |
| 22 | L5 | 415 | G |
| 22 | L5 | 431 | G |
| 22 | L5 | 432 | U |
| 22 | L5 | 440 | U |
| 22 | L5 | 449 | C |
| 22 | L5 | 450 | G |
| 22 | L5 | 452 | A |
| 22 | L5 | 453 | G |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 22 | L5 | 454 | U |
| 22 | L5 | 456 | C |
| 22 | L5 | 457 | G |
| 22 | L5 | 467 | U |
| 22 | L5 | 468 | U |
| 22 | L5 | 478 | G |
| 22 | L5 | 484 | U |
| 22 | L5 | 485 | C |
| 22 | L5 | 486 | C |
| 22 | L5 | 489 | C |
| 22 | L5 | 493 | G |
| 22 | L5 | 494 | U |
| 22 | L5 | 497 | G |
| 22 | L5 | 498 | C |
| 22 | L5 | 499 | G |
| 22 | L5 | 500 | G |
| 22 | L5 | 501 | C |
| 22 | L5 | 502 | C |
| 22 | L5 | 503 | C |
| 22 | L5 | 504 | G |
| 22 | L5 | 509 | A |
| 22 | L5 | 510 | U |
| 22 | L5 | 511 | C |
| 22 | L5 | 512 | U |
| 22 | L5 | 513 | U |
| 22 | L5 | 514 | U |
| 22 | L5 | 518 | G |
| 22 | L5 | 643 | C |
| 22 | L5 | 646 | G |
| 22 | L5 | 656 | C |
| 22 | L5 | 657 | C |
| 22 | L5 | 659 | G |
| 22 | L5 | 666 | G |
| 22 | L5 | 667 | A |
| 22 | L5 | 668 | C |
| 22 | L5 | 669 | C |
| 22 | L5 | 673 | C |
| 22 | L5 | 685 | C |
| 22 | L5 | 686 | A |
| 22 | L5 | 687 | U |
| 22 | L5 | 696 | C |
| 22 | L5 | 703 | G |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 22 | L5 | 704 | C |
| 22 | L5 | 706 | C |
| 22 | L5 | 708 | G |
| 22 | L5 | 730 | G |
| 22 | L5 | 731 | G |
| 22 | L5 | 738 | C |
| 22 | L5 | 739 | G |
| 22 | L5 | 742 | G |
| 22 | L5 | 744 | G |
| 22 | L5 | 753 | C |
| 22 | L5 | 754 | U |
| 22 | L5 | 759 | G |
| 22 | L5 | 904 | C |
| 22 | L5 | 905 | C |
| 22 | L5 | 906 | C |
| 22 | L5 | 907 | C |
| 22 | L5 | 910 | G |
| 22 | L5 | 911 | U |
| 22 | L5 | 912 | G |
| 22 | L5 | 913 | U |
| 22 | L5 | 914 | U |
| 22 | L5 | 915 | A |
| 22 | L5 | 917 | A |
| 22 | L5 | 918 | G |
| 22 | L5 | 923 | C |
| 22 | L5 | 924 | C |
| 22 | L5 | 926 | G |
| 22 | L5 | 932 | A |
| 22 | L5 | 933 | G |
| 22 | L5 | 935 | A |
| 22 | L5 | 936 | C |
| 22 | L5 | 937 | U |
| 22 | L5 | 941 | C |
| 22 | L5 | 943 | A |
| 22 | L5 | 944 | A |
| 22 | L5 | 945 | U |
| 22 | L5 | 959 | G |
| 22 | L5 | 960 | A |
| 22 | L5 | 961 | G |
| 22 | L5 | 962 | C |
| 22 | L5 | 965 | G |
| 22 | L5 | 967 | C |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 22 | L5 | 969 | C |
| 22 | L5 | 970 | G |
| 22 | L5 | 982 | U |
| 22 | L5 | 985 | C |
| 22 | L5 | 989 | U |
| 22 | L5 | 990 | C |
| 22 | L5 | 992 | C |
| 22 | L5 | 993 | G |
| 22 | L5 | 995 | C |
| 22 | L5 | 1048 | G |
| 22 | L5 | 1049 | C |
| 22 | L5 | 1050 | C |
| 22 | L5 | 1051 | G |
| 22 | L5 | 1070 | G |
| 22 | L5 | 1071 | C |
| 22 | L5 | 1072 | C |
| 22 | L5 | 1075 | G |
| 22 | L5 | 1082 | C |
| 22 | L5 | 1083 | U |
| 22 | L5 | 1095 | A |
| 22 | L5 | 1168 | G |
| 22 | L5 | 1170 | G |
| 22 | L5 | 1171 | G |
| 22 | L5 | 1172 | C |
| 22 | L5 | 1173 | G |
| 22 | L5 | 1179 | U |
| 22 | L5 | 1180 | C |
| 22 | L5 | 1182 | C |
| 22 | L5 | 1183 | C |
| 22 | L5 | 1184 | A |
| 22 | L5 | 1202 | C |
| 22 | L5 | 1203 | G |
| 22 | L5 | 1204 | C |
| 22 | L5 | 1210 | C |
| 22 | L5 | 1211 | G |
| 22 | L5 | 1214 | C |
| 22 | L5 | 1215 | C |
| 22 | L5 | 1216 | C |
| 22 | L5 | 1217 | G |
| 22 | L5 | 1218 | G |
| 22 | L5 | 1219 | G |
| 22 | L5 | 1221 | G |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 22 | L5 | 1222 | A |
| 22 | L5 | 1235 | G |
| 22 | L5 | 1241 | C |
| 22 | L5 | 1242 | G |
| 22 | L5 | 1246 | G |
| 22 | L5 | 1253 | G |
| 22 | L5 | 1254 | A |
| 22 | L5 | 1257 | A |
| 22 | L5 | 1258 | G |
| 22 | L5 | 1261 | G |
| 22 | L5 | 1266 | G |
| 22 | L5 | 1267 | C |
| 22 | L5 | 1269 | G |
| 22 | L5 | 1270 | A |
| 22 | L5 | 1271 | G |
| 22 | L5 | 1272 | C |
| 22 | L5 | 1273 | G |
| 22 | L5 | 1274 | A |
| 22 | L5 | 1275 | G |
| 22 | L5 | 1277 | G |
| 22 | L5 | 1280 | C |
| 22 | L5 | 1284 | G |
| 22 | L5 | 1285 | U |
| 22 | L5 | 1287 | G |
| 22 | L5 | 1293 | G |
| 22 | L5 | 1294 | A |
| 22 | L5 | 1295 | C |
| 22 | L5 | 1296 | G |
| 22 | L5 | 1301 | C |
| 22 | L5 | 1314 | C |
| 22 | L5 | 1324 | A |
| 22 | L5 | 1326 | A |
| 22 | L5 | 1337 | A |
| 22 | L5 | 1354 | A |
| 22 | L5 | 1358 | G |
| 22 | L5 | 1359 | G |
| 22 | L5 | 1365 | C |
| 22 | L5 | 1367 | C |
| 22 | L5 | 1387 | A |
| 22 | L5 | 1394 | G |
| 22 | L5 | 1397 | A |
| 22 | L5 | 1404 | G |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 22 | L5 | 1405 | C |
| 22 | L5 | 1407 | C |
| 22 | L5 | 1409 | C |
| 22 | L5 | 1410 | U |
| 22 | L5 | 1411 | C |
| 22 | L5 | 1414 | C |
| 22 | L5 | 1415 | G |
| 22 | L5 | 1416 | G |
| 22 | L5 | 1417 | C |
| 22 | L5 | 1420 | A |
| 22 | L5 | 1435 | G |
| 22 | L5 | 1437 | C |
| 22 | L5 | 1438 | U |
| 22 | L5 | 1439 | C |
| 22 | L5 | 1443 | A |
| 22 | L5 | 1446 | C |
| 22 | L5 | 1447 | C |
| 22 | L5 | 1457 | G |
| 22 | L5 | 1482 | G |
| 22 | L5 | 1483 | C |
| 22 | L5 | 1497 | A |
| 22 | L5 | 1498 | G |
| 22 | L5 | 1502 | G |
| 22 | L5 | 1517 | G |
| 22 | L5 | 1518 | A |
| 22 | L5 | 1525 | A |
| 22 | L5 | 1534 | A |
| 22 | L5 | 1547 | A |
| 22 | L5 | 1562 | G |
| 22 | L5 | 1564 | A |
| 22 | L5 | 1566 | C |
| 22 | L5 | 1578 | U |
| 22 | L5 | 1591 | U |
| 22 | L5 | 1596 | U |
| 22 | L5 | 1624 | G |
| 22 | L5 | 1625 | G |
| 22 | L5 | 1631 | A |
| 22 | L5 | 1633 | G |
| 22 | L5 | 1634 | A |
| 22 | L5 | 1638 | A |
| 22 | L5 | 1640 | C |
| 22 | L5 | 1641 | G |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 22 | L5 | 1642 | A |
| 22 | L5 | 1654 | G |
| 22 | L5 | 1661 | C |
| 22 | L5 | 1663 | C |
| 22 | L5 | 1676 | C |
| 22 | L5 | 1677 | U |
| 22 | L5 | 1678 | C |
| 22 | L5 | 1681 | G |
| 22 | L5 | 1691 | G |
| 22 | L5 | 1694 | C |
| 22 | L5 | 1698 | C |
| 22 | L5 | 1699 | A |
| 22 | L5 | 1700 | G |
| 22 | L5 | 1703 | C |
| 22 | L5 | 1704 | C |
| 22 | L5 | 1705 | G |
| 22 | L5 | 1707 | C |
| 22 | L5 | 1715 | C |
| 22 | L5 | 1718 | C |
| 22 | L5 | 1731 | C |
| 22 | L5 | 1734 | G |
| 22 | L5 | 1740 | C |
| 22 | L5 | 1741 | G |
| 22 | L5 | 1742 | A |
| 22 | L5 | 1750 | G |
| 22 | L5 | 1757 | U |
| 22 | L5 | 1758 | G |
| 22 | L5 | 1759 | G |
| 22 | L5 | 1760 | G |
| 22 | L5 | 1761 | G |
| 22 | L5 | 1763 | C |
| 22 | L5 | 1764 | G |
| 22 | L5 | 1765 | A |
| 22 | L5 | 1766 | A |
| 22 | L5 | 1767 | A |
| 22 | L5 | 1768 | C |
| 22 | L5 | 1770 | A |
| 22 | L5 | 1775 | A |
| 22 | L5 | 1787 | A |
| 22 | L5 | 1804 | A |
| 22 | L5 | 1806 | G |
| 22 | L5 | 1810 | G |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 22 | L5 | 1820 | C |
| 22 | L5 | 1821 | G |
| 22 | L5 | 1822 | U |
| 22 | L5 | 1834 | U |
| 22 | L5 | 1836 | G |
| 22 | L5 | 1837 | A |
| 22 | L5 | 1842 | G |
| 22 | L5 | 1855 | G |
| 22 | L5 | 1869 | G |
| 22 | L5 | 1882 | U |
| 22 | L5 | 1888 | A |
| 22 | L5 | 1892 | A |
| 22 | L5 | 1893 | C |
| 22 | L5 | 1897 | A |
| 22 | L5 | 1917 | A |
| 22 | L5 | 1918 | U |
| 22 | L5 | 1919 | G |
| 22 | L5 | 1920 | C |
| 22 | L5 | 1921 | C |
| 22 | L5 | 1922 | G |
| 22 | L5 | 1925 | G |
| 22 | L5 | 1931 | C |
| 22 | L5 | 1932 | A |
| 22 | L5 | 1936 | C |
| 22 | L5 | 1940 | G |
| 22 | L5 | 1948 | G |
| 22 | L5 | 1949 | U |
| 22 | L5 | 1959 | U |
| 22 | L5 | 1961 | G |
| 22 | L5 | 1962 | A |
| 22 | L5 | 1968 | G |
| 22 | L5 | 1974 | U |
| 22 | L5 | 1975 | G |
| 22 | L5 | 1978 | C |
| 22 | L5 | 1980 | U |
| 22 | L5 | 1981 | G |
| 22 | L5 | 1982 | G |
| 22 | L5 | 1983 | A |
| 22 | L5 | 1984 | A |
| 22 | L5 | 1985 | G |
| 22 | L5 | 1986 | U |
| 22 | L5 | 1989 | G |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 22 | L5 | 1991 | A |
| 22 | L5 | 1992 | U |
| 22 | L5 | 1993 | C |
| 22 | L5 | 1997 | U |
| 22 | L5 | 1998 | A |
| 22 | L5 | 1999 | A |
| 22 | L5 | 2001 | G |
| 22 | L5 | 2002 | A |
| 22 | L5 | 2003 | G |
| 22 | L5 | 2004 | U |
| 22 | L5 | 2011 | C |
| 22 | L5 | 2014 | C |
| 22 | L5 | 2017 | A |
| 22 | L5 | 2018 | C |
| 22 | L5 | 2024 | G |
| 22 | L5 | 2026 | A |
| 22 | L5 | 2034 | G |
| 22 | L5 | 2046 | G |
| 22 | L5 | 2048 | U |
| 22 | L5 | 2055 | G |
| 22 | L5 | 2056 | G |
| 22 | L5 | 2069 | A |
| 22 | L5 | 2084 | C |
| 22 | L5 | 2085 | G |
| 22 | L5 | 2092 | G |
| 22 | L5 | 2093 | A |
| 22 | L5 | 2095 | A |
| 22 | L5 | 2096 | G |
| 22 | L5 | 2097 | U |
| 22 | L5 | 2098 | G |
| 22 | L5 | 2101 | C |
| 22 | L5 | 2102 | G |
| 22 | L5 | 2103 | G |
| 22 | L5 | 2105 | A |
| 22 | L5 | 2107 | C |
| 22 | L5 | 2110 | C |
| 22 | L5 | 2112 | G |
| 22 | L5 | 2250 | C |
| 22 | L5 | 2252 | G |
| 22 | L5 | 2253 | A |
| 22 | L5 | 2255 | C |
| 22 | L5 | 2256 | C |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 22 | L5 | 2258 | C |
| 22 | L5 | 2259 | G |
| 22 | L5 | 2260 | C |
| 22 | L5 | 2263 | A |
| 22 | L5 | 2289 | C |
| 22 | L5 | 2300 | A |
| 22 | L5 | 2301 | G |
| 22 | L5 | 2313 | A |
| 22 | L5 | 2322 | G |
| 22 | L5 | 2333 | G |
| 22 | L5 | 2348 | G |
| 22 | L5 | 2351 | C |
| 22 | L5 | 2360 | A |
| 22 | L5 | 2383 | C |
| 22 | L5 | 2395 | A |
| 22 | L5 | 2397 | G |
| 22 | L5 | 2398 | U |
| 22 | L5 | 2402 | G |
| 22 | L5 | 2411 | C |
| 22 | L5 | 2412 | A |
| 22 | L5 | 2417 | A |
| 22 | L5 | 2421 | G |
| 22 | L5 | 2425 | U |
| 22 | L5 | 2441 | C |
| 22 | L5 | 2464 | C |
| 22 | L5 | 2465 | C |
| 22 | L5 | 2469 | C |
| 22 | L5 | 2474 | G |
| 22 | L5 | 2475 | G |
| 22 | L5 | 2478 | C |
| 22 | L5 | 2479 | G |
| 22 | L5 | 2480 | G |
| 22 | L5 | 2484 | A |
| 22 | L5 | 2485 | U |
| 22 | L5 | 2486 | G |
| 22 | L5 | 2487 | G |
| 22 | L5 | 2488 | C |
| 22 | L5 | 2489 | C |
| 22 | L5 | 2490 | U |
| 22 | L5 | 2491 | C |
| 22 | L5 | 2503 | G |
| 22 | L5 | 2504 | C |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 22 | L5 | 2506 | G |
| 22 | L5 | 2513 | A |
| 22 | L5 | 2519 | U |
| 22 | L5 | 2520 | C |
| 22 | L5 | 2529 | A |
| 22 | L5 | 2537 | A |
| 22 | L5 | 2544 | G |
| 22 | L5 | 2546 | G |
| 22 | L5 | 2547 | G |
| 22 | L5 | 2554 | U |
| 22 | L5 | 2555 | G |
| 22 | L5 | 2559 | G |
| 22 | L5 | 2560 | C |
| 22 | L5 | 2565 | A |
| 22 | L5 | 2573 | A |
| 22 | L5 | 2583 | C |
| 22 | L5 | 2586 | G |
| 22 | L5 | 2587 | A |
| 22 | L5 | 2589 | C |
| 22 | L5 | 2601 | A |
| 22 | L5 | 2618 | G |
| 22 | L5 | 2627 | C |
| 22 | L5 | 2652 | G |
| 22 | L5 | 2653 | C |
| 22 | L5 | 2662 | G |
| 22 | L5 | 2664 | G |
| 22 | L5 | 2669 | C |
| 22 | L5 | 2676 | A |
| 22 | L5 | 2687 | U |
| 22 | L5 | 2694 | G |
| 22 | L5 | 2695 | A |
| 22 | L5 | 2696 | A |
| 22 | L5 | 2703 | G |
| 22 | L5 | 2707 | U |
| 22 | L5 | 2708 | U |
| 22 | L5 | 2709 | C |
| 22 | L5 | 2710 | C |
| 22 | L5 | 2711 | G |
| 22 | L5 | 2712 | G |
| 22 | L5 | 2719 | C |
| 22 | L5 | 2721 | G |
| 22 | L5 | 2724 | G |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 22 | L5 | 2726 | G |
| 22 | L5 | 2739 | C |
| 22 | L5 | 2742 | G |
| 22 | L5 | 2743 | A |
| 22 | L5 | 2746 | A |
| 22 | L5 | 2761 | U |
| 22 | L5 | 2763 | U |
| 22 | L5 | 2764 | A |
| 22 | L5 | 2769 | U |
| 22 | L5 | 2770 | C |
| 22 | L5 | 2787 | A |
| 22 | L5 | 2788 | U |
| 22 | L5 | 2790 | U |
| 22 | L5 | 2806 | A |
| 22 | L5 | 2814 | C |
| 22 | L5 | 2815 | A |
| 22 | L5 | 2826 | U |
| 22 | L5 | 2827 | G |
| 22 | L5 | 2848 | G |
| 22 | L5 | 2855 | G |
| 22 | L5 | 2867 | C |
| 22 | L5 | 2877 | G |
| 22 | L5 | 2895 | A |
| 22 | L5 | 2900 | U |
| 22 | L5 | 2902 | G |
| 22 | L5 | 2903 | G |
| 22 | L5 | 2904 | U |
| 22 | L5 | 2905 | C |
| 22 | L5 | 2906 | G |
| 22 | L5 | 2908 | U |
| 22 | L5 | 3588 | C |
| 22 | L5 | 3590 | G |
| 22 | L5 | 3591 | C |
| 22 | L5 | 3592 | G |
| 22 | L5 | 3594 | C |
| 22 | L5 | 3595 | U |
| 22 | L5 | 3596 | A |
| 22 | L5 | 3597 | G |
| 22 | L5 | 3605 | C |
| 22 | L5 | 3615 | G |
| 22 | L5 | 3618 | C |
| 22 | L5 | 3626 | G |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 22 | L5 | 3630 | A |
| 22 | L5 | 3635 | A |
| 22 | L5 | 3644 | U |
| 22 | L5 | 3646 | A |
| 22 | L5 | 3648 | A |
| 22 | L5 | 3662 | A |
| 22 | L5 | 3664 | G |
| 22 | L5 | 3670 | C |
| 22 | L5 | 3673 | C |
| 22 | L5 | 3674 | G |
| 22 | L5 | 3680 | U |
| 22 | L5 | 3711 | A |
| 22 | L5 | 3713 | U |
| 22 | L5 | 3714 | G |
| 22 | L5 | 3727 | A |
| 22 | L5 | 3750 | G |
| 22 | L5 | 3753 | G |
| 22 | L5 | 3756 | A |
| 22 | L5 | 3757 | G |
| 22 | L5 | 3759 | A |
| 22 | L5 | 3760 | A |
| 22 | L5 | 3761 | C |
| 22 | L5 | 3762 | U |
| 22 | L5 | 3766 | A |
| 22 | L5 | 3771 | C |
| 22 | L5 | 3772 | U |
| 22 | L5 | 3773 | U |
| 22 | L5 | 3774 | A |
| 22 | L5 | 3776 | G |
| 22 | L5 | 3777 | G |
| 22 | L5 | 3783 | A |
| 22 | L5 | 3784 | A |
| 22 | L5 | 3786 | U |
| 22 | L5 | 3788 | C |
| 22 | L5 | 3802 | U |
| 22 | L5 | 3811 | G |
| 22 | L5 | 3814 | U |
| 22 | L5 | 3817 | A |
| 22 | L5 | 3818 | U |
| 22 | L5 | 3819 | G |
| 22 | L5 | 3823 | G |
| 22 | L5 | 3838 | U |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 22 | L5 | 3839 | G |
| 22 | L5 | 3840 | U |
| 22 | L5 | 3841 | C |
| 22 | L5 | 3867 | A |
| 22 | L5 | 3877 | A |
| 22 | L5 | 3878 | C |
| 22 | L5 | 3879 | G |
| 22 | L5 | 3885 | G |
| 22 | L5 | 3887 | C |
| 22 | L5 | 3890 | A |
| 22 | L5 | 3892 | U |
| 22 | L5 | 3897 | G |
| 22 | L5 | 3901 | A |
| 22 | L5 | 3906 | A |
| 22 | L5 | 3907 | G |
| 22 | L5 | 3908 | A |
| 22 | L5 | 3915 | U |
| 22 | L5 | 3922 | G |
| 22 | L5 | 3938 | G |
| 22 | L5 | 3939 | G |
| 22 | L5 | 3943 | A |
| 22 | L5 | 3944 | G |
| 22 | L5 | 3947 | A |
| 22 | L5 | 3949 | A |
| 22 | L5 | 3950 | U |
| 22 | L5 | 3951 | G |
| 22 | L5 | 3953 | G |
| 22 | L5 | 3955 | G |
| 22 | L5 | 3956 | G |
| 22 | L5 | 3957 | U |
| 22 | L5 | 3958 | G |
| 22 | L5 | 3959 | U |
| 22 | L5 | 3960 | A |
| 22 | L5 | 3961 | G |
| 22 | L5 | 3962 | A |
| 22 | L5 | 3963 | A |
| 22 | L5 | 3965 | A |
| 22 | L5 | 3966 | A |
| 22 | L5 | 3968 | U |
| 22 | L5 | 3969 | G |
| 22 | L5 | 3970 | G |
| 22 | L5 | 3972 | A |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 22 | L5 | 3973 | G |
| 22 | L5 | 3974 | G |
| 22 | L5 | 3975 | C |
| 22 | L5 | 3977 | C |
| 22 | L5 | 4034 | G |
| 22 | L5 | 4038 | C |
| 22 | L5 | 4039 | G |
| 22 | L5 | 4041 | C |
| 22 | L5 | 4042 | G |
| 22 | L5 | 4043 | G |
| 22 | L5 | 4044 | U |
| 22 | L5 | 4046 | A |
| 22 | L5 | 4047 | A |
| 22 | L5 | 4048 | A |
| 22 | L5 | 4049 | U |
| 22 | L5 | 4051 | C |
| 22 | L5 | 4052 | C |
| 22 | L5 | 4053 | A |
| 22 | L5 | 4054 | C |
| 22 | L5 | 4055 | U |
| 22 | L5 | 4056 | A |
| 22 | L5 | 4057 | C |
| 22 | L5 | 4058 | U |
| 22 | L5 | 4059 | C |
| 22 | L5 | 4060 | U |
| 22 | L5 | 4062 | A |
| 22 | L5 | 4063 | U |
| 22 | L5 | 4064 | C |
| 22 | L5 | 4065 | G |
| 22 | L5 | 4068 | U |
| 22 | L5 | 4076 | G |
| 22 | L5 | 4092 | G |
| 22 | L5 | 4093 | G |
| 22 | L5 | 4095 | G |
| 22 | L5 | 4096 | C |
| 22 | L5 | 4097 | G |
| 22 | L5 | 4099 | G |
| 22 | L5 | 4102 | C |
| 22 | L5 | 4104 | G |
| 22 | L5 | 4108 | G |
| 22 | L5 | 4111 | U |
| 22 | L5 | 4114 | C |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 22 | L5 | 4115 | G |
| 22 | L5 | 4116 | C |
| 22 | L5 | 4117 | U |
| 22 | L5 | 4119 | C |
| 22 | L5 | 4127 | A |
| 22 | L5 | 4134 | C |
| 22 | L5 | 4138 | C |
| 22 | L5 | 4140 | C |
| 22 | L5 | 4141 | G |
| 22 | L5 | 4142 | C |
| 22 | L5 | 4143 | G |
| 22 | L5 | 4144 | C |
| 22 | L5 | 4146 | G |
| 22 | L5 | 4149 | C |
| 22 | L5 | 4162 | C |
| 22 | L5 | 4163 | U |
| 22 | L5 | 4168 | G |
| 22 | L5 | 4170 | A |
| 22 | L5 | 4183 | G |
| 22 | L5 | 4184 | G |
| 22 | L5 | 4191 | G |
| 22 | L5 | 4196 | G |
| 22 | L5 | 4197 | G |
| 22 | L5 | 4201 | G |
| 22 | L5 | 4203 | A |
| 22 | L5 | 4212 | A |
| 22 | L5 | 4222 | G |
| 22 | L5 | 4228 | G |
| 22 | L5 | 4229 | U |
| 22 | L5 | 4232 | U |
| 22 | L5 | 4233 | A |
| 22 | L5 | 4249 | G |
| 22 | L5 | 4251 | A |
| 22 | L5 | 4254 | G |
| 22 | L5 | 4255 | A |
| 22 | L5 | 4258 | C |
| 22 | L5 | 4265 | U |
| 22 | L5 | 4268 | A |
| 22 | L5 | 4273 | A |
| 22 | L5 | 4304 | A |
| 22 | L5 | 4305 | G |
| 22 | L5 | 4306 | U |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 22 | L5 | 4314 | C |
| 22 | L5 | 4319 | C |
| 22 | L5 | 4330 | G |
| 22 | L5 | 4332 | C |
| 22 | L5 | 4339 | A |
| 22 | L5 | 4349 | C |
| 22 | L5 | 4350 | C |
| 22 | L5 | 4354 | U |
| 22 | L5 | 4371 | G |
| 22 | L5 | 4373 | G |
| 22 | L5 | 4376 | A |
| 22 | L5 | 4377 | G |
| 22 | L5 | 4378 | A |
| 22 | L5 | 4380 | A |
| 22 | L5 | 4387 | C |
| 22 | L5 | 4391 | G |
| 22 | L5 | 4394 | A |
| 22 | L5 | 4421 | C |
| 22 | L5 | 4422 | A |
| 22 | L5 | 4438 | U |
| 22 | L5 | 4448 | G |
| 22 | L5 | 4449 | A |
| 22 | L5 | 4453 | C |
| 22 | L5 | 4464 | A |
| 22 | L5 | 4466 | C |
| 22 | L5 | 4475 | G |
| 22 | L5 | 4488 | A |
| 22 | L5 | 4500 | U |
| 22 | L5 | 4510 | A |
| 22 | L5 | 4512 | U |
| 22 | L5 | 4513 | A |
| 22 | L5 | 4519 | C |
| 22 | L5 | 4524 | G |
| 22 | L5 | 4525 | C |
| 22 | L5 | 4545 | G |
| 22 | L5 | 4548 | A |
| 22 | L5 | 4549 | G |
| 22 | L5 | 4560 | C |
| 22 | L5 | 4567 | G |
| 22 | L5 | 4573 | G |
| 22 | L5 | 4575 | G |
| 22 | L5 | 4584 | A |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 22 | L5 | 4589 | A |
| 22 | L5 | 4590 | A |
| 22 | L5 | 4600 | G |
| 22 | L5 | 4601 | U |
| 22 | L5 | 4617 | G |
| 22 | L5 | 4627 | U |
| 22 | L5 | 4635 | A |
| 22 | L5 | 4636 | U |
| 22 | L5 | 4637 | G |
| 22 | L5 | 4648 | A |
| 22 | L5 | 4652 | G |
| 22 | L5 | 4656 | A |
| 22 | L5 | 4670 | C |
| 22 | L5 | 4672 | A |
| 22 | L5 | 4693 | C |
| 22 | L5 | 4694 | G |
| 22 | L5 | 4695 | C |
| 22 | L5 | 4700 | A |
| 22 | L5 | 4707 | A |
| 22 | L5 | 4708 | A |
| 22 | L5 | 4709 | U |
| 22 | L5 | 4719 | G |
| 22 | L5 | 4733 | C |
| 22 | L5 | 4734 | A |
| 22 | L5 | 4740 | G |
| 22 | L5 | 4741 | C |
| 22 | L5 | 4742 | G |
| 22 | L5 | 4745 | G |
| 22 | L5 | 4750 | G |
| 22 | L5 | 4754 | G |
| 22 | L5 | 4757 | C |
| 22 | L5 | 4759 | C |
| 22 | L5 | 4761 | G |
| 22 | L5 | 4764 | A |
| 22 | L5 | 4765 | G |
| 22 | L5 | 4771 | C |
| 22 | L5 | 4772 | C |
| 22 | L5 | 4775 | C |
| 22 | L5 | 4859 | C |
| 22 | L5 | 4862 | G |
| 22 | L5 | 4863 | G |
| 22 | L5 | 4870 | G |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 22 | L5 | 4871 | C |
| 22 | L5 | 4875 | G |
| 22 | L5 | 4880 | C |
| 22 | L5 | 4882 | U |
| 22 | L5 | 4883 | C |
| 22 | L5 | 4889 | G |
| 22 | L5 | 4893 | A |
| 22 | L5 | 4895 | C |
| 22 | L5 | 4896 | G |
| 22 | L5 | 4897 | G |
| 22 | L5 | 4898 | G |
| 22 | L5 | 4900 | C |
| 22 | L5 | 4901 | G |
| 22 | L5 | 4902 | C |
| 22 | L5 | 4909 | A |
| 22 | L5 | 4910 | G |
| 22 | L5 | 4912 | G |
| 22 | L5 | 4914 | C |
| 22 | L5 | 4922 | C |
| 22 | L5 | 4923 | C |
| 22 | L5 | 4924 | C |
| 22 | L5 | 4925 | U |
| 22 | L5 | 4926 | C |
| 22 | L5 | 4927 | G |
| 22 | L5 | 4928 | C |
| 22 | L5 | 4934 | A |
| 22 | L5 | 4940 | C |
| 22 | L5 | 4941 | G |
| 22 | L5 | 4943 | A |
| 22 | L5 | 4944 | C |
| 22 | L5 | 4947 | U |
| 22 | L5 | 4949 | G |
| 22 | L5 | 4951 | G |
| 22 | L5 | 4960 | G |
| 22 | L5 | 4975 | G |
| 22 | L5 | 4976 | U |
| 22 | L5 | 4979 | A |
| 22 | L5 | 4985 | U |
| 22 | L5 | 4988 | U |
| 22 | L5 | 4989 | U |
| 22 | L5 | 4990 | C |
| 22 | L5 | 4991 | U |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 22 | L5 | 5006 | U |
| 22 | L5 | 5008 | C |
| 22 | L5 | 5009 | G |
| 22 | L5 | 5014 | A |
| 22 | L5 | 5017 | G |
| 22 | L5 | 5022 | U |
| 22 | L5 | 5024 | C |
| 22 | L5 | 5025 | C |
| 22 | L5 | 5027 | C |
| 22 | L5 | 5028 | G |
| 22 | L5 | 5029 | C |
| 22 | L5 | 5030 | U |
| 22 | L5 | 5034 | A |
| 22 | L5 | 5041 | G |
| 22 | L5 | 5047 | C |
| 22 | L5 | 5050 | C |
| 22 | L5 | 5054 | C |
| 22 | L5 | 5055 | G |
| 22 | L5 | 5061 | A |
| 22 | L5 | 5069 | U |
| 23 | L7 | 7 | G |
| 23 | L7 | 22 | A |
| 23 | L7 | 24 | C |
| 23 | L7 | 33 | U |
| 23 | L7 | 38 | U |
| 23 | L7 | 53 | U |
| 23 | L7 | 54 | A |
| 23 | L7 | 63 | C |
| 23 | L7 | 64 | G |
| 23 | L7 | 97 | G |
| 23 | L7 | 100 | A |
| 23 | L7 | 110 | G |
| 23 | L7 | 111 | C |
| 24 | L8 | 25 | G |
| 24 | L8 | 34 | U |
| 24 | L8 | 35 | C |
| 24 | L8 | 52 | A |
| 24 | L8 | 59 | A |
| 24 | L8 | 60 | G |
| 24 | L8 | 62 | A |
| 24 | L8 | 63 | U |
| 24 | L8 | 68 | G |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 24 | L8 | 80 | A |
| 24 | L8 | 82 | A |
| 24 | L8 | 84 | A |
| 24 | L8 | 85 | U |
| 24 | L8 | 87 | G |
| 24 | L8 | 94 | G |
| 24 | L8 | 103 | A |
| 24 | L8 | 105 | C |
| 24 | L8 | 110 | U |
| 24 | L8 | 111 | U |
| 24 | L8 | 112 | G |
| 24 | L8 | 114 | G |
| 24 | L8 | 123 | U |
| 24 | L8 | 124 | U |
| 24 | L8 | 125 | C |
| 24 | L8 | 126 | C |
| 24 | L8 | 127 | U |
| 24 | L8 | 147 | G |
| 24 | L8 | 150 | C |
| 24 | L8 | 151 | G |
| 81 | S2 | 2 | A |
| 81 | S2 | 4 | C |
| 81 | S2 | 13 | C |
| 81 | S2 | 25 | A |
| 81 | S2 | 33 | G |
| 81 | S2 | 41 | G |
| 81 | S2 | 42 | A |
| 81 | S2 | 44 | U |
| 81 | S2 | 45 | A |
| 81 | S2 | 46 | A |
| 81 | S2 | 56 | G |
| 81 | S2 | 58 | C |
| 81 | S2 | 62 | G |
| 81 | S2 | 64 | A |
| 81 | S2 | 65 | C |
| 81 | S2 | 66 | G |
| 81 | S2 | 67 | C |
| 81 | S2 | 68 | A |
| 81 | S2 | 72 | C |
| 81 | S2 | 73 | C |
| 81 | S2 | 74 | G |
| 81 | S2 | 76 | U |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 81 | S2 | 92 | A |
| 81 | S2 | 103 | A |
| 81 | S2 | 113 | G |
| 81 | S2 | 115 | U |
| 81 | S2 | 116 | U |
| 81 | S2 | 126 | G |
| 81 | S2 | 130 | G |
| 81 | S2 | 139 | C |
| 81 | S2 | 143 | U |
| 81 | S2 | 149 | A |
| 81 | S2 | 158 | A |
| 81 | S2 | 170 | A |
| 81 | S2 | 171 | A |
| 81 | S2 | 175 | A |
| 81 | S2 | 182 | C |
| 81 | S2 | 184 | G |
| 81 | S2 | 190 | G |
| 81 | S2 | 196 | C |
| 81 | S2 | 197 | U |
| 81 | S2 | 198 | U |
| 81 | S2 | 200 | G |
| 81 | S2 | 202 | G |
| 81 | S2 | 203 | G |
| 81 | S2 | 204 | G |
| 81 | S2 | 206 | G |
| 81 | S2 | 207 | G |
| 81 | S2 | 208 | G |
| 81 | S2 | 209 | A |
| 81 | S2 | 214 | U |
| 81 | S2 | 291 | G |
| 81 | S2 | 292 | A |
| 81 | S2 | 295 | C |
| 81 | S2 | 301 | A |
| 81 | S2 | 306 | C |
| 81 | S2 | 307 | G |
| 81 | S2 | 308 | G |
| 81 | S2 | 309 | G |
| 81 | S2 | 310 | C |
| 81 | S2 | 311 | C |
| 81 | S2 | 312 | G |
| 81 | S2 | 314 | U |
| 81 | S2 | 318 | A |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 81 | S2 | 319 | C |
| 81 | S2 | 322 | C |
| 81 | S2 | 323 | C |
| 81 | S2 | 324 | C |
| 81 | S2 | 325 | C |
| 81 | S2 | 326 | C |
| 81 | S2 | 328 | U |
| 81 | S2 | 329 | G |
| 81 | S2 | 332 | G |
| 81 | S2 | 338 | G |
| 81 | S2 | 339 | A |
| 81 | S2 | 340 | C |
| 81 | S2 | 347 | G |
| 81 | S2 | 360 | A |
| 81 | S2 | 361 | U |
| 81 | S2 | 362 | C |
| 81 | S2 | 364 | A |
| 81 | S2 | 368 | U |
| 81 | S2 | 370 | G |
| 81 | S2 | 374 | G |
| 81 | S2 | 383 | G |
| 81 | S2 | 385 | G |
| 81 | S2 | 386 | C |
| 81 | S2 | 407 | G |
| 81 | S2 | 408 | A |
| 81 | S2 | 409 | C |
| 81 | S2 | 421 | G |
| 81 | S2 | 437 | G |
| 81 | S2 | 448 | A |
| 81 | S2 | 449 | A |
| 81 | S2 | 450 | C |
| 81 | S2 | 452 | G |
| 81 | S2 | 464 | A |
| 81 | S2 | 465 | A |
| 81 | S2 | 471 | G |
| 81 | S2 | 472 | C |
| 81 | S2 | 473 | A |
| 81 | S2 | 474 | G |
| 81 | S2 | 476 | A |
| 81 | S2 | 482 | G |
| 81 | S2 | 485 | A |
| 81 | S2 | 487 | U |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 81 | S2 | 488 | U |
| 81 | S2 | 492 | C |
| 81 | S2 | 493 | A |
| 81 | S2 | 502 | C |
| 81 | S2 | 531 | A |
| 81 | S2 | 532 | C |
| 81 | S2 | 536 | A |
| 81 | S2 | 537 | C |
| 81 | S2 | 540 | U |
| 81 | S2 | 541 | U |
| 81 | S2 | 542 | U |
| 81 | S2 | 546 | G |
| 81 | S2 | 547 | G |
| 81 | S2 | 557 | U |
| 81 | S2 | 558 | G |
| 81 | S2 | 559 | G |
| 81 | S2 | 563 | G |
| 81 | S2 | 564 | A |
| 81 | S2 | 566 | U |
| 81 | S2 | 576 | A |
| 81 | S2 | 583 | A |
| 81 | S2 | 587 | A |
| 81 | S2 | 589 | G |
| 81 | S2 | 590 | A |
| 81 | S2 | 591 | U |
| 81 | S2 | 607 | U |
| 81 | S2 | 608 | C |
| 81 | S2 | 614 | C |
| 81 | S2 | 617 | G |
| 81 | S2 | 623 | G |
| 81 | S2 | 628 | A |
| 81 | S2 | 629 | A |
| 81 | S2 | 631 | U |
| 81 | S2 | 643 | A |
| 81 | S2 | 644 | G |
| 81 | S2 | 655 | A |
| 81 | S2 | 660 | C |
| 81 | S2 | 664 | A |
| 81 | S2 | 668 | A |
| 81 | S2 | 669 | A |
| 81 | S2 | 671 | A |
| 81 | S2 | 672 | A |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 81 | S2 | 673 | G |
| 81 | S2 | 683 | G |
| 81 | S2 | 684 | G |
| 81 | S2 | 688 | U |
| 81 | S2 | 689 | U |
| 81 | S2 | 692 | G |
| 81 | S2 | 693 | A |
| 81 | S2 | 695 | C |
| 81 | S2 | 696 | G |
| 81 | S2 | 697 | G |
| 81 | S2 | 698 | G |
| 81 | S2 | 732 | U |
| 81 | S2 | 733 | C |
| 81 | S2 | 734 | C |
| 81 | S2 | 736 | C |
| 81 | S2 | 738 | C |
| 81 | S2 | 749 | U |
| 81 | S2 | 751 | G |
| 81 | S2 | 752 | G |
| 81 | S2 | 753 | C |
| 81 | S2 | 788 | G |
| 81 | S2 | 789 | G |
| 81 | S2 | 791 | C |
| 81 | S2 | 792 | C |
| 81 | S2 | 794 | A |
| 81 | S2 | 799 | U |
| 81 | S2 | 821 | G |
| 81 | S2 | 822 | U |
| 81 | S2 | 823 | U |
| 81 | S2 | 824 | C |
| 81 | S2 | 827 | A |
| 81 | S2 | 830 | A |
| 81 | S2 | 833 | C |
| 81 | S2 | 835 | C |
| 81 | S2 | 836 | G |
| 81 | S2 | 837 | A |
| 81 | S2 | 838 | G |
| 81 | S2 | 839 | C |
| 81 | S2 | 842 | C |
| 81 | S2 | 844 | U |
| 81 | S2 | 847 | A |
| 81 | S2 | 870 | A |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 81 | S2 | 873 | G |
| 81 | S2 | 874 | G |
| 81 | S2 | 880 | G |
| 81 | S2 | 882 | U |
| 81 | S2 | 888 | U |
| 81 | S2 | 889 | U |
| 81 | S2 | 891 | G |
| 81 | S2 | 893 | U |
| 81 | S2 | 896 | U |
| 81 | S2 | 897 | U |
| 81 | S2 | 898 | U |
| 81 | S2 | 899 | U |
| 81 | S2 | 900 | C |
| 81 | S2 | 901 | G |
| 81 | S2 | 903 | A |
| 81 | S2 | 907 | G |
| 81 | S2 | 909 | G |
| 81 | S2 | 913 | A |
| 81 | S2 | 919 | A |
| 81 | S2 | 920 | A |
| 81 | S2 | 930 | C |
| 81 | S2 | 933 | G |
| 81 | S2 | 934 | G |
| 81 | S2 | 949 | G |
| 81 | S2 | 954 | U |
| 81 | S2 | 963 | A |
| 81 | S2 | 969 | U |
| 81 | S2 | 970 | G |
| 81 | S2 | 971 | G |
| 81 | S2 | 972 | A |
| 81 | S2 | 990 | A |
| 81 | S2 | 992 | A |
| 81 | S2 | 997 | A |
| 81 | S2 | 999 | G |
| 81 | S2 | 1001 | A |
| 81 | S2 | 1008 | A |
| 81 | S2 | 1017 | U |
| 81 | S2 | 1023 | A |
| 81 | S2 | 1027 | A |
| 81 | S2 | 1045 | U |
| 81 | S2 | 1047 | C |
| 81 | S2 | 1060 | A |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 81 | S2 | 1061 | U |
| 81 | S2 | 1062 | A |
| 81 | S2 | 1067 | C |
| 81 | S2 | 1083 | A |
| 81 | S2 | 1085 | C |
| 81 | S2 | 1088 | U |
| 81 | S2 | 1107 | G |
| 81 | S2 | 1108 | G |
| 81 | S2 | 1109 | C |
| 81 | S2 | 1113 | A |
| 81 | S2 | 1114 | U |
| 81 | S2 | 1115 | U |
| 81 | S2 | 1116 | C |
| 81 | S2 | 1118 | C |
| 81 | S2 | 1119 | A |
| 81 | S2 | 1121 | G |
| 81 | S2 | 1133 | A |
| 81 | S2 | 1138 | C |
| 81 | S2 | 1148 | A |
| 81 | S2 | 1153 | C |
| 81 | S2 | 1154 | U |
| 81 | S2 | 1166 | G |
| 81 | S2 | 1195 | A |
| 81 | S2 | 1207 | G |
| 81 | S2 | 1208 | A |
| 81 | S2 | 1215 | C |
| 81 | S2 | 1216 | C |
| 81 | S2 | 1217 | A |
| 81 | S2 | 1220 | A |
| 81 | S2 | 1224 | G |
| 81 | S2 | 1227 | G |
| 81 | S2 | 1242 | U |
| 81 | S2 | 1243 | U |
| 81 | S2 | 1251 | A |
| 81 | S2 | 1253 | A |
| 81 | S2 | 1256 | G |
| 81 | S2 | 1257 | G |
| 81 | S2 | 1259 | A |
| 81 | S2 | 1263 | U |
| 81 | S2 | 1264 | C |
| 81 | S2 | 1274 | G |
| 81 | S2 | 1275 | G |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 81 | S2 | 1283 | C |
| 81 | S2 | 1284 | A |
| 81 | S2 | 1286 | G |
| 81 | S2 | 1288 | U |
| 81 | S2 | 1294 | G |
| 81 | S2 | 1295 | A |
| 81 | S2 | 1298 | G |
| 81 | S2 | 1301 | A |
| 81 | S2 | 1302 | G |
| 81 | S2 | 1304 | U |
| 81 | S2 | 1306 | U |
| 81 | S2 | 1308 | U |
| 81 | S2 | 1320 | G |
| 81 | S2 | 1322 | G |
| 81 | S2 | 1342 | U |
| 81 | S2 | 1354 | G |
| 81 | S2 | 1364 | U |
| 81 | S2 | 1371 | U |
| 81 | S2 | 1372 | U |
| 81 | S2 | 1373 | C |
| 81 | S2 | 1376 | A |
| 81 | S2 | 1378 | A |
| 81 | S2 | 1401 | A |
| 81 | S2 | 1402 | A |
| 81 | S2 | 1406 | G |
| 81 | S2 | 1411 | G |
| 81 | S2 | 1414 | A |
| 81 | S2 | 1415 | C |
| 81 | S2 | 1419 | C |
| 81 | S2 | 1420 | G |
| 81 | S2 | 1421 | A |
| 81 | S2 | 1422 | G |
| 81 | S2 | 1423 | C |
| 81 | S2 | 1424 | G |
| 81 | S2 | 1434 | C |
| 81 | S2 | 1435 | C |
| 81 | S2 | 1436 | C |
| 81 | S2 | 1438 | A |
| 81 | S2 | 1442 | U |
| 81 | S2 | 1449 | G |
| 81 | S2 | 1454 | A |
| 81 | S2 | 1462 | U |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 81 | S2 | 1463 | U |
| 81 | S2 | 1468 | C |
| 81 | S2 | 1478 | U |
| 81 | S2 | 1480 | A |
| 81 | S2 | 1489 | A |
| 81 | S2 | 1490 | G |
| 81 | S2 | 1494 | U |
| 81 | S2 | 1495 | G |
| 81 | S2 | 1497 | G |
| 81 | S2 | 1498 | A |
| 81 | S2 | 1508 | A |
| 81 | S2 | 1520 | G |
| 81 | S2 | 1521 | C |
| 81 | S2 | 1533 | A |
| 81 | S2 | 1535 | U |
| 81 | S2 | 1536 | G |
| 81 | S2 | 1537 | A |
| 81 | S2 | 1544 | C |
| 81 | S2 | 1552 | G |
| 81 | S2 | 1553 | C |
| 81 | S2 | 1556 | A |
| 81 | S2 | 1558 | C |
| 81 | S2 | 1560 | U |
| 81 | S2 | 1570 | G |
| 81 | S2 | 1574 | C |
| 81 | S2 | 1579 | A |
| 81 | S2 | 1580 | A |
| 81 | S2 | 1581 | C |
| 81 | S2 | 1582 | C |
| 81 | S2 | 1584 | G |
| 81 | S2 | 1585 | U |
| 81 | S2 | 1586 | U |
| 81 | S2 | 1587 | G |
| 81 | S2 | 1588 | A |
| 81 | S2 | 1598 | G |
| 81 | S2 | 1601 | A |
| 81 | S2 | 1603 | G |
| 81 | S2 | 1604 | G |
| 81 | S2 | 1606 | G |
| 81 | S2 | 1621 | U |
| 81 | S2 | 1623 | A |
| 81 | S2 | 1630 | A |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 81 | S2 | 1633 | A |
| 81 | S2 | 1634 | A |
| 81 | S2 | 1637 | A |
| 81 | S2 | 1638 | G |
| 81 | S2 | 1639 | G |
| 81 | S2 | 1646 | C |
| 81 | S2 | 1648 | G |
| 81 | S2 | 1654 | G |
| 81 | S2 | 1663 | A |
| 81 | S2 | 1665 | G |
| 81 | S2 | 1680 | G |
| 81 | S2 | 1683 | C |
| 81 | S2 | 1696 | C |
| 81 | S2 | 1699 | A |
| 81 | S2 | 1715 | A |
| 81 | S2 | 1721 | U |
| 81 | S2 | 1722 | G |
| 81 | S2 | 1729 | U |
| 81 | S2 | 1743 | G |
| 81 | S2 | 1744 | G |
| 81 | S2 | 1745 | A |
| 81 | S2 | 1752 | C |
| 81 | S2 | 1753 | C |
| 81 | S2 | 1754 | G |
| 81 | S2 | 1755 | C |
| 81 | S2 | 1757 | G |
| 81 | S2 | 1758 | G |
| 81 | S2 | 1759 | G |
| 81 | S2 | 1760 | G |
| 81 | S2 | 1761 | U |
| 81 | S2 | 1771 | G |
| 81 | S2 | 1772 | C |
| 81 | S2 | 1773 | C |
| 81 | S2 | 1774 | C |
| 81 | S2 | 1777 | G |
| 81 | S2 | 1780 | G |
| 81 | S2 | 1781 | A |
| 81 | S2 | 1782 | G |
| 81 | S2 | 1783 | C |
| 81 | S2 | 1784 | G |
| 81 | S2 | 1787 | G |
| 81 | S2 | 1798 | C |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 81 | S2 | 1809 | A |
| 81 | S2 | 1812 | U |
| 81 | S2 | 1813 | A |
| 81 | S2 | 1822 | A |
| 81 | S2 | 1823 | A |
| 81 | S2 | 1825 | A |
| 81 | S2 | 1826 | G |
| 81 | S2 | 1835 | A |
| 81 | S2 | 1838 | U |
| 81 | S2 | 1849 | G |
| 81 | S2 | 1851 | A |
| 81 | S2 | 1852 | C |
| 81 | S2 | 1861 | G |
| 81 | S2 | 1862 | G |
| 81 | S2 | 1863 | A |
| 81 | S2 | 1865 | C |
| 82 | Pt | 7 | G |
| 82 | Pt | 9 | A |
| 82 | Pt | 10 | G |
| 82 | Pt | 13 | U |
| 82 | Pt | 14 | A |
| 82 | Pt | 16 | A |
| 82 | Pt | 17 | A |
| 82 | Pt | 18 | G |
| 82 | Pt | 19 | G |
| 82 | Pt | 21 | A |
| 82 | Pt | 46 | G |
| 82 | Pt | 47 | U |
| 82 | Pt | 48 | C |
| 82 | Pt | 49 | C |
| 82 | Pt | 58 | A |
| 82 | Pt | 64 | G |
| 82 | Pt | 76 | A |

All (30) RNA pucker outliers are listed below:

| Mol | Chain | Res | Type |
|---|---|---|---|
| 1 | AT | 7 | G |
| 22 | L5 | 265 | C |
| 22 | L5 | 406 | C |
| 22 | L5 | 493 | G |
| 22 | L5 | 912 | G |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 22 | L5 | 914 | U |
| 22 | L5 | 1082 | C |
| 22 | L5 | 1633 | G |
| 22 | L5 | 1977 | C |
| 22 | L5 | 2033 | A |
| 22 | L5 | 2055 | G |
| 22 | L5 | 2416 | G |
| 22 | L5 | 2485 | U |
| 22 | L5 | 2675 | G |
| 22 | L5 | 2760 | G |
| 22 | L5 | 2786 | C |
| 22 | L5 | 3614 | G |
| 22 | L5 | 3673 | C |
| 22 | L5 | 4061 | G |
| 22 | L5 | 4600 | G |
| 22 | L5 | 4699 | U |
| 22 | L5 | 4913 | G |
| 23 | L7 | 109 | U |
| 81 | S2 | 291 | G |
| 81 | S2 | 420 | G |
| 81 | S2 | 531 | A |
| 81 | S2 | 563 | G |
| 81 | S2 | 688 | U |
| 81 | S2 | 1434 | C |
| 81 | S2 | 1781 | A |

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

1 non-standard protein/DNA/RNA residue is 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 | $\#\|Z\| > 2$ |
| 2 | SEP | CF | 163 | 2 | 8,9,10 | 1.61 | 1 (12%) | 7,12,14 | 1.38 | 1 (14%) |

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 |
|---|---|---|---|---|---|---|---|
| 2 | SEP | CF | 163 | 2 | - | 6/6/8/10 | - |

All (1) bond length outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed(Å) | Ideal(Å) |
|---|---|---|---|---|---|---|---|
| 2 | CF | 163 | SEP | P-O1P | 3.53 | 1.61 | 1.50 |

All (1) bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed($^o$) | Ideal($^o$) |
|---|---|---|---|---|---|---|---|
| 2 | CF | 163 | SEP | OG-CB-CA | 3.02 | 111.08 | 108.14 |

There are no chirality outliers.

All (6) torsion outliers are listed below:

| Mol | Chain | Res | Type | Atoms |
|---|---|---|---|---|
| 2 | CF | 163 | SEP | C-CA-CB-OG |
| 2 | CF | 163 | SEP | CA-CB-OG-P |
| 2 | CF | 163 | SEP | CB-OG-P-O1P |
| 2 | CF | 163 | SEP | CB-OG-P-O2P |
| 2 | CF | 163 | SEP | CB-OG-P-O3P |
| 2 | CF | 163 | SEP | N-CA-CB-OG |

There are no ring outliers.

No monomer is involved in short contacts.

## 5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

## 5.6 Ligand geometry (i)

Of 261 ligands modelled in this entry, 261 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

## 5.7 Other polymers

There are no such residues in this entry.

## 5.8 Polymer linkage issues

The following chains have linkage breaks:

| Mol | Chain | Number of breaks |
|---|---|---|
| 22 | L5 | 13 |
| 81 | S2 | 6 |
| 50 | Lb | 1 |
| 29 | LE | 1 |
| 3 | LW | 1 |
| 14 | SH | 1 |
| 85 | Lt | 1 |
| 33 | LI | 1 |
| 41 | LR | 1 |

All chain breaks are listed below:

| Model | Chain | Residue-1 | Atom-1 | Residue-2 | Atom-2 | Distance (Å) |
|---|---|---|---|---|---|---|
| 1 | Lb | 76:VAL | C | 89:VAL | N | 35.01 |
| 1 | S2 | 753:C | O3' | 785:C | P | 28.23 |
| 1 | LE | 76:ALA | C | 88:VAL | N | 24.24 |
| 1 | L5 | 2910:G | O3' | 3584:C | P | 20.00 |
| 1 | L5 | 760:G | O3' | 903:C | P | 16.79 |
| 1 | L5 | 4776:G | O3' | 4858:C | P | 16.40 |
| 1 | LW | 63:GLN | C | 70:LYS | N | 16.36 |
| 1 | S2 | 698:G | O3' | 730:C | P | 15.53 |
| 1 | L5 | 519:C | O3' | 642:G | P | 14.76 |
| 1 | L5 | 996:G | O3' | 1047:C | P | 14.00 |
| 1 | S2 | 739:C | O3' | 746:C | P | 13.41 |
| 1 | L5 | 2112:G | O3' | 2249:C | P | 13.32 |
| 1 | L5 | 1222:A | O3' | 1234:G | P | 12.49 |
| 1 | SH | 107:LYS | C | 111:LYS | N | 11.91 |
| 1 | Lt | 87:GLU | C | 104:ILE | N | 9.77 |

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| Model | Chain | Residue-1 | Atom-1 | Residue-2 | Atom-2 | Distance (Å) |
|---|---|---|---|---|---|---|
| 1 | L5 | 1051:G | O3' | 1064:G | P | 9.22 |
| 1 | LI | 102:MET | C | 114:GLY | N | 8.11 |
| 1 | S2 | 225:G | O3' | 287:U | P | 7.79 |
| 1 | L5 | 1100:U | O3' | 1167:C | P | 7.08 |
| 1 | L5 | 1709:C | O3' | 1714:C | P | 6.47 |
| 1 | S2 | 1693:G | O3' | 1694:U | P | 5.53 |
| 1 | L5 | 3944:G | O3' | 3945:A | P | 4.70 |
| 1 | L5 | 4068:U | O3' | 4069:U | P | 3.66 |
| 1 | L5 | 3985:C | O3' | 4018:G | P | 3.26 |
| 1 | S2 | 1210:G | O3' | 1211:G | P | 3.19 |
| 1 | LR | 153:LYS | C | 154:LEU | N | 0.73 |

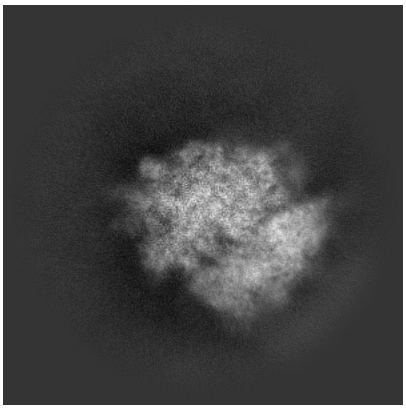
# 6 Map visualisation

This section contains visualisations of the EMDB entry EMD-44047. These allow visual inspection of the internal detail of the map and identification of artifacts.

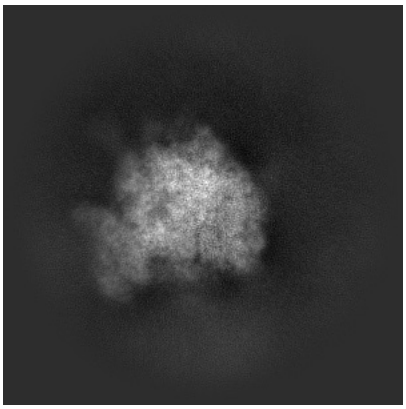
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

## 6.1 Orthogonal projections

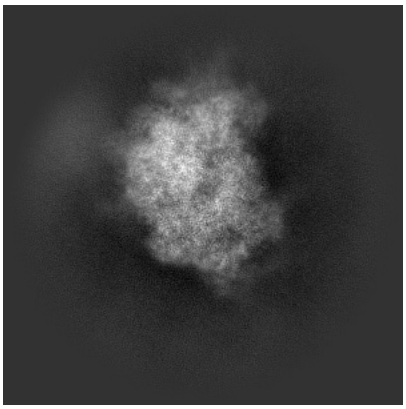
### 6.1.1 Primary map



X

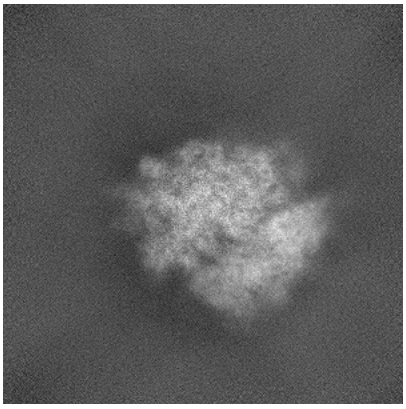


Y

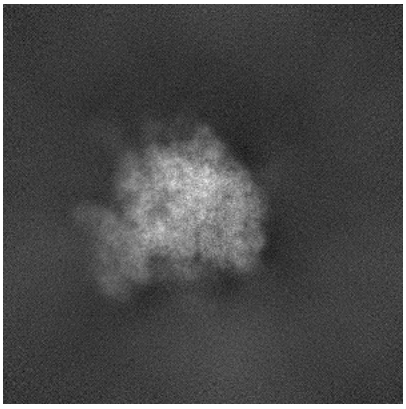


Z

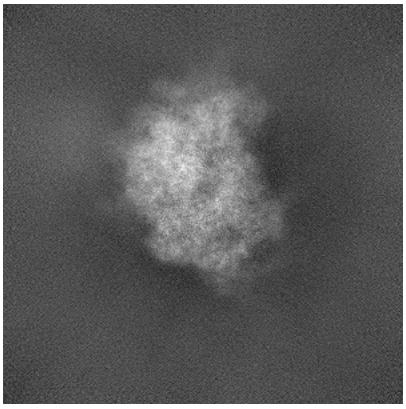
### 6.1.2 Raw map



X



Y

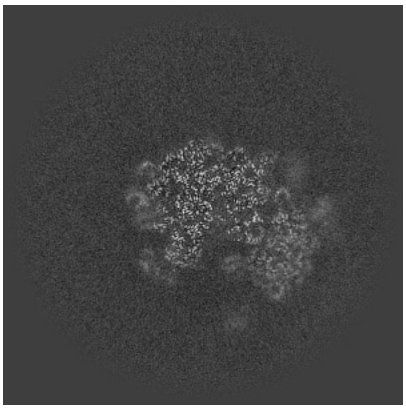


Z

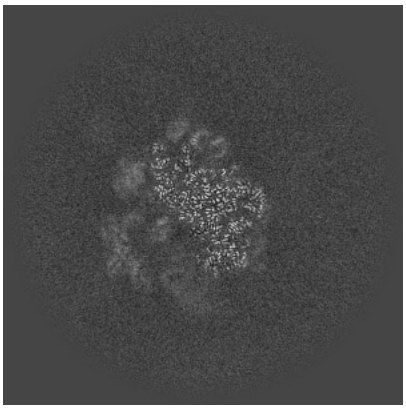
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices (i)

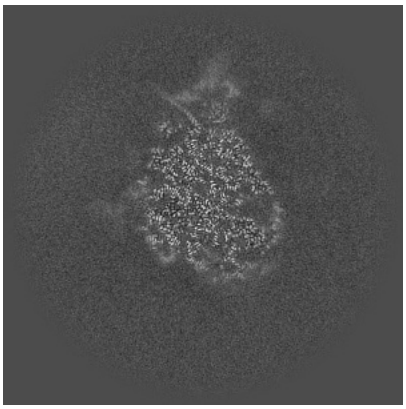
### 6.2.1 Primary map



X Index: 256

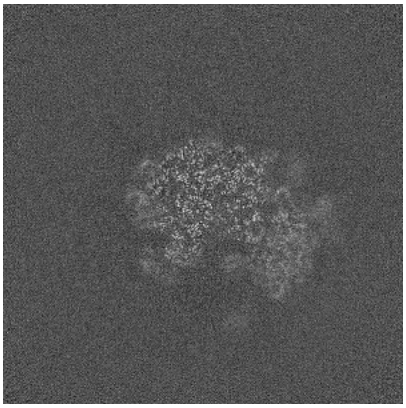


Y Index: 256

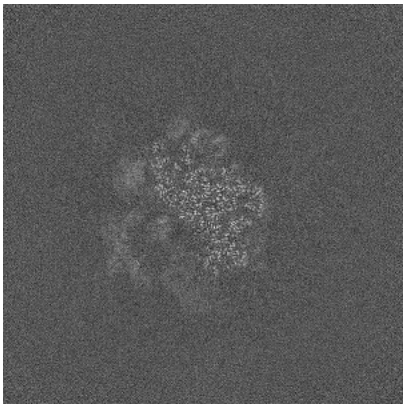


Z Index: 256

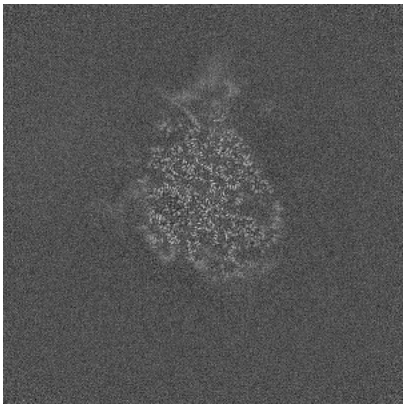
### 6.2.2 Raw map



X Index: 256



Y Index: 256

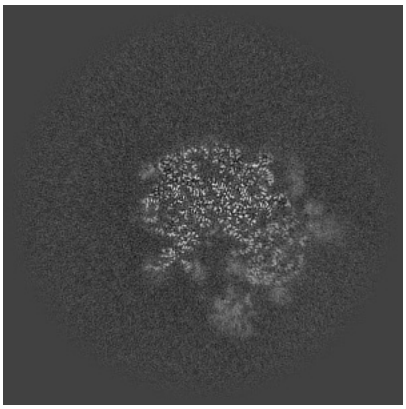


Z Index: 256

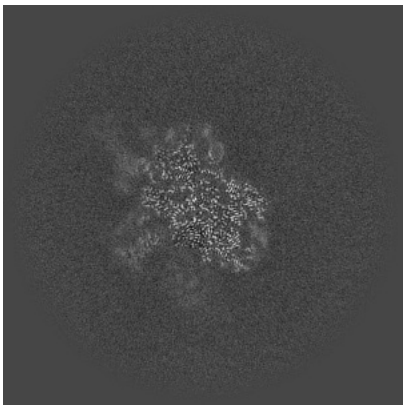
The images above show central slices of the map in three orthogonal directions.

## 6.3 Largest variance slices (i)

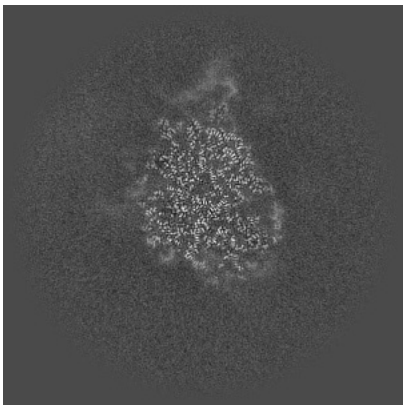
### 6.3.1 Primary map



X Index: 243

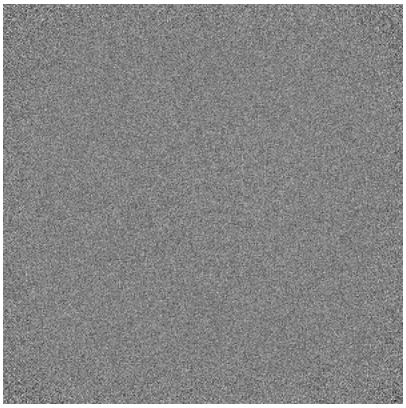


Y Index: 243

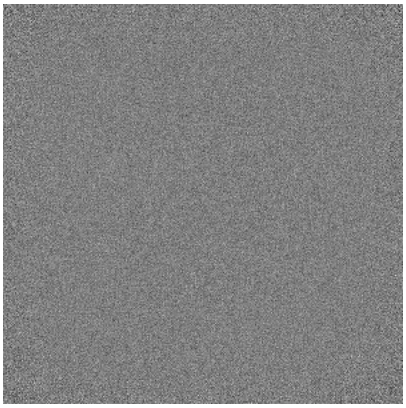


Z Index: 258

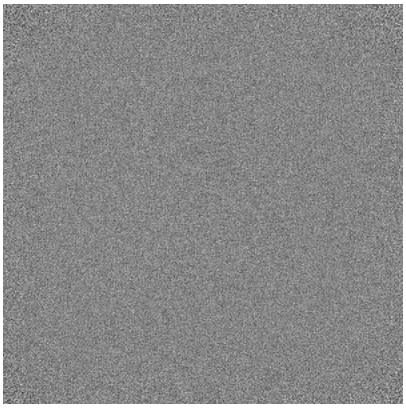
### 6.3.2 Raw map



X Index: 0



Y Index: 0

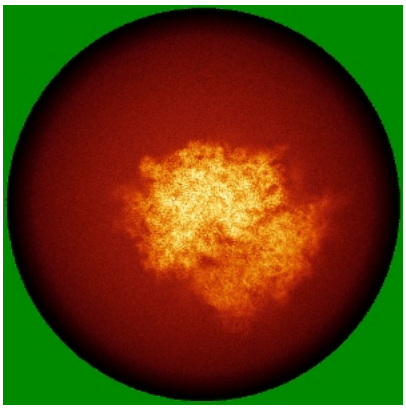


Z Index: 0

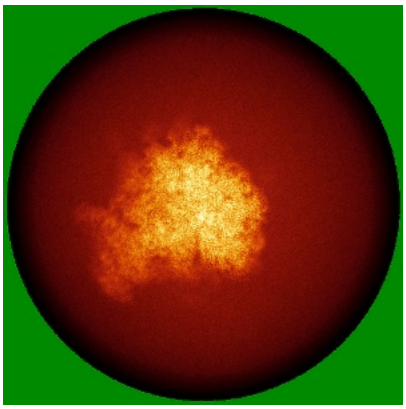
The images above show the largest variance slices of the map in three orthogonal directions.

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

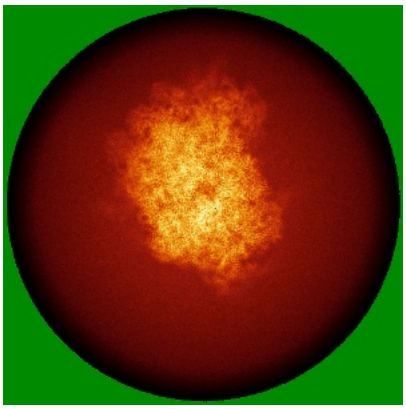
### 6.4.1 Primary map



X

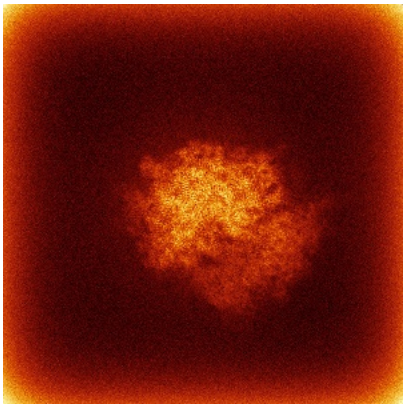


Y

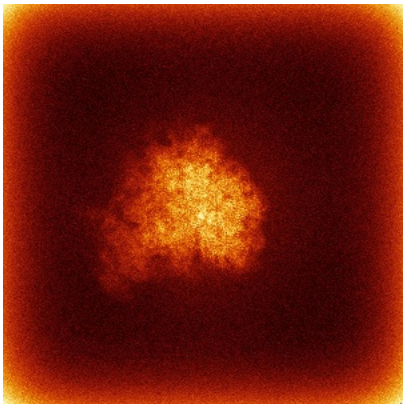


Z

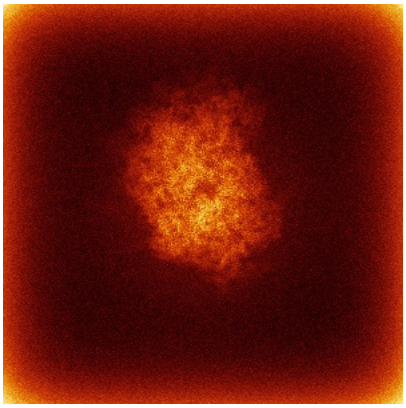
### 6.4.2 Raw map



X



Y

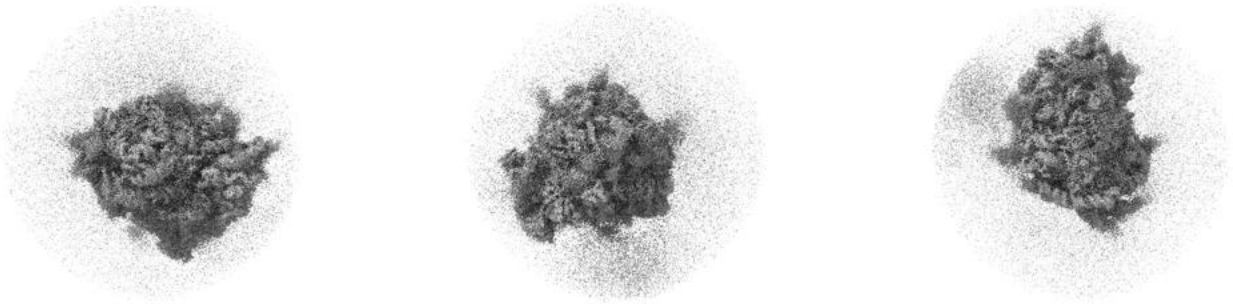


Z

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)

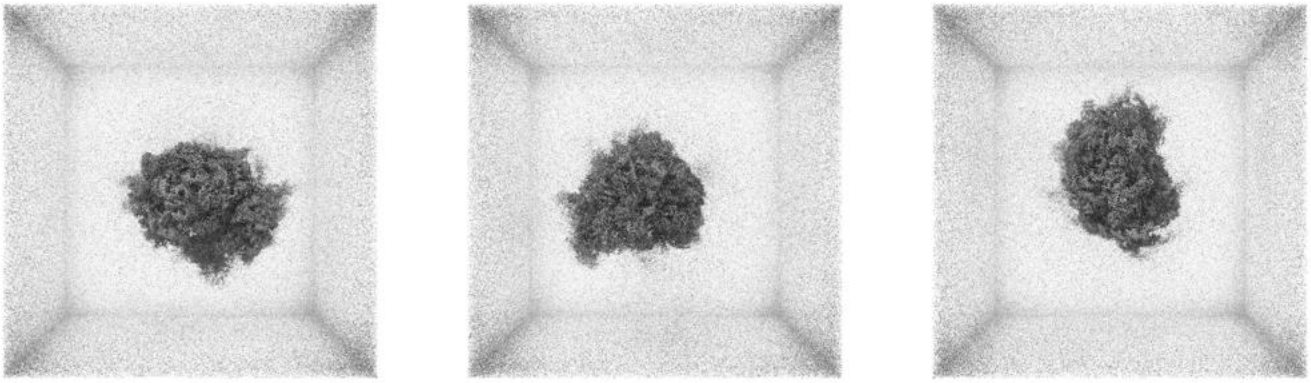
### 6.5.1 Primary map



X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.0202. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

### 6.5.2 Raw map



X Y Z

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

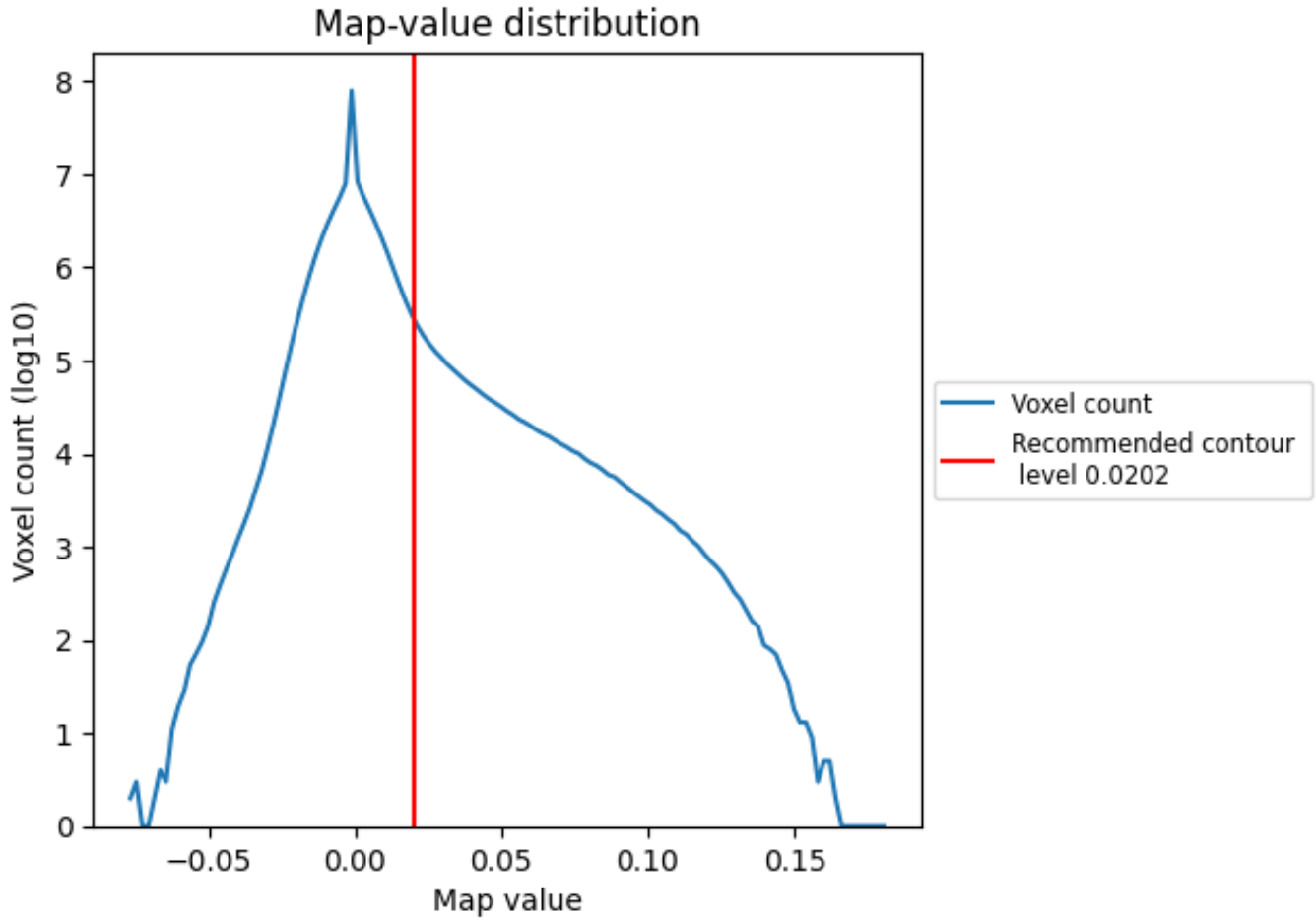
## 6.6 Mask visualisation (i)

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

# 7 Map analysis

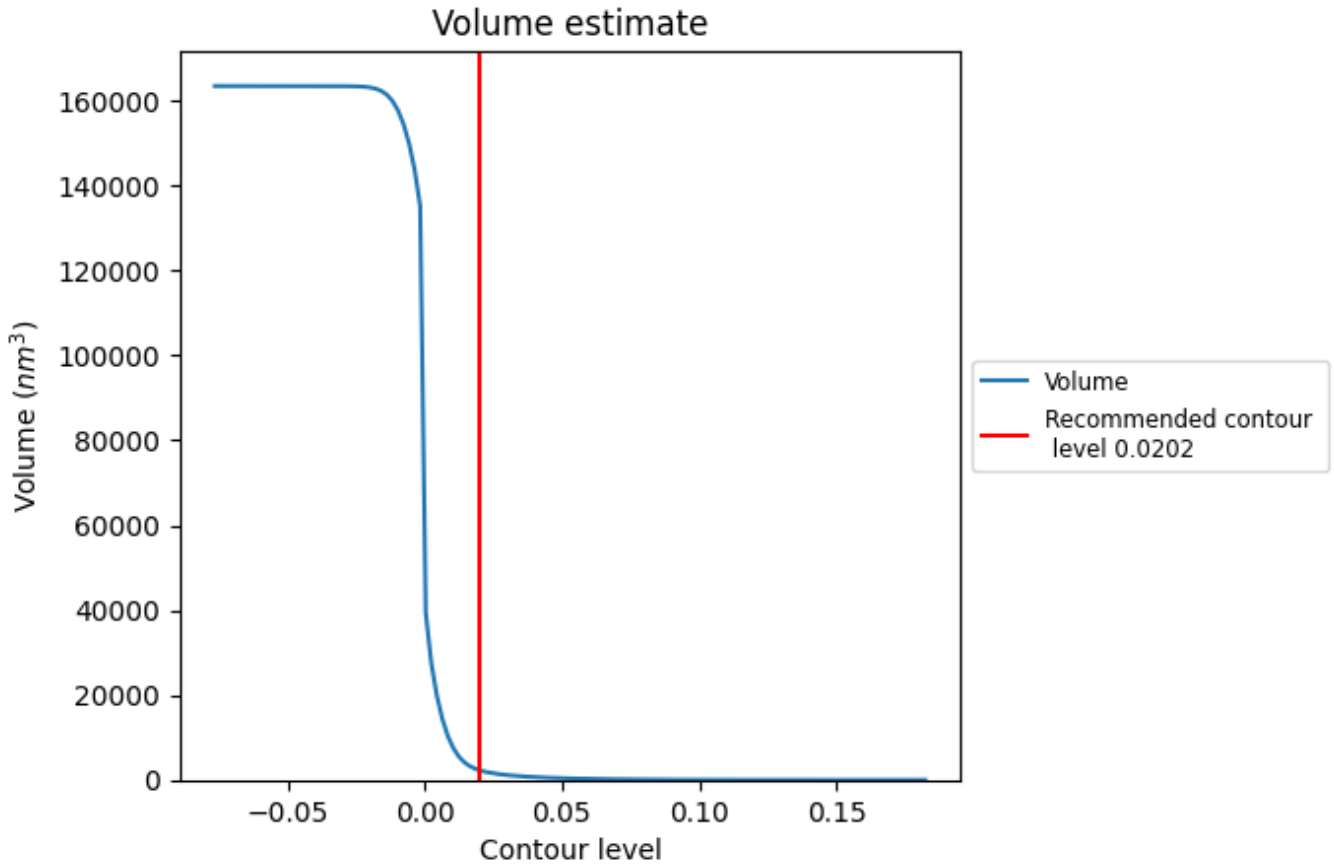
This section contains the results of statistical analysis of the map.

## 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.

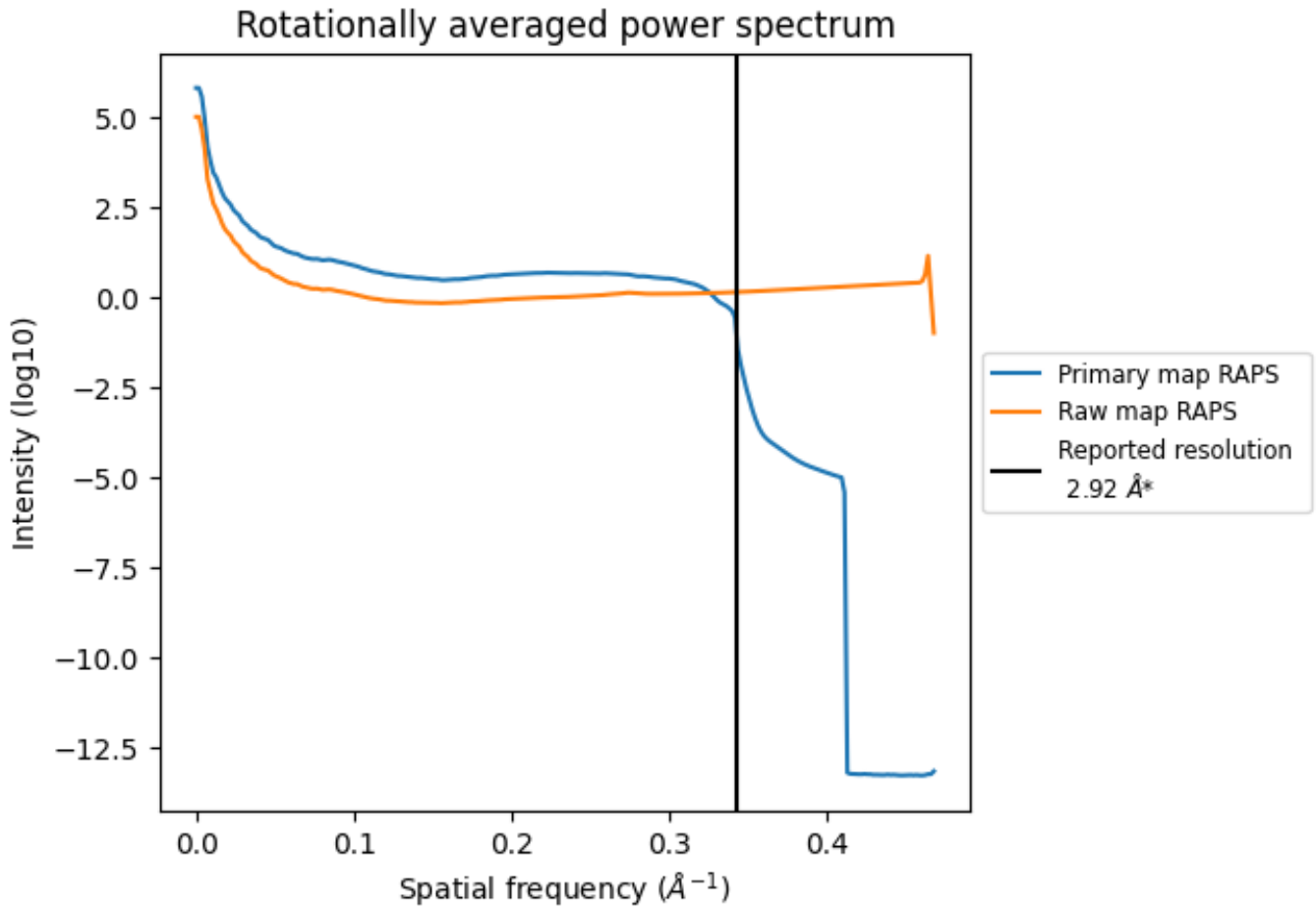
## 7.2 Volume estimate




The volume at the recommended contour level is 2243 $nm^3$; this corresponds to an approximate mass of 2026 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)

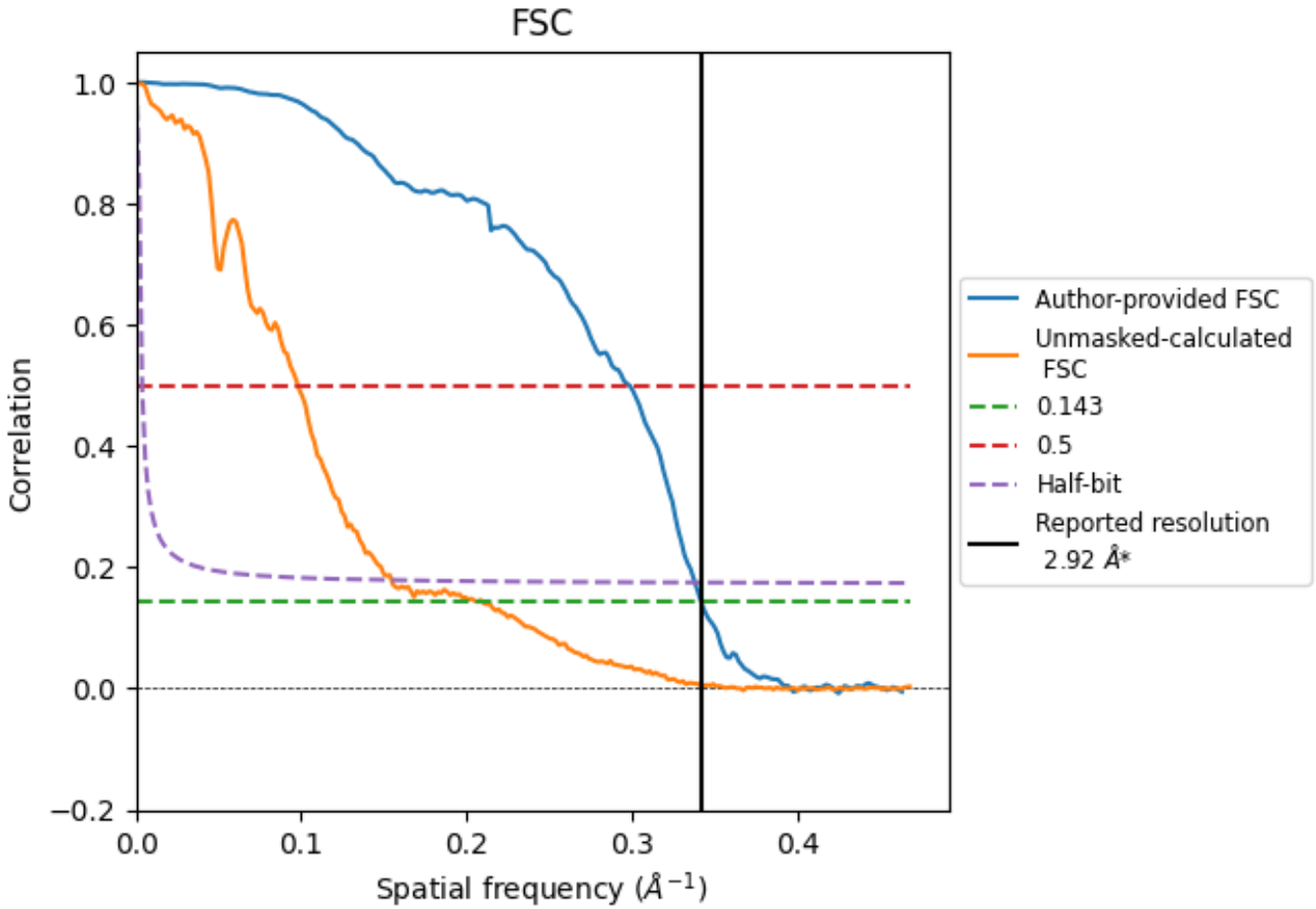



*Reported resolution corresponds to spatial frequency of 0.342 $Å^{-1}$

# 8 Fourier-Shell correlation

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

## 8.1 FSC




*Reported resolution corresponds to spatial frequency of 0.342 Å$^{-1}$

## 8.2 Resolution estimates (i)

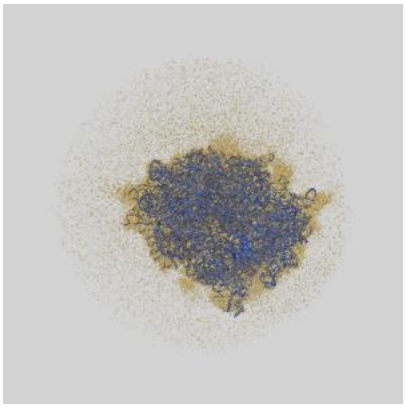
| Resolution estimate (Å) | Estimation criterion (FSC cut-off) | | |
|---|---|---|---|
| | 0.143 | 0.5 | Half-bit |
| Reported by author | 2.92 | - | - |
| Author-provided FSC curve | 2.92 | 3.35 | 2.96 |
| Unmasked-calculated* | 4.85 | 10.21 | 6.47 |

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 4.85 differs from the reported value 2.92 by more than 10 %

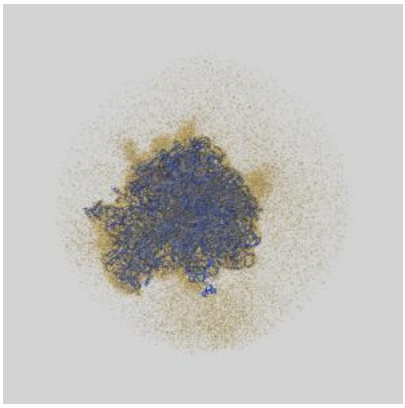
# 9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-44047 and PDB model 9B0N. Per-residue inclusion information can be found in section 3 on page 21.

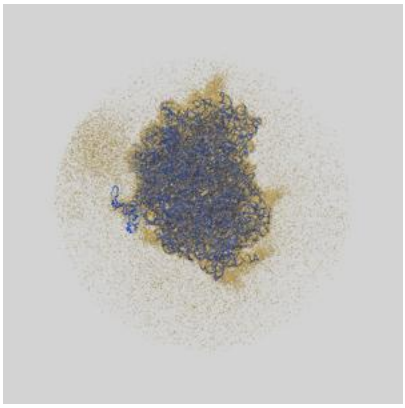
## 9.1 Map-model overlay



X



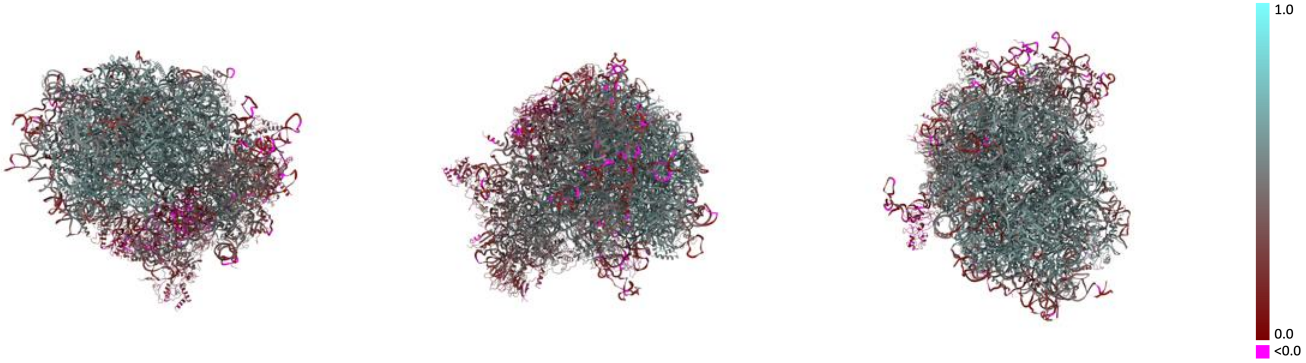
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.0202 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

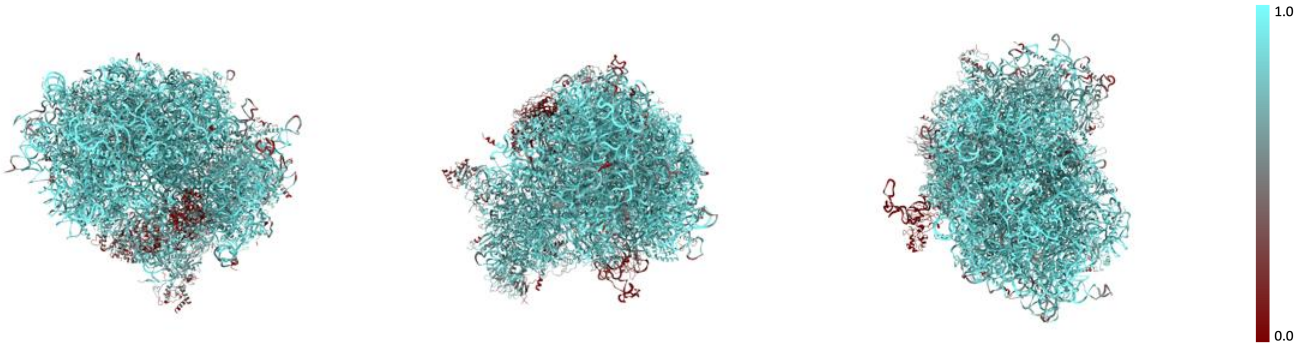
## 9.2 Q-score mapped to coordinate model (i)




X Y Z

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

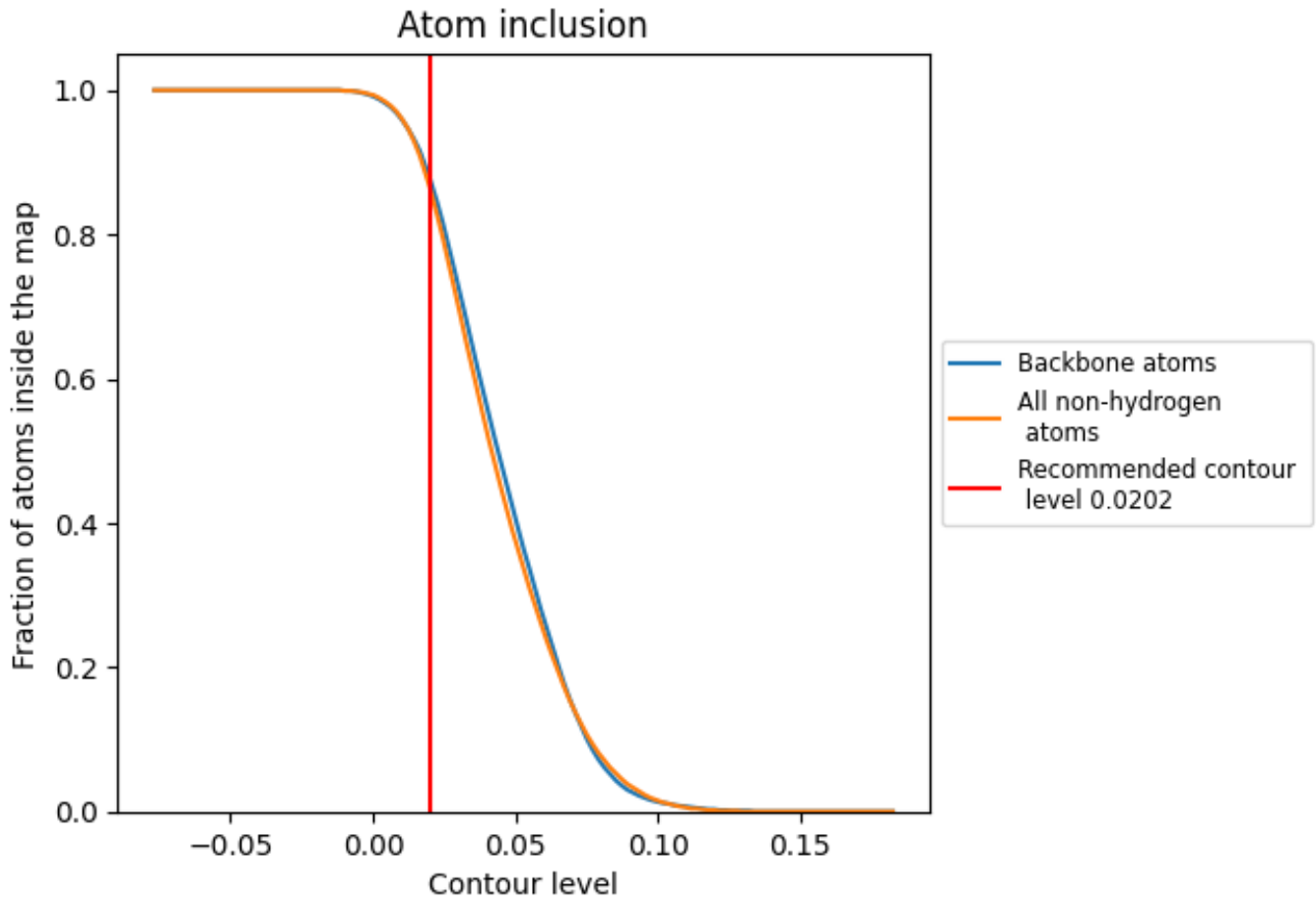
## 9.3 Atom inclusion mapped to coordinate model (i)




X Y Z

The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.0202).

## 9.4 Atom inclusion (i)




At the recommended contour level, 88% of all backbone atoms, 86% of all non-hydrogen atoms, are inside the map.

## 9.5 Map-model fit summary

The table lists the average atom inclusion at the recommended contour level (0.0202) and Q-score for the entire model and for each chain.

| Chain | Atom inclusion | Q-score |
|---|---|---|
| All | 0.8630 | 0.4660 |
| AT | 0.5860 | 0.1240 |
| CF | 0.2640 | 0.1150 |
| L5 | 0.9170 | 0.5010 |
| L7 | 0.9820 | 0.5610 |
| L8 | 0.9530 | 0.5380 |
| LA | 0.9510 | 0.5890 |
| LB | 0.9170 | 0.5670 |
| LC | 0.9140 | 0.5700 |
| LD | 0.9010 | 0.5210 |
| LE | 0.8370 | 0.4950 |
| LF | 0.9340 | 0.5760 |
| LG | 0.8400 | 0.5120 |
| LH | 0.9030 | 0.5480 |
| LI | 0.9200 | 0.5690 |
| LJ | 0.8190 | 0.4770 |
| LL | 0.8720 | 0.5360 |
| LM | 0.9280 | 0.5490 |
| LN | 0.9670 | 0.5980 |
| LO | 0.9340 | 0.5750 |
| LP | 0.9400 | 0.5870 |
| LQ | 0.9400 | 0.5900 |
| LR | 0.8470 | 0.4980 |
| LS | 0.9410 | 0.5800 |
| LT | 0.8950 | 0.5520 |
| LU | 0.8440 | 0.4720 |
| LV | 0.9250 | 0.5760 |
| LW | 0.7150 | 0.3980 |
| LX | 0.9010 | 0.5530 |
| LY | 0.9220 | 0.5600 |
| LZ | 0.9200 | 0.5400 |
| La | 0.9490 | 0.5920 |
| Lb | 0.8510 | 0.5070 |
| Lc | 0.8960 | 0.5350 |
| Ld | 0.8680 | 0.5350 |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| Chain | Atom inclusion | Q-score |
|---|---|---|
| Le | 0.9480 | 0.5910 |
| Lf | 0.9510 | 0.5890 |
| Lg | 0.9250 | 0.5660 |
| Lh | 0.9080 | 0.5550 |
| Li | 0.9020 | 0.5430 |
| Lj | 0.9550 | 0.5850 |
| Lk | 0.8440 | 0.5030 |
| Ll | 0.9430 | 0.5780 |
| Lm | 0.9180 | 0.5720 |
| Ln | 0.9330 | 0.5770 |
| Lo | 0.8110 | 0.5520 |
| Lp | 0.9130 | 0.5740 |
| Lr | 0.9270 | 0.5760 |
| Ls | 0.3270 | 0.1840 |
| Lt | 0.2300 | 0.0960 |
| Lz | 0.0140 | 0.0740 |
| Pt | 0.8810 | 0.3940 |
| S2 | 0.9250 | 0.4270 |
| SA | 0.8200 | 0.4370 |
| SB | 0.8150 | 0.4780 |
| SC | 0.8870 | 0.4800 |
| SD | 0.7200 | 0.3510 |
| SE | 0.8470 | 0.4220 |
| SF | 0.6390 | 0.3770 |
| SG | 0.7270 | 0.3350 |
| SH | 0.7300 | 0.3670 |
| SI | 0.8090 | 0.4510 |
| SJ | 0.8400 | 0.4140 |
| SK | 0.6810 | 0.2920 |
| SL | 0.8230 | 0.4740 |
| SM | 0.3410 | 0.1620 |
| SN | 0.8780 | 0.5070 |
| SO | 0.7850 | 0.4700 |
| SP | 0.7110 | 0.3340 |
| SQ | 0.7700 | 0.3710 |
| SR | 0.7280 | 0.3520 |
| SS | 0.7040 | 0.3760 |
| ST | 0.7740 | 0.3610 |
| SU | 0.7190 | 0.3120 |
| SV | 0.8470 | 0.4310 |
| SW | 0.9210 | 0.5070 |
| SX | 0.8660 | 0.4940 |

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| Chain | Atom inclusion | Q-score |
|---|---|---|
| SY | 0.7850 | 0.3250 |
| SZ | 0.4480 | 0.2950 |
| Sa | 0.8730 | 0.5000 |
| Sb | 0.8440 | 0.4610 |
| Sc | 0.6630 | 0.3500 |
| Sd | 0.9070 | 0.4240 |
| Se | 0.7390 | 0.3740 |
| Sf | 0.5220 | 0.2030 |
| Sg | 0.6100 | 0.2600 |