



wwPDB EM Validation Summary Report ⓘ

Apr 16, 2024 – 01:48 pm BST

PDB ID : 8CKU
EMDB ID : EMD-16702
Title : Translocation intermediate 1 (TI-1*) of 80S *S. cerevisiae* ribosome with ligands and eEF2 in the absence of sordarin
Authors : Milicevic, N.; Jenner, L.; Myasnikov, A.; Yusupov, M.; Yusupova, G.
Deposited on : 2023-02-16
Resolution : 3.11 Å(reported)

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

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/EMValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

EMDB validation analysis : 0.0.1.dev92
Mogul : 1.8.4, CSD as541be (2020)
MolProbity : 4.02b-467
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : **FAILED**
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36

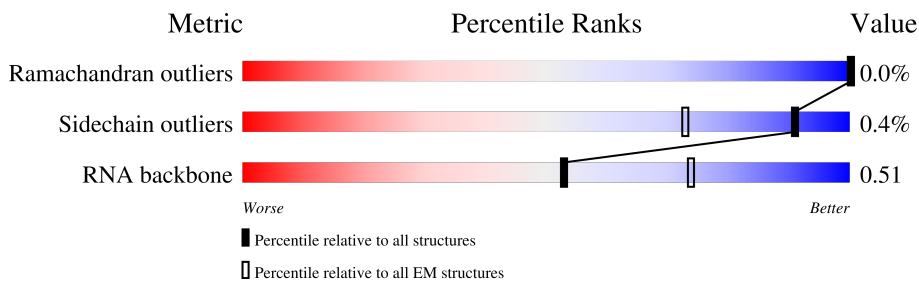
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.11 Å.

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



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

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$.

| Mol | Chain | Length | Quality of chain |
|-----|-------|--------|------------------|
| 1 | 0 | 135 | |
| 2 | 1 | 108 | |
| 3 | 2 | 119 | |
| 4 | 3 | 82 | |
| 5 | 4 | 67 | |
| 6 | 5 | 56 | |
| 7 | 6 | 63 | |
| 8 | 7 | 319 | |
| 9 | 8 | 152 | |

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| Mol | Chain | Length | Quality of chain |
|-----|-------|--------|------------------|
| 10 | A | 199 | 98% |
| 11 | AA | 3396 | 75% 18% 6% |
| 12 | Aa | 842 | 99% |
| 13 | B | 184 | 83% 16% |
| 14 | BB | 121 | 91% 9% |
| 15 | Bb | 76 | 51% 46% |
| 16 | C | 186 | 99% |
| 17 | CC | 158 | 82% 18% |
| 18 | Cc | 77 | 66% 30% |
| 19 | D | 189 | 93% 7% |
| 20 | DD | 312 | 63% 36% |
| 21 | Dd | 39 | 26% 8% 67% |
| 22 | E | 172 | 100% |
| 23 | EE | 254 | 99% |
| 24 | Ee | 165 | 95% |
| 25 | F | 160 | 99% |
| 26 | FF | 387 | 99% |
| 27 | G | 121 | 79% 20% |
| 28 | GG | 362 | 100% |
| 29 | H | 137 | 94% 6% |
| 30 | HH | 297 | 100% |
| 31 | I | 155 | 39% 59% |
| 32 | II | 176 | 88% 12% |
| 33 | J | 142 | 85% 15% |
| 34 | JJ | 244 | 91% 9% |

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| Mol | Chain | Length | Quality of chain |
|-----|-------|--------|------------------|
| 35 | K | 127 | 97% |
| 36 | KK | 256 | 91% 9% |
| 37 | L | 136 | 98% |
| 38 | LL | 191 | 99% |
| 39 | M | 149 | 99% |
| 40 | MM | 221 | 97% |
| 41 | N | 59 | 98% |
| 42 | NN | 174 | 97% |
| 43 | O | 105 | 92% 8% |
| 44 | OO | 199 | 95% |
| 45 | P | 113 | 96% |
| 46 | PP | 138 | 99% |
| 47 | Q | 130 | 98% |
| 48 | QQ | 204 | 99% |
| 49 | R | 107 | 99% |
| 50 | S | 121 | 90% 10% |
| 51 | T | 120 | 99% |
| 52 | U | 100 | 99% |
| 53 | V | 88 | 95% 5% |
| 54 | W | 78 | 99% |
| 55 | X | 51 | 98% |
| 56 | Y | 128 | 41% 59% |
| 57 | Z | 25 | 96% |
| 58 | a | 106 | 94% |
| 59 | b | 92 | 99% |

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| Mol | Chain | Length | Quality of chain |
|-----|-------|--------|------------------|
| 60 | c | 1800 | 67% 21% 11% |
| 61 | d | 252 | 81% 18% |
| 62 | e | 255 | 83% 17% |
| 63 | f | 254 | 85% 15% |
| 64 | g | 240 | 86% 14% |
| 65 | h | 261 | 98% .. |
| 66 | i | 225 | 88% 12% |
| 67 | j | 236 | 92% 7% |
| 68 | k | 190 | 97% . |
| 69 | l | 200 | 92% 8% |
| 70 | m | 197 | 94% 6% |
| 71 | n | 105 | 85% 13% |
| 72 | o | 156 | 90% 9% |
| 73 | p | 151 | 98% .. |
| 74 | q | 137 | 93% 7% |
| 75 | r | 142 | 73% 27% |
| 76 | s | 143 | 94% . . |
| 77 | t | 136 | 88% 11% |
| 78 | u | 146 | 98% .. |
| 79 | v | 144 | 99% . |
| 80 | w | 121 | 83% 17% |
| 81 | x | 87 | 100% |
| 82 | y | 130 | 99% . |
| 83 | z | 145 | 98% .. |

2 Entry composition i

There are 89 unique types of molecules in this entry. The entry contains 207340 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a protein called 40S ribosomal protein S24-A.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---------|-------|
| | | | Total | C | N | O | | |
| 1 | 0 | 134 | 1073 | 676 | 208 | 189 | 0 | 0 |

- Molecule 2 is a protein called 40S ribosomal protein S25-A.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|----|---------|-------|
| | | | Total | C | N | O | | |
| 2 | 1 | 70 | 563 | 360 | 104 | 99 | 0 | 0 |

- Molecule 3 is a protein called 40S ribosomal protein S26.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 3 | 2 | 97 | 769 | 475 | 160 | 129 | 5 | 0 | 0 |

- Molecule 4 is a protein called 40S ribosomal protein S27-A.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 4 | 3 | 81 | 610 | 382 | 110 | 113 | 5 | 0 | 0 |

- Molecule 5 is a protein called 40S ribosomal protein S28-A.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 5 | 4 | 63 | 497 | 306 | 99 | 91 | 1 | 0 | 0 |

- Molecule 6 is a protein called HLJ1_G0030400.mRNA.1.CDS.1.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 6 | 5 | 53 | 442 | 274 | 92 | 72 | 4 | 0 | 0 |

- Molecule 7 is a protein called 40S ribosomal protein S30-A.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 7 | 6 | 53 | 427 | 269 | 88 | 69 | 1 | 0 | 0 |

- Molecule 8 is a protein called Guanine nucleotide-binding protein subunit beta-like protein.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 8 | 7 | 318 | 2436 | 1541 | 418 | 469 | 8 | 0 | 0 |

- Molecule 9 is a protein called Ubiquitin-40S ribosomal protein S31.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 9 | 8 | 36 | 276 | 173 | 54 | 45 | 4 | 0 | 0 |

- Molecule 10 is a protein called 60S ribosomal protein L16-A.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 10 | A | 197 | 1555 | 1003 | 289 | 262 | 1 | 0 | 0 |

- Molecule 11 is a RNA chain called 25S ribosomal RNA.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-------|-------|-------|------|---------|-------|
| | | | Total | C | N | O | P | | |
| 11 | AA | 3190 | 68285 | 30524 | 12313 | 22258 | 3190 | 0 | 0 |

- Molecule 12 is a protein called Elongation factor 2.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|------|------|----|---------|-------|
| | | | Total | C | N | O | S | | |
| 12 | Aa | 842 | 6569 | 4173 | 1126 | 1239 | 31 | 0 | 0 |

- Molecule 13 is a protein called 60S ribosomal protein L17-A.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---------|-------|
| | | | Total | C | N | O | | |
| 13 | B | 154 | 1222 | 761 | 237 | 224 | 0 | 0 |

- Molecule 14 is a RNA chain called 5S ribosomal RNA.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|-----|---------|-------|
| | | | Total | C | N | O | P | | |
| 14 | BB | 121 | 2579 | 1152 | 461 | 845 | 121 | 0 | 0 |

- Molecule 15 is a RNA chain called Transfer RNA Phe.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|----|---------|-------|
| | | | Total | C | N | O | P | | |
| 15 | Bb | 76 | 1638 | 736 | 294 | 533 | 75 | 0 | 0 |

- Molecule 16 is a protein called 60S ribosomal protein L18-A.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 16 | C | 185 | 1441 | 908 | 290 | 241 | 2 | 0 | 0 |

- Molecule 17 is a RNA chain called 5.8S ribosomal RNA.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|------|-----|---------|-------|
| | | | Total | C | N | O | P | | |
| 17 | CC | 158 | 3353 | 1500 | 586 | 1109 | 158 | 0 | 0 |

- Molecule 18 is a RNA chain called Transfer RNA fMet.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|----|---------|-------|
| | | | Total | C | N | O | P | | |
| 18 | Cc | 77 | 1644 | 732 | 298 | 537 | 77 | 0 | 0 |

There is a discrepancy between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
|-------|---------|----------|--------|----------|--------------|
| Cc | 18 | C | U | conflict | GB 170517292 |

- Molecule 19 is a protein called 60S ribosomal protein L19-A.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---------|-------|
| | | | Total | C | N | O | | |
| 19 | D | 176 | 1423 | 875 | 308 | 240 | 0 | 0 |

- Molecule 20 is a protein called 60S acidic ribosomal protein P0.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 20 | DD | 200 | Total | C | N | O | S | 0 | 0 |
| | | | 1551 | 994 | 269 | 284 | 4 | | |

- Molecule 21 is a RNA chain called Messenger RNA.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|----|---------|-------|
| 21 | Dd | 13 | Total | C | N | O | P | 0 | 0 |
| | | | 278 | 125 | 50 | 90 | 13 | | |

- Molecule 22 is a protein called 60S ribosomal protein L20-A.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 22 | E | 172 | Total | C | N | O | S | 0 | 0 |
| | | | 1445 | 930 | 267 | 244 | 4 | | |

- Molecule 23 is a protein called 60S ribosomal protein L2-A.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 23 | EE | 252 | Total | C | N | O | S | 0 | 0 |
| | | | 1914 | 1191 | 388 | 334 | 1 | | |

- Molecule 24 is a protein called 60S ribosomal protein L12-A.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 24 | Ee | 160 | Total | C | N | O | S | 0 | 0 |
| | | | 1211 | 759 | 218 | 232 | 2 | | |

- Molecule 25 is a protein called 60S ribosomal protein L21-A.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 25 | F | 159 | Total | C | N | O | S | 0 | 0 |
| | | | 1276 | 805 | 246 | 221 | 4 | | |

- Molecule 26 is a protein called 60S ribosomal protein L3.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 26 | FF | 386 | Total | C | N | O | S | 0 | 0 |
| | | | 3075 | 1950 | 584 | 533 | 8 | | |

- Molecule 27 is a protein called 60S ribosomal protein L22-A.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---------|-------|
| 27 | G | 97 | Total | C | N | O | 0 | 0 |
| | | | 770 | 499 | 126 | 145 | | |

- Molecule 28 is a protein called 60S ribosomal protein L4-A.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 28 | GG | 361 | Total | C | N | O | S | 0 | 0 |
| | | | 2748 | 1729 | 522 | 494 | 3 | | |

- Molecule 29 is a protein called 60S ribosomal protein L23-A.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 29 | H | 129 | Total | C | N | O | S | 0 | 0 |
| | | | 963 | 607 | 180 | 169 | 7 | | |

- Molecule 30 is a protein called 60S ribosomal protein L5.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 30 | HH | 296 | Total | C | N | O | S | 0 | 0 |
| | | | 2375 | 1501 | 414 | 458 | 2 | | |

- Molecule 31 is a protein called 60S ribosomal protein L24-A.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|----|---|---------|-------|
| 31 | I | 63 | Total | C | N | O | S | 0 | 0 |
| | | | 521 | 336 | 102 | 82 | 1 | | |

- Molecule 32 is a protein called 60S ribosomal protein L6-A.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 32 | II | 155 | Total | C | N | O | S | 0 | 0 |
| | | | 1230 | 795 | 221 | 213 | 1 | | |

- Molecule 33 is a protein called 60S ribosomal protein L25.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 33 | J | 120 | Total | C | N | O | S | 0 | 0 |
| | | | 959 | 617 | 168 | 172 | 2 | | |

- Molecule 34 is a protein called 60S ribosomal protein L7-A.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 34 | JJ | 222 | 1784 | 1151 | 324 | 308 | 1 | 0 | 0 |

- Molecule 35 is a protein called 60S ribosomal protein L26-A.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 35 | K | 126 | 993 | 625 | 192 | 176 | | 0 | 0 |

- Molecule 36 is a protein called 60S ribosomal protein L8-A.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 36 | KK | 233 | 1804 | 1151 | 323 | 327 | 3 | 0 | 0 |

- Molecule 37 is a protein called 60S ribosomal protein L27-A.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 37 | L | 135 | 1092 | 710 | 202 | 180 | | 0 | 0 |

- Molecule 38 is a protein called 60S ribosomal protein L9-A.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 38 | LL | 191 | 1518 | 963 | 274 | 277 | 4 | 0 | 0 |

- Molecule 39 is a protein called 60S ribosomal protein L28.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 39 | M | 148 | 1173 | 749 | 231 | 190 | 3 | 0 | 0 |

- Molecule 40 is a protein called 60S ribosomal protein L10.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 40 | MM | 215 | 1743 | 1102 | 331 | 303 | 7 | 0 | 0 |

- Molecule 41 is a protein called 60S ribosomal protein L29.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|----|---------|-------|
| 41 | N | 58 | Total | C | N | O | 0 | 0 |
| | | | 462 | 289 | 100 | 73 | | |

- Molecule 42 is a protein called 60S ribosomal protein L11-A.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 42 | NN | 169 | Total | C | N | O | S | 0 | 0 |
| | | | 1353 | 847 | 253 | 249 | 4 | | |

- Molecule 43 is a protein called 60S ribosomal protein L30.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 43 | O | 97 | Total | C | N | O | S | 0 | 0 |
| | | | 742 | 479 | 124 | 138 | 1 | | |

- Molecule 44 is a protein called 60S ribosomal protein L13-A.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---------|-------|
| 44 | OO | 193 | Total | C | N | O | 0 | 0 |
| | | | 1543 | 962 | 315 | 266 | | |

- Molecule 45 is a protein called 60S ribosomal protein L31-A.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 45 | P | 109 | Total | C | N | O | S | 0 | 0 |
| | | | 883 | 559 | 167 | 156 | 1 | | |

- Molecule 46 is a protein called 60S ribosomal protein L14-A.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 46 | PP | 136 | Total | C | N | O | S | 0 | 0 |
| | | | 1053 | 675 | 199 | 177 | 2 | | |

- Molecule 47 is a protein called 60S ribosomal protein L32.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 47 | Q | 127 | Total | C | N | O | S | 0 | 0 |
| | | | 1020 | 647 | 205 | 167 | 1 | | |

- Molecule 48 is a protein called 60S ribosomal protein L15-A.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 48 | QQ | 203 | Total | C | N | O | S | 0 | 0 |
| | | | 1720 | 1077 | 361 | 281 | 1 | | |

- Molecule 49 is a protein called 60S ribosomal protein L33-A.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 49 | R | 106 | Total | C | N | O | S | 0 | 0 |
| | | | 850 | 540 | 165 | 144 | 1 | | |

- Molecule 50 is a protein called 60S ribosomal protein L34-A.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 50 | S | 109 | Total | C | N | O | S | 0 | 0 |
| | | | 861 | 533 | 175 | 149 | 4 | | |

- Molecule 51 is a protein called 60S ribosomal protein L35-A.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 51 | T | 119 | Total | C | N | O | S | 0 | 0 |
| | | | 969 | 615 | 186 | 167 | 1 | | |

- Molecule 52 is a protein called 60S ribosomal protein L36-A.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 52 | U | 99 | Total | C | N | O | S | 0 | 0 |
| | | | 771 | 481 | 156 | 132 | 2 | | |

- Molecule 53 is a protein called 60S ribosomal protein L37-A.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 53 | V | 84 | Total | C | N | O | S | 0 | 0 |
| | | | 665 | 405 | 145 | 110 | 5 | | |

- Molecule 54 is a protein called 60S ribosomal protein L38.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---------|-------|
| 54 | W | 77 | Total | C | N | O | 0 | 0 |
| | | | 612 | 391 | 115 | 106 | | |

- Molecule 55 is a protein called 60S ribosomal protein L39.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 55 | X | 50 | Total | C | N | O | S | 0 | 0 |
| | | | 436 | 272 | 97 | 65 | 2 | | |

- Molecule 56 is a protein called Ubiquitin-60S ribosomal protein L40.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 56 | Y | 52 | Total | C | N | O | S | 0 | 0 |
| | | | 417 | 259 | 86 | 67 | 5 | | |

- Molecule 57 is a protein called RPL41A isoform 1.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 57 | Z | 25 | Total | C | N | O | S | 0 | 0 |
| | | | 233 | 142 | 63 | 27 | 1 | | |

- Molecule 58 is a protein called 60S ribosomal protein L42-A.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 58 | a | 102 | Total | C | N | O | S | 0 | 0 |
| | | | 819 | 514 | 166 | 134 | 5 | | |

- Molecule 59 is a protein called 60S ribosomal protein L43-A.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 59 | b | 91 | Total | C | N | O | S | 0 | 0 |
| | | | 694 | 429 | 138 | 121 | 6 | | |

- Molecule 60 is a RNA chain called 18S ribosomal RNA.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-------|------|-------|------|---------|-------|
| 60 | c | 1604 | Total | C | N | O | P | 0 | 0 |
| | | | 34236 | 15322 | 6079 | 11231 | 1604 | | |

- Molecule 61 is a protein called 40S ribosomal protein S0-A.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 61 | d | 206 | Total | C | N | O | S | 0 | 0 |
| | | | 1583 | 1017 | 281 | 283 | 2 | | |

- Molecule 62 is a protein called 40S ribosomal protein S1-A.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 62 | e | 212 | Total | C | N | O | S | 0 | 0 |
| | | | 1689 | 1073 | 303 | 309 | 4 | | |

- Molecule 63 is a protein called 40S ribosomal protein S2.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 63 | f | 217 | Total | C | N | O | S | 0 | 0 |
| | | | 1635 | 1047 | 289 | 297 | 2 | | |

- Molecule 64 is a protein called RPS3 isoform 1.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 64 | g | 206 | Total | C | N | O | S | 0 | 0 |
| | | | 1601 | 1014 | 294 | 287 | 6 | | |

- Molecule 65 is a protein called 40S ribosomal protein S4-A.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 65 | h | 258 | Total | C | N | O | S | 0 | 0 |
| | | | 2056 | 1308 | 387 | 358 | 3 | | |

- Molecule 66 is a protein called 40S ribosomal protein S5.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 66 | i | 199 | Total | C | N | O | S | 0 | 0 |
| | | | 1572 | 987 | 290 | 292 | 3 | | |

- Molecule 67 is a protein called 40S ribosomal protein S6-A.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 67 | j | 219 | Total | C | N | O | S | 0 | 0 |
| | | | 1766 | 1108 | 341 | 314 | 3 | | |

- Molecule 68 is a protein called 40S ribosomal protein S7-A.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---------|-------|
| 68 | k | 184 | Total | C | N | O | 0 | 0 |
| | | | 1481 | 951 | 265 | 265 | | |

- Molecule 69 is a protein called 40S ribosomal protein S8-A.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 69 | l | 184 | 1457 | 906 | 291 | 258 | 2 | 0 | 0 |

- Molecule 70 is a protein called 40S ribosomal protein S9-A.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 70 | m | 185 | 1494 | 943 | 289 | 261 | 1 | 0 | 0 |

- Molecule 71 is a protein called 40S ribosomal protein S10-A.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 71 | n | 91 | 772 | 503 | 123 | 144 | 2 | 0 | 0 |

- Molecule 72 is a protein called 40S ribosomal protein S11-A.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 72 | o | 142 | 1146 | 735 | 217 | 191 | 3 | 0 | 0 |

- Molecule 73 is a protein called 40S ribosomal protein S13.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 73 | p | 150 | 1192 | 759 | 224 | 207 | 2 | 0 | 0 |

- Molecule 74 is a protein called 40S ribosomal protein S14-A.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 74 | q | 127 | 891 | 545 | 182 | 163 | 1 | 0 | 0 |

- Molecule 75 is a protein called 40S ribosomal protein S15.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 75 | r | 104 | 837 | 533 | 155 | 143 | 6 | 0 | 0 |

- Molecule 76 is a protein called 40S ribosomal protein S16-A.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---------|-------|
| | | | Total | C | N | O | | |
| 76 | s | 137 | 1080 | 692 | 199 | 189 | 0 | 0 |

- Molecule 77 is a protein called 40S ribosomal protein S17-A.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 77 | t | 121 | 961 | 599 | 182 | 178 | 2 | 0 | 0 |

- Molecule 78 is a protein called 40S ribosomal protein S18-A.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 78 | u | 145 | 1192 | 743 | 237 | 210 | 2 | 0 | 0 |

- Molecule 79 is a protein called 40S ribosomal protein S19-A.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 79 | v | 143 | 1112 | 694 | 208 | 208 | 2 | 0 | 0 |

- Molecule 80 is a protein called 40S ribosomal protein S20.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 80 | w | 100 | 800 | 509 | 144 | 146 | 1 | 0 | 0 |

- Molecule 81 is a protein called 40S ribosomal protein S21-A.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 81 | x | 87 | 684 | 420 | 125 | 137 | 2 | 0 | 0 |

- Molecule 82 is a protein called 40S ribosomal protein S22-A.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 82 | y | 129 | 1021 | 650 | 188 | 180 | 3 | 0 | 0 |

- Molecule 83 is a protein called 40S ribosomal protein S23-A.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| | | | Total | C | N | O | S | | |
| 83 | z | 144 | 1121 | 708 | 220 | 191 | 2 | 0 | 0 |

- Molecule 84 is ZINC ION (three-letter code: ZN) (formula: Zn).

| Mol | Chain | Residues | Atoms | | AltConf |
|-----|-------|----------|------------|---------|---------|
| 84 | 2 | 1 | Total 1 | Zn 1 | 0 |
| 84 | 5 | 1 | Total 1 | Zn 1 | 0 |
| 84 | 8 | 1 | Total 1 | Zn 1 | 0 |
| 84 | S | 1 | Total 1 | Zn 1 | 0 |
| 84 | V | 1 | Total 1 | Zn 1 | 0 |
| 84 | Y | 1 | Total 1 | Zn 1 | 0 |
| 84 | a | 1 | Total 1 | Zn 1 | 0 |
| 84 | b | 1 | Total 1 | Zn 1 | 0 |

- Molecule 85 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

| Mol | Chain | Residues | Atoms | | AltConf |
|-----|-------|----------|--------------|-----------|---------|
| 85 | AA | 157 | Total 157 | Mg 157 | 0 |
| 85 | Aa | 1 | Total 1 | Mg 1 | 0 |
| 85 | B | 1 | Total 1 | Mg 1 | 0 |
| 85 | BB | 3 | Total 3 | Mg 3 | 0 |
| 85 | Bb | 1 | Total 1 | Mg 1 | 0 |
| 85 | CC | 2 | Total 2 | Mg 2 | 0 |
| 85 | D | 1 | Total 1 | Mg 1 | 0 |
| 85 | EE | 1 | Total 1 | Mg 1 | 0 |
| 85 | F | 1 | Total 1 | Mg 1 | 0 |

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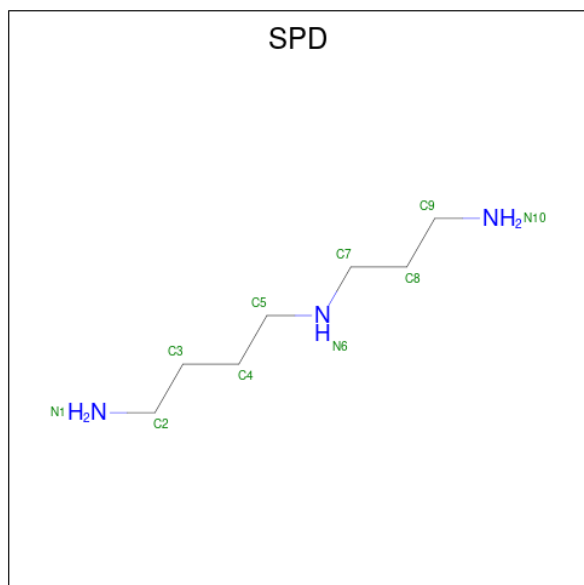
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| Mol | Chain | Residues | Atoms | | AltConf |
|-----|-------|----------|-------------|----------|---------|
| 85 | FF | 1 | Total 1 | Mg 1 | 0 |
| 85 | H | 1 | Total 1 | Mg 1 | 0 |
| 85 | c | 35 | Total 35 | Mg 35 | 0 |

- Molecule 86 is POTASSIUM ION (three-letter code: K) (formula: K).

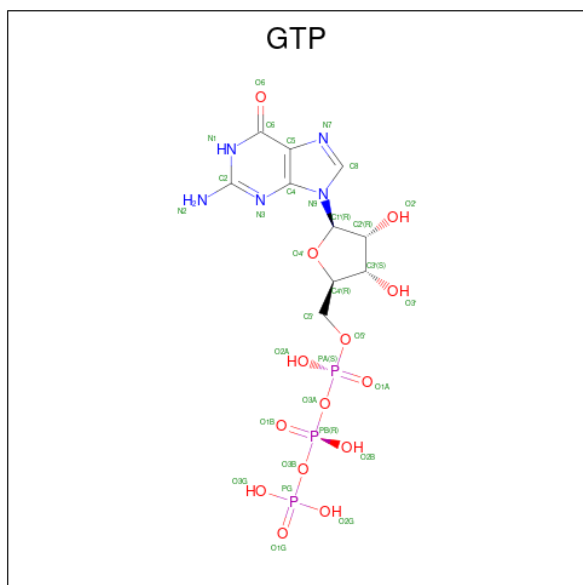
| Mol | Chain | Residues | Atoms | | AltConf |
|-----|-------|----------|-------------|---------|---------|
| 86 | AA | 10 | Total 10 | K 10 | 0 |
| 86 | BB | 1 | Total 1 | K 1 | 0 |
| 86 | Dd | 1 | Total 1 | K 1 | 0 |
| 86 | EE | 1 | Total 1 | K 1 | 0 |
| 86 | MM | 1 | Total 1 | K 1 | 0 |
| 86 | Q | 1 | Total 1 | K 1 | 0 |
| 86 | c | 1 | Total 1 | K 1 | 0 |

- Molecule 87 is SPERMIDINE (three-letter code: SPD) (formula: C₇H₁₉N₃).



| Mol | Chain | Residues | Atoms | AltConf |
|-----|-------|----------|---------------------|---------|
| 87 | AA | 1 | Total C N 10 7 3 | 0 |
| 87 | AA | 1 | Total C N 10 7 3 | 0 |
| 87 | c | 1 | Total C N 10 7 3 | 0 |

- Molecule 88 is GUANOSINE-5'-TRIPHOSPHATE (three-letter code: GTP) (formula: $C_{10}H_{16}N_5O_{14}P_3$).



| Mol | Chain | Residues | Atoms | AltConf |
|-----|-------|----------|-------------------------------|---------|
| 88 | Aa | 1 | Total C N O P 32 10 5 14 3 | 0 |

- Molecule 89 is water.

| Mol | Chain | Residues | Atoms | AltConf |
|-----|-------|----------|--------------------|---------|
| 89 | 2 | 1 | Total O 1 1 | 0 |
| 89 | AA | 258 | Total O 258 258 | 0 |
| 89 | Aa | 1 | Total O 1 1 | 0 |
| 89 | B | 2 | Total O 2 2 | 0 |
| 89 | BB | 4 | Total O 4 4 | 0 |

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| Mol | Chain | Residues | Atoms | | AltConf |
|-----|-------|----------|-------------|---------|---------|
| 89 | CC | 3 | Total 3 | O 3 | 0 |
| 89 | Cc | 1 | Total 1 | O 1 | 0 |
| 89 | F | 4 | Total 4 | O 4 | 0 |
| 89 | FF | 3 | Total 3 | O 3 | 0 |
| 89 | GG | 1 | Total 1 | O 1 | 0 |
| 89 | M | 1 | Total 1 | O 1 | 0 |
| 89 | Q | 2 | Total 2 | O 2 | 0 |
| 89 | QQ | 1 | Total 1 | O 1 | 0 |
| 89 | S | 1 | Total 1 | O 1 | 0 |
| 89 | V | 2 | Total 2 | O 2 | 0 |
| 89 | a | 1 | Total 1 | O 1 | 0 |
| 89 | c | 53 | Total 53 | O 53 | 0 |
| 89 | p | 1 | Total 1 | O 1 | 0 |
| 89 | q | 2 | Total 2 | O 2 | 0 |

3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry. 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. 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.

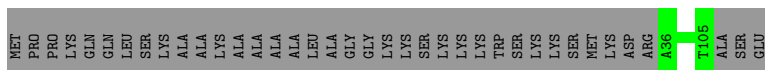
- Molecule 1: 40S ribosomal protein S24-A

Chain 0:  99%




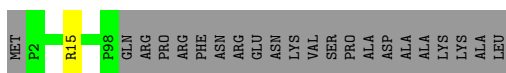
- Molecule 2: 40S ribosomal protein S25-A

Chain 1:  65% 35%



- Molecule 3: 40S ribosomal protein S26

Chain 2:  81% 18%



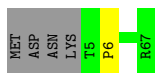
- Molecule 4: 40S ribosomal protein S27-A

Chain 3:  99%



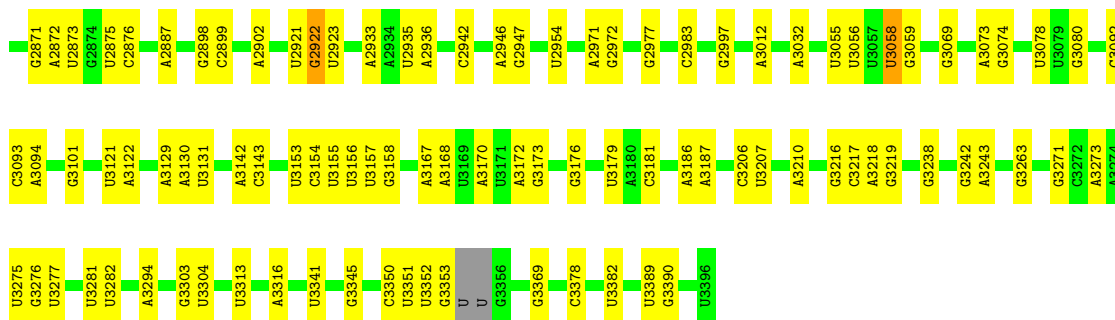
- Molecule 5: 40S ribosomal protein S28-A

Chain 4:  93% 6%



- Molecule 6: HLJ1_G0030400.mRNA.1.CDS.1

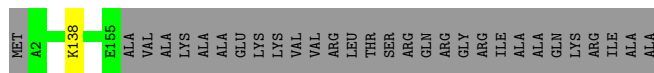
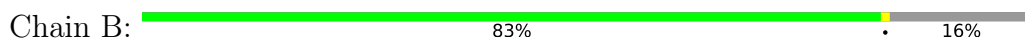
Chain 5:  95% 5%



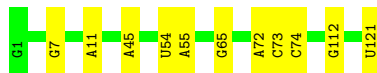
• Molecule 12: Elongation factor 2



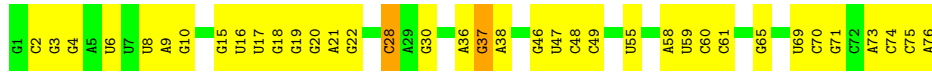
• Molecule 13: 60S ribosomal protein L17-A



• Molecule 14: 5S ribosomal RNA



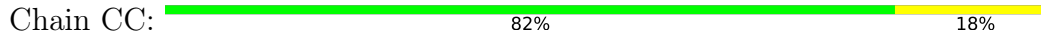
• Molecule 15: Transfer RNA Phe

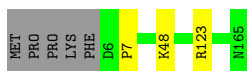


• Molecule 16: 60S ribosomal protein L18-A



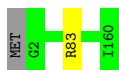
• Molecule 17: 5.8S ribosomal RNA





- Molecule 25: 60S ribosomal protein L21-A

Chain F: 99%



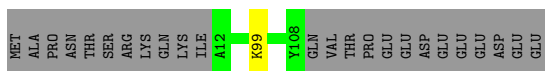
- Molecule 26: 60S ribosomal protein L3

Chain FF: 99%



- Molecule 27: 60S ribosomal protein L22-A

Chain G: 79% 20%



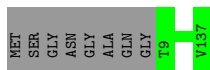
- Molecule 28: 60S ribosomal protein L4-A

Chain GG: 100%



- Molecule 29: 60S ribosomal protein L23-A

Chain H: 94% 6%



- Molecule 30: 60S ribosomal protein L5

Chain HH: 100%



- Molecule 31: 60S ribosomal protein L24-A

Chain I: 39% 59%

Chain LL:  99%



- Molecule 39: 60S ribosomal protein L28

Chain M:  99%



- Molecule 40: 60S ribosomal protein L10

Chain MM:  97%



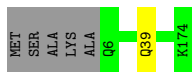
- Molecule 41: 60S ribosomal protein L29

Chain N:  98%




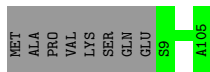
- Molecule 42: 60S ribosomal protein L11-A

Chain NN:  97%



- Molecule 43: 60S ribosomal protein L30

Chain O:  92% 8%



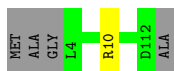
- Molecule 44: 60S ribosomal protein L13-A

Chain OO:  95%



- Molecule 45: 60S ribosomal protein L31-A

Chain P:  96%



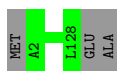
- Molecule 46: 60S ribosomal protein L14-A

Chain PP:  99%



- Molecule 47: 60S ribosomal protein L32

Chain Q:  98%



- Molecule 48: 60S ribosomal protein L15-A

Chain QQ:  99%




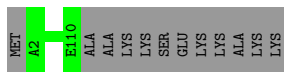
- Molecule 49: 60S ribosomal protein L33-A

Chain R:  99%



- Molecule 50: 60S ribosomal protein L34-A

Chain S:  90%



- Molecule 51: 60S ribosomal protein L35-A

Chain T:  99%



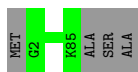
- Molecule 52: 60S ribosomal protein L36-A

Chain U:  99%



- Molecule 53: 60S ribosomal protein L37-A

Chain V:  95%



- Molecule 54: 60S ribosomal protein L38

Chain W:  99%



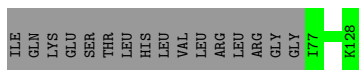
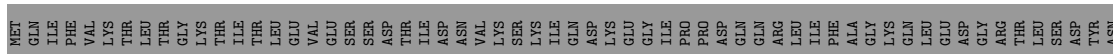
- Molecule 55: 60S ribosomal protein L39

Chain X:  98%



- Molecule 56: Ubiquitin-60S ribosomal protein L40

Chain Y:  41%



- Molecule 57: RPL41A isoform 1

Chain Z:  96%



- Molecule 58: 60S ribosomal protein L42-A

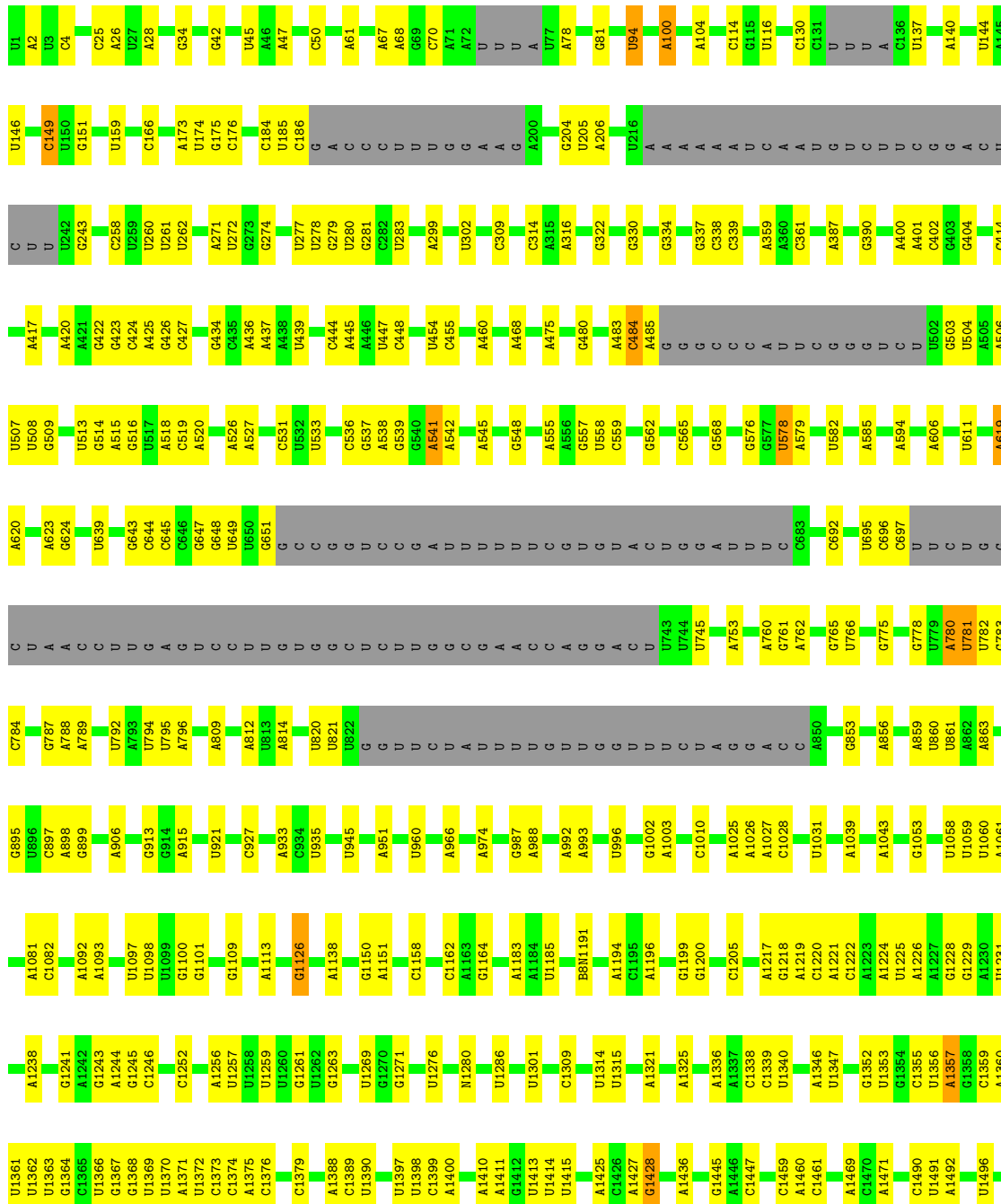
Chain a:  94%

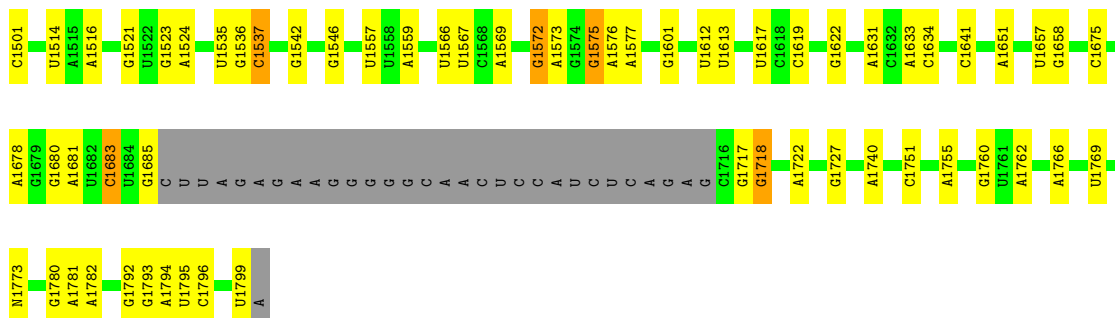


• Molecule 59: 60S ribosomal protein L43-A

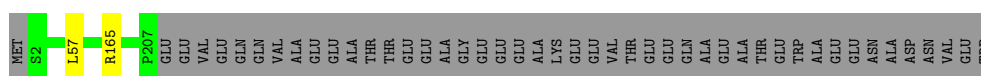
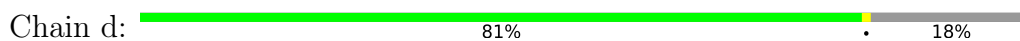


• Molecule 60: 18S ribosomal RNA

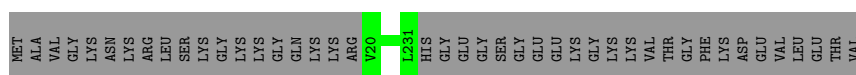
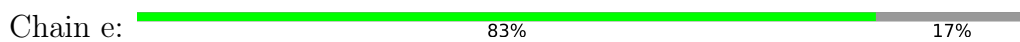




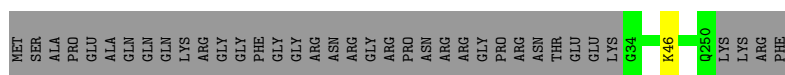
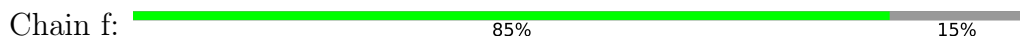
● Molecule 61: 40S ribosomal protein S0-A



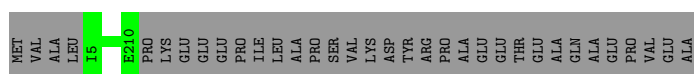
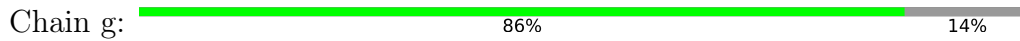
● Molecule 62: 40S ribosomal protein S1-A



● Molecule 63: 40S ribosomal protein S2



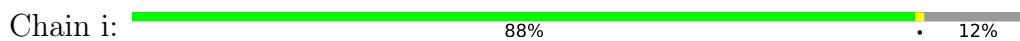
● Molecule 64: RPS3 isoform 1



● Molecule 65: 40S ribosomal protein S4-A



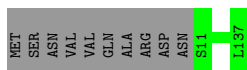
● Molecule 66: 40S ribosomal protein S5





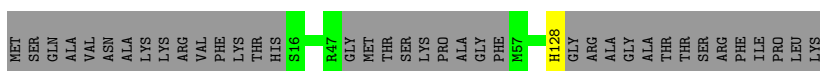
- Molecule 74: 40S ribosomal protein S14-A

Chain q: 93% 7%



- Molecule 75: 40S ribosomal protein S15

Chain r: 73% 27%



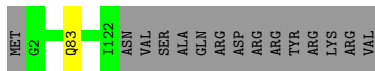
- Molecule 76: 40S ribosomal protein S16-A

Chain s: 94%



- Molecule 77: 40S ribosomal protein S17-A

Chain t: 88% 11%



- Molecule 78: 40S ribosomal protein S18-A

Chain u: 98%



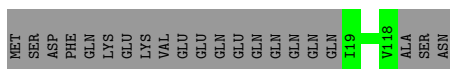
- Molecule 79: 40S ribosomal protein S19-A

Chain v: 99%



- Molecule 80: 40S ribosomal protein S20

Chain w: 83% 17%



- Molecule 81: 40S ribosomal protein S21-A

Chain x: 100%

There are no outlier residues recorded for this chain.

- Molecule 82: 40S ribosomal protein S22-A

Chain y: 99%



- Molecule 83: 40S ribosomal protein S23-A

Chain z: 98%



4 Experimental information

| Property | Value | Source |
|--------------------------------------|-----------------------------------------|-----------|
| EM reconstruction method | SINGLE PARTICLE | Depositor |
| Imposed symmetry | POINT, Not provided | |
| Number of particles used | 22551 | Depositor |
| Resolution determination method | FSC 0.143 CUT-OFF | Depositor |
| CTF correction method | PHASE FLIPPING AND AMPLITUDE CORRECTION | Depositor |
| Microscope | FEI TITAN KRIOS | Depositor |
| Voltage (kV) | 300 | Depositor |
| Electron dose ($e^-/\text{\AA}^2$) | 40 | Depositor |
| Minimum defocus (nm) | 400 | Depositor |
| Maximum defocus (nm) | 1000 | Depositor |
| Magnification | 165000 | Depositor |
| Image detector | FEI FALCON IV (4k x 4k) | Depositor |

5 Model quality i

5.1 Standard geometry i

Bond lengths and bond angles in the following residue types are not validated in this section: GTP, OMU, B8N, DDE, MA6, SPD, G7M, MG, 4AC, 5MC, OMC, UR3, OMG, ZN, 1MA, A2M, K, YYG

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 | 0 | 0.30 | 0/1087 | 0.59 | 1/1449 (0.1%) |
| 2 | 1 | 0.29 | 0/571 | 0.70 | 0/768 |
| 3 | 2 | 0.34 | 0/782 | 0.61 | 0/1047 |
| 4 | 3 | 0.32 | 0/620 | 0.56 | 0/838 |
| 5 | 4 | 0.32 | 0/499 | 0.73 | 1/670 (0.1%) |
| 6 | 5 | 0.32 | 0/452 | 0.62 | 0/600 |
| 7 | 6 | 0.30 | 0/433 | 0.62 | 0/575 |
| 8 | 7 | 0.31 | 0/2489 | 0.61 | 0/3389 |
| 9 | 8 | 0.25 | 0/279 | 0.57 | 0/369 |
| 10 | A | 0.39 | 0/1585 | 0.57 | 0/2128 |
| 11 | AA | 0.55 | 0/75384 | 0.84 | 33/117530 (0.0%) |
| 12 | Aa | 0.29 | 0/6673 | 0.56 | 1/9032 (0.0%) |
| 13 | B | 0.37 | 0/1245 | 0.57 | 0/1676 |
| 14 | BB | 0.48 | 0/2883 | 0.79 | 0/4491 |
| 15 | Bb | 0.34 | 0/1788 | 0.99 | 2/2786 (0.1%) |
| 16 | C | 0.34 | 0/1465 | 0.60 | 0/1965 |
| 17 | CC | 0.55 | 0/3746 | 0.82 | 4/5832 (0.1%) |
| 18 | Cc | 0.48 | 1/1836 (0.1%) | 1.10 | 15/2859 (0.5%) |
| 19 | D | 0.34 | 0/1440 | 0.64 | 0/1921 |
| 20 | DD | 0.27 | 0/1578 | 0.53 | 0/2134 |
| 21 | Dd | 0.38 | 0/311 | 0.70 | 0/482 |
| 22 | E | 0.39 | 0/1481 | 0.63 | 0/1990 |
| 23 | EE | 0.37 | 0/1948 | 0.60 | 0/2617 |
| 24 | Ee | 0.26 | 0/1226 | 0.51 | 0/1650 |
| 25 | F | 0.37 | 0/1300 | 0.59 | 0/1743 |
| 26 | FF | 0.37 | 0/3146 | 0.59 | 0/4228 |
| 27 | G | 0.32 | 0/786 | 0.54 | 0/1065 |
| 28 | GG | 0.34 | 0/2800 | 0.56 | 0/3790 |
| 29 | H | 0.37 | 0/978 | 0.61 | 0/1316 |
| 30 | HH | 0.31 | 0/2425 | 0.54 | 0/3271 |
| 31 | I | 0.40 | 0/533 | 0.61 | 0/707 |

| Mol | Chain | Bond lengths | | Bond angles | |
|-----|-------|--------------|-----------------|-------------|-----------------|
| | | RMSZ | # Z >5 | RMSZ | # Z >5 |
| 32 | II | 0.34 | 0/1251 | 0.55 | 0/1682 |
| 33 | J | 0.37 | 0/974 | 0.59 | 0/1314 |
| 34 | JJ | 0.37 | 0/1821 | 0.52 | 0/2451 |
| 35 | K | 0.32 | 0/1004 | 0.65 | 2/1341 (0.1%) |
| 36 | KK | 0.31 | 0/1836 | 0.51 | 0/2481 |
| 37 | L | 0.35 | 0/1118 | 0.55 | 0/1497 |
| 38 | LL | 0.36 | 0/1539 | 0.60 | 1/2073 (0.0%) |
| 39 | M | 0.34 | 0/1204 | 0.58 | 0/1612 |
| 40 | MM | 0.36 | 0/1779 | 0.58 | 0/2386 |
| 41 | N | 0.30 | 0/473 | 0.58 | 0/629 |
| 42 | NN | 0.32 | 0/1374 | 0.62 | 0/1842 |
| 43 | O | 0.33 | 0/750 | 0.50 | 0/1008 |
| 44 | OO | 0.33 | 0/1568 | 0.60 | 0/2106 |
| 45 | P | 0.35 | 0/897 | 0.61 | 0/1205 |
| 46 | PP | 0.33 | 0/1068 | 0.55 | 0/1438 |
| 47 | Q | 0.35 | 0/1041 | 0.57 | 0/1394 |
| 48 | QQ | 0.37 | 0/1757 | 0.64 | 1/2354 (0.0%) |
| 49 | R | 0.43 | 0/868 | 0.58 | 0/1168 |
| 50 | S | 0.35 | 0/871 | 0.62 | 0/1164 |
| 51 | T | 0.34 | 0/978 | 0.61 | 0/1301 |
| 52 | U | 0.30 | 0/778 | 0.63 | 0/1034 |
| 53 | V | 0.35 | 0/680 | 0.61 | 0/901 |
| 54 | W | 0.33 | 0/618 | 0.62 | 0/826 |
| 55 | X | 0.33 | 0/443 | 0.65 | 0/588 |
| 56 | Y | 0.30 | 0/423 | 0.59 | 0/562 |
| 57 | Z | 0.31 | 0/234 | 0.77 | 0/300 |
| 58 | a | 0.35 | 0/831 | 0.62 | 0/1097 |
| 59 | b | 0.33 | 0/701 | 0.61 | 0/934 |
| 60 | c | 0.87 | 13/37665 (0.0%) | 1.02 | 52/58663 (0.1%) |
| 61 | d | 0.31 | 0/1623 | 0.61 | 1/2222 (0.0%) |
| 62 | e | 0.32 | 0/1714 | 0.59 | 0/2308 |
| 63 | f | 0.35 | 0/1665 | 0.59 | 0/2263 |
| 64 | g | 0.32 | 0/1622 | 0.59 | 0/2180 |
| 65 | h | 0.31 | 0/2097 | 0.60 | 1/2823 (0.0%) |
| 66 | i | 0.31 | 0/1591 | 0.62 | 0/2151 |
| 67 | j | 0.30 | 0/1790 | 0.63 | 0/2393 |
| 68 | k | 0.31 | 0/1506 | 0.61 | 0/2028 |
| 69 | l | 0.33 | 0/1482 | 0.64 | 0/1980 |
| 70 | m | 0.31 | 0/1519 | 0.60 | 0/2035 |
| 71 | n | 0.33 | 0/792 | 0.57 | 0/1071 |
| 72 | o | 0.34 | 0/1172 | 0.57 | 0/1580 |
| 73 | p | 0.34 | 0/1215 | 0.56 | 0/1638 |
| 74 | q | 0.35 | 0/901 | 0.64 | 0/1217 |

| Mol | Chain | Bond lengths | | Bond angles | |
|-----|-------|--------------|------------------|-------------|-------------------|
| | | RMSZ | # Z >5 | RMSZ | # Z >5 |
| 75 | r | 0.35 | 0/853 | 0.63 | 0/1145 |
| 76 | s | 0.33 | 0/1099 | 0.59 | 0/1473 |
| 77 | t | 0.30 | 0/971 | 0.67 | 0/1303 |
| 78 | u | 0.31 | 0/1211 | 0.66 | 1/1628 (0.1%) |
| 79 | v | 0.30 | 0/1130 | 0.60 | 0/1517 |
| 80 | w | 0.33 | 0/810 | 0.61 | 0/1095 |
| 81 | x | 0.36 | 0/693 | 0.63 | 0/935 |
| 82 | y | 0.35 | 0/1038 | 0.59 | 0/1395 |
| 83 | z | 0.31 | 0/1139 | 0.61 | 0/1518 |
| All | All | 0.54 | 14/219946 (0.0%) | 0.79 | 116/322167 (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 |
|-----|-------|---------------------|---------------------|
| 24 | Ee | 0 | 1 |
| 34 | JJ | 0 | 1 |
| 37 | L | 0 | 1 |
| 66 | i | 0 | 2 |
| 73 | p | 0 | 1 |
| 76 | s | 0 | 1 |
| 77 | t | 0 | 1 |
| 78 | u | 0 | 1 |
| 83 | z | 0 | 1 |
| All | All | 0 | 10 |

The worst 5 of 14 bond length outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed(Å) | Ideal(Å) |
|-----|-------|-----|------|-------|-------|-------------|----------|
| 60 | c | 507 | U | C2-N3 | 68.36 | 1.85 | 1.37 |
| 60 | c | 507 | U | N3-C4 | 52.05 | 1.85 | 1.38 |
| 60 | c | 507 | U | N1-C2 | 50.72 | 1.84 | 1.38 |
| 60 | c | 483 | A | N9-C4 | 50.13 | 1.68 | 1.37 |
| 60 | c | 507 | U | C4-C5 | 48.31 | 1.87 | 1.43 |

The worst 5 of 116 bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed(°) | Ideal(°) |
|-----|-------|-----|------|----------|--------|-------------|----------|
| 60 | c | 483 | A | C8-N9-C4 | -95.54 | 67.58 | 105.80 |
| 60 | c | 483 | A | N7-C8-N9 | 68.57 | 148.09 | 113.80 |

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| Mol | Chain | Res | Type | Atoms | Z | Observed(°) | Ideal(°) |
|-----|-------|-----|------|----------|--------|-------------|----------|
| 60 | c | 483 | A | N9-C4-C5 | 42.22 | 122.69 | 105.80 |
| 60 | c | 483 | A | N3-C4-C5 | -26.12 | 108.51 | 126.80 |
| 60 | c | 483 | A | C2-N3-C4 | 24.13 | 122.67 | 110.60 |

There are no chirality outliers.

5 of 10 planarity outliers are listed below:

| Mol | Chain | Res | Type | Group |
|-----|-------|-----|------|---------|
| 24 | Ee | 7 | PRO | Peptide |
| 34 | JJ | 232 | ARG | Peptide |
| 37 | L | 102 | GLU | Peptide |
| 66 | i | 220 | VAL | Peptide |
| 66 | i | 65 | ARG | Peptide |

5.2 Too-close contacts [i](#)

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

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

| Mol | Chain | Analysed | Favoured | Allowed | Outliers | Percentiles | |
|-----|-------|---------------|-----------|---------|----------|-------------|-----|
| 1 | 0 | 132/135 (98%) | 130 (98%) | 2 (2%) | 0 | 100 | 100 |
| 2 | 1 | 68/108 (63%) | 65 (96%) | 3 (4%) | 0 | 100 | 100 |
| 3 | 2 | 95/119 (80%) | 90 (95%) | 5 (5%) | 0 | 100 | 100 |
| 4 | 3 | 79/82 (96%) | 74 (94%) | 5 (6%) | 0 | 100 | 100 |
| 5 | 4 | 61/67 (91%) | 60 (98%) | 1 (2%) | 0 | 100 | 100 |
| 6 | 5 | 51/56 (91%) | 51 (100%) | 0 | 0 | 100 | 100 |
| 7 | 6 | 51/63 (81%) | 48 (94%) | 3 (6%) | 0 | 100 | 100 |
| 8 | 7 | 316/319 (99%) | 301 (95%) | 15 (5%) | 0 | 100 | 100 |

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| Mol | Chain | Analysed | Favoured | Allowed | Outliers | Percentiles | |
|-----|-------|----------------|------------|---------|----------|-------------|-----|
| 9 | 8 | 32/152 (21%) | 26 (81%) | 6 (19%) | 0 | 100 | 100 |
| 10 | A | 195/199 (98%) | 193 (99%) | 2 (1%) | 0 | 100 | 100 |
| 12 | Aa | 839/842 (100%) | 808 (96%) | 31 (4%) | 0 | 100 | 100 |
| 13 | B | 152/184 (83%) | 150 (99%) | 2 (1%) | 0 | 100 | 100 |
| 16 | C | 183/186 (98%) | 182 (100%) | 1 (0%) | 0 | 100 | 100 |
| 19 | D | 174/189 (92%) | 170 (98%) | 4 (2%) | 0 | 100 | 100 |
| 20 | DD | 198/312 (64%) | 193 (98%) | 5 (2%) | 0 | 100 | 100 |
| 22 | E | 170/172 (99%) | 163 (96%) | 7 (4%) | 0 | 100 | 100 |
| 23 | EE | 250/254 (98%) | 246 (98%) | 4 (2%) | 0 | 100 | 100 |
| 24 | Ee | 158/165 (96%) | 155 (98%) | 3 (2%) | 0 | 100 | 100 |
| 25 | F | 157/160 (98%) | 153 (98%) | 4 (2%) | 0 | 100 | 100 |
| 26 | FF | 384/387 (99%) | 375 (98%) | 9 (2%) | 0 | 100 | 100 |
| 27 | G | 95/121 (78%) | 95 (100%) | 0 | 0 | 100 | 100 |
| 28 | GG | 359/362 (99%) | 350 (98%) | 9 (2%) | 0 | 100 | 100 |
| 29 | H | 127/137 (93%) | 126 (99%) | 1 (1%) | 0 | 100 | 100 |
| 30 | HH | 294/297 (99%) | 288 (98%) | 6 (2%) | 0 | 100 | 100 |
| 31 | I | 61/155 (39%) | 61 (100%) | 0 | 0 | 100 | 100 |
| 32 | II | 151/176 (86%) | 149 (99%) | 2 (1%) | 0 | 100 | 100 |
| 33 | J | 118/142 (83%) | 115 (98%) | 3 (2%) | 0 | 100 | 100 |
| 34 | JJ | 220/244 (90%) | 219 (100%) | 1 (0%) | 0 | 100 | 100 |
| 35 | K | 124/127 (98%) | 121 (98%) | 3 (2%) | 0 | 100 | 100 |
| 36 | KK | 231/256 (90%) | 226 (98%) | 5 (2%) | 0 | 100 | 100 |
| 37 | L | 133/136 (98%) | 128 (96%) | 4 (3%) | 1 (1%) | 19 | 53 |
| 38 | LL | 189/191 (99%) | 181 (96%) | 8 (4%) | 0 | 100 | 100 |
| 39 | M | 146/149 (98%) | 142 (97%) | 4 (3%) | 0 | 100 | 100 |
| 40 | MM | 213/221 (96%) | 206 (97%) | 7 (3%) | 0 | 100 | 100 |
| 41 | N | 56/59 (95%) | 53 (95%) | 3 (5%) | 0 | 100 | 100 |
| 42 | NN | 167/174 (96%) | 160 (96%) | 7 (4%) | 0 | 100 | 100 |
| 43 | O | 95/105 (90%) | 95 (100%) | 0 | 0 | 100 | 100 |
| 44 | OO | 191/199 (96%) | 178 (93%) | 12 (6%) | 1 (0%) | 29 | 63 |
| 45 | P | 107/113 (95%) | 103 (96%) | 4 (4%) | 0 | 100 | 100 |

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| Mol | Chain | Analysed | Favoured | Allowed | Outliers | Percentiles | |
|-----|-------|---------------|------------|---------|----------|-------------|-----|
| 46 | PP | 134/138 (97%) | 133 (99%) | 1 (1%) | 0 | 100 | 100 |
| 47 | Q | 125/130 (96%) | 125 (100%) | 0 | 0 | 100 | 100 |
| 48 | QQ | 201/204 (98%) | 194 (96%) | 7 (4%) | 0 | 100 | 100 |
| 49 | R | 104/107 (97%) | 103 (99%) | 1 (1%) | 0 | 100 | 100 |
| 50 | S | 107/121 (88%) | 107 (100%) | 0 | 0 | 100 | 100 |
| 51 | T | 117/120 (98%) | 115 (98%) | 2 (2%) | 0 | 100 | 100 |
| 52 | U | 97/100 (97%) | 89 (92%) | 8 (8%) | 0 | 100 | 100 |
| 53 | V | 82/88 (93%) | 81 (99%) | 1 (1%) | 0 | 100 | 100 |
| 54 | W | 75/78 (96%) | 70 (93%) | 5 (7%) | 0 | 100 | 100 |
| 55 | X | 48/51 (94%) | 44 (92%) | 4 (8%) | 0 | 100 | 100 |
| 56 | Y | 50/128 (39%) | 50 (100%) | 0 | 0 | 100 | 100 |
| 57 | Z | 23/25 (92%) | 23 (100%) | 0 | 0 | 100 | 100 |
| 58 | a | 100/106 (94%) | 95 (95%) | 5 (5%) | 0 | 100 | 100 |
| 59 | b | 89/92 (97%) | 87 (98%) | 2 (2%) | 0 | 100 | 100 |
| 61 | d | 204/252 (81%) | 193 (95%) | 11 (5%) | 0 | 100 | 100 |
| 62 | e | 210/255 (82%) | 200 (95%) | 10 (5%) | 0 | 100 | 100 |
| 63 | f | 215/254 (85%) | 205 (95%) | 10 (5%) | 0 | 100 | 100 |
| 64 | g | 204/240 (85%) | 198 (97%) | 6 (3%) | 0 | 100 | 100 |
| 65 | h | 256/261 (98%) | 248 (97%) | 8 (3%) | 0 | 100 | 100 |
| 66 | i | 195/225 (87%) | 182 (93%) | 13 (7%) | 0 | 100 | 100 |
| 67 | j | 217/236 (92%) | 209 (96%) | 8 (4%) | 0 | 100 | 100 |
| 68 | k | 182/190 (96%) | 175 (96%) | 7 (4%) | 0 | 100 | 100 |
| 69 | l | 180/200 (90%) | 170 (94%) | 10 (6%) | 0 | 100 | 100 |
| 70 | m | 183/197 (93%) | 177 (97%) | 6 (3%) | 0 | 100 | 100 |
| 71 | n | 89/105 (85%) | 84 (94%) | 3 (3%) | 2 (2%) | 6 | 28 |
| 72 | o | 140/156 (90%) | 134 (96%) | 6 (4%) | 0 | 100 | 100 |
| 73 | p | 148/151 (98%) | 145 (98%) | 3 (2%) | 0 | 100 | 100 |
| 74 | q | 125/137 (91%) | 120 (96%) | 5 (4%) | 0 | 100 | 100 |
| 75 | r | 100/142 (70%) | 96 (96%) | 4 (4%) | 0 | 100 | 100 |
| 76 | s | 135/143 (94%) | 129 (96%) | 6 (4%) | 0 | 100 | 100 |
| 77 | t | 119/136 (88%) | 108 (91%) | 11 (9%) | 0 | 100 | 100 |

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| Mol | Chain | Analysed | Favoured | Allowed | Outliers | Percentiles | |
|-----|-------|-------------------|-------------|----------|----------|-------------|-----|
| 78 | u | 143/146 (98%) | 134 (94%) | 9 (6%) | 0 | 100 | 100 |
| 79 | v | 141/144 (98%) | 138 (98%) | 3 (2%) | 0 | 100 | 100 |
| 80 | w | 98/121 (81%) | 98 (100%) | 0 | 0 | 100 | 100 |
| 81 | x | 85/87 (98%) | 82 (96%) | 3 (4%) | 0 | 100 | 100 |
| 82 | y | 127/130 (98%) | 125 (98%) | 2 (2%) | 0 | 100 | 100 |
| 83 | z | 142/145 (98%) | 131 (92%) | 11 (8%) | 0 | 100 | 100 |
| All | All | 11812/13056 (90%) | 11426 (97%) | 382 (3%) | 4 (0%) | 100 | 100 |

All (4) Ramachandran outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 71 | n | 49 | LEU |
| 71 | n | 48 | SER |
| 37 | L | 102 | GLU |
| 44 | OO | 63 | VAL |

5.3.2 Protein sidechains [i](#)

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

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

| Mol | Chain | Analysed | Rotameric | Outliers | Percentiles | |
|-----|-------|---------------|------------|----------|-------------|-----|
| 1 | 0 | 112/113 (99%) | 112 (100%) | 0 | 100 | 100 |
| 2 | 1 | 61/89 (68%) | 61 (100%) | 0 | 100 | 100 |
| 3 | 2 | 83/101 (82%) | 82 (99%) | 1 (1%) | 71 | 87 |
| 4 | 3 | 70/71 (99%) | 70 (100%) | 0 | 100 | 100 |
| 5 | 4 | 56/60 (93%) | 56 (100%) | 0 | 100 | 100 |
| 6 | 5 | 47/49 (96%) | 47 (100%) | 0 | 100 | 100 |
| 7 | 6 | 46/54 (85%) | 45 (98%) | 1 (2%) | 52 | 77 |
| 8 | 7 | 259/262 (99%) | 259 (100%) | 0 | 100 | 100 |
| 9 | 8 | 30/135 (22%) | 28 (93%) | 2 (7%) | 16 | 45 |
| 10 | A | 160/162 (99%) | 159 (99%) | 1 (1%) | 86 | 93 |

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| Mol | Chain | Analysed | Rotameric | Outliers | Percentiles | |
|-----|-------|----------------|------------|----------|-------------|-----|
| 12 | Aa | 714/714 (100%) | 711 (100%) | 3 (0%) | 91 | 96 |
| 13 | B | 125/146 (86%) | 124 (99%) | 1 (1%) | 81 | 92 |
| 16 | C | 150/151 (99%) | 150 (100%) | 0 | 100 | 100 |
| 19 | D | 143/154 (93%) | 142 (99%) | 1 (1%) | 84 | 93 |
| 20 | DD | 169/254 (66%) | 167 (99%) | 2 (1%) | 71 | 87 |
| 22 | E | 156/156 (100%) | 156 (100%) | 0 | 100 | 100 |
| 23 | EE | 193/196 (98%) | 193 (100%) | 0 | 100 | 100 |
| 24 | Ee | 131/136 (96%) | 129 (98%) | 2 (2%) | 65 | 85 |
| 25 | F | 136/137 (99%) | 135 (99%) | 1 (1%) | 84 | 93 |
| 26 | FF | 318/323 (98%) | 315 (99%) | 3 (1%) | 78 | 91 |
| 27 | G | 84/107 (78%) | 83 (99%) | 1 (1%) | 71 | 87 |
| 28 | GG | 288/289 (100%) | 288 (100%) | 0 | 100 | 100 |
| 29 | H | 101/105 (96%) | 101 (100%) | 0 | 100 | 100 |
| 30 | HH | 244/245 (100%) | 244 (100%) | 0 | 100 | 100 |
| 31 | I | 55/129 (43%) | 53 (96%) | 2 (4%) | 35 | 66 |
| 32 | II | 133/153 (87%) | 133 (100%) | 0 | 100 | 100 |
| 33 | J | 104/118 (88%) | 104 (100%) | 0 | 100 | 100 |
| 34 | JJ | 186/205 (91%) | 186 (100%) | 0 | 100 | 100 |
| 35 | K | 109/110 (99%) | 108 (99%) | 1 (1%) | 78 | 91 |
| 36 | KK | 187/208 (90%) | 187 (100%) | 0 | 100 | 100 |
| 37 | L | 115/116 (99%) | 114 (99%) | 1 (1%) | 78 | 91 |
| 38 | LL | 171/171 (100%) | 170 (99%) | 1 (1%) | 86 | 93 |
| 39 | M | 118/119 (99%) | 118 (100%) | 0 | 100 | 100 |
| 40 | MM | 184/187 (98%) | 183 (100%) | 1 (0%) | 88 | 94 |
| 41 | N | 46/47 (98%) | 46 (100%) | 0 | 100 | 100 |
| 42 | NN | 147/150 (98%) | 146 (99%) | 1 (1%) | 84 | 93 |
| 43 | O | 81/88 (92%) | 81 (100%) | 0 | 100 | 100 |
| 44 | OO | 154/159 (97%) | 152 (99%) | 2 (1%) | 69 | 86 |
| 45 | P | 94/97 (97%) | 93 (99%) | 1 (1%) | 73 | 88 |
| 46 | PP | 107/109 (98%) | 107 (100%) | 0 | 100 | 100 |
| 47 | Q | 109/111 (98%) | 109 (100%) | 0 | 100 | 100 |

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| Mol | Chain | Analysed | Rotameric | Outliers | Percentiles | |
|-----|-------|---------------|------------|----------|-------------|-----|
| 48 | QQ | 175/176 (99%) | 175 (100%) | 0 | 100 | 100 |
| 49 | R | 90/91 (99%) | 90 (100%) | 0 | 100 | 100 |
| 50 | S | 94/103 (91%) | 94 (100%) | 0 | 100 | 100 |
| 51 | T | 104/105 (99%) | 104 (100%) | 0 | 100 | 100 |
| 52 | U | 81/82 (99%) | 81 (100%) | 0 | 100 | 100 |
| 53 | V | 69/71 (97%) | 69 (100%) | 0 | 100 | 100 |
| 54 | W | 68/69 (99%) | 68 (100%) | 0 | 100 | 100 |
| 55 | X | 45/46 (98%) | 45 (100%) | 0 | 100 | 100 |
| 56 | Y | 47/116 (40%) | 47 (100%) | 0 | 100 | 100 |
| 57 | Z | 23/23 (100%) | 22 (96%) | 1 (4%) | 29 | 61 |
| 58 | a | 87/91 (96%) | 85 (98%) | 2 (2%) | 50 | 76 |
| 59 | b | 71/72 (99%) | 71 (100%) | 0 | 100 | 100 |
| 61 | d | 165/210 (79%) | 164 (99%) | 1 (1%) | 86 | 93 |
| 62 | e | 189/224 (84%) | 189 (100%) | 0 | 100 | 100 |
| 63 | f | 176/205 (86%) | 175 (99%) | 1 (1%) | 86 | 93 |
| 64 | g | 167/195 (86%) | 167 (100%) | 0 | 100 | 100 |
| 65 | h | 220/222 (99%) | 219 (100%) | 1 (0%) | 88 | 94 |
| 66 | i | 172/191 (90%) | 172 (100%) | 0 | 100 | 100 |
| 67 | j | 188/201 (94%) | 187 (100%) | 1 (0%) | 88 | 94 |
| 68 | k | 165/170 (97%) | 165 (100%) | 0 | 100 | 100 |
| 69 | l | 146/161 (91%) | 145 (99%) | 1 (1%) | 84 | 93 |
| 70 | m | 158/166 (95%) | 158 (100%) | 0 | 100 | 100 |
| 71 | n | 84/98 (86%) | 84 (100%) | 0 | 100 | 100 |
| 72 | o | 127/137 (93%) | 125 (98%) | 2 (2%) | 62 | 84 |
| 73 | p | 127/128 (99%) | 126 (99%) | 1 (1%) | 81 | 92 |
| 74 | q | 81/105 (77%) | 81 (100%) | 0 | 100 | 100 |
| 75 | r | 89/118 (75%) | 88 (99%) | 1 (1%) | 73 | 88 |
| 76 | s | 114/119 (96%) | 113 (99%) | 1 (1%) | 78 | 91 |
| 77 | t | 105/124 (85%) | 105 (100%) | 0 | 100 | 100 |
| 78 | u | 128/129 (99%) | 128 (100%) | 0 | 100 | 100 |
| 79 | v | 115/116 (99%) | 115 (100%) | 0 | 100 | 100 |

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| Mol | Chain | Analysed | Rotameric | Outliers | Percentiles | |
|-----|-------|-------------------|--------------|----------|-------------|-----|
| 80 | w | 94/114 (82%) | 94 (100%) | 0 | 100 | 100 |
| 81 | x | 74/74 (100%) | 74 (100%) | 0 | 100 | 100 |
| 82 | y | 110/111 (99%) | 110 (100%) | 0 | 100 | 100 |
| 83 | z | 119/120 (99%) | 118 (99%) | 1 (1%) | 81 | 92 |
| All | All | 10043/10969 (92%) | 10000 (100%) | 43 (0%) | 91 | 96 |

5 of 43 residues with a non-rotameric sidechain are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 45 | P | 10 | ARG |
| 67 | j | 31 | ARG |
| 57 | Z | 15 | ARG |
| 61 | d | 165 | ARG |
| 72 | o | 11 | ARG |

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 49 such sidechains are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 58 | a | 82 | GLN |
| 66 | i | 63 | GLN |
| 61 | d | 30 | GLN |
| 64 | g | 92 | GLN |
| 68 | k | 19 | GLN |

5.3.3 RNA [i](#)

| Mol | Chain | Analysed | Backbone Outliers | Pucker Outliers |
|-----|-------|-----------------|-------------------|-----------------|
| 11 | AA | 3185/3396 (93%) | 591 (18%) | 17 (0%) |
| 14 | BB | 120/121 (99%) | 10 (8%) | 1 (0%) |
| 15 | Bb | 75/76 (98%) | 36 (48%) | 0 |
| 17 | CC | 157/158 (99%) | 25 (15%) | 0 |
| 18 | Cc | 76/77 (98%) | 21 (27%) | 0 |
| 21 | Dd | 12/39 (30%) | 3 (25%) | 0 |
| 60 | c | 1589/1800 (88%) | 374 (23%) | 0 |
| All | All | 5214/5667 (92%) | 1060 (20%) | 18 (0%) |

5 of 1060 RNA backbone outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 11 | AA | 4 | U |
| 11 | AA | 26 | A |
| 11 | AA | 40 | A |
| 11 | AA | 43 | A |
| 11 | AA | 49 | A |

5 of 18 RNA pucker outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|------|------|
| 11 | AA | 2792 | A |
| 14 | BB | 72 | A |
| 11 | AA | 3206 | C |
| 11 | AA | 1904 | C |
| 11 | AA | 2500 | A |

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

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

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

| Mol | Type | Chain | Res | Link | Bond lengths | | | Bond angles | | |
|-----|------|-------|------|-------|--------------|------|-------------|-------------|------|-------------|
| | | | | | Counts | RMSZ | # $ Z > 2$ | Counts | RMSZ | # $ Z > 2$ |
| 11 | OMG | AA | 1450 | 11 | 18,26,27 | 1.16 | 2 (11%) | 19,38,41 | 0.84 | 1 (5%) |
| 60 | G7M | c | 1575 | 60 | 20,26,27 | 2.34 | 7 (35%) | 17,39,42 | 1.15 | 1 (5%) |
| 60 | OMU | c | 578 | 60 | 19,22,23 | 3.01 | 8 (42%) | 26,31,34 | 1.66 | 5 (19%) |
| 60 | B8N | c | 1191 | 60 | 24,29,30 | 5.04 | 9 (37%) | 29,42,45 | 2.08 | 8 (27%) |
| 11 | OMC | AA | 650 | 85,11 | 19,22,23 | 0.62 | 0 | 26,31,34 | 0.71 | 0 |
| 11 | OMG | AA | 2288 | 11 | 18,26,27 | 1.20 | 2 (11%) | 19,38,41 | 0.84 | 1 (5%) |
| 60 | OMU | c | 1269 | 60 | 19,22,23 | 3.02 | 8 (42%) | 26,31,34 | 1.71 | 5 (19%) |
| 11 | OMC | AA | 2337 | 11 | 19,22,23 | 0.62 | 0 | 26,31,34 | 0.60 | 0 |
| 11 | A2M | AA | 649 | 11 | 18,25,26 | 3.62 | 8 (44%) | 18,36,39 | 3.40 | 4 (22%) |
| 60 | OMC | c | 414 | 60 | 19,22,23 | 0.56 | 0 | 26,31,34 | 0.68 | 0 |
| 11 | 1MA | AA | 2142 | 85,11 | 16,25,26 | 1.02 | 2 (12%) | 18,37,40 | 1.09 | 1 (5%) |
| 11 | OMU | AA | 2921 | 11 | 19,22,23 | 2.89 | 8 (42%) | 26,31,34 | 1.78 | 5 (19%) |

| Mol | Type | Chain | Res | Link | Bond lengths | | | Bond angles | | |
|-----|------|-------|------|-------|--------------|------|----------|-------------|------|----------|
| | | | | | Counts | RMSZ | # Z > 2 | Counts | RMSZ | # Z > 2 |
| 60 | A2M | c | 796 | 60 | 18,25,26 | 3.62 | 8 (44%) | 18,36,39 | 3.32 | 3 (16%) |
| 11 | OMG | AA | 805 | 11 | 18,26,27 | 1.20 | 3 (16%) | 19,38,41 | 0.85 | 1 (5%) |
| 11 | UR3 | AA | 2634 | 11 | 19,22,23 | 2.74 | 7 (36%) | 26,32,35 | 1.34 | 2 (7%) |
| 11 | OMC | AA | 2197 | 86,11 | 19,22,23 | 0.57 | 0 | 26,31,34 | 0.61 | 0 |
| 11 | A2M | AA | 2946 | 85,11 | 18,25,26 | 3.59 | 7 (38%) | 18,36,39 | 3.38 | 3 (16%) |
| 11 | OMC | AA | 2948 | 11 | 19,22,23 | 0.60 | 0 | 26,31,34 | 0.67 | 0 |
| 11 | 5MC | AA | 2278 | 57,11 | 18,22,23 | 0.62 | 0 | 26,32,35 | 0.71 | 0 |
| 11 | OMG | AA | 867 | 86,11 | 18,26,27 | 1.19 | 2 (11%) | 19,38,41 | 0.82 | 1 (5%) |
| 11 | A2M | AA | 2280 | 11 | 18,25,26 | 3.67 | 9 (50%) | 18,36,39 | 3.44 | 4 (22%) |
| 11 | OMC | AA | 2959 | 11 | 19,22,23 | 0.63 | 0 | 26,31,34 | 0.64 | 0 |
| 11 | A2M | AA | 876 | 11 | 18,25,26 | 3.64 | 8 (44%) | 18,36,39 | 3.37 | 4 (22%) |
| 60 | A2M | c | 420 | 60 | 18,25,26 | 3.60 | 8 (44%) | 18,36,39 | 3.39 | 4 (22%) |
| 11 | OMC | AA | 663 | 11 | 19,22,23 | 0.65 | 0 | 26,31,34 | 0.62 | 0 |
| 11 | A2M | AA | 817 | 85,11 | 18,25,26 | 3.71 | 7 (38%) | 18,36,39 | 3.58 | 4 (22%) |
| 11 | OMU | AA | 2729 | 11 | 19,22,23 | 3.01 | 8 (42%) | 26,31,34 | 1.65 | 4 (15%) |
| 60 | OMG | c | 1126 | 60 | 18,26,27 | 1.25 | 2 (11%) | 19,38,41 | 0.82 | 1 (5%) |
| 60 | MA6 | c | 1782 | 60 | 18,26,27 | 1.11 | 2 (11%) | 19,38,41 | 3.51 | 2 (10%) |
| 11 | A2M | AA | 1133 | 11 | 18,25,26 | 3.64 | 8 (44%) | 18,36,39 | 3.45 | 3 (16%) |
| 11 | OMC | AA | 1437 | 11 | 19,22,23 | 0.67 | 0 | 26,31,34 | 1.31 | 2 (7%) |
| 11 | A2M | AA | 2640 | 11 | 18,25,26 | 3.67 | 8 (44%) | 18,36,39 | 3.29 | 4 (22%) |
| 60 | 4AC | c | 1280 | 60 | 21,24,25 | 3.53 | 10 (47%) | 29,34,37 | 1.68 | 6 (20%) |
| 11 | OMU | AA | 2347 | 11 | 19,22,23 | 2.93 | 8 (42%) | 26,31,34 | 1.72 | 5 (19%) |
| 11 | OMG | AA | 2791 | 11 | 18,26,27 | 1.15 | 2 (11%) | 19,38,41 | 0.86 | 1 (5%) |
| 60 | OMG | c | 1271 | 60 | 18,26,27 | 1.12 | 2 (11%) | 19,38,41 | 0.89 | 1 (5%) |
| 11 | A2M | AA | 2256 | 11 | 18,25,26 | 3.59 | 8 (44%) | 18,36,39 | 3.44 | 5 (27%) |
| 60 | OMG | c | 1428 | 60,85 | 18,26,27 | 1.18 | 2 (11%) | 19,38,41 | 0.85 | 1 (5%) |
| 11 | OMU | AA | 898 | 11 | 19,22,23 | 2.91 | 8 (42%) | 26,31,34 | 1.80 | 5 (19%) |
| 11 | OMG | AA | 2815 | 11 | 18,26,27 | 1.18 | 2 (11%) | 19,38,41 | 0.87 | 2 (10%) |
| 60 | A2M | c | 436 | 60 | 18,25,26 | 3.72 | 8 (44%) | 18,36,39 | 3.49 | 4 (22%) |
| 11 | OMU | AA | 2724 | 11 | 19,22,23 | 2.92 | 8 (42%) | 26,31,34 | 1.77 | 5 (19%) |
| 11 | OMG | AA | 2793 | 11 | 18,26,27 | 1.18 | 2 (11%) | 19,38,41 | 0.84 | 1 (5%) |
| 11 | A2M | AA | 1449 | 85,11 | 18,25,26 | 3.63 | 9 (50%) | 18,36,39 | 3.38 | 4 (22%) |
| 11 | 5MC | AA | 2870 | 86,11 | 18,22,23 | 0.71 | 0 | 26,32,35 | 0.65 | 0 |
| 11 | A2M | AA | 2281 | 11 | 18,25,26 | 3.72 | 8 (44%) | 18,36,39 | 3.44 | 4 (22%) |
| 11 | OMG | AA | 908 | 11 | 18,26,27 | 1.20 | 2 (11%) | 19,38,41 | 0.82 | 1 (5%) |
| 11 | OMU | AA | 2417 | 11 | 19,22,23 | 3.00 | 8 (42%) | 26,31,34 | 1.75 | 5 (19%) |

| Mol | Type | Chain | Res | Link | Bond lengths | | | Bond angles | | |
|-----|------|-------|------|-------|--------------|------|----------|-------------|------|----------|
| | | | | | Counts | RMSZ | # Z > 2 | Counts | RMSZ | # Z > 2 |
| 12 | DDE | Aa | 699 | 12 | 14,20,21 | 0.97 | 1 (7%) | 14,28,30 | 1.25 | 2 (14%) |
| 60 | A2M | c | 28 | 60 | 18,25,26 | 3.65 | 8 (44%) | 18,36,39 | 3.39 | 4 (22%) |
| 60 | A2M | c | 541 | 60 | 18,25,26 | 3.56 | 8 (44%) | 18,36,39 | 3.44 | 5 (27%) |
| 11 | OMG | AA | 2922 | 11 | 18,26,27 | 1.21 | 2 (11%) | 19,38,41 | 0.92 | 1 (5%) |
| 60 | OMG | c | 1572 | 60 | 18,26,27 | 1.15 | 2 (11%) | 19,38,41 | 0.89 | 1 (5%) |
| 60 | A2M | c | 100 | 60 | 18,25,26 | 3.62 | 7 (38%) | 18,36,39 | 3.35 | 3 (16%) |
| 60 | OMC | c | 1639 | 60,85 | 19,22,23 | 0.60 | 0 | 26,31,34 | 0.56 | 0 |
| 60 | MA6 | c | 1781 | 60 | 18,26,27 | 1.06 | 2 (11%) | 19,38,41 | 3.56 | 2 (10%) |
| 60 | OMC | c | 1007 | 60 | 19,22,23 | 0.62 | 0 | 26,31,34 | 0.64 | 0 |
| 60 | A2M | c | 974 | 60 | 18,25,26 | 3.65 | 7 (38%) | 18,36,39 | 3.34 | 3 (16%) |
| 11 | A2M | AA | 807 | 11 | 18,25,26 | 3.66 | 9 (50%) | 18,36,39 | 3.40 | 4 (22%) |
| 11 | OMU | AA | 1888 | 11 | 19,22,23 | 2.96 | 8 (42%) | 26,31,34 | 1.81 | 5 (19%) |
| 60 | OMG | c | 562 | 60 | 18,26,27 | 1.18 | 2 (11%) | 19,38,41 | 0.79 | 1 (5%) |
| 11 | A2M | AA | 2220 | 11 | 18,25,26 | 3.64 | 8 (44%) | 18,36,39 | 3.23 | 4 (22%) |
| 11 | OMU | AA | 2421 | 11 | 19,22,23 | 2.97 | 8 (42%) | 26,31,34 | 1.77 | 5 (19%) |
| 11 | 1MA | AA | 645 | 85,11 | 16,25,26 | 0.98 | 2 (12%) | 18,37,40 | 1.11 | 2 (11%) |
| 11 | OMG | AA | 2619 | 11 | 18,26,27 | 1.19 | 2 (11%) | 19,38,41 | 0.84 | 1 (5%) |
| 60 | A2M | c | 619 | 60,85 | 18,25,26 | 3.65 | 8 (44%) | 18,36,39 | 3.52 | 3 (16%) |
| 60 | 4AC | c | 1773 | 60 | 21,24,25 | 3.39 | 10 (47%) | 29,34,37 | 1.64 | 5 (17%) |
| 15 | YYG | Bb | 37 | 85,15 | 31,42,43 | 2.19 | 8 (25%) | 33,62,65 | 1.91 | 10 (30%) |

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 |
|-----|------|-------|------|-------|---------|------------|---------|
| 11 | OMG | AA | 1450 | 11 | - | 3/5/27/28 | 0/3/3/3 |
| 60 | G7M | c | 1575 | 60 | - | 2/3/25/26 | 0/3/3/3 |
| 60 | OMU | c | 578 | 60 | - | 1/9/27/28 | 0/2/2/2 |
| 60 | B8N | c | 1191 | 60 | - | 4/16/34/35 | 0/2/2/2 |
| 11 | OMC | AA | 650 | 85,11 | - | 0/9/27/28 | 0/2/2/2 |
| 11 | OMG | AA | 2288 | 11 | - | 0/5/27/28 | 0/3/3/3 |
| 60 | OMU | c | 1269 | 60 | - | 0/9/27/28 | 0/2/2/2 |
| 11 | OMC | AA | 2337 | 11 | - | 1/9/27/28 | 0/2/2/2 |
| 11 | A2M | AA | 649 | 11 | - | 2/5/27/28 | 0/3/3/3 |
| 60 | OMC | c | 414 | 60 | - | 2/9/27/28 | 0/2/2/2 |

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| Mol | Type | Chain | Res | Link | Chirals | Torsions | Rings |
|-----|------|-------|------|-------|---------|------------|---------|
| 11 | 1MA | AA | 2142 | 85,11 | - | 1/3/25/26 | 0/3/3/3 |
| 11 | OMU | AA | 2921 | 11 | - | 0/9/27/28 | 0/2/2/2 |
| 60 | A2M | c | 796 | 60 | - | 0/5/27/28 | 0/3/3/3 |
| 11 | OMG | AA | 805 | 11 | - | 0/5/27/28 | 0/3/3/3 |
| 11 | UR3 | AA | 2634 | 11 | - | 0/7/25/26 | 0/2/2/2 |
| 11 | OMC | AA | 2197 | 86,11 | - | 4/9/27/28 | 0/2/2/2 |
| 11 | A2M | AA | 2946 | 85,11 | - | 0/5/27/28 | 0/3/3/3 |
| 11 | OMC | AA | 2948 | 11 | - | 0/9/27/28 | 0/2/2/2 |
| 11 | 5MC | AA | 2278 | 57,11 | - | 0/7/25/26 | 0/2/2/2 |
| 11 | OMG | AA | 867 | 86,11 | - | 2/5/27/28 | 0/3/3/3 |
| 11 | A2M | AA | 2280 | 11 | - | 3/5/27/28 | 0/3/3/3 |
| 11 | OMC | AA | 2959 | 11 | - | 0/9/27/28 | 0/2/2/2 |
| 11 | A2M | AA | 876 | 11 | - | 1/5/27/28 | 0/3/3/3 |
| 60 | A2M | c | 420 | 60 | - | 1/5/27/28 | 0/3/3/3 |
| 11 | OMC | AA | 663 | 11 | - | 1/9/27/28 | 0/2/2/2 |
| 11 | A2M | AA | 817 | 85,11 | - | 1/5/27/28 | 0/3/3/3 |
| 11 | OMU | AA | 2729 | 11 | - | 3/9/27/28 | 0/2/2/2 |
| 60 | OMG | c | 1126 | 60 | - | 2/5/27/28 | 0/3/3/3 |
| 60 | MA6 | c | 1782 | 60 | - | 3/7/29/30 | 0/3/3/3 |
| 11 | A2M | AA | 1133 | 11 | - | 0/5/27/28 | 0/3/3/3 |
| 11 | OMC | AA | 1437 | 11 | - | 4/9/27/28 | 0/2/2/2 |
| 11 | A2M | AA | 2640 | 11 | - | 1/5/27/28 | 0/3/3/3 |
| 60 | 4AC | c | 1280 | 60 | - | 3/11/29/30 | 0/2/2/2 |
| 11 | OMU | AA | 2347 | 11 | - | 1/9/27/28 | 0/2/2/2 |
| 11 | OMG | AA | 2791 | 11 | - | 2/5/27/28 | 0/3/3/3 |
| 60 | OMG | c | 1271 | 60 | - | 1/5/27/28 | 0/3/3/3 |
| 11 | A2M | AA | 2256 | 11 | - | 1/5/27/28 | 0/3/3/3 |
| 60 | OMG | c | 1428 | 60,85 | - | 0/5/27/28 | 0/3/3/3 |
| 11 | OMU | AA | 898 | 11 | - | 0/9/27/28 | 0/2/2/2 |
| 11 | OMG | AA | 2815 | 11 | - | 0/5/27/28 | 0/3/3/3 |
| 60 | A2M | c | 436 | 60 | - | 1/5/27/28 | 0/3/3/3 |
| 11 | OMU | AA | 2724 | 11 | - | 1/9/27/28 | 0/2/2/2 |
| 11 | OMG | AA | 2793 | 11 | - | 2/5/27/28 | 0/3/3/3 |
| 11 | A2M | AA | 1449 | 85,11 | - | 0/5/27/28 | 0/3/3/3 |
| 11 | 5MC | AA | 2870 | 86,11 | - | 4/7/25/26 | 0/2/2/2 |
| 11 | A2M | AA | 2281 | 11 | - | 3/5/27/28 | 0/3/3/3 |
| 11 | OMG | AA | 908 | 11 | - | 2/5/27/28 | 0/3/3/3 |
| 11 | OMU | AA | 2417 | 11 | - | 1/9/27/28 | 0/2/2/2 |
| 12 | DDE | Aa | 699 | 12 | - | 9/20/21/23 | 0/1/1/1 |

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| Mol | Type | Chain | Res | Link | Chirals | Torsions | Rings |
|-----|------|-------|------|-------|---------|-------------|---------|
| 60 | A2M | c | 28 | 60 | - | 3/5/27/28 | 0/3/3/3 |
| 60 | A2M | c | 541 | 60 | - | 3/5/27/28 | 0/3/3/3 |
| 11 | OMG | AA | 2922 | 11 | - | 1/5/27/28 | 0/3/3/3 |
| 60 | OMG | c | 1572 | 60 | - | 4/5/27/28 | 0/3/3/3 |
| 60 | A2M | c | 100 | 60 | - | 2/5/27/28 | 0/3/3/3 |
| 60 | OMC | c | 1639 | 60,85 | - | 1/9/27/28 | 0/2/2/2 |
| 60 | MA6 | c | 1781 | 60 | - | 0/7/29/30 | 0/3/3/3 |
| 60 | OMC | c | 1007 | 60 | - | 1/9/27/28 | 0/2/2/2 |
| 60 | A2M | c | 974 | 60 | - | 1/5/27/28 | 0/3/3/3 |
| 11 | A2M | AA | 807 | 11 | - | 0/5/27/28 | 0/3/3/3 |
| 11 | OMU | AA | 1888 | 11 | - | 1/9/27/28 | 0/2/2/2 |
| 60 | OMG | c | 562 | 60 | - | 1/5/27/28 | 0/3/3/3 |
| 11 | A2M | AA | 2220 | 11 | - | 1/5/27/28 | 0/3/3/3 |
| 11 | OMU | AA | 2421 | 11 | - | 1/9/27/28 | 0/2/2/2 |
| 11 | 1MA | AA | 645 | 85,11 | - | 0/3/25/26 | 0/3/3/3 |
| 11 | OMG | AA | 2619 | 11 | - | 0/5/27/28 | 0/3/3/3 |
| 60 | A2M | c | 619 | 60,85 | - | 2/5/27/28 | 0/3/3/3 |
| 60 | 4AC | c | 1773 | 60 | - | 2/11/29/30 | 0/2/2/2 |
| 15 | YYG | Bb | 37 | 85,15 | - | 11/20/42/43 | 0/3/4/4 |

The worst 5 of 330 bond length outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed(Å) | Ideal(Å) |
|-----|-------|------|------|---------|--------|-------------|----------|
| 60 | c | 1191 | B8N | C2'-C1' | -17.84 | 1.30 | 1.53 |
| 60 | c | 1191 | B8N | O4'-C1' | 9.10 | 1.56 | 1.43 |
| 11 | AA | 807 | A2M | C3'-C4' | -9.09 | 1.29 | 1.53 |
| 60 | c | 619 | A2M | C3'-C4' | -9.01 | 1.30 | 1.53 |
| 11 | AA | 817 | A2M | C3'-C4' | -8.97 | 1.30 | 1.53 |

The worst 5 of 184 bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed(°) | Ideal(°) |
|-----|-------|------|------|----------|--------|-------------|----------|
| 60 | c | 1781 | MA6 | N1-C6-N6 | -14.32 | 101.98 | 117.06 |
| 60 | c | 1782 | MA6 | N1-C6-N6 | -14.03 | 102.29 | 117.06 |
| 60 | c | 619 | A2M | C5-C6-N6 | 11.05 | 137.15 | 120.35 |
| 11 | AA | 1133 | A2M | C5-C6-N6 | 10.96 | 137.00 | 120.35 |
| 60 | c | 436 | A2M | C5-C6-N6 | 10.82 | 136.80 | 120.35 |

There are no chirality outliers.

5 of 108 torsion outliers are listed below:

| Mol | Chain | Res | Type | Atoms |
|-----|-------|-----|------|-----------------|
| 11 | AA | 649 | A2M | C1'-C2'-O2'-CM' |
| 11 | AA | 663 | OMC | C1'-C2'-O2'-CM2 |
| 11 | AA | 867 | OMG | O4'-C4'-C5'-O5' |
| 11 | AA | 867 | OMG | C3'-C4'-C5'-O5' |
| 11 | AA | 876 | A2M | C1'-C2'-O2'-CM' |

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 233 ligands modelled in this entry, 229 are monoatomic - leaving 4 for Mogul analysis.

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

| Mol | Type | Chain | Res | Link | Bond lengths | | | Bond angles | | |
|-----|------|-------|------|------|--------------|------|----------|-------------|------|----------|
| | | | | | Counts | RMSZ | # Z > 2 | Counts | RMSZ | # Z > 2 |
| 87 | SPD | AA | 3566 | - | 9,9,9 | 0.31 | 0 | 8,8,8 | 0.81 | 0 |
| 87 | SPD | AA | 3567 | - | 9,9,9 | 0.31 | 0 | 8,8,8 | 0.69 | 0 |
| 87 | SPD | c | 1937 | - | 9,9,9 | 0.32 | 0 | 8,8,8 | 0.93 | 0 |
| 88 | GTP | Aa | 1001 | 85 | 26,34,34 | 1.20 | 2 (7%) | 32,54,54 | 1.61 | 7 (21%) |

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 |
|-----|------|-------|------|------|---------|----------|-------|
| 87 | SPD | AA | 3566 | - | - | 4/7/7/7 | - |
| 87 | SPD | AA | 3567 | - | - | 3/7/7/7 | - |
| 87 | SPD | c | 1937 | - | - | 3/7/7/7 | - |

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| Mol | Type | Chain | Res | Link | Chirals | Torsions | Rings |
|-----|------|-------|------|------|---------|------------|---------|
| 88 | GTP | Aa | 1001 | 85 | - | 2/18/38/38 | 0/3/3/3 |

All (2) bond length outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed(Å) | Ideal(Å) |
|-----|-------|------|------|-------|-------|-------------|----------|
| 88 | Aa | 1001 | GTP | C5-C6 | -4.37 | 1.38 | 1.47 |
| 88 | Aa | 1001 | GTP | C2-N3 | 2.07 | 1.38 | 1.33 |

The worst 5 of 7 bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed(°) | Ideal(°) |
|-----|-------|------|------|-------------|-------|-------------|----------|
| 88 | Aa | 1001 | GTP | PB-O3B-PG | -3.94 | 119.31 | 132.83 |
| 88 | Aa | 1001 | GTP | C5-C6-N1 | 3.24 | 119.68 | 113.95 |
| 88 | Aa | 1001 | GTP | C3'-C2'-C1' | 3.15 | 105.73 | 100.98 |
| 88 | Aa | 1001 | GTP | C8-N7-C5 | 2.94 | 108.59 | 102.99 |
| 88 | Aa | 1001 | GTP | C2-N1-C6 | -2.79 | 119.96 | 125.10 |

There are no chirality outliers.

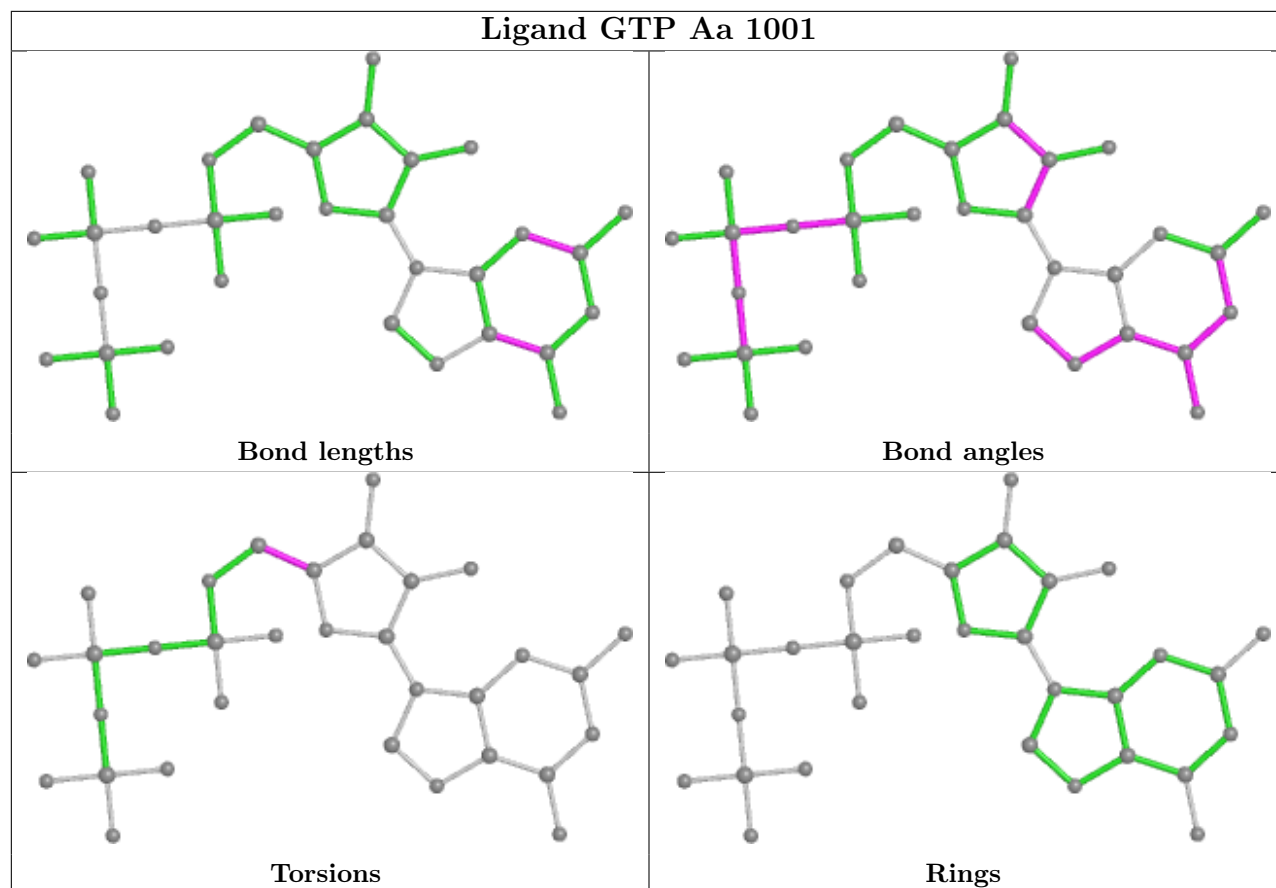
5 of 12 torsion outliers are listed below:

| Mol | Chain | Res | Type | Atoms |
|-----|-------|------|------|-----------------|
| 87 | AA | 3566 | SPD | N6-C7-C8-C9 |
| 87 | AA | 3567 | SPD | C3-C4-C5-N6 |
| 88 | Aa | 1001 | GTP | O4'-C4'-C5'-O5' |
| 88 | Aa | 1001 | GTP | C3'-C4'-C5'-O5' |
| 87 | AA | 3567 | SPD | C8-C7-N6-C5 |

There are no ring outliers.

No monomer is involved in short contacts.

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



5.7 Other polymers [\(i\)](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [\(i\)](#)

There are no chain breaks in this entry.

6 Map visualisation

This section contains visualisations of the EMDB entry EMD-16702. 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

This section was not generated.

6.2 Central slices

This section was not generated.

6.3 Largest variance slices

This section was not generated.

6.4 Orthogonal standard-deviation projections (False-color)

This section was not generated.

6.5 Orthogonal surface views

This section was not generated.

6.6 Mask visualisation

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

This section was not generated.

7.2 Volume estimate versus contour level

This section was not generated.

7.3 Rotationally averaged power spectrum

This section was not generated. The rotationally averaged power spectrum had issues being displayed.

8 Fourier-Shell correlation

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

9 Map-model fit

This section was not generated.