



## Full wwPDB EM Validation Report ⓘ

Jul 16, 2023 – 09:48 PM EDT

PDB ID : 8FL7  
EMDB ID : EMD-29269  
Title : Human nuclear pre-60S ribosomal subunit (State J2)  
Authors : Vanden Broeck, A.; Klinge, S.  
Deposited on : 2022-12-21  
Resolution : 2.55 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](mailto: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:

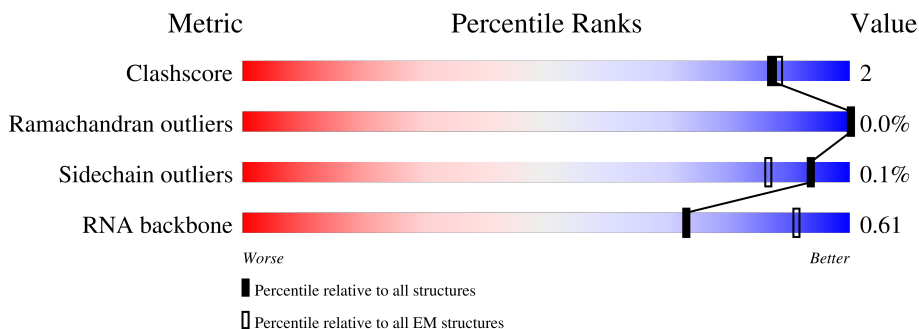
EMDB validation analysis : 0.0.1.dev50  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
MolProbity : 4.02b-467  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
MapQ : 1.9.9  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.34

# 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 2.55 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.




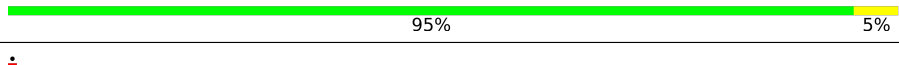

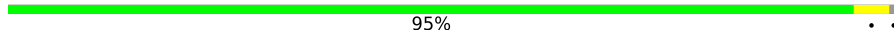
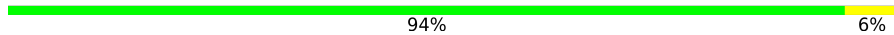

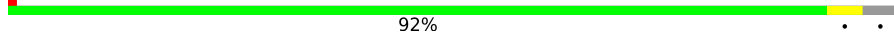

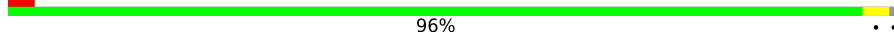


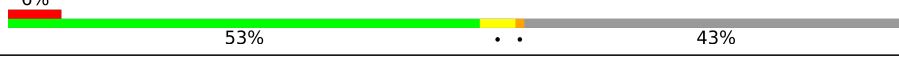



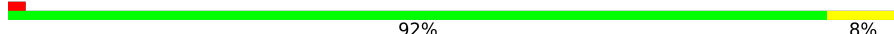




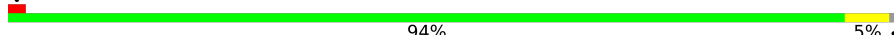
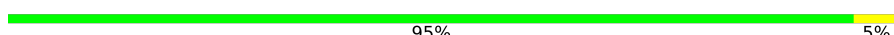



| Metric                | Whole archive (#Entries) | EM structures (#Entries) |
|-----------------------|--------------------------|--------------------------|
| Clashscore            | 158937                   | 4297                     |
| Ramachandran outliers | 154571                   | 4023                     |
| 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  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ . The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion  $< 40\%$ ). The numeric value is given above the bar.

| Mol | Chain | Length | Quality of chain |
|-----|-------|--------|------------------|
| 1   | BA    | 165    |                  |
| 2   | L1    | 157    |                  |
| 3   | L3    | 5070   |                  |
| 4   | L4    | 121    |                  |
| 5   | L5    | 178    |                  |
| 6   | L6    | 211    |                  |
| 7   | L7    | 203    |                  |

*Continued on next page...*

Continued from previous page...

| Mol | Chain | Length | Quality of chain   |
|-----|-------|--------|--|
| 8   | L8    | 215    |    |
| 9   | L9    | 204    |    |
| 10  | LA    | 184    |    |
| 11  | LB    | 188    |    |
| 12  | LC    | 176    |    |
| 13  | LD    | 196    |    |
| 14  | LE    | 160    |    |
| 15  | LF    | 128    |    |
| 16  | LG    | 140    |    |
| 17  | LH    | 156    |    |
| 18  | LI    | 145    |    |
| 19  | LJ    | 136    |   |
| 20  | LK    | 148    |  |
| 21  | LL    | 137    |  |
| 22  | LM    | 159    |  |
| 23  | LN    | 403    |  |
| 24  | LO    | 115    |  |
| 25  | LP    | 125    |  |
| 26  | LQ    | 135    |  |
| 27  | LR    | 117    |  |
| 28  | LS    | 123    |  |
| 29  | LT    | 110    |  |
| 30  | LU    | 105    |  |
| 31  | LV    | 106    |  |
| 32  | LW    | 97     |  |

Continued on next page...

Continued from previous page...

| Mol | Chain | Length | Quality of chain |
|-----|-------|--------|------------------|
| 33  | LX    | 92     |                  |
| 34  | LY    | 70     |                  |
| 35  | LZ    | 51     |                  |
| 36  | NC    | 731    |                  |
| 37  | NF    | 260    |                  |
| 38  | NK    | 129    |                  |
| 39  | NL    | 478    |                  |
| 40  | NP    | 134    |                  |
| 41  | SA    | 427    |                  |
| 42  | SB    | 297    |                  |
| 43  | SC    | 288    |                  |
| 44  | SD    | 248    |                  |
| 45  | SE    | 266    |                  |
| 46  | SF    | 257    |                  |
| 47  | SG    | 192    |                  |
| 48  | SH    | 293    |                  |
| 49  | SI    | 255    |                  |
| 50  | SK    | 245    |                  |
| 51  | SM    | 588    |                  |
| 52  | SQ    | 239    |                  |
| 53  | SR    | 634    |                  |
| 54  | SV    | 163    |                  |

## 2 Entry composition

There are 58 unique types of molecules in this entry. The entry contains 149506 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 60S ribosomal protein L12.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
|     |       |          | Total | C   | N   | O   | S |         |       |
| 1   | BA    | 160      | 954   | 570 | 188 | 193 | 3 | 0       | 0     |

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

| Mol | Chain | Residues | Atoms |      |     |      |     | AltConf | Trace |
|-----|-------|----------|-------|------|-----|------|-----|---------|-------|
|     |       |          | Total | C    | N   | O    | P   |         |       |
| 2   | L1    | 154      | 3278  | 1463 | 581 | 1080 | 154 | 0       | 0     |

- Molecule 3 is a RNA chain called 28S rRNA.

| Mol | Chain | Residues | Atoms |       |       |       |      | AltConf | Trace |
|-----|-------|----------|-------|-------|-------|-------|------|---------|-------|
|     |       |          | Total | C     | N     | O     | P    |         |       |
| 3   | L3    | 3409     | 73178 | 32611 | 13401 | 23757 | 3409 | 0       | 0     |

- Molecule 4 is a RNA chain called 5S rRNA.

| Mol | Chain | Residues | Atoms |      |     |     |     | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|-----|---------|-------|
|     |       |          | Total | C    | N   | O   | P   |         |       |
| 4   | L4    | 120      | 2561  | 1141 | 456 | 844 | 120 | 0       | 0     |

- Molecule 5 is a protein called 60S ribosomal protein L11.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
|     |       |          | Total | C   | N   | O   | S |         |       |
| 5   | L5    | 168      | 1349  | 853 | 251 | 239 | 6 | 0       | 0     |

- Molecule 6 is a protein called 60S ribosomal protein L13.

| Mol | Chain | Residues | Atoms |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
|     |       |          | Total | C    | N   | O   | S |         |       |
| 6   | L6    | 210      | 1701  | 1064 | 352 | 281 | 4 | 0       | 0     |

- Molecule 7 is a protein called 60S ribosomal protein L13a.

| Mol | Chain | Residues | Atoms |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
|     |       |          | Total | C    | N   | O   | S |         |       |
| 7   | L7    | 201      | 1650  | 1063 | 321 | 261 | 5 | 0       | 0     |

- Molecule 8 is a protein called 60S ribosomal protein L14.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
|     |       |          | Total | C   | N   | O   | S |         |       |
| 8   | L8    | 135      | 1111  | 713 | 213 | 178 | 7 | 0       | 0     |

- Molecule 9 is a protein called 60S ribosomal protein L15.

| Mol | Chain | Residues | Atoms |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
|     |       |          | Total | C    | N   | O   | S |         |       |
| 9   | L9    | 203      | 1701  | 1072 | 359 | 266 | 4 | 0       | 0     |

- Molecule 10 is a protein called 60S ribosomal protein L17.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
|     |       |          | Total | C   | N   | O   | S |         |       |
| 10  | LA    | 153      | 1242  | 776 | 241 | 216 | 9 | 0       | 0     |

- Molecule 11 is a protein called 60S ribosomal protein L18.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
|     |       |          | Total | C   | N   | O   | S |         |       |
| 11  | LB    | 187      | 1512  | 944 | 314 | 249 | 5 | 0       | 0     |

- Molecule 12 is a protein called 60S ribosomal protein L18a.

| Mol | Chain | Residues | Atoms |     |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|----|---------|-------|
|     |       |          | Total | C   | N   | O   | S  |         |       |
| 12  | LC    | 176      | 1461  | 930 | 284 | 236 | 11 | 0       | 0     |

- Molecule 13 is a protein called 60S ribosomal protein L19.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
|     |       |          | Total | C   | N   | O   | S |         |       |
| 13  | LD    | 154      | 1289  | 805 | 277 | 198 | 9 | 0       | 0     |

- Molecule 14 is a protein called 60S ribosomal protein L21.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 14  | LE    | 154      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1264  | 803 | 246 | 210 | 5 |         |       |

- Molecule 15 is a protein called 60S ribosomal protein L22.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 15  | LF    | 103      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 842   | 538 | 148 | 154 | 2 |         |       |

- Molecule 16 is a protein called 60S ribosomal protein L23.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 16  | LG    | 139      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1034  | 648 | 199 | 182 | 5 |         |       |

- Molecule 17 is a protein called 60S ribosomal protein L23a.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 17  | LH    | 143      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1156  | 740 | 220 | 195 | 1 |         |       |

- Molecule 18 is a protein called 60S ribosomal protein L26.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 18  | LI    | 134      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1115  | 700 | 226 | 186 | 3 |         |       |

- Molecule 19 is a protein called 60S ribosomal protein L27.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 19  | LJ    | 135      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1107  | 714 | 208 | 182 | 3 |         |       |

- Molecule 20 is a protein called 60S ribosomal protein L27a.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 20  | LK    | 147      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1162  | 736 | 237 | 186 | 3 |         |       |

- Molecule 21 is a protein called 60S ribosomal protein L28.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 21  | LL    | 125      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1002  | 622 | 207 | 168 | 5 |         |       |

- Molecule 22 is a protein called 60S ribosomal protein L29.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 22  | LM    | 91       | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 751   | 469 | 165 | 113 | 4 |         |       |

- Molecule 23 is a protein called 60S ribosomal protein L3.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 23  | LN    | 402      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 3239  | 2061 | 608 | 556 | 14 |         |       |

- Molecule 24 is a protein called 60S ribosomal protein L30.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 24  | LO    | 95       | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 738   | 468 | 131 | 133 | 6 |         |       |

- Molecule 25 is a protein called 60S ribosomal protein L31.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 25  | LP    | 106      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 879   | 555 | 170 | 152 | 2 |         |       |

- Molecule 26 is a protein called 60S ribosomal protein L32.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 26  | LQ    | 128      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1053  | 667 | 216 | 165 | 5 |         |       |

- Molecule 27 is a protein called 60S ribosomal protein L34.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 27  | LR    | 112      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 888   | 555 | 183 | 144 | 6 |         |       |

- Molecule 28 is a protein called 60S ribosomal protein L35.



| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
|     |       |          | Total | C   | N   | O   | S |         |       |
| 28  | LS    | 122      | 1015  | 641 | 205 | 168 | 1 | 0       | 0     |

- Molecule 29 is a protein called 60S ribosomal protein L35a.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
|     |       |          | Total | C   | N   | O   | S |         |       |
| 29  | LT    | 109      | 876   | 555 | 174 | 144 | 3 | 0       | 0     |

- Molecule 30 is a protein called 60S ribosomal protein L36.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
|     |       |          | Total | C   | N   | O   | S |         |       |
| 30  | LU    | 102      | 832   | 521 | 177 | 129 | 5 | 0       | 0     |

- Molecule 31 is a protein called 60S ribosomal protein L36a.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
|     |       |          | Total | C   | N   | O   | S |         |       |
| 31  | LV    | 104      | 851   | 533 | 174 | 138 | 6 | 0       | 0     |

- Molecule 32 is a protein called 60S ribosomal protein L37.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
|     |       |          | Total | C   | N   | O   | S |         |       |
| 32  | LW    | 86       | 705   | 434 | 155 | 111 | 5 | 0       | 0     |

- Molecule 33 is a protein called 60S ribosomal protein L37a.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
|     |       |          | Total | C   | N   | O   | S |         |       |
| 33  | LX    | 91       | 708   | 445 | 136 | 120 | 7 | 0       | 0     |

- Molecule 34 is a protein called 60S ribosomal protein L38.

| Mol | Chain | Residues | Atoms |     |     |    |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|----|---|---------|-------|
|     |       |          | Total | C   | N   | O  | S |         |       |
| 34  | LY    | 69       | 569   | 366 | 103 | 99 | 1 | 0       | 0     |

- Molecule 35 is a protein called 60S ribosomal protein L39.

| Mol | Chain | Residues | Atoms |     |    |    |   | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 35  | LZ    | 50       | Total | C   | N  | O  | S | 0       | 0     |
|     |       |          | 444   | 281 | 98 | 64 | 1 |         |       |

- Molecule 36 is a protein called Nucleolar GTP-binding protein 2.

| Mol | Chain | Residues | Atoms |     |    |    |   | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 36  | NC    | 44       | Total | C   | N  | O  | S | 0       | 0     |
|     |       |          | 219   | 131 | 44 | 44 |   |         |       |

- Molecule 37 is a protein called Ribosome biogenesis protein NSA2 homolog.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 37  | NF    | 71       | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 626   | 392 | 129 | 102 | 3 |         |       |

- Molecule 38 is a protein called Protein LLP homolog.

| Mol | Chain | Residues | Atoms |     |     |    |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|----|---|---------|-------|
| 38  | NK    | 67       | Total | C   | N   | O  | S | 0       | 0     |
|     |       |          | 581   | 363 | 128 | 88 | 2 |         |       |

- Molecule 39 is a protein called Ribosome biogenesis protein NOP53.

| Mol | Chain | Residues | Atoms |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 39  | NL    | 263      | Total | C    | N   | O   | S | 0       | 0     |
|     |       |          | 2175  | 1347 | 433 | 393 | 2 |         |       |

- Molecule 40 is a protein called Zinc finger protein 593.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 40  | NP    | 104      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 847   | 520 | 178 | 145 | 4 |         |       |

- Molecule 41 is a protein called 60S ribosomal protein L4.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 41  | SA    | 358      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 2853  | 1797 | 570 | 473 | 13 |         |       |

- Molecule 42 is a protein called 60S ribosomal protein L5.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 42  | SB    | 275      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 2243  | 1419 | 406 | 404 | 14 |         |       |

- Molecule 43 is a protein called 60S ribosomal protein L6.

| Mol | Chain | Residues | Atoms |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 43  | SC    | 217      | Total | C    | N   | O   | S | 0       | 0     |
|     |       |          | 1747  | 1124 | 332 | 287 | 4 |         |       |

- Molecule 44 is a protein called 60S ribosomal protein L7.

| Mol | Chain | Residues | Atoms |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 44  | SD    | 225      | Total | C    | N   | O   | S | 0       | 0     |
|     |       |          | 1870  | 1202 | 358 | 301 | 9 |         |       |

- Molecule 45 is a protein called 60S ribosomal protein L7a.

| Mol | Chain | Residues | Atoms |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 45  | SE    | 231      | Total | C    | N   | O   | S | 1       | 0     |
|     |       |          | 1869  | 1191 | 361 | 313 | 4 |         |       |

- Molecule 46 is a protein called 60S ribosomal protein L8.

| Mol | Chain | Residues | Atoms |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 46  | SF    | 245      | Total | C    | N   | O   | S | 0       | 0     |
|     |       |          | 1876  | 1177 | 383 | 310 | 6 |         |       |

- Molecule 47 is a protein called 60S ribosomal protein L9.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 47  | SG    | 190      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1518  | 956 | 284 | 272 | 6 |         |       |

- Molecule 48 is a protein called MKI67 FHA domain-interacting nucleolar phosphoprotein.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 48  | SH    | 93       | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 773   | 501 | 130 | 139 | 3 |         |       |

- Molecule 49 is a protein called 60S ribosomal protein L7-like 1.

| Mol | Chain | Residues | Atoms |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 49  | SI    | 234      | Total | C    | N   | O   | S | 3       | 0     |
|     |       |          | 1952  | 1267 | 365 | 316 | 4 |         |       |

- Molecule 50 is a protein called Eukaryotic translation initiation factor 6.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 50  | SK    | 244      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 1852  | 1149 | 318 | 372 | 13 |         |       |

- Molecule 51 is a protein called Pescadillo homolog.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 51  | SM    | 399      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 3278  | 2120 | 576 | 571 | 11 |         |       |

- Molecule 52 is a protein called mRNA turnover protein 4 homolog.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 52  | SQ    | 217      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 1771  | 1129 | 311 | 320 | 11 |         |       |

- Molecule 53 is a protein called GTP-binding protein 4.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 53  | SR    | 601      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 4932  | 3105 | 899 | 902 | 26 |         |       |

- Molecule 54 is a protein called Probable ribosome biogenesis protein RLP24.

| Mol | Chain | Residues | Atoms |     |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|----|---------|-------|
| 54  | SV    | 139      | Total | C   | N   | O   | S  | 0       | 0     |
|     |       |          | 1184  | 754 | 229 | 191 | 10 |         |       |

- Molecule 55 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

| Mol | Chain | Residues | Atoms |    | AltConf |
|-----|-------|----------|-------|----|---------|
| 55  | L1    | 4        | Total | Mg | 0       |
|     |       |          | 4     | 4  |         |
| 55  | L3    | 73       | Total | Mg | 0       |
|     |       |          | 73    | 73 |         |
| 55  | L4    | 3        | Total | Mg | 0       |
|     |       |          | 3     | 3  |         |

*Continued on next page...*

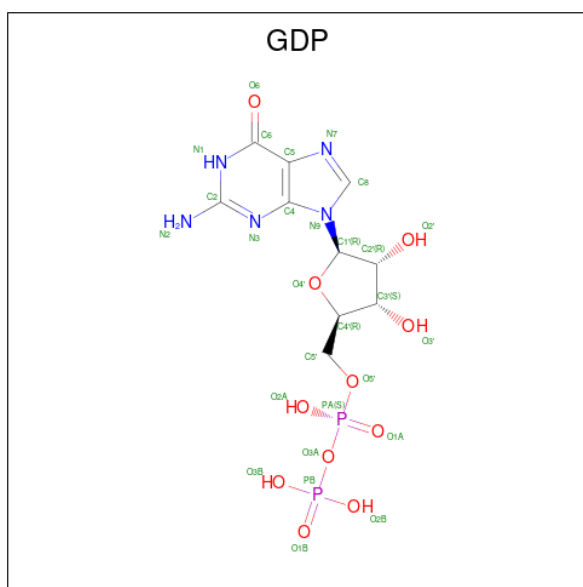
*Continued from previous page...*

| Mol | Chain | Residues | Atoms      |         | AltConf |
|-----|-------|----------|------------|---------|---------|
| 55  | LG    | 1        | Total<br>1 | Mg<br>1 | 0       |
| 55  | LQ    | 1        | Total<br>1 | Mg<br>1 | 0       |
| 55  | LR    | 1        | Total<br>1 | Mg<br>1 | 0       |
| 55  | LT    | 1        | Total<br>1 | Mg<br>1 | 0       |
| 55  | LW    | 1        | Total<br>1 | Mg<br>1 | 0       |
| 55  | SA    | 1        | Total<br>1 | Mg<br>1 | 0       |
| 55  | SF    | 1        | Total<br>1 | Mg<br>1 | 0       |
| 55  | SR    | 1        | Total<br>1 | Mg<br>1 | 0       |

- Molecule 56 is ZINC ION (three-letter code: ZN) (formula: Zn).

| Mol | Chain | Residues | Atoms      |         | AltConf |
|-----|-------|----------|------------|---------|---------|
| 56  | LR    | 1        | Total<br>1 | Zn<br>1 | 0       |
| 56  | LV    | 1        | Total<br>1 | Zn<br>1 | 0       |
| 56  | LW    | 1        | Total<br>1 | Zn<br>1 | 0       |
| 56  | LX    | 1        | Total<br>1 | Zn<br>1 | 0       |
| 56  | NP    | 1        | Total<br>1 | Zn<br>1 | 0       |
| 56  | SV    | 1        | Total<br>1 | Zn<br>1 | 0       |

- Molecule 57 is GUANOSINE-5'-DIPHOSPHATE (three-letter code: GDP) (formula: C<sub>10</sub>H<sub>15</sub>N<sub>5</sub>O<sub>11</sub>P<sub>2</sub>).

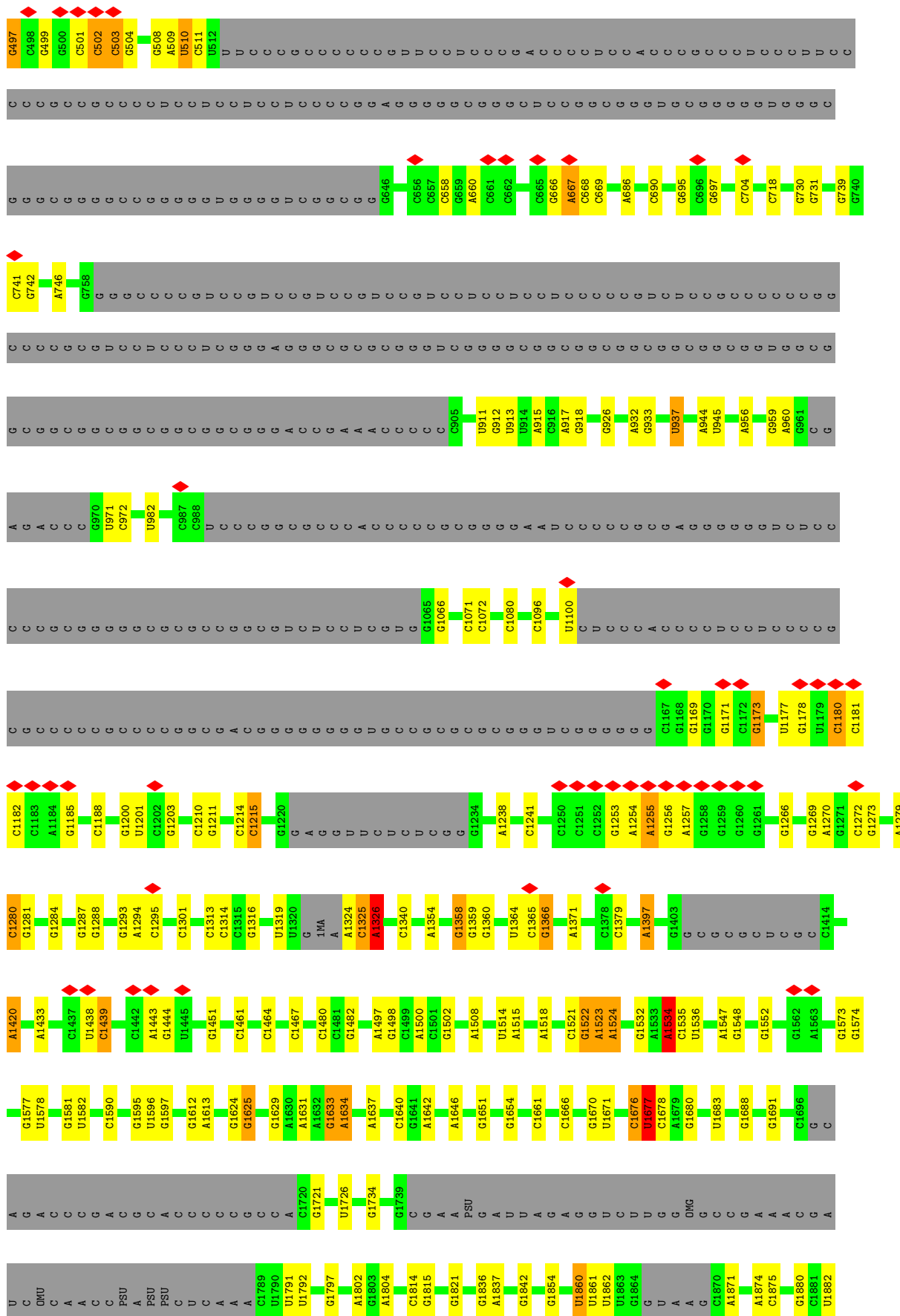


| Mol | Chain | Residues | Atoms |    |   |    |   | AltConf |
|-----|-------|----------|-------|----|---|----|---|---------|
|     |       |          | Total | C  | N | O  | P |         |
| 57  | SR    | 1        | 28    | 10 | 5 | 11 | 2 | 0       |

- Molecule 58 is POTASSIUM ION (three-letter code: K) (formula: K).

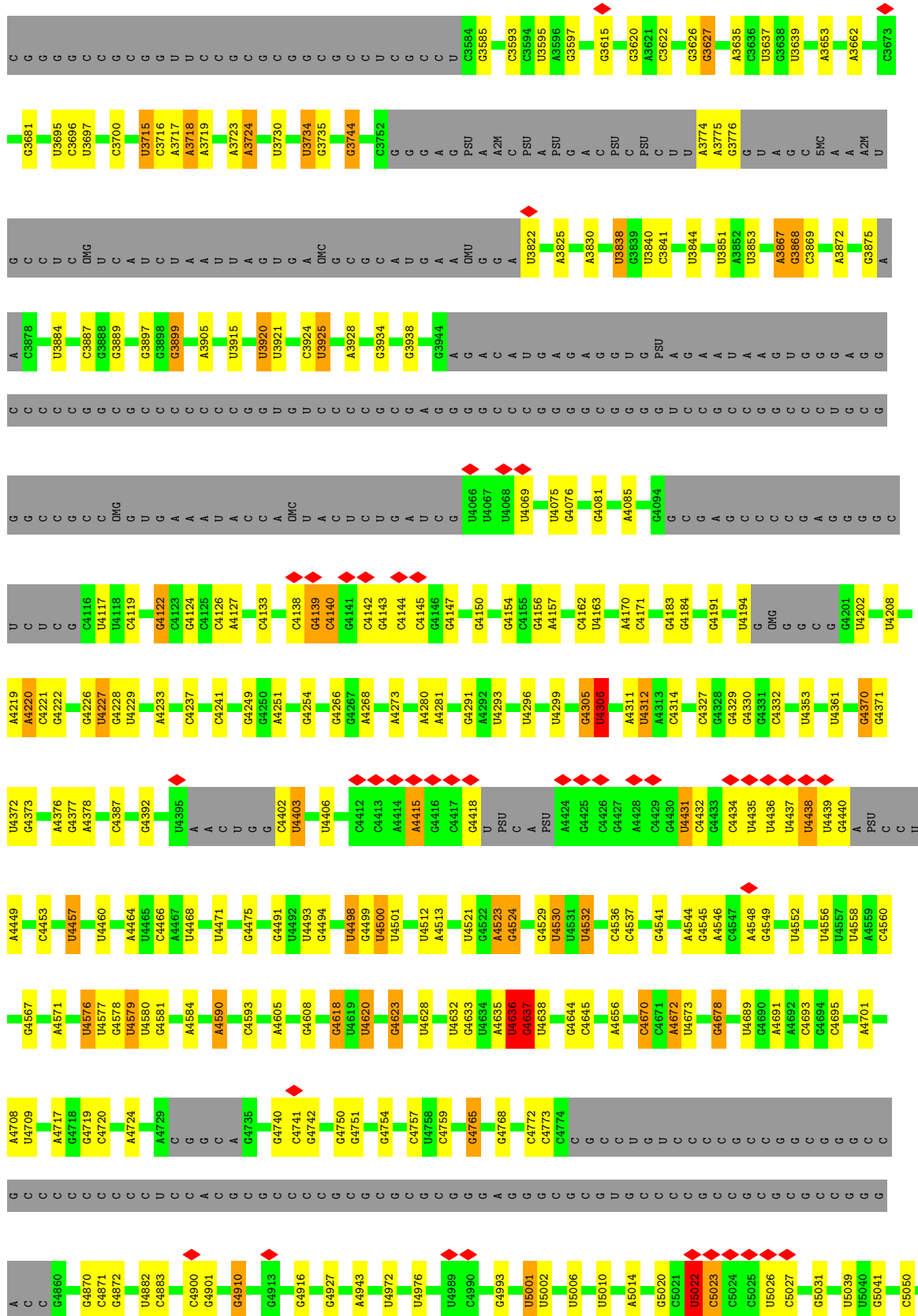
| Mol | Chain | Residues | Atoms |   | AltConf |
|-----|-------|----------|-------|---|---------|
|     |       |          | Total | K |         |
| 58  | SR    | 1        | 1     | 1 | 0       |





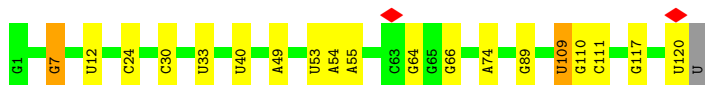
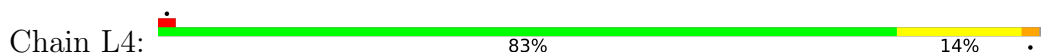




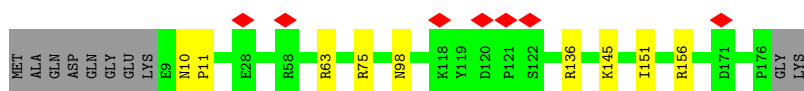
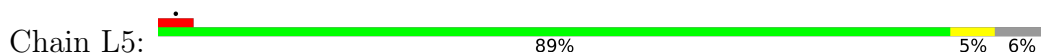




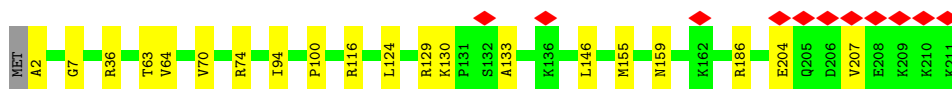
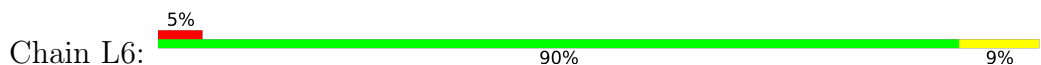
• Molecule 4: 5S rRNA



• Molecule 5: 60S ribosomal protein L11



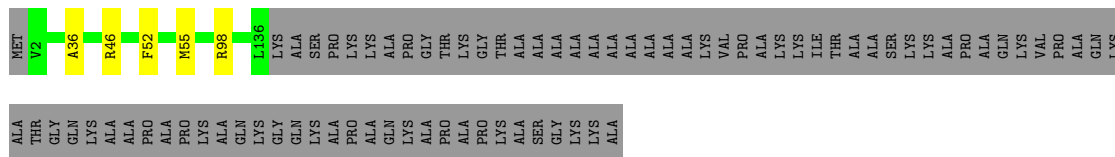
• Molecule 6: 60S ribosomal protein L13



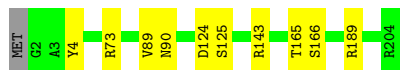
• Molecule 7: 60S ribosomal protein L13a



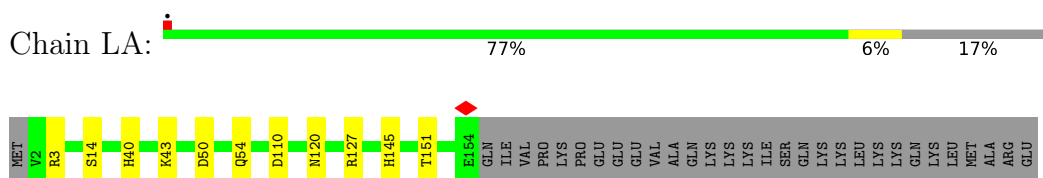
• Molecule 8: 60S ribosomal protein L14



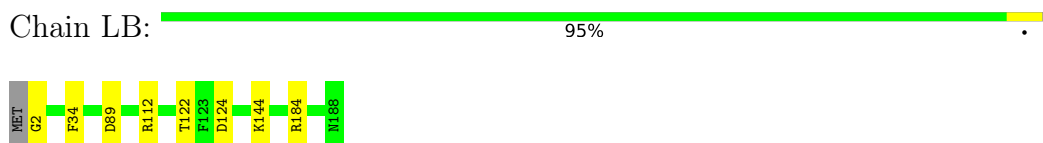
• Molecule 9: 60S ribosomal protein L15



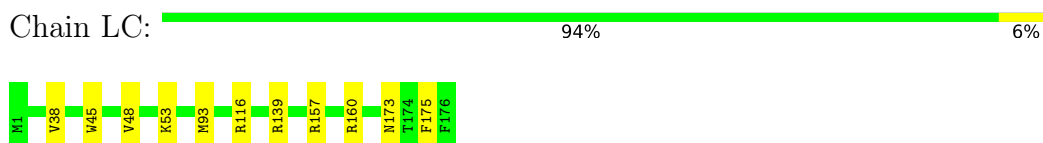
- Molecule 10: 60S ribosomal protein L17



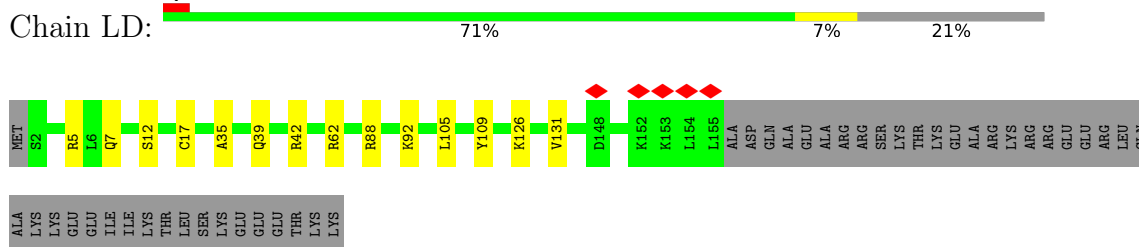
- Molecule 11: 60S ribosomal protein L18



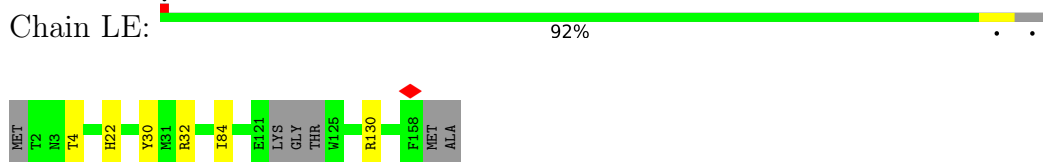
- Molecule 12: 60S ribosomal protein L18a



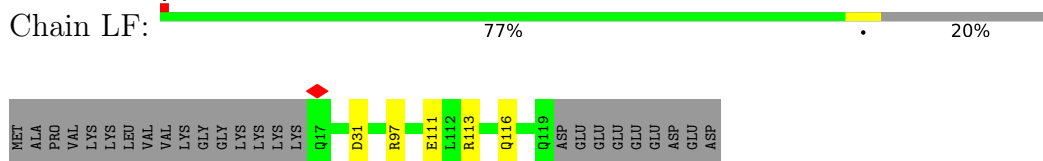
- Molecule 13: 60S ribosomal protein L19



- Molecule 14: 60S ribosomal protein L21

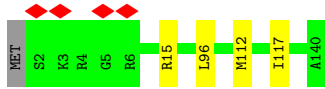


- Molecule 15: 60S ribosomal protein L22

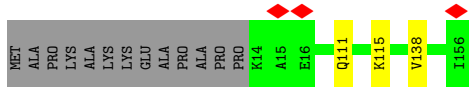
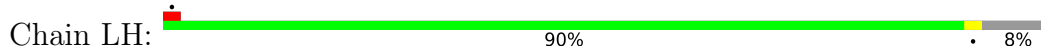


- Molecule 16: 60S ribosomal protein L23

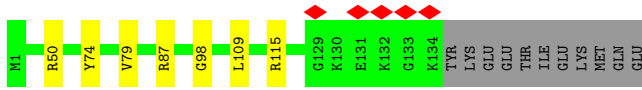
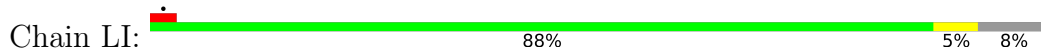




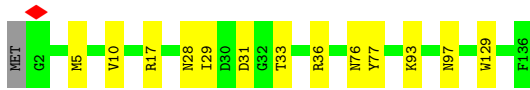
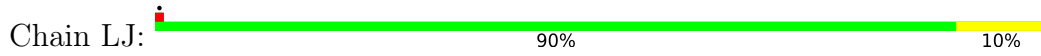
- Molecule 17: 60S ribosomal protein L23a



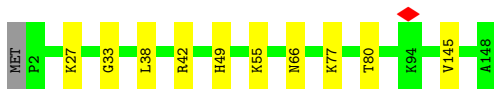
- Molecule 18: 60S ribosomal protein L26



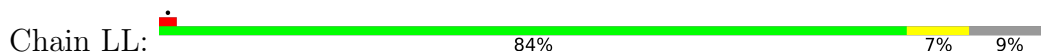
- Molecule 19: 60S ribosomal protein L27



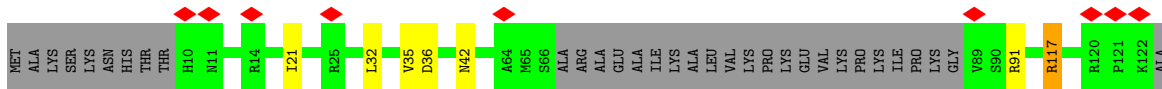
- Molecule 20: 60S ribosomal protein L27a



- Molecule 21: 60S ribosomal protein L28



- Molecule 22: 60S ribosomal protein L29




LYS  
ALA  
LYS  
LYS  
LYS  
LYS  
ASP  
GLN  
THR  
LYS  
LYS  
ALA  
GLN  
ALA  
ALA  
ALA  
ALA  
PRO  
PRO  
SER  
VAL  
PRO  
PRO  
ALA  
GLN  
ALA  
ALA  
PRO  
PRO  
LYS  
LYS  
ARG  
THR  
GLN  
ALA  
ALA  
THR  
LYS  
ALA  
SER  
SER  
GLU

- Molecule 23: 60S ribosomal protein L3

Chain LN:  92% 8%




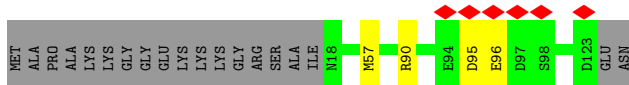
- Molecule 24: 60S ribosomal protein L30

Chain LO:  74% 9% 17%



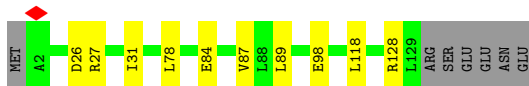
- Molecule 25: 60S ribosomal protein L31

Chain LP:  5% 82% 15%

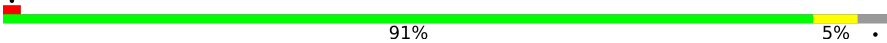


- Molecule 26: 60S ribosomal protein L32

Chain LQ:  87% 7% 5%



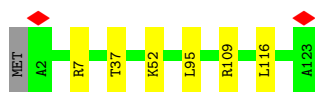
- Molecule 27: 60S ribosomal protein L34

Chain LR:  91% 5%



- Molecule 28: 60S ribosomal protein L35

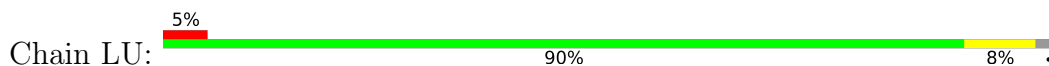
Chain LS:  94% 5%



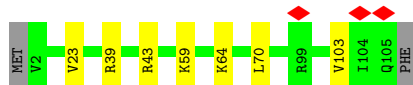
- Molecule 29: 60S ribosomal protein L35a



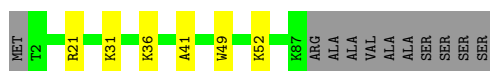
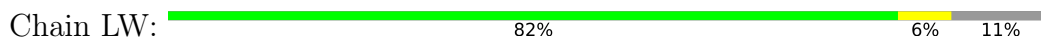
- Molecule 30: 60S ribosomal protein L36



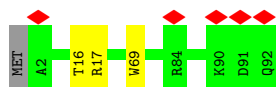
- Molecule 31: 60S ribosomal protein L36a



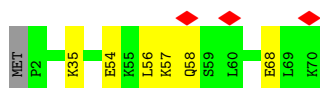
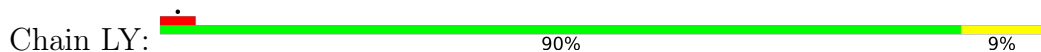
- Molecule 32: 60S ribosomal protein L37



- Molecule 33: 60S ribosomal protein L37a



- Molecule 34: 60S ribosomal protein L38

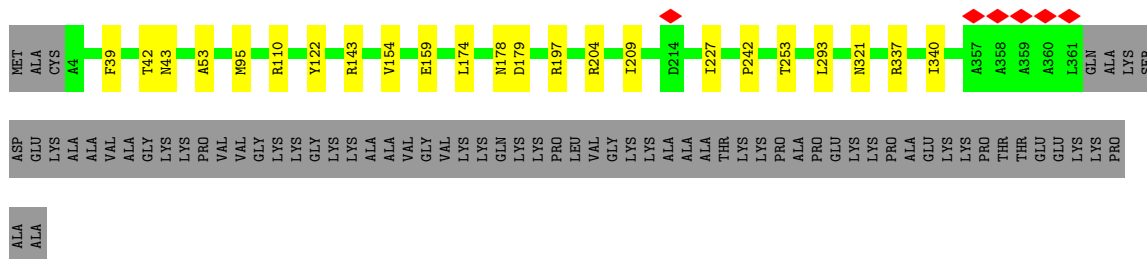


- Molecule 35: 60S ribosomal protein L39

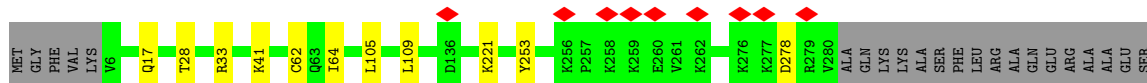




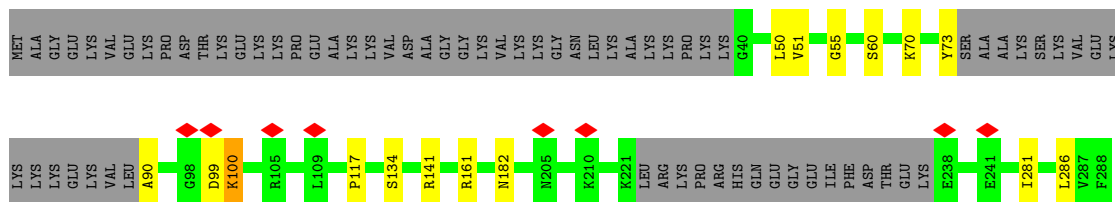




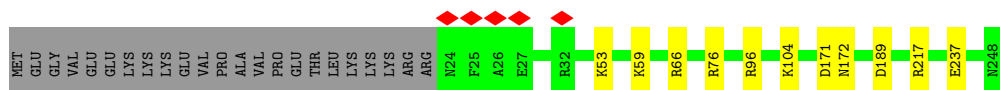
• Molecule 42: 60S ribosomal protein L5



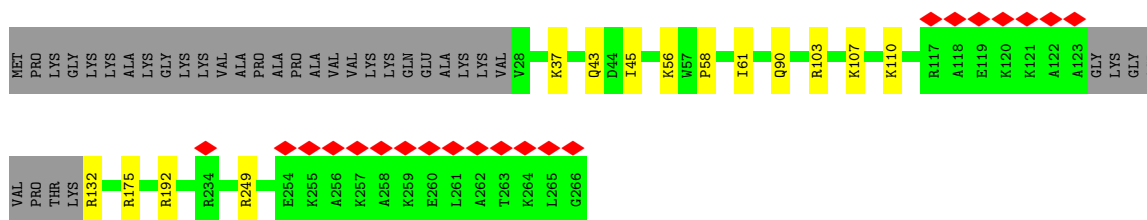
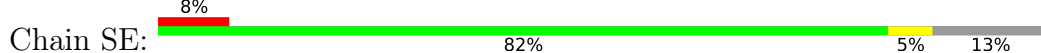
• Molecule 43: 60S ribosomal protein L6



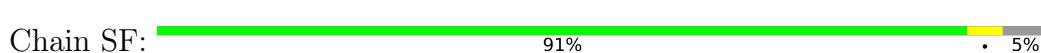
• Molecule 44: 60S ribosomal protein L7



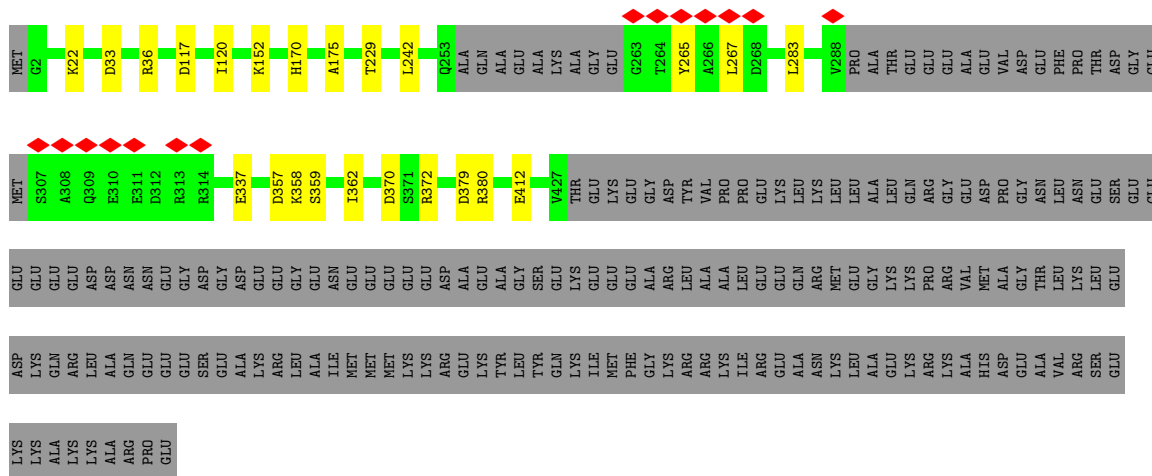
• Molecule 45: 60S ribosomal protein L7a



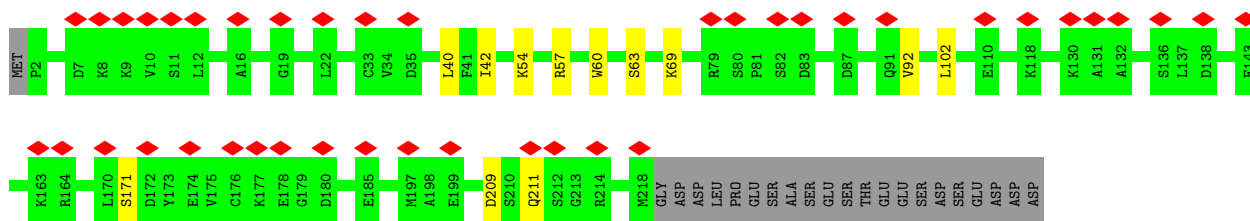
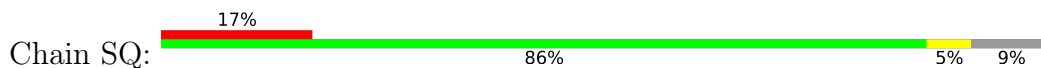
• Molecule 46: 60S ribosomal protein L8



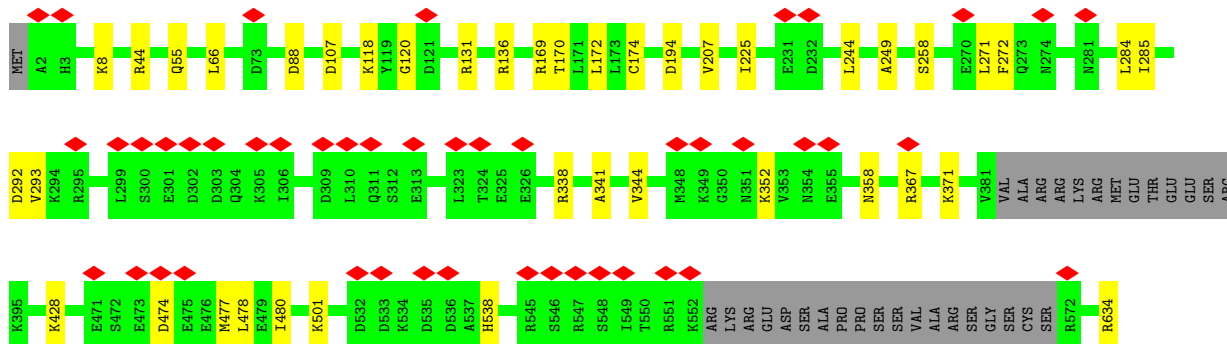
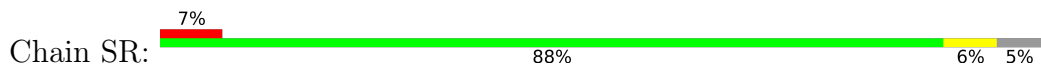




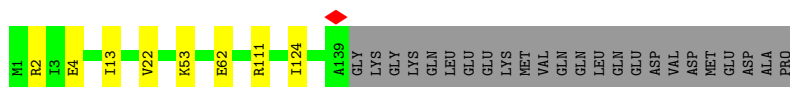
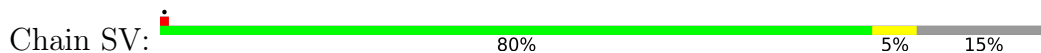
• Molecule 52: mRNA turnover protein 4 homolog



• Molecule 53: GTP-binding protein 4



• Molecule 54: Probable ribosome biogenesis protein RLP24



## 4 Experimental information

| Property                             | Value                                   | Source    |
|--------------------------------------|---|-----------|
| EM reconstruction method             | SINGLE PARTICLE                         | Depositor |
| Imposed symmetry                     | POINT, C1                               | Depositor |
| Number of particles used             | 74556                                   | Depositor |
| Resolution determination method      | FSC 0.143 CUT-OFF                       | Depositor |
| CTF correction method                | PHASE FLIPPING AND AMPLITUDE CORRECTION | Depositor |
| Microscope                           | FEI TITAN KRIOS                         | Depositor |
| Voltage (kV)                         | 300                                     | Depositor |
| Electron dose ( $e^-/\text{\AA}^2$ ) | 60                                      | Depositor |
| Minimum defocus (nm)                 | 500                                     | Depositor |
| Maximum defocus (nm)                 | 2500                                    | Depositor |
| Magnification                        | 64000                                   | Depositor |
| Image detector                       | GATAN K3 (6k x 4k)                      | Depositor |
| Maximum map value                    | 8.592                                   | Depositor |
| Minimum map value                    | -0.003                                  | Depositor |
| Average map value                    | 0.047                                   | Depositor |
| Map value standard deviation         | 0.184                                   | Depositor |
| Recommended contour level            | 0.85                                    | Depositor |
| Map size ( $\text{\AA}$ )            | 514.56, 514.56, 514.56                  | wwPDB     |
| Map dimensions                       | 480, 480, 480                           | wwPDB     |
| Map angles ( $^\circ$ )              | 90.0, 90.0, 90.0                        | wwPDB     |
| Pixel spacing ( $\text{\AA}$ )       | 1.072, 1.072, 1.072                     | 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: K, ZN, OMC, GDP, A2M, OMU, 6MZ, UR3, MG, HIC, PSU, OMG

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   | BA    | 0.24         | 0/959   | 0.47        | 0/1312          |
| 2   | L1    | 0.35         | 0/3589  | 0.74        | 0/5589          |
| 3   | L3    | 0.33         | 0/79388 | 0.77        | 9/123813 (0.0%) |
| 4   | L4    | 0.43         | 0/2861  | 0.79        | 0/4459          |
| 5   | L5    | 0.26         | 0/1372  | 0.57        | 0/1836          |
| 6   | L6    | 0.25         | 0/1732  | 0.59        | 0/2315          |
| 7   | L7    | 0.26         | 0/1682  | 0.55        | 0/2250          |
| 8   | L8    | 0.25         | 0/1133  | 0.51        | 0/1516          |
| 9   | L9    | 0.27         | 0/1746  | 0.63        | 0/2338          |
| 10  | LA    | 0.25         | 0/1268  | 0.53        | 0/1701          |
| 11  | LB    | 0.26         | 0/1536  | 0.64        | 0/2052          |
| 12  | LC    | 0.30         | 0/1501  | 0.58        | 0/2013          |
| 13  | LD    | 0.23         | 0/1305  | 0.60        | 0/1727          |
| 14  | LE    | 0.28         | 0/1291  | 0.56        | 0/1724          |
| 15  | LF    | 0.26         | 0/856   | 0.51        | 0/1149          |
| 16  | LG    | 0.26         | 0/1048  | 0.57        | 0/1402          |
| 17  | LH    | 0.25         | 0/1175  | 0.52        | 0/1572          |
| 18  | LI    | 0.27         | 0/1132  | 0.59        | 0/1504          |
| 19  | LJ    | 0.29         | 0/1130  | 0.55        | 0/1507          |
| 20  | LK    | 0.26         | 0/1191  | 0.54        | 0/1591          |
| 21  | LL    | 0.24         | 0/1017  | 0.59        | 0/1364          |
| 22  | LM    | 0.26         | 0/763   | 0.58        | 0/1005          |
| 23  | LN    | 0.26         | 0/3294  | 0.54        | 0/4406          |
| 24  | LO    | 0.26         | 0/748   | 0.48        | 0/1004          |
| 25  | LP    | 0.25         | 0/894   | 0.58        | 0/1204          |
| 26  | LQ    | 0.25         | 0/1071  | 0.56        | 0/1429          |
| 27  | LR    | 0.26         | 0/898   | 0.61        | 0/1197          |
| 28  | LS    | 0.24         | 0/1023  | 0.56        | 0/1351          |
| 29  | LT    | 0.26         | 0/895   | 0.61        | 0/1198          |
| 30  | LU    | 0.24         | 0/843   | 0.58        | 0/1115          |
| 31  | LV    | 0.28         | 0/864   | 0.60        | 0/1140          |
| 32  | LW    | 0.27         | 0/720   | 0.64        | 0/952           |

| Mol | Chain | Bond lengths |          | Bond angles |                 |
|-----|-------|--------------|----------|-------------|-----------------|
|     |       | RMSZ         | # Z  >5  | RMSZ        | # Z  >5         |
| 33  | LX    | 0.25         | 0/718    | 0.55        | 0/953           |
| 34  | LY    | 0.25         | 0/575    | 0.50        | 0/761           |
| 35  | LZ    | 0.24         | 0/454    | 0.60        | 0/599           |
| 36  | NC    | 0.21         | 0/218    | 0.36        | 0/303           |
| 37  | NF    | 0.26         | 0/637    | 0.55        | 0/834           |
| 38  | NK    | 0.23         | 0/587    | 0.59        | 0/767           |
| 39  | NL    | 0.24         | 0/2207   | 0.58        | 0/2955          |
| 40  | NP    | 0.24         | 0/864    | 0.61        | 0/1154          |
| 41  | SA    | 0.25         | 0/2907   | 0.56        | 0/3905          |
| 42  | SB    | 0.29         | 0/2287   | 0.54        | 0/3065          |
| 43  | SC    | 0.25         | 0/1781   | 0.55        | 0/2388          |
| 44  | SD    | 0.26         | 0/1905   | 0.56        | 0/2539          |
| 45  | SE    | 0.26         | 0/1903   | 0.55        | 0/2559          |
| 46  | SF    | 0.26         | 0/1914   | 0.60        | 0/2567          |
| 47  | SG    | 0.25         | 0/1537   | 0.54        | 0/2066          |
| 48  | SH    | 0.26         | 0/794    | 0.50        | 0/1071          |
| 49  | SI    | 0.24         | 0/2003   | 0.52        | 0/2688          |
| 50  | SK    | 0.25         | 0/1877   | 0.52        | 0/2554          |
| 51  | SM    | 0.26         | 0/3357   | 0.51        | 0/4529          |
| 52  | SQ    | 0.25         | 0/1806   | 0.51        | 0/2420          |
| 53  | SR    | 0.24         | 0/5014   | 0.51        | 0/6727          |
| 54  | SV    | 0.26         | 0/1207   | 0.52        | 0/1600          |
| All | All   | 0.30         | 0/157477 | 0.69        | 9/229739 (0.0%) |

There are no bond length outliers.

All (9) bond angle outliers are listed below:

| Mol | Chain | Res  | Type | Atoms      | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|------------|-------|-------------|----------|
| 3   | L3    | 2469 | C    | C2-N1-C1'  | 6.66  | 126.12      | 118.80   |
| 3   | L3    | 170  | C    | C6-N1-C2   | -6.42 | 117.73      | 120.30   |
| 3   | L3    | 2486 | G    | N1-C6-O6   | -5.91 | 116.36      | 119.90   |
| 3   | L3    | 5022 | U    | O4'-C1'-N1 | 5.79  | 112.83      | 108.20   |
| 3   | L3    | 1961 | G    | O4'-C1'-N9 | 5.57  | 112.65      | 108.20   |
| 3   | L3    | 2486 | G    | C5-C6-O6   | 5.46  | 131.88      | 128.60   |
| 3   | L3    | 4434 | C    | N1-C2-O2   | 5.21  | 122.03      | 118.90   |
| 3   | L3    | 4438 | U    | C2-N1-C1'  | 5.19  | 123.93      | 117.70   |
| 3   | L3    | 2519 | U    | O4'-C1'-N1 | 5.13  | 112.31      | 108.20   |

There are no chirality outliers.

There are no planarity outliers.

## 5.2 Too-close contacts [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

| Mol | Chain | Non-H | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|-------|----------|----------|---------|--------------|
| 1   | BA    | 954   | 0        | 690      | 6       | 0            |
| 2   | L1    | 3278  | 0        | 1665     | 11      | 0            |
| 3   | L3    | 73178 | 0        | 37073    | 293     | 0            |
| 4   | L4    | 2561  | 0        | 1295     | 7       | 0            |
| 5   | L5    | 1349  | 0        | 1383     | 7       | 0            |
| 6   | L6    | 1701  | 0        | 1818     | 15      | 0            |
| 7   | L7    | 1650  | 0        | 1794     | 7       | 0            |
| 8   | L8    | 1111  | 0        | 1174     | 4       | 0            |
| 9   | L9    | 1701  | 0        | 1749     | 7       | 0            |
| 10  | LA    | 1242  | 0        | 1269     | 7       | 0            |
| 11  | LB    | 1512  | 0        | 1628     | 6       | 0            |
| 12  | LC    | 1461  | 0        | 1502     | 9       | 0            |
| 13  | LD    | 1289  | 0        | 1429     | 10      | 0            |
| 14  | LE    | 1264  | 0        | 1328     | 7       | 0            |
| 15  | LF    | 842   | 0        | 864      | 3       | 0            |
| 16  | LG    | 1034  | 0        | 1097     | 3       | 0            |
| 17  | LH    | 1156  | 0        | 1268     | 2       | 0            |
| 18  | LI    | 1115  | 0        | 1205     | 7       | 0            |
| 19  | LJ    | 1107  | 0        | 1182     | 7       | 0            |
| 20  | LK    | 1162  | 0        | 1213     | 8       | 0            |
| 21  | LL    | 1002  | 0        | 1068     | 7       | 0            |
| 22  | LM    | 751   | 0        | 820      | 6       | 0            |
| 23  | LN    | 3239  | 0        | 3377     | 26      | 0            |
| 24  | LO    | 738   | 0        | 774      | 6       | 0            |
| 25  | LP    | 879   | 0        | 924      | 2       | 0            |
| 26  | LQ    | 1053  | 0        | 1147     | 7       | 0            |
| 27  | LR    | 888   | 0        | 977      | 4       | 0            |
| 28  | LS    | 1015  | 0        | 1148     | 6       | 0            |
| 29  | LT    | 876   | 0        | 912      | 4       | 0            |
| 30  | LU    | 832   | 0        | 917      | 7       | 0            |
| 31  | LV    | 851   | 0        | 920      | 6       | 0            |
| 32  | LW    | 705   | 0        | 737      | 5       | 0            |
| 33  | LX    | 708   | 0        | 756      | 3       | 0            |
| 34  | LY    | 569   | 0        | 637      | 5       | 0            |
| 35  | LZ    | 444   | 0        | 483      | 4       | 0            |
| 36  | NC    | 219   | 0        | 92       | 1       | 0            |
| 37  | NF    | 626   | 0        | 665      | 7       | 0            |

*Continued on next page...*



Continued from previous page...

| Mol | Chain | Non-H  | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|--------|----------|----------|---------|--------------|
| 38  | NK    | 581    | 0        | 656      | 7       | 0            |
| 39  | NL    | 2175   | 0        | 2235     | 15      | 0            |
| 40  | NP    | 847    | 0        | 854      | 4       | 0            |
| 41  | SA    | 2853   | 0        | 3028     | 17      | 0            |
| 42  | SB    | 2243   | 0        | 2268     | 11      | 0            |
| 43  | SC    | 1747   | 0        | 1897     | 16      | 0            |
| 44  | SD    | 1870   | 0        | 1996     | 9       | 0            |
| 45  | SE    | 1869   | 0        | 2014     | 13      | 0            |
| 46  | SF    | 1876   | 0        | 1970     | 9       | 0            |
| 47  | SG    | 1518   | 0        | 1601     | 7       | 0            |
| 48  | SH    | 773    | 0        | 755      | 4       | 0            |
| 49  | SI    | 1952   | 0        | 2086     | 7       | 0            |
| 50  | SK    | 1852   | 0        | 1828     | 13      | 0            |
| 51  | SM    | 3278   | 0        | 3332     | 16      | 0            |
| 52  | SQ    | 1771   | 0        | 1810     | 8       | 0            |
| 53  | SR    | 4932   | 0        | 5070     | 29      | 0            |
| 54  | SV    | 1184   | 0        | 1248     | 6       | 0            |
| 55  | L1    | 4      | 0        | 0        | 0       | 0            |
| 55  | L3    | 73     | 0        | 0        | 0       | 0            |
| 55  | L4    | 3      | 0        | 0        | 0       | 0            |
| 55  | LG    | 1      | 0        | 0        | 0       | 0            |
| 55  | LQ    | 1      | 0        | 0        | 0       | 0            |
| 55  | LR    | 1      | 0        | 0        | 0       | 0            |
| 55  | LT    | 1      | 0        | 0        | 0       | 0            |
| 55  | LW    | 1      | 0        | 0        | 0       | 0            |
| 55  | SA    | 1      | 0        | 0        | 0       | 0            |
| 55  | SF    | 1      | 0        | 0        | 0       | 0            |
| 55  | SR    | 1      | 0        | 0        | 0       | 0            |
| 56  | LR    | 1      | 0        | 0        | 0       | 0            |
| 56  | LV    | 1      | 0        | 0        | 0       | 0            |
| 56  | LW    | 1      | 0        | 0        | 0       | 0            |
| 56  | LX    | 1      | 0        | 0        | 0       | 0            |
| 56  | NP    | 1      | 0        | 0        | 0       | 0            |
| 56  | SV    | 1      | 0        | 0        | 0       | 0            |
| 57  | SR    | 28     | 0        | 12       | 0       | 0            |
| 58  | SR    | 1      | 0        | 0        | 0       | 0            |
| All | All   | 149506 | 0        | 113640   | 523     | 0            |

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 2.

All (523) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 4:L4:40:U:O2      | 5:L5:75:ARG:NH1   | 2.06                     | 0.89              |
| 3:L3:4075:U:OP1   | 45:SE:249:ARG:NH1 | 2.11                     | 0.84              |
| 2:L1:51:U:OP2     | 35:LZ:21:ARG:NH2  | 2.11                     | 0.83              |
| 3:L3:2520:C:O2    | 3:L3:2640:G:N2    | 2.11                     | 0.82              |
| 3:L3:4156:G:OP2   | 3:L3:4157:A:O2'   | 1.98                     | 0.81              |
| 37:NF:17:ARG:NH1  | 47:SG:180:TYR:OH  | 2.13                     | 0.81              |
| 3:L3:4371:G:OP1   | 31:LV:59:LYS:NZ   | 2.12                     | 0.80              |
| 3:L3:695:G:O2'    | 3:L3:697:G:OP2    | 2.00                     | 0.80              |
| 2:L1:75:OMG:OP2   | 18:LI:74:TYR:OH   | 1.99                     | 0.80              |
| 3:L3:3928:A:OP1   | 9:L9:90:ASN:ND2   | 2.14                     | 0.79              |
| 3:L3:4435:U:OP2   | 3:L3:4436:U:O2'   | 2.00                     | 0.79              |
| 22:LM:117:ARG:NH1 | 43:SC:73:TYR:O    | 2.16                     | 0.79              |
| 3:L3:2848:G:O2'   | 3:L3:3838:U:O4    | 2.01                     | 0.78              |
| 3:L3:1480:C:O2'   | 3:L3:1482:G:OP2   | 2.02                     | 0.78              |
| 3:L3:1892:A:OP1   | 3:L3:1893:C:N4    | 2.13                     | 0.78              |
| 4:L4:30:C:O2'     | 42:SB:221:LYS:NZ  | 2.13                     | 0.78              |
| 3:L3:2300:A:N6    | 41:SA:178:ASN:OD1 | 2.18                     | 0.77              |
| 2:L1:71:A:O2'     | 2:L1:83:C:N4      | 2.18                     | 0.77              |
| 3:L3:1280:C:O2'   | 41:SA:321:ASN:OD1 | 2.02                     | 0.77              |
| 3:L3:4305:G:O2'   | 3:L3:4306:OMU:O5' | 2.03                     | 0.76              |
| 3:L3:4415:A:OP1   | 37:NF:66:LYS:NZ   | 2.18                     | 0.76              |
| 3:L3:2545:U:O2'   | 3:L3:2547:G:N7    | 2.19                     | 0.76              |
| 47:SG:140:GLN:NE2 | 52:SQ:171:SER:OG  | 2.18                     | 0.76              |
| 41:SA:179:ASP:OD1 | 41:SA:204:ARG:NH2 | 2.20                     | 0.75              |
| 3:L3:1886:G:OP2   | 29:LT:19:ARG:NH2  | 2.19                     | 0.75              |
| 3:L3:502:C:O2'    | 3:L3:503:C:OP1    | 2.04                     | 0.75              |
| 46:SF:142:GLU:O   | 46:SF:143:THR:OG1 | 2.03                     | 0.75              |
| 3:L3:937:U:OP1    | 8:L8:46:ARG:NH2   | 2.20                     | 0.74              |
| 11:LB:122:THR:OG1 | 11:LB:124:ASP:OD1 | 2.05                     | 0.74              |
| 3:L3:4081:G:O2'   | 46:SF:119:LYS:NZ  | 2.20                     | 0.74              |
| 13:LD:39:GLN:OE1  | 13:LD:42:ARG:NH1  | 2.21                     | 0.74              |
| 3:L3:4693:C:O2    | 3:L3:4695:C:N4    | 2.20                     | 0.74              |
| 51:SM:357:ASP:OD2 | 51:SM:359:SER:OG  | 2.03                     | 0.74              |
| 3:L3:4927:G:OP2   | 3:L3:4927:G:N2    | 2.16                     | 0.73              |
| 2:L1:62:A:OP1     | 28:LS:52:LYS:NZ   | 2.21                     | 0.73              |
| 2:L1:12:G:OP1     | 10:LA:3:ARG:NH1   | 2.22                     | 0.72              |
| 3:L3:1397:A:HO2'  | 3:L3:1467:C:HO2'  | 1.37                     | 0.72              |
| 3:L3:151:G:OP2    | 9:L9:4:TYR:OH     | 2.07                     | 0.72              |
| 3:L3:1943:A:OP2   | 3:L3:2039:G:N2    | 2.23                     | 0.72              |
| 3:L3:295:A:OP2    | 31:LV:39:ARG:NH1  | 2.23                     | 0.72              |
| 13:LD:12:SER:OG   | 13:LD:17:CYS:O    | 2.07                     | 0.71              |
| 3:L3:1508:A:OP1   | 41:SA:110:ARG:NH2 | 2.24                     | 0.71              |

*Continued on next page...*

*Continued from previous page...*

| Atom-1            | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|--------------------|--------------------------|-------------------|
| 3:L3:1071:C:O2    | 43:SC:70:LYS:NZ    | 2.21                     | 0.71              |
| 49:SI:249:GLN:OE1 | 51:SM:267:LEU:HD21 | 1.91                     | 0.70              |
| 4:L4:55:A:O2'     | 5:L5:151:ILE:O     | 2.07                     | 0.70              |
| 3:L3:67:C:OP2     | 3:L3:312:G:N2      | 2.22                     | 0.70              |
| 3:L3:4449:A:OP1   | 53:SR:118:LYS:NZ   | 2.22                     | 0.70              |
| 3:L3:277:G:OP2    | 30:LU:29:ARG:NH2   | 2.25                     | 0.69              |
| 3:L3:4460:U:OP1   | 23:LN:10:ARG:NH1   | 2.25                     | 0.69              |
| 3:L3:2487:G:OP1   | 39:NL:456:ARG:NH2  | 2.26                     | 0.69              |
| 3:L3:4872:G:O6    | 8:L8:98:ARG:NH1    | 2.26                     | 0.69              |
| 3:L3:1518:A:OP1   | 20:LK:27:LYS:NZ    | 2.23                     | 0.69              |
| 3:L3:1943:A:N6    | 3:L3:2039:G:O2'    | 2.25                     | 0.69              |
| 3:L3:3776:G:N2    | 3:L3:3776:G:OP2    | 2.23                     | 0.69              |
| 3:L3:4620:OMU:OP2 | 3:L3:4670:C:N4     | 2.21                     | 0.69              |
| 40:NP:72:ASP:OD1  | 40:NP:73:SER:N     | 2.27                     | 0.68              |
| 3:L3:2601:A:OP1   | 27:LR:40:LYS:NZ    | 2.26                     | 0.68              |
| 51:SM:337:GLU:OE1 | 51:SM:380:ARG:NH2  | 2.26                     | 0.68              |
| 3:L3:4678:G:OP1   | 38:NK:14:ARG:NH1   | 2.26                     | 0.68              |
| 3:L3:2725:A:N6    | 13:LD:88:ARG:O     | 2.27                     | 0.68              |
| 37:NF:3:GLN:NE2   | 53:SR:207:VAL:O    | 2.27                     | 0.67              |
| 51:SM:370:ASP:OD2 | 51:SM:372:ARG:NH2  | 2.27                     | 0.67              |
| 3:L3:1255:A:OP1   | 3:L3:1257:A:N6     | 2.27                     | 0.67              |
| 3:L3:2324:C:O2'   | 26:LQ:98:GLU:OE1   | 2.12                     | 0.67              |
| 9:L9:73:ARG:HB3   | 9:L9:89:VAL:HG23   | 1.76                     | 0.67              |
| 3:L3:3734:PSU:H2' | 3:L3:3735:G:O4'    | 1.95                     | 0.67              |
| 3:L3:3717:A:OP2   | 3:L3:3735:G:N2     | 2.27                     | 0.67              |
| 3:L3:4435:U:O2'   | 53:SR:136:ARG:NH2  | 2.28                     | 0.66              |
| 17:LH:111:GLN:OE1 | 17:LH:115:LYS:NZ   | 2.28                     | 0.66              |
| 3:L3:404:U:O3'    | 18:LI:87:ARG:NH2   | 2.28                     | 0.66              |
| 3:L3:2318:G:N2    | 3:L3:2321:G:OP2    | 2.19                     | 0.66              |
| 3:L3:119:G:O4'    | 45:SE:132:ARG:NH1  | 2.29                     | 0.66              |
| 3:L3:1433:A:N6    | 3:L3:1451:G:O2'    | 2.28                     | 0.66              |
| 23:LN:141:ASP:OD2 | 38:NK:81:ARG:NH1   | 2.29                     | 0.65              |
| 3:L3:5066:U:OP1   | 10:LA:43:LYS:NZ    | 2.30                     | 0.65              |
| 53:SR:174:CYS:SG  | 53:SR:244:LEU:HD21 | 2.36                     | 0.65              |
| 3:L3:3838:U:OP2   | 40:NP:23:ARG:NH2   | 2.29                     | 0.65              |
| 43:SC:99:ASP:OD1  | 43:SC:100:LYS:N    | 2.30                     | 0.65              |
| 3:L3:2470:C:O2'   | 45:SE:56:LYS:NZ    | 2.18                     | 0.65              |
| 3:L3:121:A:OP1    | 45:SE:110:LYS:NZ   | 2.26                     | 0.65              |
| 39:NL:427:SER:OG  | 51:SM:379:ASP:OD1  | 2.15                     | 0.65              |
| 3:L3:4910:G:N2    | 7:L7:106:ASP:O     | 2.30                     | 0.65              |
| 3:L3:386:A:O2'    | 18:LI:87:ARG:NH1   | 2.29                     | 0.65              |

*Continued on next page...*

*Continued from previous page...*

| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 3:L3:2414:G:O2'    | 3:L3:2415:OMU:H5'' | 1.97                     | 0.64              |
| 3:L3:1397:A:O2'    | 3:L3:1467:C:O2'    | 2.09                     | 0.64              |
| 3:L3:62:A:N3       | 3:L3:77:U:O2'      | 2.29                     | 0.64              |
| 29:LT:49:TYR:OH    | 29:LT:95:LYS:NZ    | 2.30                     | 0.64              |
| 3:L3:4541:G:N2     | 3:L3:4544:A:OP2    | 2.28                     | 0.64              |
| 9:L9:124:ASP:OD1   | 9:L9:125:SER:N     | 2.30                     | 0.64              |
| 3:L3:4220:6MZ:H8   | 3:L3:4220:6MZ:O1P  | 1.97                     | 0.64              |
| 3:L3:4524:G:O3'    | 23:LN:246:ARG:NH2  | 2.30                     | 0.63              |
| 3:L3:1215:C:OP2    | 44:SD:59:LYS:NZ    | 2.29                     | 0.63              |
| 3:L3:1595:G:N2     | 53:SR:634:ARG:OXT  | 2.27                     | 0.63              |
| 3:L3:2072:C:OP1    | 11:LB:2:GLY:N      | 2.32                     | 0.63              |
| 3:L3:2601:A:N6     | 3:L3:2744:A:OP2    | 2.31                     | 0.63              |
| 3:L3:3681:G:N2     | 46:SF:118:GLU:OE2  | 2.29                     | 0.63              |
| 11:LB:184:ARG:NH1  | 20:LK:55:LYS:O     | 2.31                     | 0.63              |
| 14:LE:22:HIS:HB2   | 42:SB:17:GLN:HE22  | 1.64                     | 0.63              |
| 50:SK:21:ASN:ND2   | 50:SK:112:ASP:OD2  | 2.31                     | 0.63              |
| 3:L3:2588:C:OP1    | 3:L3:2768:C:O2'    | 2.14                     | 0.63              |
| 3:L3:408:A:O2'     | 3:L3:411:G:OP2     | 2.17                     | 0.63              |
| 3:L3:4580:U:O2'    | 23:LN:182:GLU:OE2  | 2.16                     | 0.62              |
| 3:L3:4765:G:OP1    | 47:SG:23:ARG:NE    | 2.32                     | 0.62              |
| 49:SI:70:ARG:NE    | 49:SI:106:ASP:O    | 2.33                     | 0.62              |
| 3:L3:1941:A:N6     | 3:L3:2040:A:OP2    | 2.32                     | 0.62              |
| 3:L3:1366:G:N2     | 3:L3:1371:A:OP2    | 2.33                     | 0.62              |
| 3:L3:1629:G:N1     | 46:SF:208:GLU:OE1  | 2.33                     | 0.62              |
| 3:L3:2843:U:O2'    | 3:L3:4632:U:OP1    | 2.18                     | 0.62              |
| 3:L3:122:U:O4      | 45:SE:107:LYS:NZ   | 2.27                     | 0.62              |
| 3:L3:375:G:OP2     | 32:LW:52:LYS:NZ    | 2.30                     | 0.62              |
| 3:L3:4124:G:N2     | 45:SE:43:GLN:O     | 2.33                     | 0.61              |
| 1:BA:138:SER:OG    | 3:L3:2002:A:N6     | 2.34                     | 0.61              |
| 3:L3:4126:C:OP1    | 45:SE:37:LYS:NZ    | 2.29                     | 0.61              |
| 3:L3:1325:C:O2'    | 3:L3:1326:A2M:OP1  | 2.15                     | 0.61              |
| 3:L3:2368:A:N6     | 3:L3:2827:G:O2'    | 2.32                     | 0.61              |
| 39:NL:258:LEU:HD23 | 39:NL:418:VAL:HG11 | 1.83                     | 0.61              |
| 3:L3:2876:OMG:HM22 | 3:L3:2877:G:H5'    | 1.82                     | 0.61              |
| 53:SR:474:ASP:O    | 53:SR:478:LEU:HD12 | 2.00                     | 0.60              |
| 3:L3:3718:A2M:H2   | 3:L3:3934:G:O4'    | 2.01                     | 0.60              |
| 6:L6:204:GLU:O     | 6:L6:207:VAL:HG22  | 2.01                     | 0.60              |
| 3:L3:508:G:O2'     | 3:L3:510:U:OP2     | 2.07                     | 0.60              |
| 4:L4:12:U:O3'      | 4:L4:109:U:O2'     | 2.16                     | 0.59              |
| 3:L3:1177:U:OP2    | 3:L3:1180:C:N4     | 2.35                     | 0.59              |
| 43:SC:281:ILE:HG23 | 43:SC:286:LEU:HD11 | 1.84                     | 0.59              |

*Continued on next page...*

*Continued from previous page...*

| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 50:SK:99:GLU:OE1   | 50:SK:125:THR:OG1  | 2.17                     | 0.59              |
| 3:L3:2000:G:O2'    | 3:L3:2017:A:N1     | 2.29                     | 0.59              |
| 3:L3:4117:U:O4'    | 45:SE:43:GLN:NE2   | 2.35                     | 0.59              |
| 16:LG:96:LEU:HD11  | 54:SV:22:VAL:HG23  | 1.84                     | 0.59              |
| 3:L3:2579:G:N2     | 3:L3:2582:A:OP2    | 2.28                     | 0.59              |
| 3:L3:2695:A:OP1    | 34:LY:35:LYS:NZ    | 2.32                     | 0.59              |
| 4:L4:7:G:OP1       | 42:SB:33:ARG:NH1   | 2.35                     | 0.59              |
| 3:L3:2350:U:O5'    | 3:L3:2351:OMC:H5'  | 2.03                     | 0.59              |
| 3:L3:2578:G:N7     | 19:LJ:17:ARG:NH1   | 2.50                     | 0.59              |
| 3:L3:4440:G:N2     | 53:SR:66:LEU:O     | 2.36                     | 0.59              |
| 3:L3:90:G:OP2      | 3:L3:92:C:N4       | 2.34                     | 0.59              |
| 3:L3:3938:G:N2     | 3:L3:4171:C:OP2    | 2.35                     | 0.58              |
| 3:L3:1514:U:OP1    | 6:L6:2:ALA:N       | 2.37                     | 0.58              |
| 25:LP:57:MET:SD    | 25:LP:90:ARG:NH1   | 2.75                     | 0.58              |
| 3:L3:1573:G:OP1    | 13:LD:92:LYS:NZ    | 2.33                     | 0.58              |
| 3:L3:4637:OMG:H2'  | 3:L3:4638:U:C6     | 2.38                     | 0.58              |
| 3:L3:1173:G:N2     | 3:L3:1188:C:N3     | 2.52                     | 0.58              |
| 3:L3:1802:A:N3     | 14:LE:130:ARG:NH2  | 2.51                     | 0.58              |
| 3:L3:2415:OMU:HM22 | 3:L3:2415:OMU:O2   | 2.04                     | 0.58              |
| 7:L7:54:TYR:OH     | 7:L7:73:PHE:O      | 2.19                     | 0.58              |
| 1:BA:119:ARG:NH1   | 3:L3:1974:U:OP2    | 2.37                     | 0.57              |
| 3:L3:4241:C:OP2    | 5:L5:145:LYS:NZ    | 2.36                     | 0.57              |
| 23:LN:222:VAL:O    | 23:LN:343:ARG:NH1  | 2.36                     | 0.57              |
| 3:L3:4305:G:HO2'   | 3:L3:4306:OMU:P    | 2.25                     | 0.57              |
| 14:LE:84:ILE:HD12  | 22:LM:21:ILE:HG22  | 1.86                     | 0.57              |
| 3:L3:109:G:OP2     | 6:L6:74:ARG:NH2    | 2.36                     | 0.57              |
| 3:L3:2763:U:O2'    | 39:NL:391:ARG:NH2  | 2.37                     | 0.57              |
| 24:LO:13:SER:O     | 24:LO:16:SER:OG    | 2.22                     | 0.57              |
| 42:SB:62:CYS:HB3   | 42:SB:105:LEU:HD22 | 1.87                     | 0.57              |
| 3:L3:2696:A:H62    | 34:LY:35:LYS:HZ2   | 1.51                     | 0.57              |
| 3:L3:4691:A:OP1    | 47:SG:75:SER:OG    | 2.21                     | 0.57              |
| 3:L3:4724:A:O2'    | 23:LN:104:THR:HG22 | 2.05                     | 0.57              |
| 15:LF:31:ASP:OD1   | 53:SR:538:HIS:N    | 2.38                     | 0.57              |
| 3:L3:1325:C:HO2'   | 3:L3:1326:A2M:P    | 2.28                     | 0.56              |
| 3:L3:4546:A:N7     | 46:SF:215:ASN:ND2  | 2.52                     | 0.56              |
| 3:L3:4431:PSU:H2'  | 3:L3:4432:C:C6     | 2.41                     | 0.56              |
| 1:BA:128:THR:O     | 1:BA:132:ILE:HD12  | 2.04                     | 0.56              |
| 3:L3:4237:C:OP1    | 3:L3:4327:C:O2'    | 2.22                     | 0.56              |
| 29:LT:110:ILE:O    | 43:SC:141:ARG:NH2  | 2.39                     | 0.56              |
| 3:L3:294:G:OP2     | 31:LV:43:ARG:NH1   | 2.37                     | 0.56              |
| 3:L3:3681:G:OP2    | 46:SF:128:ARG:NH2  | 2.39                     | 0.56              |

*Continued on next page...*

Continued from previous page...

| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 3:L3:2781:G:O2'    | 35:LZ:3:SER:O      | 2.24                     | 0.56              |
| 3:L3:4406:U:OP2    | 53:SR:131:ARG:NH1  | 2.39                     | 0.56              |
| 3:L3:1288:G:OP1    | 43:SC:134:SER:OG   | 2.22                     | 0.56              |
| 50:SK:238:ASP:OD1  | 50:SK:239:SER:N    | 2.38                     | 0.56              |
| 54:SV:4:GLU:O      | 54:SV:13:ILE:N     | 2.38                     | 0.56              |
| 3:L3:4371:G:O2'    | 3:L3:4372:U:OP2    | 2.20                     | 0.56              |
| 3:L3:4500:PSU:H2'  | 3:L3:4501:U:C6     | 2.41                     | 0.56              |
| 3:L3:4593:C:OP2    | 38:NK:2:ALA:N      | 2.39                     | 0.56              |
| 4:L4:117:G:OP1     | 42:SB:253:TYR:OH   | 2.20                     | 0.56              |
| 6:L6:7:GLY:O       | 20:LK:49:HIS:NE2   | 2.35                     | 0.56              |
| 3:L3:2415:OMU:HM23 | 3:L3:2416:G:H8     | 1.70                     | 0.55              |
| 26:LQ:26:ASP:OD1   | 26:LQ:27:ARG:N     | 2.40                     | 0.55              |
| 39:NL:239:GLU:OE2  | 39:NL:447:ARG:NH1  | 2.39                     | 0.55              |
| 2:L1:69:PSU:H2'    | 2:L1:70:G:O4'      | 2.05                     | 0.55              |
| 3:L3:2480:G:OP1    | 51:SM:22:LYS:NZ    | 2.39                     | 0.55              |
| 3:L3:1814:C:O2'    | 22:LM:42:ASN:OD1   | 2.13                     | 0.55              |
| 3:L3:1998:A:N3     | 3:L3:2019:C:O2'    | 2.35                     | 0.55              |
| 30:LU:73:ILE:O     | 30:LU:77:VAL:HG22  | 2.05                     | 0.55              |
| 3:L3:4581:G:O2'    | 23:LN:92:TYR:OH    | 2.25                     | 0.55              |
| 43:SC:161:ARG:O    | 43:SC:182:ASN:ND2  | 2.39                     | 0.55              |
| 43:SC:281:ILE:CG2  | 43:SC:286:LEU:HD11 | 2.37                     | 0.55              |
| 3:L3:4529:G:O2'    | 3:L3:4530:UR3:H5'  | 2.07                     | 0.55              |
| 6:L6:146:LEU:HD12  | 6:L6:146:LEU:O     | 2.06                     | 0.54              |
| 3:L3:431:G:N2      | 3:L3:3889:G:OP2    | 2.40                     | 0.54              |
| 3:L3:2562:G:O2'    | 3:L3:2565:A:N6     | 2.41                     | 0.54              |
| 39:NL:452:GLU:OE2  | 39:NL:454:ARG:NH1  | 2.40                     | 0.54              |
| 3:L3:369:G:N2      | 3:L3:372:A:OP2     | 2.29                     | 0.54              |
| 3:L3:5022:U:O2'    | 3:L3:5023:C:OP2    | 2.24                     | 0.54              |
| 39:NL:209:GLN:HB2  | 39:NL:214:LEU:HD11 | 1.89                     | 0.54              |
| 3:L3:4122:G:N2     | 27:LR:98:GLU:OE2   | 2.40                     | 0.54              |
| 34:LY:57:LYS:NZ    | 34:LY:68:GLU:OE2   | 2.41                     | 0.54              |
| 46:SF:27:ALA:O     | 46:SF:128:ARG:NH1  | 2.39                     | 0.54              |
| 3:L3:4581:G:HO2'   | 23:LN:92:TYR:HH    | 1.55                     | 0.54              |
| 24:LO:102:SER:O    | 24:LO:106:ARG:NH2  | 2.40                     | 0.54              |
| 3:L3:2300:A:N7     | 41:SA:143:ARG:NH1  | 2.56                     | 0.53              |
| 3:L3:2407:G:O6     | 35:LZ:2:SER:N      | 2.40                     | 0.53              |
| 3:L3:4691:A:O2'    | 47:SG:68:ALA:O     | 2.25                     | 0.53              |
| 14:LE:32:ARG:O     | 42:SB:41:LYS:NZ    | 2.29                     | 0.53              |
| 3:L3:2841:G:OP1    | 40:NP:10:HIS:NE2   | 2.39                     | 0.53              |
| 3:L3:4633:G:O2'    | 3:L3:4635:A:OP2    | 2.13                     | 0.53              |
| 45:SE:90:GLN:NE2   | 49:SI:62:GLU:OE2   | 2.41                     | 0.53              |

Continued on next page...

*Continued from previous page...*

| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 3:L3:2493:G:O4'    | 51:SM:36:ARG:NH2   | 2.41                     | 0.53              |
| 50:SK:126:GLU:OE1  | 50:SK:139:ARG:NH2  | 2.41                     | 0.53              |
| 3:L3:2835:A:O2'    | 23:LN:228:TYR:O    | 2.27                     | 0.53              |
| 19:LJ:33:THR:HG23  | 19:LJ:36:ARG:H     | 1.74                     | 0.53              |
| 19:LJ:93:LYS:O     | 19:LJ:97:ASN:ND2   | 2.41                     | 0.53              |
| 3:L3:1942:A:N6     | 3:L3:2040:A:OP2    | 2.42                     | 0.53              |
| 3:L3:1552:G:O2'    | 3:L3:1574:G:N2     | 2.33                     | 0.53              |
| 3:L3:1997:U:O3'    | 52:SQ:57:ARG:NH2   | 2.42                     | 0.53              |
| 3:L3:3868:G:O2'    | 3:L3:3869:OMC:H5'' | 2.09                     | 0.53              |
| 54:SV:53:LYS:NZ    | 54:SV:62:GLU:OE2   | 2.42                     | 0.53              |
| 3:L3:489:C:O2'     | 3:L3:667:A:N6      | 2.42                     | 0.52              |
| 3:L3:2632:PSU:H2'  | 3:L3:2633:U:C6     | 2.43                     | 0.52              |
| 3:L3:3924:C:O2'    | 3:L3:3925:OMU:H5'' | 2.07                     | 0.52              |
| 3:L3:4311:A:O2'    | 3:L3:4312:PSU:H5'' | 2.08                     | 0.52              |
| 3:L3:2922:G:O2'    | 3:L3:3275:A:N6     | 2.42                     | 0.52              |
| 7:L7:190:ASP:OD1   | 7:L7:191:LYS:N     | 2.43                     | 0.52              |
| 3:L3:155:C:OP1     | 28:LS:109:ARG:NH2  | 2.42                     | 0.52              |
| 3:L3:2487:G:O6     | 49:SI:51:LYS:NZ    | 2.37                     | 0.52              |
| 3:L3:4226:G:O2'    | 3:L3:4227:OMU:H5'' | 2.09                     | 0.52              |
| 3:L3:5001:PSU:H2'  | 3:L3:5002:U:O4'    | 2.10                     | 0.52              |
| 6:L6:70:VAL:HG12   | 6:L6:159:ASN:OD1   | 2.10                     | 0.52              |
| 7:L7:202:LEU:O     | 7:L7:202:LEU:HD23  | 2.10                     | 0.52              |
| 14:LE:84:ILE:CD1   | 22:LM:21:ILE:HG22  | 2.40                     | 0.52              |
| 3:L3:730:G:OP2     | 44:SD:76:ARG:NE    | 2.43                     | 0.52              |
| 3:L3:4536:OMC:HM22 | 3:L3:4537:C:O4'    | 2.09                     | 0.52              |
| 2:L1:71:A:OP2      | 18:LI:50:ARG:NH1   | 2.42                     | 0.52              |
| 23:LN:306:ASP:OD2  | 53:SR:428:LYS:NZ   | 2.27                     | 0.52              |
| 3:L3:1464:C:H5''   | 22:LM:32:LEU:HD12  | 1.92                     | 0.51              |
| 8:L8:55:MET:O      | 12:LC:157:ARG:NH2  | 2.43                     | 0.51              |
| 10:LA:14:SER:OG    | 10:LA:151:THR:HG22 | 2.09                     | 0.51              |
| 12:LC:173:ASN:ND2  | 12:LC:175:PHE:O    | 2.42                     | 0.51              |
| 42:SB:64:ILE:HD13  | 42:SB:109:LEU:HD22 | 1.92                     | 0.51              |
| 3:L3:718:C:OP1     | 44:SD:217:ARG:NH1  | 2.43                     | 0.51              |
| 28:LS:37:THR:O     | 28:LS:37:THR:HG22  | 2.11                     | 0.51              |
| 3:L3:3723:A:H2'    | 3:L3:3724:A2M:H8   | 1.93                     | 0.51              |
| 3:L3:4524:G:C2     | 23:LN:252:ALA:HB1  | 2.45                     | 0.51              |
| 3:L3:1534:A2M:HM'3 | 3:L3:1637:A:C4     | 2.45                     | 0.51              |
| 7:L7:185:VAL:O     | 7:L7:189:ILE:HG22  | 2.11                     | 0.51              |
| 3:L3:1185:G:O2'    | 42:SB:278:ASP:OD1  | 2.24                     | 0.51              |
| 3:L3:4645:C:OP2    | 13:LD:62:ARG:NH1   | 2.44                     | 0.51              |
| 3:L3:4670:C:O2'    | 3:L3:4672:A:OP2    | 2.27                     | 0.51              |

*Continued on next page...*



*Continued from previous page...*

| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 3:L3:2351:OMC:HM23 | 41:SA:95:MET:HG3   | 1.92                     | 0.51              |
| 41:SA:337:ARG:NH1  | 43:SC:55:GLY:O     | 2.43                     | 0.51              |
| 3:L3:1364:U:OP2    | 6:L6:36:ARG:NH2    | 2.43                     | 0.50              |
| 3:L3:2415:OMU:HM22 | 3:L3:2415:OMU:C2   | 2.41                     | 0.50              |
| 3:L3:4402:C:H2'    | 3:L3:4403:PSU:H5'' | 1.92                     | 0.50              |
| 23:LN:223:THR:HG22 | 23:LN:338:VAL:HG13 | 1.92                     | 0.50              |
| 3:L3:1438:U:O2'    | 3:L3:1439:C:OP1    | 2.29                     | 0.50              |
| 3:L3:2038:U:O2'    | 37:NF:42:MET:O     | 2.22                     | 0.50              |
| 3:L3:4635:A:H3'    | 3:L3:4636:PSU:H4'  | 1.93                     | 0.50              |
| 41:SA:154:VAL:HG11 | 41:SA:174:LEU:HD11 | 1.92                     | 0.50              |
| 52:SQ:60:TRP:HE3   | 52:SQ:63:SER:HG    | 1.57                     | 0.50              |
| 3:L3:2590:G:O2'    | 3:L3:2755:A:N6     | 2.40                     | 0.50              |
| 53:SR:55:GLN:NE2   | 53:SR:107:ASP:OD1  | 2.45                     | 0.50              |
| 3:L3:1646:A:O2'    | 32:LW:49:TRP:O     | 2.21                     | 0.50              |
| 51:SM:265:TYR:HB3  | 51:SM:362:ILE:HD11 | 1.94                     | 0.50              |
| 20:LK:38:LEU:O     | 20:LK:42:ARG:NH1   | 2.45                     | 0.50              |
| 41:SA:159:GLU:OE2  | 41:SA:253:THR:HG21 | 2.12                     | 0.49              |
| 3:L3:4605:A:N7     | 37:NF:3:GLN:HG3    | 2.26                     | 0.49              |
| 19:LJ:29:ILE:O     | 19:LJ:31:ASP:N     | 2.44                     | 0.49              |
| 3:L3:2562:G:N2     | 3:L3:2565:A:OP2    | 2.42                     | 0.49              |
| 3:L3:2838:G:O2'    | 3:L3:2839:PSU:H5'' | 2.12                     | 0.49              |
| 3:L3:1577:G:OP1    | 33:LX:17:ARG:NH2   | 2.43                     | 0.49              |
| 5:L5:136:ARG:NH1   | 5:L5:156:ARG:O     | 2.45                     | 0.49              |
| 21:LL:31:ASN:ND2   | 21:LL:40:TYR:O     | 2.46                     | 0.49              |
| 50:SK:242:ASP:OD2  | 53:SR:169:ARG:NH2  | 2.43                     | 0.49              |
| 3:L3:1521:C:O2'    | 3:L3:1522:OMG:H5'  | 2.13                     | 0.49              |
| 3:L3:4208:U:OP2    | 14:LE:4:THR:HG23   | 2.12                     | 0.49              |
| 50:SK:244:LEU:O    | 53:SR:352:LYS:NZ   | 2.41                     | 0.49              |
| 52:SQ:42:ILE:HD11  | 52:SQ:92:VAL:HG13  | 1.95                     | 0.49              |
| 3:L3:1358:G:O2'    | 3:L3:1360:G:O6     | 2.22                     | 0.49              |
| 13:LD:7:GLN:NE2    | 13:LD:35:ALA:O     | 2.45                     | 0.49              |
| 51:SM:33:ASP:OD1   | 51:SM:36:ARG:NH1   | 2.45                     | 0.49              |
| 3:L3:1238:A:OP2    | 43:SC:60:SER:OG    | 2.12                     | 0.49              |
| 27:LR:93:ARG:HG2   | 27:LR:97:ILE:HD12  | 1.94                     | 0.49              |
| 50:SK:167:ILE:HD11 | 53:SR:358:ASN:HA   | 1.95                     | 0.49              |
| 50:SK:78:ASP:OD2   | 54:SV:2:ARG:NH1    | 2.42                     | 0.48              |
| 2:L1:87:G:OP2      | 28:LS:7:ARG:NH2    | 2.46                     | 0.48              |
| 3:L3:2815:A2M:H2'  | 3:L3:2816:G:C8     | 2.47                     | 0.48              |
| 3:L3:2347:A:C4     | 26:LQ:31:ILE:HD11  | 2.49                     | 0.48              |
| 2:L1:26:C:O2'      | 41:SA:53:ALA:O     | 2.28                     | 0.48              |
| 3:L3:36:U:OP1      | 3:L3:1651:G:N2     | 2.46                     | 0.48              |

*Continued on next page...*



Continued from previous page...

| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 23:LN:217:ILE:HD11 | 23:LN:333:LEU:HD21 | 1.94                     | 0.48              |
| 52:SQ:40:LEU:HD21  | 52:SQ:102:LEU:HD22 | 1.95                     | 0.48              |
| 11:LB:89:ASP:O     | 11:LB:112:ARG:NH1  | 2.46                     | 0.48              |
| 20:LK:77:LYS:O     | 20:LK:80:THR:OG1   | 2.28                     | 0.48              |
| 39:NL:190:ARG:NH2  | 51:SM:117:ASP:OD1  | 2.44                     | 0.48              |
| 53:SR:367:ARG:NH2  | 53:SR:371:LYS:O    | 2.44                     | 0.48              |
| 2:L1:68:G:O2'      | 2:L1:69:PSU:H5''   | 2.13                     | 0.48              |
| 3:L3:1946:G:O2'    | 37:NF:36:SER:OG    | 2.25                     | 0.48              |
| 39:NL:384:GLU:OE2  | 39:NL:388:ARG:NE   | 2.47                     | 0.48              |
| 3:L3:1420:A:O2'    | 3:L3:1500:A:O2'    | 2.18                     | 0.47              |
| 3:L3:3841:OMC:H1'  | 3:L3:3841:OMC:HM23 | 1.50                     | 0.47              |
| 13:LD:105:LEU:HD11 | 13:LD:109:TYR:CZ   | 2.49                     | 0.47              |
| 23:LN:95:THR:OG1   | 23:LN:98:GLY:O     | 2.22                     | 0.47              |
| 50:SK:6:SER:HA     | 50:SK:13:ILE:HD11  | 1.96                     | 0.47              |
| 53:SR:285:ILE:HD11 | 53:SR:338:ARG:HD2  | 1.96                     | 0.47              |
| 38:NK:86:LEU:HB2   | 38:NK:105:LEU:HD21 | 1.95                     | 0.47              |
| 51:SM:170:HIS:HB3  | 51:SM:283:LEU:HD11 | 1.97                     | 0.47              |
| 3:L3:4139:G:H21    | 3:L3:4140:C:N4     | 2.12                     | 0.47              |
| 23:LN:370:THR:O    | 23:LN:370:THR:HG22 | 2.15                     | 0.47              |
| 27:LR:44:SER:OG    | 27:LR:46:CYS:SG    | 2.68                     | 0.47              |
| 3:L3:2258:C:N3     | 43:SC:90:ALA:N     | 2.62                     | 0.47              |
| 3:L3:2296:G:O2'    | 41:SA:242:PRO:O    | 2.32                     | 0.47              |
| 3:L3:1326:A2M:HM'3 | 3:L3:1326:A2M:H1'  | 1.59                     | 0.47              |
| 3:L3:2000:G:O6     | 52:SQ:54:LYS:NZ    | 2.34                     | 0.47              |
| 3:L3:5022:U:HO2'   | 3:L3:5023:C:P      | 2.38                     | 0.47              |
| 53:SR:477:MET:SD   | 53:SR:480:ILE:HD11 | 2.55                     | 0.47              |
| 3:L3:1279:A:O2'    | 3:L3:1281:G:N7     | 2.41                     | 0.47              |
| 19:LJ:76:ASN:OD1   | 19:LJ:77:TYR:N     | 2.48                     | 0.47              |
| 43:SC:50:LEU:HD23  | 43:SC:50:LEU:H     | 1.79                     | 0.47              |
| 3:L3:1895:G:OP1    | 44:SD:96:ARG:NH2   | 2.48                     | 0.46              |
| 13:LD:126:LYS:O    | 13:LD:131:VAL:HG22 | 2.15                     | 0.46              |
| 19:LJ:5:MET:O      | 19:LJ:28:ASN:ND2   | 2.48                     | 0.46              |
| 3:L3:2861:OMC:H1'  | 3:L3:2861:OMC:HM23 | 1.48                     | 0.46              |
| 3:L3:3920:PSU:H2'  | 3:L3:3921:U:C6     | 2.50                     | 0.46              |
| 3:L3:4768:G:OP1    | 7:L7:168:TYR:OH    | 2.32                     | 0.46              |
| 7:L7:203:VAL:HG22  | 7:L7:203:VAL:O     | 2.15                     | 0.46              |
| 3:L3:1523:A:O2'    | 3:L3:1524:A2M:H5'  | 2.16                     | 0.46              |
| 3:L3:2363:A2M:H2'  | 3:L3:2364:OMG:O4'  | 2.16                     | 0.46              |
| 3:L3:2724:G:O2'    | 3:L3:2726:G:OP2    | 2.24                     | 0.46              |
| 3:L3:1210:C:H41    | 44:SD:66:ARG:CZ    | 2.28                     | 0.46              |
| 14:LE:30:TYR:O     | 42:SB:41:LYS:NZ    | 2.36                     | 0.46              |

Continued on next page...

*Continued from previous page...*

| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 21:LL:112:ARG:NH1  | 43:SC:117:PRO:O    | 2.44                     | 0.46              |
| 45:SE:58:PRO:HD2   | 45:SE:61:ILE:HD12  | 1.97                     | 0.46              |
| 3:L3:1666:C:O2'    | 3:L3:1688:G:OP1    | 2.27                     | 0.46              |
| 3:L3:1874:A:O2'    | 3:L3:4219:A:N3     | 2.41                     | 0.46              |
| 3:L3:1921:C:O2'    | 12:LC:160:ARG:NH2  | 2.43                     | 0.46              |
| 50:SK:42:LEU:HD21  | 50:SK:203:CYS:SG   | 2.56                     | 0.46              |
| 3:L3:690:C:OP1     | 21:LL:87:ARG:NH1   | 2.48                     | 0.46              |
| 3:L3:2422:OMC:HM23 | 3:L3:2422:OMC:H1'  | 1.51                     | 0.46              |
| 6:L6:63:THR:HG21   | 20:LK:66:ASN:HB3   | 1.98                     | 0.46              |
| 10:LA:40:HIS:NE2   | 10:LA:110:ASP:O    | 2.44                     | 0.46              |
| 31:LV:23:VAL:HG12  | 31:LV:70:LEU:HD23  | 1.98                     | 0.46              |
| 34:LY:56:LEU:HD21  | 39:NL:371:LEU:HD21 | 1.97                     | 0.46              |
| 39:NL:478:LEU:HD11 | 48:SH:101:ILE:HD13 | 1.97                     | 0.46              |
| 41:SA:340:ILE:HD13 | 43:SC:51:VAL:HG21  | 1.98                     | 0.46              |
| 43:SC:100:LYS:HD2  | 43:SC:100:LYS:O    | 2.16                     | 0.46              |
| 3:L3:982:U:O5'     | 43:SC:73:TYR:OH    | 2.34                     | 0.46              |
| 3:L3:1633:G:O2'    | 3:L3:1634:A:OP2    | 2.32                     | 0.46              |
| 3:L3:1676:C:OP2    | 3:L3:1677:PSU:N1   | 2.48                     | 0.46              |
| 3:L3:2306:G:OP1    | 26:LQ:128:ARG:NH1  | 2.49                     | 0.46              |
| 23:LN:67:VAL:O     | 23:LN:67:VAL:HG22  | 2.16                     | 0.46              |
| 39:NL:225:PRO:HD2  | 39:NL:228:LEU:HD12 | 1.96                     | 0.46              |
| 44:SD:53:LYS:NZ    | 44:SD:189:ASP:OD2  | 2.31                     | 0.46              |
| 47:SG:41:ILE:HG21  | 47:SG:73:ILE:HD11  | 1.97                     | 0.45              |
| 51:SM:175:ALA:HB2  | 51:SM:242:LEU:HD11 | 1.97                     | 0.45              |
| 1:BA:135:THR:HG22  | 3:L3:1974:U:O4     | 2.17                     | 0.45              |
| 15:LF:111:GLU:OE2  | 15:LF:113:ARG:NH2  | 2.44                     | 0.45              |
| 18:LI:109:LEU:HD22 | 18:LI:115:ARG:HH21 | 1.81                     | 0.45              |
| 3:L3:2280:G:HO2'   | 3:L3:2281:U:H6     | 1.65                     | 0.45              |
| 3:L3:2809:G:O2'    | 3:L3:4644:G:OP1    | 2.31                     | 0.45              |
| 16:LG:112:MET:HE1  | 16:LG:117:ILE:HD11 | 1.97                     | 0.45              |
| 50:SK:175:SER:O    | 50:SK:178:GLN:NE2  | 2.50                     | 0.45              |
| 53:SR:170:THR:HG23 | 53:SR:249:ALA:HB2  | 1.97                     | 0.45              |
| 3:L3:4717:A:OP2    | 23:LN:30:LYS:NZ    | 2.43                     | 0.45              |
| 45:SE:103:ARG:NH2  | 45:SE:192:ARG:O    | 2.50                     | 0.45              |
| 3:L3:5039:U:OP1    | 54:SV:111:ARG:NH1  | 2.50                     | 0.45              |
| 6:L6:116:ARG:NH2   | 6:L6:155:MET:O     | 2.44                     | 0.45              |
| 30:LU:81:ILE:H     | 30:LU:81:ILE:HD12  | 1.80                     | 0.45              |
| 3:L3:131:C:N4      | 3:L3:138:G:O6      | 2.50                     | 0.45              |
| 6:L6:129:ARG:NH1   | 28:LS:116:LEU:O    | 2.50                     | 0.45              |
| 6:L6:130:LYS:HE2   | 6:L6:133:ALA:HB3   | 1.98                     | 0.45              |
| 13:LD:7:GLN:OE1    | 13:LD:7:GLN:N      | 2.49                     | 0.45              |

*Continued on next page...*

*Continued from previous page...*

| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 25:LP:95:ASP:OD1   | 25:LP:96:GLU:N     | 2.49                     | 0.45              |
| 45:SE:45:ILE:HD12  | 45:SE:45:ILE:H     | 1.82                     | 0.45              |
| 3:L3:4623:OMG:N2   | 23:LN:279:GLU:OE2  | 2.37                     | 0.45              |
| 3:L3:373:G:OP2     | 32:LW:36:LYS:NZ    | 2.47                     | 0.44              |
| 3:L3:1950:U:O2'    | 12:LC:116:ARG:NH1  | 2.50                     | 0.44              |
| 32:LW:21:ARG:NH2   | 32:LW:41:ALA:O     | 2.39                     | 0.44              |
| 3:L3:3718:A2M:H2'  | 3:L3:3719:A:C8     | 2.51                     | 0.44              |
| 3:L3:66:A:O2'      | 3:L3:326:C:O2      | 2.35                     | 0.44              |
| 3:L3:3718:A2M:H2   | 3:L3:3934:G:C1'    | 2.47                     | 0.44              |
| 3:L3:1340:OMC:H1'  | 3:L3:1340:OMC:HM23 | 1.50                     | 0.44              |
| 3:L3:2815:A2M:H2'  | 3:L3:2816:G:H8     | 1.83                     | 0.44              |
| 3:L3:3700:C:O2'    | 3:L3:3774:A:N3     | 2.43                     | 0.44              |
| 19:LJ:10:VAL:HG11  | 19:LJ:129:TRP:HZ3  | 1.82                     | 0.44              |
| 3:L3:4678:G:N7     | 38:NK:11:ARG:NH2   | 2.65                     | 0.44              |
| 23:LN:10:ARG:NH1   | 23:LN:14:LEU:HD11  | 2.33                     | 0.44              |
| 46:SF:36:GLU:OE2   | 46:SF:163:ARG:NH1  | 2.41                     | 0.44              |
| 53:SR:480:ILE:HD12 | 54:SV:124:ILE:HD13 | 1.99                     | 0.44              |
| 3:L3:1548:G:O2'    | 3:L3:2812:A:N3     | 2.42                     | 0.44              |
| 3:L3:1860:PSU:H2'  | 3:L3:1861:U:C6     | 2.52                     | 0.44              |
| 5:L5:10:ASN:OD1    | 5:L5:11:PRO:HD2    | 2.17                     | 0.44              |
| 3:L3:1461:C:OP1    | 11:LB:144:LYS:NZ   | 2.46                     | 0.44              |
| 3:L3:2097:U:O3'    | 3:L3:2098:G:H4'    | 2.18                     | 0.44              |
| 3:L3:4578:G:O2'    | 3:L3:4579:PSU:H5'' | 2.17                     | 0.44              |
| 48:SH:79:SER:O     | 48:SH:83:GLY:N     | 2.46                     | 0.44              |
| 3:L3:404:U:O2'     | 18:LI:87:ARG:NH2   | 2.51                     | 0.44              |
| 3:L3:3744:OMG:H1'  | 3:L3:3744:OMG:HM23 | 1.56                     | 0.44              |
| 24:LO:31:TYR:OH    | 24:LO:59:GLU:OE1   | 2.31                     | 0.44              |
| 26:LQ:84:GLU:O     | 26:LQ:87:VAL:HG22  | 2.17                     | 0.44              |
| 48:SH:110:LEU:HD12 | 48:SH:115:LEU:HD21 | 1.98                     | 0.44              |
| 3:L3:2470:C:C2'    | 45:SE:56:LYS:HZ3   | 2.25                     | 0.43              |
| 6:L6:63:THR:HG22   | 6:L6:64:VAL:N      | 2.33                     | 0.43              |
| 21:LL:32:LEU:O     | 21:LL:113:ARG:NH1  | 2.51                     | 0.43              |
| 30:LU:63:VAL:HG12  | 30:LU:63:VAL:O     | 2.18                     | 0.43              |
| 44:SD:171:ASP:OD1  | 44:SD:172:ASN:N    | 2.51                     | 0.43              |
| 3:L3:1532:G:OP2    | 32:LW:31:LYS:NZ    | 2.50                     | 0.43              |
| 36:NC:168:GLU:O    | 36:NC:171:THR:N    | 2.50                     | 0.43              |
| 3:L3:2351:OMC:HM22 | 3:L3:2352:U:H5'    | 2.00                     | 0.43              |
| 3:L3:3717:A:H2'    | 3:L3:3718:A2M:H8   | 2.01                     | 0.43              |
| 3:L3:3867:A2M:HM'2 | 3:L3:3867:A2M:H1'  | 1.54                     | 0.43              |
| 3:L3:4249:G:O2'    | 5:L5:98:ASN:O      | 2.30                     | 0.43              |
| 3:L3:4457:PSU:H1'  | 23:LN:252:ALA:HB3  | 2.00                     | 0.43              |

*Continued on next page...*

*Continued from previous page...*

| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 9:L9:143:ARG:HH11  | 28:LS:95:LEU:HD23  | 1.83                     | 0.43              |
| 39:NL:254:HIS:CE1  | 39:NL:258:LEU:HD11 | 2.54                     | 0.43              |
| 2:L1:75:OMG:H1'    | 2:L1:75:OMG:HM23   | 1.47                     | 0.43              |
| 3:L3:2759:G:O2'    | 3:L3:2760:G:O4'    | 2.30                     | 0.43              |
| 34:LY:54:GLU:O     | 34:LY:58:GLN:NE2   | 2.51                     | 0.43              |
| 1:BA:125:LEU:O     | 1:BA:128:THR:OG1   | 2.26                     | 0.43              |
| 3:L3:1515:A:OP1    | 20:LK:33:GLY:N     | 2.46                     | 0.43              |
| 3:L3:2263:A:OP1    | 21:LL:107:ARG:NH2  | 2.51                     | 0.43              |
| 53:SR:172:LEU:HD23 | 53:SR:244:LEU:HD23 | 2.00                     | 0.43              |
| 3:L3:351:C:OP2     | 41:SA:197:ARG:NH1  | 2.50                     | 0.43              |
| 3:L3:2340:C:H4'    | 41:SA:42:THR:HG23  | 2.00                     | 0.43              |
| 3:L3:4305:G:H4'    | 3:L3:4306:OMU:OP1  | 2.18                     | 0.43              |
| 3:L3:4468:U:HO2'   | 38:NK:2:ALA:N      | 2.17                     | 0.43              |
| 3:L3:4576:PSU:H2'  | 3:L3:4577:U:C6     | 2.54                     | 0.43              |
| 49:SI:193:CYS:SG   | 49:SI:194:LEU:N    | 2.91                     | 0.43              |
| 23:LN:107:ALA:HB2  | 23:LN:201:LEU:HG   | 2.00                     | 0.43              |
| 3:L3:442:G:OP1     | 29:LT:68:ARG:NH1   | 2.47                     | 0.43              |
| 3:L3:1590:C:O2'    | 40:NP:5:ARG:NH2    | 2.52                     | 0.43              |
| 23:LN:29:VAL:HG13  | 23:LN:348:ARG:HD3  | 2.00                     | 0.43              |
| 53:SR:44:ARG:NH2   | 53:SR:120:GLY:O    | 2.46                     | 0.43              |
| 3:L3:2487:G:OP2    | 51:SM:152:LYS:NZ   | 2.41                     | 0.42              |
| 3:L3:4620:OMU:H1'  | 3:L3:4620:OMU:HM23 | 1.72                     | 0.42              |
| 20:LK:145:VAL:HG13 | 30:LU:5:TYR:CE1    | 2.54                     | 0.42              |
| 3:L3:1797:G:OP1    | 44:SD:104:LYS:NZ   | 2.52                     | 0.42              |
| 48:SH:123:PRO:O    | 48:SH:126:VAL:HG12 | 2.19                     | 0.42              |
| 3:L3:2837:OMU:HM23 | 3:L3:2837:OMU:H1'  | 1.58                     | 0.42              |
| 3:L3:5068:G:N2     | 3:L3:5069:U:O4     | 2.45                     | 0.42              |
| 3:L3:3899:OMG:HM23 | 3:L3:3899:OMG:H1'  | 1.62                     | 0.42              |
| 3:L3:3925:OMU:HM23 | 3:L3:3925:OMU:H1'  | 1.57                     | 0.42              |
| 3:L3:4219:A:O2'    | 3:L3:4220:6MZ:O5'  | 2.23                     | 0.42              |
| 4:L4:74:A:N3       | 12:LC:53:LYS:NZ    | 2.67                     | 0.42              |
| 3:L3:2624:G:OP2    | 15:LF:97:ARG:NH2   | 2.52                     | 0.42              |
| 3:L3:496:G:O2'     | 3:L3:497:G:OP1     | 2.29                     | 0.42              |
| 3:L3:4457:PSU:O4   | 23:LN:252:ALA:HB3  | 2.20                     | 0.42              |
| 3:L3:2691:U:C2     | 3:L3:2692:U:C5     | 3.08                     | 0.42              |
| 3:L3:3620:G:OP1    | 3:L3:3622:C:N4     | 2.53                     | 0.42              |
| 5:L5:63:ARG:CD     | 31:LV:103:VAL:HG11 | 2.50                     | 0.42              |
| 23:LN:224:LYS:HG2  | 23:LN:340:THR:HG22 | 2.02                     | 0.42              |
| 24:LO:14:ILE:HD13  | 24:LO:17:ARG:NH2   | 2.35                     | 0.42              |
| 41:SA:209:ILE:HD11 | 41:SA:227:ILE:HD12 | 2.02                     | 0.42              |
| 42:SB:64:ILE:CD1   | 42:SB:109:LEU:HD22 | 2.49                     | 0.42              |

*Continued on next page...*

*Continued from previous page...*

| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 3:L3:453:G:H1      | 3:L3:1293:G:H22    | 1.68                     | 0.42              |
| 3:L3:3718:A2M:H1'  | 3:L3:3718:A2M:HM'3 | 1.64                     | 0.42              |
| 18:LI:79:VAL:HG21  | 18:LI:98:GLY:HA3   | 2.01                     | 0.42              |
| 3:L3:4530:UR3:H6   | 3:L3:4530:UR3:O5'  | 2.20                     | 0.42              |
| 6:L6:94:ILE:HG23   | 6:L6:124:LEU:HD21  | 2.02                     | 0.42              |
| 12:LC:45:TRP:HA    | 12:LC:48:VAL:HG12  | 2.02                     | 0.42              |
| 3:L3:2364:OMG:HM23 | 3:L3:2364:OMG:H1'  | 1.48                     | 0.41              |
| 6:L6:100:PRO:O     | 30:LU:25:ARG:NH1   | 2.45                     | 0.41              |
| 12:LC:38:VAL:HG13  | 44:SD:237:GLU:OE1  | 2.20                     | 0.41              |
| 3:L3:1677:PSU:H4'  | 3:L3:1680:G:C2     | 2.56                     | 0.41              |
| 8:L8:36:ALA:HB2    | 8:L8:52:PHE:CE1    | 2.56                     | 0.41              |
| 23:LN:220:ILE:HG12 | 23:LN:278:THR:HG23 | 2.03                     | 0.41              |
| 26:LQ:89:LEU:HD13  | 26:LQ:118:LEU:HD22 | 2.02                     | 0.41              |
| 35:LZ:12:PHE:CD2   | 35:LZ:51:LEU:HD22  | 2.55                     | 0.41              |
| 51:SM:120:ILE:HD11 | 51:SM:229:THR:HB   | 2.02                     | 0.41              |
| 3:L3:2427:G:OP1    | 13:LD:5:ARG:NH2    | 2.53                     | 0.41              |
| 21:LL:39:ARG:NH1   | 21:LL:105:ASP:OD2  | 2.52                     | 0.41              |
| 50:SK:163:PRO:O    | 53:SR:358:ASN:ND2  | 2.52                     | 0.41              |
| 52:SQ:209:ASP:OD2  | 52:SQ:211:GLN:NE2  | 2.47                     | 0.41              |
| 3:L3:1096:C:O2     | 3:L3:1200:G:N2     | 2.53                     | 0.41              |
| 3:L3:1577:G:O2'    | 3:L3:1612:G:H4'    | 2.20                     | 0.41              |
| 3:L3:2415:OMU:O5'  | 3:L3:2415:OMU:H6   | 2.20                     | 0.41              |
| 38:NK:82:ASN:O     | 38:NK:86:LEU:N     | 2.44                     | 0.41              |
| 3:L3:49:U:OP2      | 9:L9:189:ARG:NH1   | 2.52                     | 0.41              |
| 3:L3:2876:OMG:C8   | 33:LX:16:THR:HG22  | 2.56                     | 0.41              |
| 53:SR:272:PHE:CZ   | 53:SR:284:LEU:HD21 | 2.56                     | 0.41              |
| 3:L3:1534:A2M:HM'2 | 3:L3:1535:C:C6     | 2.56                     | 0.41              |
| 3:L3:3715:PSU:H2'  | 3:L3:3716:C:O4'    | 2.20                     | 0.41              |
| 22:LM:35:VAL:HG12  | 22:LM:36:ASP:N     | 2.36                     | 0.41              |
| 39:NL:257:LEU:HG   | 39:NL:418:VAL:HG22 | 2.03                     | 0.41              |
| 53:SR:292:ASP:OD1  | 53:SR:293:VAL:N    | 2.53                     | 0.41              |
| 1:BA:138:SER:HG    | 3:L3:2002:A:N6     | 2.18                     | 0.41              |
| 3:L3:3627:OMG:HM23 | 3:L3:3627:OMG:H1'  | 1.70                     | 0.41              |
| 3:L3:4618:OMG:H5'' | 16:LG:15:ARG:HB2   | 2.03                     | 0.41              |
| 9:L9:165:THR:HG22  | 9:L9:166:SER:N     | 2.35                     | 0.41              |
| 17:LH:138:VAL:O    | 17:LH:138:VAL:HG23 | 2.20                     | 0.41              |
| 53:SR:341:ALA:O    | 53:SR:344:VAL:HG22 | 2.21                     | 0.41              |
| 3:L3:1952:G:H4'    | 12:LC:93:MET:HB2   | 2.03                     | 0.41              |
| 3:L3:4993:G:H22    | 3:L3:5058:A:H2     | 1.69                     | 0.41              |
| 39:NL:416:ILE:HG22 | 39:NL:418:VAL:HG23 | 2.03                     | 0.41              |
| 3:L3:2407:G:OP2    | 3:L3:2407:G:N2     | 2.50                     | 0.41              |

*Continued on next page...*

Continued from previous page...

| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 3:L3:4227:OMU:H1'  | 3:L3:4227:OMU:HM23 | 1.58                     | 0.41              |
| 3:L3:4431:PSU:H2'  | 3:L3:4432:C:H6     | 1.82                     | 0.41              |
| 3:L3:4637:OMG:HM23 | 3:L3:4637:OMG:H1'  | 1.70                     | 0.41              |
| 3:L3:5002:U:OP2    | 23:LN:385:LYS:NZ   | 2.38                     | 0.41              |
| 24:LO:14:ILE:HD13  | 24:LO:17:ARG:HH21  | 1.86                     | 0.41              |
| 41:SA:39:PHE:O     | 41:SA:43:ASN:ND2   | 2.53                     | 0.41              |
| 49:SI:101:ARG:NH1  | 49:SI:122:LYS:O    | 2.54                     | 0.41              |
| 50:SK:116:LEU:HD11 | 50:SK:177:LEU:HD11 | 2.03                     | 0.41              |
| 51:SM:265:TYR:OH   | 51:SM:358:LYS:O    | 2.34                     | 0.41              |
| 51:SM:412:GLU:OE1  | 51:SM:412:GLU:N    | 2.51                     | 0.41              |
| 3:L3:308:G:OP2     | 3:L3:308:G:N2      | 2.36                     | 0.41              |
| 3:L3:911:U:H2'     | 3:L3:912:G:O4'     | 2.21                     | 0.41              |
| 3:L3:1952:G:OP1    | 12:LC:139:ARG:NE   | 2.54                     | 0.41              |
| 6:L6:186:ARG:HG2   | 30:LU:9:VAL:HG21   | 2.02                     | 0.41              |
| 37:Nf:12:LYS:NZ    | 53:SR:194:ASP:OD2  | 2.49                     | 0.41              |
| 21:LL:20:ARG:NH1   | 26:LQ:78:LEU:O     | 2.49                     | 0.40              |
| 24:LO:78:ASN:OD1   | 24:LO:79:ILE:N     | 2.54                     | 0.40              |
| 53:SR:258:SER:OG   | 53:SR:293:VAL:HG11 | 2.21                     | 0.40              |
| 3:L3:2422:OMC:OP1  | 10:LA:127:ARG:NH2  | 2.47                     | 0.40              |
| 11:LB:34:PHE:CD2   | 41:SA:293:LEU:HD22 | 2.56                     | 0.40              |
| 47:SG:120:GLU:OE1  | 47:SG:124:ARG:NH1  | 2.54                     | 0.40              |
| 53:SR:225:ILE:HG13 | 53:SR:271:LEU:HD21 | 2.03                     | 0.40              |
| 3:L3:4370:OMG:H4'  | 31:LV:64:LYS:HE3   | 2.02                     | 0.40              |
| 33:LX:69:TRP:NE1   | 46:SF:173:GLY:O    | 2.55                     | 0.40              |
| 49:SI:98:PHE:HB2   | 49:SI:152:PRO:HG3  | 2.03                     | 0.40              |
| 3:L3:1961:G:OP1    | 52:SQ:69:LYS:NZ    | 2.36                     | 0.40              |
| 3:L3:2626:U:OP2    | 53:SR:501:LYS:NZ   | 2.51                     | 0.40              |
| 3:L3:4280:A:N6     | 42:SB:28:THR:O     | 2.51                     | 0.40              |
| 10:LA:50:ASP:O     | 10:LA:54:GLN:N     | 2.55                     | 0.40              |
| 10:LA:120:ASN:O    | 10:LA:145:HIS:N    | 2.49                     | 0.40              |

There are no symmetry-related clashes.

## 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   | BA    | 158/165 (96%) | 157 (99%)  | 1 (1%)  | 0        | 100         | 100 |
| 5   | L5    | 166/178 (93%) | 164 (99%)  | 2 (1%)  | 0        | 100         | 100 |
| 6   | L6    | 208/211 (99%) | 204 (98%)  | 4 (2%)  | 0        | 100         | 100 |
| 7   | L7    | 199/203 (98%) | 198 (100%) | 1 (0%)  | 0        | 100         | 100 |
| 8   | L8    | 133/215 (62%) | 131 (98%)  | 2 (2%)  | 0        | 100         | 100 |
| 9   | L9    | 201/204 (98%) | 197 (98%)  | 4 (2%)  | 0        | 100         | 100 |
| 10  | LA    | 151/184 (82%) | 146 (97%)  | 5 (3%)  | 0        | 100         | 100 |
| 11  | LB    | 185/188 (98%) | 181 (98%)  | 4 (2%)  | 0        | 100         | 100 |
| 12  | LC    | 174/176 (99%) | 171 (98%)  | 3 (2%)  | 0        | 100         | 100 |
| 13  | LD    | 152/196 (78%) | 151 (99%)  | 1 (1%)  | 0        | 100         | 100 |
| 14  | LE    | 150/160 (94%) | 146 (97%)  | 4 (3%)  | 0        | 100         | 100 |
| 15  | LF    | 101/128 (79%) | 100 (99%)  | 1 (1%)  | 0        | 100         | 100 |
| 16  | LG    | 137/140 (98%) | 135 (98%)  | 2 (2%)  | 0        | 100         | 100 |
| 17  | LH    | 141/156 (90%) | 141 (100%) | 0       | 0        | 100         | 100 |
| 18  | LI    | 132/145 (91%) | 131 (99%)  | 1 (1%)  | 0        | 100         | 100 |
| 19  | LJ    | 133/136 (98%) | 131 (98%)  | 2 (2%)  | 0        | 100         | 100 |
| 20  | LK    | 145/148 (98%) | 144 (99%)  | 1 (1%)  | 0        | 100         | 100 |
| 21  | LL    | 123/137 (90%) | 120 (98%)  | 3 (2%)  | 0        | 100         | 100 |
| 22  | LM    | 87/159 (55%)  | 86 (99%)   | 1 (1%)  | 0        | 100         | 100 |
| 23  | LN    | 399/403 (99%) | 392 (98%)  | 7 (2%)  | 0        | 100         | 100 |
| 24  | LO    | 93/115 (81%)  | 93 (100%)  | 0       | 0        | 100         | 100 |
| 25  | LP    | 104/125 (83%) | 104 (100%) | 0       | 0        | 100         | 100 |
| 26  | LQ    | 126/135 (93%) | 126 (100%) | 0       | 0        | 100         | 100 |
| 27  | LR    | 110/117 (94%) | 109 (99%)  | 1 (1%)  | 0        | 100         | 100 |
| 28  | LS    | 120/123 (98%) | 119 (99%)  | 1 (1%)  | 0        | 100         | 100 |
| 29  | LT    | 107/110 (97%) | 107 (100%) | 0       | 0        | 100         | 100 |
| 30  | LU    | 100/105 (95%) | 100 (100%) | 0       | 0        | 100         | 100 |
| 31  | LV    | 102/106 (96%) | 100 (98%)  | 2 (2%)  | 0        | 100         | 100 |
| 32  | LW    | 84/97 (87%)   | 83 (99%)   | 1 (1%)  | 0        | 100         | 100 |
| 33  | LX    | 89/92 (97%)   | 87 (98%)   | 2 (2%)  | 0        | 100         | 100 |

*Continued on next page...*



Continued from previous page...

| Mol | Chain | Analysed         | Favoured   | Allowed  | Outliers | Percentiles |     |
|-----|-------|------------------|------------|----------|----------|-------------|-----|
| 34  | LY    | 67/70 (96%)      | 67 (100%)  | 0        | 0        | 100         | 100 |
| 35  | LZ    | 48/51 (94%)      | 47 (98%)   | 1 (2%)   | 0        | 100         | 100 |
| 36  | NC    | 42/731 (6%)      | 42 (100%)  | 0        | 0        | 100         | 100 |
| 37  | NF    | 69/260 (26%)     | 68 (99%)   | 1 (1%)   | 0        | 100         | 100 |
| 38  | NK    | 63/129 (49%)     | 63 (100%)  | 0        | 0        | 100         | 100 |
| 39  | NL    | 259/478 (54%)    | 258 (100%) | 1 (0%)   | 0        | 100         | 100 |
| 40  | NP    | 100/134 (75%)    | 100 (100%) | 0        | 0        | 100         | 100 |
| 41  | SA    | 356/427 (83%)    | 351 (99%)  | 5 (1%)   | 0        | 100         | 100 |
| 42  | SB    | 273/297 (92%)    | 270 (99%)  | 3 (1%)   | 0        | 100         | 100 |
| 43  | SC    | 211/288 (73%)    | 206 (98%)  | 5 (2%)   | 0        | 100         | 100 |
| 44  | SD    | 223/248 (90%)    | 217 (97%)  | 6 (3%)   | 0        | 100         | 100 |
| 45  | SE    | 228/266 (86%)    | 226 (99%)  | 2 (1%)   | 0        | 100         | 100 |
| 46  | SF    | 243/257 (95%)    | 236 (97%)  | 7 (3%)   | 0        | 100         | 100 |
| 47  | SG    | 188/192 (98%)    | 186 (99%)  | 2 (1%)   | 0        | 100         | 100 |
| 48  | SH    | 91/293 (31%)     | 90 (99%)   | 1 (1%)   | 0        | 100         | 100 |
| 49  | SI    | 233/255 (91%)    | 230 (99%)  | 3 (1%)   | 0        | 100         | 100 |
| 50  | SK    | 242/245 (99%)    | 234 (97%)  | 8 (3%)   | 0        | 100         | 100 |
| 51  | SM    | 393/588 (67%)    | 389 (99%)  | 4 (1%)   | 0        | 100         | 100 |
| 52  | SQ    | 215/239 (90%)    | 214 (100%) | 1 (0%)   | 0        | 100         | 100 |
| 53  | SR    | 595/634 (94%)    | 589 (99%)  | 5 (1%)   | 1 (0%)   | 47          | 60  |
| 54  | SV    | 137/163 (84%)    | 135 (98%)  | 2 (2%)   | 0        | 100         | 100 |
| All | All   | 8586/11002 (78%) | 8472 (99%) | 113 (1%) | 1 (0%)   | 100         | 100 |

All (1) Ramachandran outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 53  | SR    | 88  | ASP  |

### 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   | BA    | 53/137 (39%)   | 53 (100%)  | 0        | 100         | 100 |
| 5   | L5    | 142/149 (95%)  | 142 (100%) | 0        | 100         | 100 |
| 6   | L6    | 176/177 (99%)  | 176 (100%) | 0        | 100         | 100 |
| 7   | L7    | 173/174 (99%)  | 173 (100%) | 0        | 100         | 100 |
| 8   | L8    | 115/161 (71%)  | 115 (100%) | 0        | 100         | 100 |
| 9   | L9    | 171/172 (99%)  | 171 (100%) | 0        | 100         | 100 |
| 10  | LA    | 134/163 (82%)  | 134 (100%) | 0        | 100         | 100 |
| 11  | LB    | 164/165 (99%)  | 164 (100%) | 0        | 100         | 100 |
| 12  | LC    | 157/157 (100%) | 157 (100%) | 0        | 100         | 100 |
| 13  | LD    | 138/175 (79%)  | 138 (100%) | 0        | 100         | 100 |
| 14  | LE    | 136/140 (97%)  | 136 (100%) | 0        | 100         | 100 |
| 15  | LF    | 93/115 (81%)   | 92 (99%)   | 1 (1%)   | 73          | 83  |
| 16  | LG    | 106/107 (99%)  | 106 (100%) | 0        | 100         | 100 |
| 17  | LH    | 124/133 (93%)  | 124 (100%) | 0        | 100         | 100 |
| 18  | LI    | 124/135 (92%)  | 124 (100%) | 0        | 100         | 100 |
| 19  | LJ    | 117/118 (99%)  | 117 (100%) | 0        | 100         | 100 |
| 20  | LK    | 120/121 (99%)  | 120 (100%) | 0        | 100         | 100 |
| 21  | LL    | 109/121 (90%)  | 109 (100%) | 0        | 100         | 100 |
| 22  | LM    | 77/126 (61%)   | 75 (97%)   | 2 (3%)   | 46          | 61  |
| 23  | LN    | 347/348 (100%) | 346 (100%) | 1 (0%)   | 92          | 96  |
| 24  | LO    | 80/97 (82%)    | 80 (100%)  | 0        | 100         | 100 |
| 25  | LP    | 97/110 (88%)   | 97 (100%)  | 0        | 100         | 100 |
| 26  | LQ    | 114/121 (94%)  | 114 (100%) | 0        | 100         | 100 |
| 27  | LR    | 96/100 (96%)   | 96 (100%)  | 0        | 100         | 100 |
| 28  | LS    | 109/110 (99%)  | 109 (100%) | 0        | 100         | 100 |
| 29  | LT    | 88/89 (99%)    | 88 (100%)  | 0        | 100         | 100 |
| 30  | LU    | 86/89 (97%)    | 86 (100%)  | 0        | 100         | 100 |
| 31  | LV    | 92/94 (98%)    | 92 (100%)  | 0        | 100         | 100 |
| 32  | LW    | 73/80 (91%)    | 73 (100%)  | 0        | 100         | 100 |
| 33  | LX    | 74/75 (99%)    | 74 (100%)  | 0        | 100         | 100 |
| 34  | LY    | 64/65 (98%)    | 64 (100%)  | 0        | 100         | 100 |

*Continued on next page...*

Continued from previous page...

| Mol | Chain | Analysed        | Rotameric   | Outliers | Percentiles |     |
|-----|-------|-----------------|-------------|----------|-------------|-----|
| 35  | LZ    | 47/48 (98%)     | 47 (100%)   | 0        | 100         | 100 |
| 37  | NF    | 65/228 (28%)    | 65 (100%)   | 0        | 100         | 100 |
| 38  | NK    | 61/115 (53%)    | 61 (100%)   | 0        | 100         | 100 |
| 39  | NL    | 227/402 (56%)   | 227 (100%)  | 0        | 100         | 100 |
| 40  | NP    | 88/114 (77%)    | 88 (100%)   | 0        | 100         | 100 |
| 41  | SA    | 298/348 (86%)   | 297 (100%)  | 1 (0%)   | 92          | 96  |
| 42  | SB    | 234/250 (94%)   | 234 (100%)  | 0        | 100         | 100 |
| 43  | SC    | 192/252 (76%)   | 191 (100%)  | 1 (0%)   | 88          | 93  |
| 44  | SD    | 194/215 (90%)   | 194 (100%)  | 0        | 100         | 100 |
| 45  | SE    | 198/223 (89%)   | 197 (100%)  | 1 (0%)   | 88          | 93  |
| 46  | SF    | 188/199 (94%)   | 188 (100%)  | 0        | 100         | 100 |
| 47  | SG    | 169/171 (99%)   | 169 (100%)  | 0        | 100         | 100 |
| 48  | SH    | 85/274 (31%)    | 85 (100%)   | 0        | 100         | 100 |
| 49  | SI    | 212/228 (93%)   | 212 (100%)  | 0        | 100         | 100 |
| 50  | SK    | 212/213 (100%)  | 211 (100%)  | 1 (0%)   | 88          | 93  |
| 51  | SM    | 354/509 (70%)   | 354 (100%)  | 0        | 100         | 100 |
| 52  | SQ    | 194/214 (91%)   | 194 (100%)  | 0        | 100         | 100 |
| 53  | SR    | 545/574 (95%)   | 544 (100%)  | 1 (0%)   | 93          | 97  |
| 54  | SV    | 128/149 (86%)   | 128 (100%)  | 0        | 100         | 100 |
| All | All   | 7440/8850 (84%) | 7431 (100%) | 9 (0%)   | 93          | 97  |

All (9) residues with a non-rotameric sidechain are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 15  | LF    | 116 | GLN  |
| 22  | LM    | 91  | ARG  |
| 22  | LM    | 117 | ARG  |
| 23  | LN    | 246 | ARG  |
| 41  | SA    | 122 | TYR  |
| 43  | SC    | 100 | LYS  |
| 45  | SE    | 175 | ARG  |
| 50  | SK    | 57  | ARG  |
| 53  | SR    | 8   | LYS  |

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (11) such sidechains are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 20  | LK    | 17  | HIS  |
| 20  | LK    | 19  | HIS  |
| 23  | LN    | 123 | HIS  |
| 23  | LN    | 322 | HIS  |
| 42  | SB    | 17  | GLN  |
| 43  | SC    | 190 | HIS  |
| 47  | SG    | 140 | GLN  |
| 49  | SI    | 94  | HIS  |
| 51  | SM    | 211 | HIS  |
| 53  | SR    | 157 | HIS  |
| 53  | SR    | 209 | HIS  |

### 5.3.3 RNA [i](#)

| Mol | Chain | Analysed        | Backbone Outliers | Pucker Outliers |
|-----|-------|-----------------|-------------------|-----------------|
| 2   | L1    | 152/157 (96%)   | 18 (11%)          | 0               |
| 3   | L3    | 3376/5070 (66%) | 413 (12%)         | 6 (0%)          |
| 4   | L4    | 119/121 (98%)   | 12 (10%)          | 1 (0%)          |
| All | All   | 3647/5348 (68%) | 443 (12%)         | 7 (0%)          |

All (443) RNA backbone outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 2   | L1    | 23  | C    |
| 2   | L1    | 34  | U    |
| 2   | L1    | 35  | C    |
| 2   | L1    | 59  | A    |
| 2   | L1    | 62  | A    |
| 2   | L1    | 63  | U    |
| 2   | L1    | 82  | A    |
| 2   | L1    | 83  | C    |
| 2   | L1    | 84  | A    |
| 2   | L1    | 86  | U    |
| 2   | L1    | 94  | G    |
| 2   | L1    | 103 | A    |
| 2   | L1    | 105 | C    |
| 2   | L1    | 110 | U    |
| 2   | L1    | 111 | U    |
| 2   | L1    | 114 | G    |
| 2   | L1    | 151 | G    |
| 2   | L1    | 156 | U    |
| 3   | L3    | 6   | C    |

*Continued on next page...*

*Continued from previous page...*

| <b>Mol</b> | <b>Chain</b> | <b>Res</b> | <b>Type</b> |
|------------|--------------|------------|-------------|
| 3          | L3           | 13         | U           |
| 3          | L3           | 25         | A           |
| 3          | L3           | 39         | A           |
| 3          | L3           | 42         | A           |
| 3          | L3           | 48         | G           |
| 3          | L3           | 56         | A           |
| 3          | L3           | 58         | G           |
| 3          | L3           | 59         | A           |
| 3          | L3           | 64         | A           |
| 3          | L3           | 65         | A           |
| 3          | L3           | 66         | A           |
| 3          | L3           | 69         | A           |
| 3          | L3           | 91         | G           |
| 3          | L3           | 108        | A           |
| 3          | L3           | 119        | G           |
| 3          | L3           | 159        | C           |
| 3          | L3           | 167        | C           |
| 3          | L3           | 170        | C           |
| 3          | L3           | 171        | U           |
| 3          | L3           | 173        | C           |
| 3          | L3           | 181        | C           |
| 3          | L3           | 200        | U           |
| 3          | L3           | 210        | C           |
| 3          | L3           | 218        | A           |
| 3          | L3           | 234        | G           |
| 3          | L3           | 261        | G           |
| 3          | L3           | 263        | G           |
| 3          | L3           | 266        | C           |
| 3          | L3           | 274        | C           |
| 3          | L3           | 297        | U           |
| 3          | L3           | 316        | U           |
| 3          | L3           | 340        | C           |
| 3          | L3           | 387        | G           |
| 3          | L3           | 409        | G           |
| 3          | L3           | 410        | A           |
| 3          | L3           | 412        | G           |
| 3          | L3           | 450        | G           |
| 3          | L3           | 452        | A           |
| 3          | L3           | 453        | G           |
| 3          | L3           | 454        | U           |
| 3          | L3           | 464        | G           |
| 3          | L3           | 467        | U           |

*Continued on next page...*

*Continued from previous page...*

| <b>Mol</b> | <b>Chain</b> | <b>Res</b> | <b>Type</b> |
|------------|--------------|------------|-------------|
| 3          | L3           | 469        | C           |
| 3          | L3           | 473        | C           |
| 3          | L3           | 492        | U           |
| 3          | L3           | 493        | G           |
| 3          | L3           | 496        | G           |
| 3          | L3           | 497        | G           |
| 3          | L3           | 499        | G           |
| 3          | L3           | 501        | C           |
| 3          | L3           | 502        | C           |
| 3          | L3           | 503        | C           |
| 3          | L3           | 504        | G           |
| 3          | L3           | 509        | A           |
| 3          | L3           | 510        | U           |
| 3          | L3           | 511        | C           |
| 3          | L3           | 658        | C           |
| 3          | L3           | 660        | A           |
| 3          | L3           | 666        | G           |
| 3          | L3           | 667        | A           |
| 3          | L3           | 668        | C           |
| 3          | L3           | 669        | C           |
| 3          | L3           | 686        | A           |
| 3          | L3           | 704        | C           |
| 3          | L3           | 731        | G           |
| 3          | L3           | 739        | G           |
| 3          | L3           | 741        | C           |
| 3          | L3           | 742        | G           |
| 3          | L3           | 746        | A           |
| 3          | L3           | 913        | U           |
| 3          | L3           | 915        | A           |
| 3          | L3           | 917        | A           |
| 3          | L3           | 918        | G           |
| 3          | L3           | 926        | G           |
| 3          | L3           | 932        | A           |
| 3          | L3           | 933        | G           |
| 3          | L3           | 937        | U           |
| 3          | L3           | 944        | A           |
| 3          | L3           | 945        | U           |
| 3          | L3           | 956        | A           |
| 3          | L3           | 959        | G           |
| 3          | L3           | 960        | A           |
| 3          | L3           | 971        | U           |
| 3          | L3           | 972        | C           |

*Continued on next page...*

*Continued from previous page...*

| <b>Mol</b> | <b>Chain</b> | <b>Res</b> | <b>Type</b> |
|------------|--------------|------------|-------------|
| 3          | L3           | 1066       | G           |
| 3          | L3           | 1072       | C           |
| 3          | L3           | 1080       | C           |
| 3          | L3           | 1100       | U           |
| 3          | L3           | 1169       | G           |
| 3          | L3           | 1171       | G           |
| 3          | L3           | 1173       | G           |
| 3          | L3           | 1178       | G           |
| 3          | L3           | 1180       | C           |
| 3          | L3           | 1181       | C           |
| 3          | L3           | 1182       | C           |
| 3          | L3           | 1201       | U           |
| 3          | L3           | 1203       | G           |
| 3          | L3           | 1211       | G           |
| 3          | L3           | 1214       | C           |
| 3          | L3           | 1215       | C           |
| 3          | L3           | 1241       | C           |
| 3          | L3           | 1253       | G           |
| 3          | L3           | 1254       | A           |
| 3          | L3           | 1255       | A           |
| 3          | L3           | 1256       | G           |
| 3          | L3           | 1266       | G           |
| 3          | L3           | 1269       | G           |
| 3          | L3           | 1270       | A           |
| 3          | L3           | 1272       | C           |
| 3          | L3           | 1273       | G           |
| 3          | L3           | 1280       | C           |
| 3          | L3           | 1284       | G           |
| 3          | L3           | 1287       | G           |
| 3          | L3           | 1294       | A           |
| 3          | L3           | 1295       | C           |
| 3          | L3           | 1301       | C           |
| 3          | L3           | 1313       | C           |
| 3          | L3           | 1314       | C           |
| 3          | L3           | 1319       | U           |
| 3          | L3           | 1325       | C           |
| 3          | L3           | 1326       | A2M         |
| 3          | L3           | 1354       | A           |
| 3          | L3           | 1358       | G           |
| 3          | L3           | 1359       | G           |
| 3          | L3           | 1365       | C           |
| 3          | L3           | 1366       | G           |

*Continued on next page...*

*Continued from previous page...*

| <b>Mol</b> | <b>Chain</b> | <b>Res</b> | <b>Type</b> |
|------------|--------------|------------|-------------|
| 3          | L3           | 1379       | C           |
| 3          | L3           | 1397       | A           |
| 3          | L3           | 1420       | A           |
| 3          | L3           | 1439       | C           |
| 3          | L3           | 1443       | A           |
| 3          | L3           | 1444       | G           |
| 3          | L3           | 1497       | A           |
| 3          | L3           | 1498       | G           |
| 3          | L3           | 1502       | G           |
| 3          | L3           | 1523       | A           |
| 3          | L3           | 1534       | A2M         |
| 3          | L3           | 1547       | A           |
| 3          | L3           | 1578       | U           |
| 3          | L3           | 1581       | G           |
| 3          | L3           | 1596       | U           |
| 3          | L3           | 1597       | G           |
| 3          | L3           | 1613       | A           |
| 3          | L3           | 1624       | G           |
| 3          | L3           | 1625       | OMG         |
| 3          | L3           | 1631       | A           |
| 3          | L3           | 1633       | G           |
| 3          | L3           | 1634       | A           |
| 3          | L3           | 1640       | C           |
| 3          | L3           | 1642       | A           |
| 3          | L3           | 1654       | G           |
| 3          | L3           | 1661       | C           |
| 3          | L3           | 1670       | G           |
| 3          | L3           | 1671       | U           |
| 3          | L3           | 1676       | C           |
| 3          | L3           | 1677       | PSU         |
| 3          | L3           | 1678       | C           |
| 3          | L3           | 1691       | G           |
| 3          | L3           | 1721       | G           |
| 3          | L3           | 1726       | U           |
| 3          | L3           | 1734       | G           |
| 3          | L3           | 1791       | U           |
| 3          | L3           | 1804       | A           |
| 3          | L3           | 1815       | G           |
| 3          | L3           | 1821       | G           |
| 3          | L3           | 1836       | G           |
| 3          | L3           | 1837       | A           |
| 3          | L3           | 1842       | G           |

*Continued on next page...*

*Continued from previous page...*

| <b>Mol</b> | <b>Chain</b> | <b>Res</b> | <b>Type</b> |
|------------|--------------|------------|-------------|
| 3          | L3           | 1854       | G           |
| 3          | L3           | 1875       | C           |
| 3          | L3           | 1880       | G           |
| 3          | L3           | 1882       | U           |
| 3          | L3           | 1883       | G           |
| 3          | L3           | 1887       | G           |
| 3          | L3           | 1888       | A           |
| 3          | L3           | 1897       | A           |
| 3          | L3           | 1910       | G           |
| 3          | L3           | 1919       | G           |
| 3          | L3           | 1921       | C           |
| 3          | L3           | 1922       | G           |
| 3          | L3           | 1925       | G           |
| 3          | L3           | 1973       | G           |
| 3          | L3           | 1974       | U           |
| 3          | L3           | 1978       | C           |
| 3          | L3           | 1984       | A           |
| 3          | L3           | 1997       | U           |
| 3          | L3           | 2002       | A           |
| 3          | L3           | 2016       | C           |
| 3          | L3           | 2021       | G           |
| 3          | L3           | 2026       | A           |
| 3          | L3           | 2041       | A           |
| 3          | L3           | 2044       | U           |
| 3          | L3           | 2046       | G           |
| 3          | L3           | 2055       | G           |
| 3          | L3           | 2056       | G           |
| 3          | L3           | 2069       | A           |
| 3          | L3           | 2084       | C           |
| 3          | L3           | 2092       | G           |
| 3          | L3           | 2093       | A           |
| 3          | L3           | 2094       | G           |
| 3          | L3           | 2095       | A           |
| 3          | L3           | 2096       | G           |
| 3          | L3           | 2097       | U           |
| 3          | L3           | 2098       | G           |
| 3          | L3           | 2099       | G           |
| 3          | L3           | 2109       | G           |
| 3          | L3           | 2110       | C           |
| 3          | L3           | 2111       | G           |
| 3          | L3           | 2262       | G           |
| 3          | L3           | 2289       | C           |

*Continued on next page...*



*Continued from previous page...*

| <b>Mol</b> | <b>Chain</b> | <b>Res</b> | <b>Type</b> |
|------------|--------------|------------|-------------|
| 3          | L3           | 2300       | A           |
| 3          | L3           | 2301       | G           |
| 3          | L3           | 2313       | A           |
| 3          | L3           | 2348       | G           |
| 3          | L3           | 2351       | OMC         |
| 3          | L3           | 2395       | A           |
| 3          | L3           | 2417       | A           |
| 3          | L3           | 2422       | OMC         |
| 3          | L3           | 2425       | U           |
| 3          | L3           | 2429       | A           |
| 3          | L3           | 2450       | G           |
| 3          | L3           | 2453       | A           |
| 3          | L3           | 2470       | C           |
| 3          | L3           | 2471       | G           |
| 3          | L3           | 2475       | G           |
| 3          | L3           | 2476       | G           |
| 3          | L3           | 2477       | A           |
| 3          | L3           | 2478       | C           |
| 3          | L3           | 2480       | G           |
| 3          | L3           | 2486       | G           |
| 3          | L3           | 2487       | G           |
| 3          | L3           | 2488       | C           |
| 3          | L3           | 2489       | C           |
| 3          | L3           | 2492       | C           |
| 3          | L3           | 2493       | G           |
| 3          | L3           | 2512       | A           |
| 3          | L3           | 2513       | A           |
| 3          | L3           | 2519       | U           |
| 3          | L3           | 2544       | G           |
| 3          | L3           | 2545       | U           |
| 3          | L3           | 2548       | C           |
| 3          | L3           | 2554       | U           |
| 3          | L3           | 2587       | A           |
| 3          | L3           | 2627       | C           |
| 3          | L3           | 2653       | C           |
| 3          | L3           | 2669       | C           |
| 3          | L3           | 2687       | U           |
| 3          | L3           | 2694       | G           |
| 3          | L3           | 2695       | A           |
| 3          | L3           | 2696       | A           |
| 3          | L3           | 2711       | G           |
| 3          | L3           | 2743       | A           |

*Continued on next page...*

*Continued from previous page...*

| <b>Mol</b> | <b>Chain</b> | <b>Res</b> | <b>Type</b> |
|------------|--------------|------------|-------------|
| 3          | L3           | 2760       | G           |
| 3          | L3           | 2764       | A           |
| 3          | L3           | 2769       | U           |
| 3          | L3           | 2772       | C           |
| 3          | L3           | 2787       | A2M         |
| 3          | L3           | 2788       | U           |
| 3          | L3           | 2790       | U           |
| 3          | L3           | 2814       | C           |
| 3          | L3           | 2826       | U           |
| 3          | L3           | 2827       | G           |
| 3          | L3           | 2829       | U           |
| 3          | L3           | 2855       | G           |
| 3          | L3           | 2877       | G           |
| 3          | L3           | 2894       | A           |
| 3          | L3           | 2902       | G           |
| 3          | L3           | 2917       | G           |
| 3          | L3           | 2918       | G           |
| 3          | L3           | 2922       | G           |
| 3          | L3           | 3271       | G           |
| 3          | L3           | 3585       | G           |
| 3          | L3           | 3593       | C           |
| 3          | L3           | 3595       | U           |
| 3          | L3           | 3597       | G           |
| 3          | L3           | 3615       | G           |
| 3          | L3           | 3626       | G           |
| 3          | L3           | 3635       | A           |
| 3          | L3           | 3653       | A           |
| 3          | L3           | 3662       | A           |
| 3          | L3           | 3696       | C           |
| 3          | L3           | 3697       | U           |
| 3          | L3           | 3775       | A           |
| 3          | L3           | 3838       | U           |
| 3          | L3           | 3840       | U           |
| 3          | L3           | 3868       | G           |
| 3          | L3           | 3872       | A           |
| 3          | L3           | 3875       | G           |
| 3          | L3           | 3887       | OMC         |
| 3          | L3           | 3897       | G           |
| 3          | L3           | 3905       | A           |
| 3          | L3           | 3915       | U           |
| 3          | L3           | 4069       | U           |
| 3          | L3           | 4076       | G           |

*Continued on next page...*

*Continued from previous page...*

| <b>Mol</b> | <b>Chain</b> | <b>Res</b> | <b>Type</b> |
|------------|--------------|------------|-------------|
| 3          | L3           | 4085       | A           |
| 3          | L3           | 4119       | C           |
| 3          | L3           | 4122       | G           |
| 3          | L3           | 4127       | A           |
| 3          | L3           | 4133       | C           |
| 3          | L3           | 4138       | C           |
| 3          | L3           | 4139       | G           |
| 3          | L3           | 4140       | C           |
| 3          | L3           | 4142       | C           |
| 3          | L3           | 4143       | G           |
| 3          | L3           | 4144       | C           |
| 3          | L3           | 4145       | C           |
| 3          | L3           | 4147       | G           |
| 3          | L3           | 4150       | G           |
| 3          | L3           | 4154       | G           |
| 3          | L3           | 4162       | C           |
| 3          | L3           | 4163       | U           |
| 3          | L3           | 4170       | A           |
| 3          | L3           | 4183       | G           |
| 3          | L3           | 4184       | G           |
| 3          | L3           | 4191       | G           |
| 3          | L3           | 4194       | U           |
| 3          | L3           | 4202       | U           |
| 3          | L3           | 4221       | C           |
| 3          | L3           | 4222       | G           |
| 3          | L3           | 4229       | U           |
| 3          | L3           | 4233       | A           |
| 3          | L3           | 4251       | A           |
| 3          | L3           | 4254       | G           |
| 3          | L3           | 4266       | G           |
| 3          | L3           | 4268       | A           |
| 3          | L3           | 4273       | A           |
| 3          | L3           | 4281       | A           |
| 3          | L3           | 4291       | G           |
| 3          | L3           | 4305       | G           |
| 3          | L3           | 4306       | OMU         |
| 3          | L3           | 4314       | C           |
| 3          | L3           | 4329       | G           |
| 3          | L3           | 4330       | G           |
| 3          | L3           | 4332       | C           |
| 3          | L3           | 4373       | G           |
| 3          | L3           | 4376       | A           |

*Continued on next page...*

*Continued from previous page...*

| <b>Mol</b> | <b>Chain</b> | <b>Res</b> | <b>Type</b> |
|------------|--------------|------------|-------------|
| 3          | L3           | 4377       | G           |
| 3          | L3           | 4378       | A           |
| 3          | L3           | 4387       | C           |
| 3          | L3           | 4415       | A           |
| 3          | L3           | 4418       | G           |
| 3          | L3           | 4437       | U           |
| 3          | L3           | 4438       | U           |
| 3          | L3           | 4439       | U           |
| 3          | L3           | 4453       | C           |
| 3          | L3           | 4464       | A           |
| 3          | L3           | 4466       | C           |
| 3          | L3           | 4475       | G           |
| 3          | L3           | 4491       | G           |
| 3          | L3           | 4498       | OMU         |
| 3          | L3           | 4512       | U           |
| 3          | L3           | 4513       | A           |
| 3          | L3           | 4523       | A2M         |
| 3          | L3           | 4524       | G           |
| 3          | L3           | 4532       | PSU         |
| 3          | L3           | 4545       | G           |
| 3          | L3           | 4548       | A           |
| 3          | L3           | 4549       | G           |
| 3          | L3           | 4556       | U           |
| 3          | L3           | 4558       | U           |
| 3          | L3           | 4560       | C           |
| 3          | L3           | 4567       | G           |
| 3          | L3           | 4584       | A           |
| 3          | L3           | 4590       | A2M         |
| 3          | L3           | 4608       | G           |
| 3          | L3           | 4636       | PSU         |
| 3          | L3           | 4637       | OMG         |
| 3          | L3           | 4656       | A           |
| 3          | L3           | 4670       | C           |
| 3          | L3           | 4672       | A           |
| 3          | L3           | 4678       | G           |
| 3          | L3           | 4701       | A           |
| 3          | L3           | 4708       | A           |
| 3          | L3           | 4709       | U           |
| 3          | L3           | 4719       | G           |
| 3          | L3           | 4720       | C           |
| 3          | L3           | 4740       | G           |
| 3          | L3           | 4741       | C           |

*Continued on next page...*

*Continued from previous page...*

| <b>Mol</b> | <b>Chain</b> | <b>Res</b> | <b>Type</b> |
|------------|--------------|------------|-------------|
| 3          | L3           | 4742       | G           |
| 3          | L3           | 4750       | G           |
| 3          | L3           | 4751       | G           |
| 3          | L3           | 4754       | G           |
| 3          | L3           | 4757       | C           |
| 3          | L3           | 4759       | C           |
| 3          | L3           | 4765       | G           |
| 3          | L3           | 4772       | C           |
| 3          | L3           | 4773       | C           |
| 3          | L3           | 4870       | G           |
| 3          | L3           | 4871       | C           |
| 3          | L3           | 4882       | U           |
| 3          | L3           | 4883       | C           |
| 3          | L3           | 4900       | C           |
| 3          | L3           | 4901       | G           |
| 3          | L3           | 4910       | G           |
| 3          | L3           | 4916       | G           |
| 3          | L3           | 4943       | A           |
| 3          | L3           | 4976       | U           |
| 3          | L3           | 5006       | U           |
| 3          | L3           | 5014       | A           |
| 3          | L3           | 5020       | G           |
| 3          | L3           | 5022       | U           |
| 3          | L3           | 5023       | C           |
| 3          | L3           | 5026       | U           |
| 3          | L3           | 5027       | C           |
| 3          | L3           | 5031       | G           |
| 3          | L3           | 5041       | G           |
| 3          | L3           | 5050       | C           |
| 3          | L3           | 5054       | C           |
| 3          | L3           | 5055       | G           |
| 3          | L3           | 5061       | A           |
| 3          | L3           | 5062       | G           |
| 3          | L3           | 5069       | U           |
| 4          | L4           | 7          | G           |
| 4          | L4           | 24         | C           |
| 4          | L4           | 33         | U           |
| 4          | L4           | 49         | A           |
| 4          | L4           | 53         | U           |
| 4          | L4           | 54         | A           |
| 4          | L4           | 64         | G           |
| 4          | L4           | 66         | G           |

*Continued on next page...*

Continued from previous page...

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 4   | L4    | 89  | G    |
| 4   | L4    | 110 | G    |
| 4   | L4    | 111 | C    |
| 4   | L4    | 120 | U    |

All (7) RNA pucker outliers are listed below:

| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 3   | L3    | 496  | G    |
| 3   | L3    | 502  | C    |
| 3   | L3    | 503  | C    |
| 3   | L3    | 1324 | A    |
| 3   | L3    | 1633 | G    |
| 3   | L3    | 2095 | A    |
| 4   | L4    | 109  | U    |

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

107 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 |
| 3   | OMC  | L3    | 1340 | 3    | 19,22,23     | 0.60 | 0        | 26,31,34    | 0.78 | 0        |
| 3   | OMU  | L3    | 4306 | 3    | 19,22,23     | 1.99 | 6 (31%)  | 26,31,34    | 1.73 | 4 (15%)  |
| 3   | OMG  | L3    | 3744 | 3    | 18,26,27     | 1.13 | 2 (11%)  | 19,38,41    | 0.88 | 1 (5%)   |
| 3   | A2M  | L3    | 3867 | 3    | 18,25,26     | 1.15 | 2 (11%)  | 18,36,39    | 1.32 | 2 (11%)  |
| 3   | PSU  | L3    | 4579 | 3    | 18,21,22     | 1.01 | 1 (5%)   | 22,30,33    | 1.75 | 4 (18%)  |
| 3   | PSU  | L3    | 4521 | 3    | 18,21,22     | 1.05 | 1 (5%)   | 22,30,33    | 1.78 | 4 (18%)  |
| 3   | PSU  | L3    | 1792 | 3    | 18,21,22     | 1.05 | 1 (5%)   | 22,30,33    | 1.79 | 4 (18%)  |
| 3   | OMG  | L3    | 1522 | 3    | 18,26,27     | 1.19 | 2 (11%)  | 19,38,41    | 0.86 | 1 (5%)   |
| 3   | PSU  | L3    | 5010 | 3    | 18,21,22     | 1.02 | 1 (5%)   | 22,30,33    | 1.81 | 5 (22%)  |
| 3   | OMG  | L3    | 3899 | 3    | 18,26,27     | 1.17 | 2 (11%)  | 19,38,41    | 0.86 | 1 (5%)   |

| Mol | Type | Chain | Res  | Link | Bond lengths |      |          | Bond angles |      |          |
|-----|------|-------|------|------|--------------|------|----------|-------------|------|----------|
|     |      |       |      |      | Counts       | RMSZ | # Z  > 2 | Counts      | RMSZ | # Z  > 2 |
| 3   | A2M  | L3    | 3825 | 3    | 18,25,26     | 1.19 | 2 (11%)  | 18,36,39    | 1.25 | 2 (11%)  |
| 3   | A2M  | L3    | 2363 | 55,3 | 18,25,26     | 1.22 | 2 (11%)  | 18,36,39    | 1.22 | 1 (5%)   |
| 3   | PSU  | L3    | 4296 | 3    | 18,21,22     | 1.02 | 1 (5%)   | 22,30,33    | 1.88 | 5 (22%)  |
| 3   | OMC  | L3    | 3869 | 3    | 19,22,23     | 0.57 | 0        | 26,31,34    | 0.68 | 0        |
| 3   | PSU  | L3    | 4628 | 3    | 18,21,22     | 1.03 | 1 (5%)   | 22,30,33    | 1.83 | 6 (27%)  |
| 3   | A2M  | L3    | 4590 | 3    | 18,25,26     | 1.18 | 2 (11%)  | 18,36,39    | 1.40 | 3 (16%)  |
| 3   | OMG  | L3    | 2876 | 3    | 18,26,27     | 1.14 | 2 (11%)  | 19,38,41    | 0.82 | 1 (5%)   |
| 3   | PSU  | L3    | 3844 | 3    | 18,21,22     | 1.08 | 1 (5%)   | 22,30,33    | 1.82 | 5 (22%)  |
| 3   | OMG  | L3    | 4623 | 3    | 18,26,27     | 1.17 | 2 (11%)  | 19,38,41    | 0.91 | 1 (5%)   |
| 3   | PSU  | L3    | 1860 | 3    | 18,21,22     | 1.04 | 1 (5%)   | 22,30,33    | 1.80 | 5 (22%)  |
| 3   | PSU  | L3    | 1582 | 3    | 18,21,22     | 1.01 | 1 (5%)   | 22,30,33    | 1.79 | 3 (13%)  |
| 3   | 6MZ  | L3    | 4220 | 3    | 18,25,26     | 1.05 | 3 (16%)  | 16,36,39    | 1.98 | 4 (25%)  |
| 3   | A2M  | L3    | 400  | 3    | 18,25,26     | 1.19 | 2 (11%)  | 18,36,39    | 1.30 | 2 (11%)  |
| 3   | A2M  | L3    | 1871 | 3    | 18,25,26     | 1.19 | 2 (11%)  | 18,36,39    | 1.37 | 2 (11%)  |
| 3   | PSU  | L3    | 4552 | 3    | 18,21,22     | 1.03 | 1 (5%)   | 22,30,33    | 1.78 | 5 (22%)  |
| 3   | OMG  | L3    | 4392 | 3    | 18,26,27     | 1.18 | 2 (11%)  | 19,38,41    | 0.85 | 1 (5%)   |
| 3   | PSU  | L3    | 2508 | 3    | 18,21,22     | 1.03 | 1 (5%)   | 22,30,33    | 1.82 | 4 (18%)  |
| 3   | A2M  | L3    | 2401 | 3    | 18,25,26     | 1.21 | 2 (11%)  | 18,36,39    | 1.31 | 2 (11%)  |
| 3   | PSU  | L3    | 4353 | 3    | 18,21,22     | 1.02 | 1 (5%)   | 22,30,33    | 1.84 | 5 (22%)  |
| 3   | OMC  | L3    | 4536 | 3    | 19,22,23     | 0.56 | 0        | 26,31,34    | 0.66 | 0        |
| 3   | PSU  | L3    | 4972 | 3    | 18,21,22     | 1.05 | 1 (5%)   | 22,30,33    | 1.80 | 5 (22%)  |
| 23  | HIC  | LN    | 245  | 23   | 8,11,12      | 1.62 | 2 (25%)  | 6,14,16     | 1.08 | 0        |
| 3   | OMG  | L3    | 2364 | 3    | 18,26,27     | 1.16 | 2 (11%)  | 19,38,41    | 0.88 | 1 (5%)   |
| 3   | PSU  | L3    | 1536 | 3    | 18,21,22     | 1.03 | 1 (5%)   | 22,30,33    | 1.76 | 4 (18%)  |
| 3   | OMC  | L3    | 2861 | 3    | 19,22,23     | 0.54 | 0        | 26,31,34    | 0.67 | 0        |
| 3   | PSU  | L3    | 3822 | 3    | 18,21,22     | 1.10 | 1 (5%)   | 22,30,33    | 1.79 | 5 (22%)  |
| 3   | PSU  | L3    | 4457 | 3    | 18,21,22     | 1.09 | 1 (5%)   | 22,30,33    | 1.80 | 4 (18%)  |
| 3   | PSU  | L3    | 4493 | 3    | 18,21,22     | 1.04 | 1 (5%)   | 22,30,33    | 1.80 | 4 (18%)  |
| 3   | OMU  | L3    | 4620 | 3    | 19,22,23     | 1.96 | 6 (31%)  | 26,31,34    | 1.60 | 4 (15%)  |
| 3   | A2M  | L3    | 2815 | 3    | 18,25,26     | 1.20 | 2 (11%)  | 18,36,39    | 1.25 | 2 (11%)  |
| 3   | PSU  | L3    | 4673 | 3    | 18,21,22     | 1.05 | 1 (5%)   | 22,30,33    | 1.78 | 4 (18%)  |
| 3   | OMG  | L3    | 1316 | 3    | 18,26,27     | 1.17 | 2 (11%)  | 19,38,41    | 0.87 | 1 (5%)   |
| 3   | PSU  | L3    | 5001 | 3    | 18,21,22     | 1.08 | 1 (5%)   | 22,30,33    | 1.78 | 4 (18%)  |
| 3   | OMG  | L3    | 4228 | 3    | 18,26,27     | 1.21 | 2 (11%)  | 19,38,41    | 0.92 | 1 (5%)   |
| 3   | PSU  | L3    | 4293 | 3    | 18,21,22     | 1.00 | 1 (5%)   | 22,30,33    | 1.64 | 4 (18%)  |

| Mol | Type | Chain | Res  | Link | Bond lengths |      |          | Bond angles |      |          |
|-----|------|-------|------|------|--------------|------|----------|-------------|------|----------|
|     |      |       |      |      | Counts       | RMSZ | # Z  > 2 | Counts      | RMSZ | # Z  > 2 |
| 3   | OMG  | L3    | 4494 | 3    | 18,26,27     | 1.18 | 2 (11%)  | 19,38,41    | 0.89 | 1 (5%)   |
| 3   | A2M  | L3    | 1534 | 55,3 | 18,25,26     | 1.19 | 2 (11%)  | 18,36,39    | 1.39 | 3 (16%)  |
| 2   | PSU  | L1    | 69   | 2    | 18,21,22     | 1.08 | 1 (5%)   | 22,30,33    | 1.80 | 5 (22%)  |
| 3   | A2M  | L3    | 3724 | 3    | 18,25,26     | 1.21 | 2 (11%)  | 18,36,39    | 1.28 | 2 (11%)  |
| 2   | OMG  | L1    | 75   | 2    | 18,26,27     | 1.16 | 2 (11%)  | 19,38,41    | 0.85 | 1 (5%)   |
| 3   | PSU  | L3    | 1683 | 3    | 18,21,22     | 1.04 | 1 (5%)   | 22,30,33    | 1.77 | 4 (18%)  |
| 3   | OMC  | L3    | 4456 | 3    | 19,22,23     | 0.56 | 0        | 26,31,34    | 0.66 | 0        |
| 3   | PSU  | L3    | 4576 | 3    | 18,21,22     | 1.07 | 1 (5%)   | 22,30,33    | 1.82 | 6 (27%)  |
| 3   | PSU  | L3    | 3715 | 3    | 18,21,22     | 1.08 | 1 (5%)   | 22,30,33    | 1.80 | 5 (22%)  |
| 3   | PSU  | L3    | 2632 | 3    | 18,21,22     | 1.04 | 1 (5%)   | 22,30,33    | 1.74 | 4 (18%)  |
| 3   | PSU  | L3    | 3853 | 3    | 18,21,22     | 1.03 | 1 (5%)   | 22,30,33    | 1.68 | 4 (18%)  |
| 3   | PSU  | L3    | 4500 | 3    | 18,21,22     | 1.06 | 1 (5%)   | 22,30,33    | 1.79 | 4 (18%)  |
| 3   | OMC  | L3    | 2422 | 55,3 | 19,22,23     | 0.55 | 0        | 26,31,34    | 0.73 | 1 (3%)   |
| 3   | PSU  | L3    | 4361 | 3    | 18,21,22     | 1.04 | 1 (5%)   | 22,30,33    | 1.74 | 4 (18%)  |
| 3   | OMC  | L3    | 3701 | 3    | 19,22,23     | 0.51 | 0        | 26,31,34    | 0.63 | 0        |
| 2   | PSU  | L1    | 55   | 2    | 18,21,22     | 1.03 | 1 (5%)   | 22,30,33    | 1.79 | 5 (22%)  |
| 3   | A2M  | L3    | 3718 | 3    | 18,25,26     | 1.21 | 3 (16%)  | 18,36,39    | 1.19 | 2 (11%)  |
| 3   | A2M  | L3    | 4523 | 3    | 18,25,26     | 1.17 | 2 (11%)  | 18,36,39    | 1.26 | 2 (11%)  |
| 3   | OMC  | L3    | 3841 | 3    | 19,22,23     | 0.56 | 0        | 26,31,34    | 0.71 | 0        |
| 3   | OMC  | L3    | 2365 | 3    | 19,22,23     | 0.55 | 0        | 26,31,34    | 0.69 | 0        |
| 3   | PSU  | L3    | 4636 | 3    | 18,21,22     | 1.06 | 1 (5%)   | 22,30,33    | 1.87 | 6 (27%)  |
| 3   | PSU  | L3    | 3851 | 3    | 18,21,22     | 1.05 | 1 (5%)   | 22,30,33    | 1.78 | 5 (22%)  |
| 3   | A2M  | L3    | 4571 | 3    | 18,25,26     | 1.20 | 2 (11%)  | 18,36,39    | 1.21 | 1 (5%)   |
| 3   | OMC  | L3    | 2804 | 3    | 19,22,23     | 0.56 | 0        | 26,31,34    | 0.68 | 0        |
| 3   | A2M  | L3    | 3830 | 3    | 18,25,26     | 1.17 | 2 (11%)  | 18,36,39    | 1.29 | 2 (11%)  |
| 3   | A2M  | L3    | 2787 | 3    | 18,25,26     | 1.19 | 2 (11%)  | 18,36,39    | 1.35 | 2 (11%)  |
| 3   | OMG  | L3    | 4618 | 3    | 18,26,27     | 1.17 | 2 (11%)  | 19,38,41    | 0.94 | 1 (5%)   |
| 3   | UR3  | L3    | 4530 | 3    | 19,22,23     | 1.09 | 3 (15%)  | 26,32,35    | 1.24 | 1 (3%)   |
| 3   | OMG  | L3    | 4499 | 3    | 18,26,27     | 1.11 | 2 (11%)  | 19,38,41    | 0.84 | 1 (5%)   |
| 3   | OMC  | L3    | 2351 | 55,3 | 19,22,23     | 0.60 | 0        | 26,31,34    | 0.82 | 1 (3%)   |
| 3   | A2M  | L3    | 1524 | 3    | 18,25,26     | 1.18 | 2 (11%)  | 18,36,39    | 1.32 | 2 (11%)  |
| 3   | PSU  | L3    | 4431 | 3    | 18,21,22     | 1.09 | 1 (5%)   | 22,30,33    | 1.82 | 5 (22%)  |
| 3   | OMU  | L3    | 3925 | 3    | 19,22,23     | 2.01 | 6 (31%)  | 26,31,34    | 1.71 | 5 (19%)  |
| 3   | PSU  | L3    | 3730 | 3    | 18,21,22     | 1.08 | 1 (5%)   | 22,30,33    | 1.81 | 5 (22%)  |
| 3   | PSU  | L3    | 4403 | 3    | 18,21,22     | 1.04 | 1 (5%)   | 22,30,33    | 1.82 | 5 (22%)  |
| 3   | OMG  | L3    | 1625 | 3    | 18,26,27     | 1.17 | 2 (11%)  | 19,38,41    | 0.84 | 1 (5%)   |



| Mol | Type | Chain | Res  | Link | Bond lengths |      |          | Bond angles |      |          |
|-----|------|-------|------|------|--------------|------|----------|-------------|------|----------|
|     |      |       |      |      | Counts       | RMSZ | # Z  > 2 | Counts      | RMSZ | # Z  > 2 |
| 3   | A2M  | L3    | 398  | 3    | 18,25,26     | 1.19 | 2 (11%)  | 18,36,39    | 1.28 | 2 (11%)  |
| 3   | PSU  | L3    | 3884 | 3    | 18,21,22     | 1.03 | 1 (5%)   | 22,30,33    | 1.72 | 4 (18%)  |
| 3   | PSU  | L3    | 4299 | 3    | 18,21,22     | 1.00 | 1 (5%)   | 22,30,33    | 1.87 | 5 (22%)  |
| 3   | PSU  | L3    | 4532 | 3    | 18,21,22     | 1.06 | 1 (5%)   | 22,30,33    | 1.86 | 5 (22%)  |
| 3   | PSU  | L3    | 3639 | 3    | 18,21,22     | 1.05 | 1 (5%)   | 22,30,33    | 1.80 | 5 (22%)  |
| 3   | OMG  | L3    | 4637 | 3    | 18,26,27     | 1.15 | 2 (11%)  | 19,38,41    | 0.86 | 1 (5%)   |
| 3   | OMC  | L3    | 2824 | 3    | 19,22,23     | 0.55 | 0        | 26,31,34    | 0.67 | 0        |
| 3   | A2M  | L3    | 1326 | 3    | 18,25,26     | 1.20 | 2 (11%)  | 18,36,39    | 1.30 | 2 (11%)  |
| 3   | OMG  | L3    | 2424 | 3    | 18,26,27     | 1.20 | 2 (11%)  | 19,38,41    | 0.79 | 1 (5%)   |
| 3   | PSU  | L3    | 3734 | 3    | 18,21,22     | 1.08 | 1 (5%)   | 22,30,33    | 1.81 | 5 (22%)  |
| 3   | OMC  | L3    | 3887 | 3    | 19,22,23     | 0.57 | 0        | 26,31,34    | 0.69 | 0        |
| 3   | OMU  | L3    | 4498 | 3    | 19,22,23     | 2.07 | 7 (36%)  | 26,31,34    | 1.70 | 5 (19%)  |
| 3   | OMG  | L3    | 4370 | 3    | 18,26,27     | 1.21 | 3 (16%)  | 19,38,41    | 0.91 | 1 (5%)   |
| 3   | OMU  | L3    | 2837 | 3    | 19,22,23     | 2.03 | 7 (36%)  | 26,31,34    | 1.74 | 5 (19%)  |
| 3   | PSU  | L3    | 4471 | 3    | 18,21,22     | 1.10 | 1 (5%)   | 22,30,33    | 1.78 | 4 (18%)  |
| 3   | PSU  | L3    | 1862 | 3    | 18,21,22     | 1.08 | 1 (5%)   | 22,30,33    | 1.78 | 5 (22%)  |
| 3   | OMU  | L3    | 4227 | 3    | 19,22,23     | 2.00 | 6 (31%)  | 26,31,34    | 1.69 | 4 (15%)  |
| 3   | PSU  | L3    | 4689 | 3    | 18,21,22     | 1.03 | 1 (5%)   | 22,30,33    | 1.82 | 4 (18%)  |
| 3   | PSU  | L3    | 1677 | 3    | 18,21,22     | 1.03 | 1 (5%)   | 22,30,33    | 1.71 | 4 (18%)  |
| 3   | PSU  | L3    | 3920 | 55,3 | 18,21,22     | 1.07 | 1 (5%)   | 22,30,33    | 1.75 | 4 (18%)  |
| 3   | PSU  | L3    | 3695 | 3    | 18,21,22     | 1.10 | 1 (5%)   | 22,30,33    | 1.81 | 5 (22%)  |
| 3   | PSU  | L3    | 4312 | 3    | 18,21,22     | 1.01 | 1 (5%)   | 22,30,33    | 1.83 | 4 (18%)  |
| 3   | OMU  | L3    | 2415 | 3    | 19,22,23     | 2.01 | 6 (31%)  | 26,31,34    | 1.71 | 4 (15%)  |
| 3   | PSU  | L3    | 2839 | 3    | 18,21,22     | 1.03 | 1 (5%)   | 22,30,33    | 1.77 | 4 (18%)  |
| 3   | OMG  | L3    | 3627 | 3    | 18,26,27     | 1.16 | 2 (11%)  | 19,38,41    | 0.89 | 1 (5%)   |
| 3   | PSU  | L3    | 3637 | 3    | 18,21,22     | 1.03 | 1 (5%)   | 22,30,33    | 1.87 | 5 (22%)  |

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   |
|-----|------|-------|------|------|---------|-----------|---------|
| 3   | OMC  | L3    | 1340 | 3    | -       | 1/9/27/28 | 0/2/2/2 |
| 3   | OMU  | L3    | 4306 | 3    | -       | 4/9/27/28 | 0/2/2/2 |
| 3   | OMG  | L3    | 3744 | 3    | -       | 1/5/27/28 | 0/3/3/3 |
| 3   | A2M  | L3    | 3867 | 3    | -       | 1/5/27/28 | 0/3/3/3 |

Continued on next page...

*Continued from previous page...*

| Mol | Type | Chain | Res  | Link | Chirals | Torsions  | Rings   |
|-----|------|-------|------|------|---------|-----------|---------|
| 3   | PSU  | L3    | 4579 | 3    | -       | 0/7/25/26 | 0/2/2/2 |
| 3   | PSU  | L3    | 4521 | 3    | -       | 2/7/25/26 | 0/2/2/2 |
| 3   | PSU  | L3    | 1792 | 3    | -       | 0/7/25/26 | 0/2/2/2 |
| 3   | OMG  | L3    | 1522 | 3    | -       | 0/5/27/28 | 0/3/3/3 |
| 3   | PSU  | L3    | 5010 | 3    | -       | 0/7/25/26 | 0/2/2/2 |
| 3   | OMG  | L3    | 3899 | 3    | -       | 1/5/27/28 | 0/3/3/3 |
| 3   | A2M  | L3    | 3825 | 3    | -       | 0/5/27/28 | 0/3/3/3 |
| 3   | A2M  | L3    | 2363 | 55,3 | -       | 0/5/27/28 | 0/3/3/3 |
| 3   | PSU  | L3    | 4296 | 3    | -       | 0/7/25/26 | 0/2/2/2 |
| 3   | OMC  | L3    | 3869 | 3    | -       | 0/9/27/28 | 0/2/2/2 |
| 3   | PSU  | L3    | 4628 | 3    | -       | 0/7/25/26 | 0/2/2/2 |
| 3   | A2M  | L3    | 4590 | 3    | -       | 4/5/27/28 | 0/3/3/3 |
| 3   | OMG  | L3    | 2876 | 3    | -       | 3/5/27/28 | 0/3/3/3 |
| 3   | PSU  | L3    | 3844 | 3    | -       | 1/7/25/26 | 0/2/2/2 |
| 3   | OMG  | L3    | 4623 | 3    | -       | 0/5/27/28 | 0/3/3/3 |
| 3   | PSU  | L3    | 1860 | 3    | -       | 0/7/25/26 | 0/2/2/2 |
| 3   | PSU  | L3    | 1582 | 3    | -       | 0/7/25/26 | 0/2/2/2 |
| 3   | 6MZ  | L3    | 4220 | 3    | -       | 3/5/27/28 | 0/3/3/3 |
| 3   | A2M  | L3    | 400  | 3    | -       | 0/5/27/28 | 0/3/3/3 |
| 3   | A2M  | L3    | 1871 | 3    | -       | 0/5/27/28 | 0/3/3/3 |
| 3   | PSU  | L3    | 4552 | 3    | -       | 0/7/25/26 | 0/2/2/2 |
| 3   | OMG  | L3    | 4392 | 3    | -       | 1/5/27/28 | 0/3/3/3 |
| 3   | PSU  | L3    | 2508 | 3    | -       | 0/7/25/26 | 0/2/2/2 |
| 3   | A2M  | L3    | 2401 | 3    | -       | 2/5/27/28 | 0/3/3/3 |
| 3   | PSU  | L3    | 4353 | 3    | -       | 0/7/25/26 | 0/2/2/2 |
| 3   | OMC  | L3    | 4536 | 3    | -       | 0/9/27/28 | 0/2/2/2 |
| 3   | PSU  | L3    | 4972 | 3    | -       | 0/7/25/26 | 0/2/2/2 |
| 23  | HIC  | LN    | 245  | 23   | -       | 2/5/6/8   | 0/1/1/1 |
| 3   | OMG  | L3    | 2364 | 3    | -       | 1/5/27/28 | 0/3/3/3 |
| 3   | PSU  | L3    | 1536 | 3    | -       | 0/7/25/26 | 0/2/2/2 |
| 3   | OMC  | L3    | 2861 | 3    | -       | 1/9/27/28 | 0/2/2/2 |
| 3   | PSU  | L3    | 3822 | 3    | -       | 0/7/25/26 | 0/2/2/2 |
| 3   | PSU  | L3    | 4457 | 3    | -       | 0/7/25/26 | 0/2/2/2 |
| 3   | PSU  | L3    | 4493 | 3    | -       | 0/7/25/26 | 0/2/2/2 |
| 3   | OMU  | L3    | 4620 | 3    | -       | 1/9/27/28 | 0/2/2/2 |
| 3   | A2M  | L3    | 2815 | 3    | -       | 1/5/27/28 | 0/3/3/3 |
| 3   | PSU  | L3    | 4673 | 3    | -       | 0/7/25/26 | 0/2/2/2 |
| 3   | OMG  | L3    | 1316 | 3    | -       | 2/5/27/28 | 0/3/3/3 |
| 3   | PSU  | L3    | 5001 | 3    | -       | 0/7/25/26 | 0/2/2/2 |
| 3   | OMG  | L3    | 4228 | 3    | -       | 0/5/27/28 | 0/3/3/3 |
| 3   | PSU  | L3    | 4293 | 3    | -       | 0/7/25/26 | 0/2/2/2 |

*Continued on next page...*

*Continued from previous page...*

| Mol | Type | Chain | Res  | Link | Chirals | Torsions  | Rings   |
|-----|------|-------|------|------|---------|-----------|---------|
| 3   | OMG  | L3    | 4494 | 3    | -       | 0/5/27/28 | 0/3/3/3 |
| 3   | A2M  | L3    | 1534 | 55,3 | -       | 2/5/27/28 | 0/3/3/3 |
| 2   | PSU  | L1    | 69   | 2    | -       | 0/7/25/26 | 0/2/2/2 |
| 3   | A2M  | L3    | 3724 | 3    | -       | 2/5/27/28 | 0/3/3/3 |
| 2   | OMG  | L1    | 75   | 2    | -       | 1/5/27/28 | 0/3/3/3 |
| 3   | PSU  | L3    | 1683 | 3    | -       | 0/7/25/26 | 0/2/2/2 |
| 3   | OMC  | L3    | 4456 | 3    | -       | 0/9/27/28 | 0/2/2/2 |
| 3   | PSU  | L3    | 4576 | 3    | -       | 0/7/25/26 | 0/2/2/2 |
| 3   | PSU  | L3    | 3715 | 3    | -       | 0/7/25/26 | 0/2/2/2 |
| 3   | PSU  | L3    | 2632 | 3    | -       | 0/7/25/26 | 0/2/2/2 |
| 3   | PSU  | L3    | 3853 | 3    | -       | 0/7/25/26 | 0/2/2/2 |
| 3   | PSU  | L3    | 4500 | 3    | -       | 0/7/25/26 | 0/2/2/2 |
| 3   | OMC  | L3    | 2422 | 55,3 | -       | 2/9/27/28 | 0/2/2/2 |
| 3   | PSU  | L3    | 4361 | 3    | -       | 0/7/25/26 | 0/2/2/2 |
| 3   | OMC  | L3    | 3701 | 3    | -       | 6/9/27/28 | 0/2/2/2 |
| 2   | PSU  | L1    | 55   | 2    | -       | 0/7/25/26 | 0/2/2/2 |
| 3   | A2M  | L3    | 3718 | 3    | -       | 1/5/27/28 | 0/3/3/3 |
| 3   | A2M  | L3    | 4523 | 3    | -       | 2/5/27/28 | 0/3/3/3 |
| 3   | OMC  | L3    | 3841 | 3    | -       | 1/9/27/28 | 0/2/2/2 |
| 3   | OMC  | L3    | 2365 | 3    | -       | 0/9/27/28 | 0/2/2/2 |
| 3   | PSU  | L3    | 4636 | 3    | -       | 4/7/25/26 | 0/2/2/2 |
| 3   | PSU  | L3    | 3851 | 3    | -       | 0/7/25/26 | 0/2/2/2 |
| 3   | A2M  | L3    | 4571 | 3    | -       | 1/5/27/28 | 0/3/3/3 |
| 3   | OMC  | L3    | 2804 | 3    | -       | 0/9/27/28 | 0/2/2/2 |
| 3   | A2M  | L3    | 3830 | 3    | -       | 2/5/27/28 | 0/3/3/3 |
| 3   | A2M  | L3    | 2787 | 3    | -       | 2/5/27/28 | 0/3/3/3 |
| 3   | OMG  | L3    | 4618 | 3    | -       | 2/5/27/28 | 0/3/3/3 |
| 3   | UR3  | L3    | 4530 | 3    | -       | 0/7/25/26 | 0/2/2/2 |
| 3   | OMG  | L3    | 4499 | 3    | -       | 0/5/27/28 | 0/3/3/3 |
| 3   | OMC  | L3    | 2351 | 55,3 | -       | 4/9/27/28 | 0/2/2/2 |
| 3   | A2M  | L3    | 1524 | 3    | -       | 1/5/27/28 | 0/3/3/3 |
| 3   | PSU  | L3    | 4431 | 3    | -       | 0/7/25/26 | 0/2/2/2 |
| 3   | OMU  | L3    | 3925 | 3    | -       | 1/9/27/28 | 0/2/2/2 |
| 3   | PSU  | L3    | 3730 | 3    | -       | 0/7/25/26 | 0/2/2/2 |
| 3   | PSU  | L3    | 4403 | 3    | -       | 0/7/25/26 | 0/2/2/2 |
| 3   | OMG  | L3    | 1625 | 3    | -       | 2/5/27/28 | 0/3/3/3 |
| 3   | A2M  | L3    | 398  | 3    | -       | 1/5/27/28 | 0/3/3/3 |
| 3   | PSU  | L3    | 3884 | 3    | -       | 0/7/25/26 | 0/2/2/2 |
| 3   | PSU  | L3    | 4299 | 3    | -       | 0/7/25/26 | 0/2/2/2 |
| 3   | PSU  | L3    | 4532 | 3    | -       | 0/7/25/26 | 0/2/2/2 |

*Continued on next page...*

Continued from previous page...

| Mol | Type | Chain | Res  | Link | Chirals | Torsions  | Rings   |
|-----|------|-------|------|------|---------|-----------|---------|
| 3   | PSU  | L3    | 3639 | 3    | -       | 0/7/25/26 | 0/2/2/2 |
| 3   | OMG  | L3    | 4637 | 3    | -       | 3/5/27/28 | 0/3/3/3 |
| 3   | OMC  | L3    | 2824 | 3    | -       | 0/9/27/28 | 0/2/2/2 |
| 3   | A2M  | L3    | 1326 | 3    | -       | 3/5/27/28 | 0/3/3/3 |
| 3   | OMG  | L3    | 2424 | 3    | -       | 0/5/27/28 | 0/3/3/3 |
| 3   | PSU  | L3    | 3734 | 3    | -       | 0/7/25/26 | 0/2/2/2 |
| 3   | OMC  | L3    | 3887 | 3    | -       | 2/9/27/28 | 0/2/2/2 |
| 3   | OMU  | L3    | 4498 | 3    | -       | 0/9/27/28 | 0/2/2/2 |
| 3   | OMG  | L3    | 4370 | 3    | -       | 1/5/27/28 | 0/3/3/3 |
| 3   | OMU  | L3    | 2837 | 3    | -       | 1/9/27/28 | 0/2/2/2 |
| 3   | PSU  | L3    | 4471 | 3    | -       | 0/7/25/26 | 0/2/2/2 |
| 3   | PSU  | L3    | 1862 | 3    | -       | 2/7/25/26 | 0/2/2/2 |
| 3   | OMU  | L3    | 4227 | 3    | -       | 1/9/27/28 | 0/2/2/2 |
| 3   | PSU  | L3    | 4689 | 3    | -       | 0/7/25/26 | 0/2/2/2 |
| 3   | PSU  | L3    | 1677 | 3    | -       | 3/7/25/26 | 0/2/2/2 |
| 3   | PSU  | L3    | 3920 | 55,3 | -       | 0/7/25/26 | 0/2/2/2 |
| 3   | PSU  | L3    | 3695 | 3    | -       | 0/7/25/26 | 0/2/2/2 |
| 3   | PSU  | L3    | 4312 | 3    | -       | 1/7/25/26 | 0/2/2/2 |
| 3   | OMU  | L3    | 2415 | 3    | -       | 1/9/27/28 | 0/2/2/2 |
| 3   | PSU  | L3    | 2839 | 3    | -       | 2/7/25/26 | 0/2/2/2 |
| 3   | OMG  | L3    | 3627 | 3    | -       | 1/5/27/28 | 0/3/3/3 |
| 3   | PSU  | L3    | 3637 | 3    | -       | 0/7/25/26 | 0/2/2/2 |

All (174) bond length outliers are listed below:

| Mol | Chain | Res  | Type | Atoms | Z    | Observed(Å) | Ideal(Å) |
|-----|-------|------|------|-------|------|-------------|----------|
| 3   | L3    | 4498 | OMU  | C6-N1 | 4.79 | 1.49        | 1.38     |
| 3   | L3    | 2837 | OMU  | C6-N1 | 4.70 | 1.49        | 1.38     |
| 3   | L3    | 4620 | OMU  | C6-N1 | 4.65 | 1.49        | 1.38     |
| 3   | L3    | 2415 | OMU  | C6-N1 | 4.65 | 1.49        | 1.38     |
| 3   | L3    | 4306 | OMU  | C6-N1 | 4.64 | 1.49        | 1.38     |
| 3   | L3    | 3925 | OMU  | C6-N1 | 4.62 | 1.49        | 1.38     |
| 3   | L3    | 4227 | OMU  | C6-N1 | 4.62 | 1.49        | 1.38     |
| 3   | L3    | 4498 | OMU  | C2-N1 | 4.29 | 1.45        | 1.38     |
| 3   | L3    | 4498 | OMU  | C5-C4 | 4.08 | 1.52        | 1.43     |
| 3   | L3    | 2837 | OMU  | C2-N1 | 4.06 | 1.45        | 1.38     |
| 3   | L3    | 2415 | OMU  | C2-N1 | 4.04 | 1.44        | 1.38     |
| 3   | L3    | 4227 | OMU  | C2-N1 | 4.01 | 1.44        | 1.38     |
| 3   | L3    | 4306 | OMU  | C2-N1 | 4.00 | 1.44        | 1.38     |
| 3   | L3    | 3925 | OMU  | C2-N1 | 3.99 | 1.44        | 1.38     |
| 3   | L3    | 2837 | OMU  | C5-C4 | 3.97 | 1.52        | 1.43     |

Continued on next page...

*Continued from previous page...*

| Mol | Chain | Res  | Type | Atoms   | Z    | Observed(Å) | Ideal(Å) |
|-----|-------|------|------|---------|------|-------------|----------|
| 3   | L3    | 2415 | OMU  | C5-C4   | 3.90 | 1.52        | 1.43     |
| 3   | L3    | 4620 | OMU  | C2-N1   | 3.89 | 1.44        | 1.38     |
| 3   | L3    | 3925 | OMU  | C5-C4   | 3.89 | 1.52        | 1.43     |
| 3   | L3    | 4227 | OMU  | C5-C4   | 3.86 | 1.52        | 1.43     |
| 3   | L3    | 4620 | OMU  | C5-C4   | 3.82 | 1.52        | 1.43     |
| 3   | L3    | 4306 | OMU  | C5-C4   | 3.80 | 1.52        | 1.43     |
| 3   | L3    | 3822 | PSU  | C6-C5   | 3.58 | 1.39        | 1.35     |
| 23  | LN    | 245  | HIC  | CD2-CG  | 3.54 | 1.41        | 1.36     |
| 3   | L3    | 3695 | PSU  | C6-C5   | 3.49 | 1.39        | 1.35     |
| 3   | L3    | 3715 | PSU  | C6-C5   | 3.48 | 1.39        | 1.35     |
| 3   | L3    | 4471 | PSU  | C6-C5   | 3.45 | 1.39        | 1.35     |
| 3   | L3    | 3730 | PSU  | C6-C5   | 3.42 | 1.39        | 1.35     |
| 3   | L3    | 4431 | PSU  | C6-C5   | 3.42 | 1.39        | 1.35     |
| 3   | L3    | 4457 | PSU  | C6-C5   | 3.40 | 1.39        | 1.35     |
| 3   | L3    | 1862 | PSU  | C6-C5   | 3.40 | 1.39        | 1.35     |
| 3   | L3    | 3734 | PSU  | C6-C5   | 3.39 | 1.39        | 1.35     |
| 3   | L3    | 1871 | A2M  | O4'-C1' | 3.34 | 1.45        | 1.41     |
| 3   | L3    | 5001 | PSU  | C6-C5   | 3.33 | 1.39        | 1.35     |
| 3   | L3    | 4576 | PSU  | C6-C5   | 3.32 | 1.39        | 1.35     |
| 2   | L1    | 69   | PSU  | C6-C5   | 3.32 | 1.39        | 1.35     |
| 3   | L3    | 4500 | PSU  | C6-C5   | 3.31 | 1.39        | 1.35     |
| 3   | L3    | 4636 | PSU  | C6-C5   | 3.30 | 1.39        | 1.35     |
| 3   | L3    | 4532 | PSU  | C6-C5   | 3.30 | 1.39        | 1.35     |
| 3   | L3    | 3844 | PSU  | C6-C5   | 3.29 | 1.39        | 1.35     |
| 3   | L3    | 1860 | PSU  | C6-C5   | 3.27 | 1.39        | 1.35     |
| 3   | L3    | 1792 | PSU  | C6-C5   | 3.26 | 1.39        | 1.35     |
| 3   | L3    | 4673 | PSU  | C6-C5   | 3.26 | 1.39        | 1.35     |
| 3   | L3    | 4521 | PSU  | C6-C5   | 3.25 | 1.39        | 1.35     |
| 3   | L3    | 4403 | PSU  | C6-C5   | 3.24 | 1.39        | 1.35     |
| 3   | L3    | 3853 | PSU  | C6-C5   | 3.24 | 1.39        | 1.35     |
| 3   | L3    | 3920 | PSU  | C6-C5   | 3.24 | 1.39        | 1.35     |
| 3   | L3    | 4361 | PSU  | C6-C5   | 3.22 | 1.39        | 1.35     |
| 3   | L3    | 2632 | PSU  | C6-C5   | 3.21 | 1.39        | 1.35     |
| 3   | L3    | 3851 | PSU  | C6-C5   | 3.21 | 1.39        | 1.35     |
| 3   | L3    | 4972 | PSU  | C6-C5   | 3.21 | 1.39        | 1.35     |
| 3   | L3    | 2508 | PSU  | C6-C5   | 3.20 | 1.39        | 1.35     |
| 3   | L3    | 2839 | PSU  | C6-C5   | 3.18 | 1.39        | 1.35     |
| 3   | L3    | 4353 | PSU  | C6-C5   | 3.17 | 1.39        | 1.35     |
| 3   | L3    | 4493 | PSU  | C6-C5   | 3.17 | 1.39        | 1.35     |
| 3   | L3    | 4552 | PSU  | C6-C5   | 3.16 | 1.39        | 1.35     |
| 3   | L3    | 3724 | A2M  | O4'-C1' | 3.16 | 1.45        | 1.41     |
| 3   | L3    | 3639 | PSU  | C6-C5   | 3.15 | 1.39        | 1.35     |

*Continued on next page...*

*Continued from previous page...*

| Mol | Chain | Res  | Type | Atoms   | Z     | Observed(Å) | Ideal(Å) |
|-----|-------|------|------|---------|-------|-------------|----------|
| 3   | L3    | 3637 | PSU  | C6-C5   | 3.14  | 1.39        | 1.35     |
| 3   | L3    | 3884 | PSU  | C6-C5   | 3.14  | 1.39        | 1.35     |
| 3   | L3    | 1683 | PSU  | C6-C5   | 3.13  | 1.39        | 1.35     |
| 3   | L3    | 5010 | PSU  | C6-C5   | 3.13  | 1.39        | 1.35     |
| 3   | L3    | 4689 | PSU  | C6-C5   | 3.13  | 1.39        | 1.35     |
| 3   | L3    | 2401 | A2M  | O4'-C1' | 3.12  | 1.45        | 1.41     |
| 3   | L3    | 1536 | PSU  | C6-C5   | 3.11  | 1.38        | 1.35     |
| 3   | L3    | 1326 | A2M  | O4'-C1' | 3.10  | 1.45        | 1.41     |
| 3   | L3    | 4579 | PSU  | C6-C5   | 3.10  | 1.38        | 1.35     |
| 2   | L1    | 55   | PSU  | C6-C5   | 3.10  | 1.38        | 1.35     |
| 3   | L3    | 3825 | A2M  | O4'-C1' | 3.10  | 1.45        | 1.41     |
| 3   | L3    | 4571 | A2M  | O4'-C1' | 3.09  | 1.45        | 1.41     |
| 3   | L3    | 2815 | A2M  | O4'-C1' | 3.09  | 1.45        | 1.41     |
| 3   | L3    | 1582 | PSU  | C6-C5   | 3.08  | 1.38        | 1.35     |
| 3   | L3    | 398  | A2M  | O4'-C1' | 3.08  | 1.45        | 1.41     |
| 3   | L3    | 3830 | A2M  | O4'-C1' | 3.07  | 1.45        | 1.41     |
| 3   | L3    | 4312 | PSU  | C6-C5   | 3.07  | 1.38        | 1.35     |
| 3   | L3    | 4628 | PSU  | C6-C5   | 3.05  | 1.38        | 1.35     |
| 3   | L3    | 400  | A2M  | O4'-C1' | 3.04  | 1.45        | 1.41     |
| 3   | L3    | 1677 | PSU  | C6-C5   | 3.01  | 1.38        | 1.35     |
| 3   | L3    | 2363 | A2M  | O4'-C1' | 3.00  | 1.45        | 1.41     |
| 3   | L3    | 4293 | PSU  | C6-C5   | 2.99  | 1.38        | 1.35     |
| 3   | L3    | 4523 | A2M  | O4'-C1' | 2.97  | 1.45        | 1.41     |
| 3   | L3    | 4296 | PSU  | C6-C5   | 2.97  | 1.38        | 1.35     |
| 3   | L3    | 4306 | OMU  | O4-C4   | -2.96 | 1.18        | 1.24     |
| 3   | L3    | 2424 | OMG  | C8-N7   | -2.95 | 1.30        | 1.35     |
| 3   | L3    | 4618 | OMG  | C8-N7   | -2.93 | 1.30        | 1.35     |
| 3   | L3    | 3718 | A2M  | O4'-C1' | 2.92  | 1.45        | 1.41     |
| 3   | L3    | 1534 | A2M  | O4'-C1' | 2.92  | 1.45        | 1.41     |
| 3   | L3    | 4228 | OMG  | C8-N7   | -2.91 | 1.30        | 1.35     |
| 3   | L3    | 2876 | OMG  | C8-N7   | -2.91 | 1.30        | 1.35     |
| 3   | L3    | 4392 | OMG  | C8-N7   | -2.91 | 1.30        | 1.35     |
| 2   | L1    | 75   | OMG  | C8-N7   | -2.88 | 1.30        | 1.35     |
| 3   | L3    | 3899 | OMG  | C8-N7   | -2.88 | 1.30        | 1.35     |
| 3   | L3    | 4494 | OMG  | C8-N7   | -2.86 | 1.30        | 1.35     |
| 3   | L3    | 1316 | OMG  | C8-N7   | -2.86 | 1.30        | 1.35     |
| 3   | L3    | 3925 | OMU  | O4-C4   | -2.86 | 1.18        | 1.24     |
| 3   | L3    | 1522 | OMG  | C8-N7   | -2.86 | 1.30        | 1.35     |
| 3   | L3    | 4530 | UR3  | C2-N1   | -2.85 | 1.34        | 1.38     |
| 3   | L3    | 4299 | PSU  | C6-C5   | 2.85  | 1.38        | 1.35     |
| 3   | L3    | 2364 | OMG  | C8-N7   | -2.84 | 1.30        | 1.35     |
| 3   | L3    | 4590 | A2M  | O4'-C1' | 2.84  | 1.45        | 1.41     |

*Continued on next page...*

*Continued from previous page...*

| Mol | Chain | Res  | Type | Atoms   | Z     | Observed(Å) | Ideal(Å) |
|-----|-------|------|------|---------|-------|-------------|----------|
| 3   | L3    | 4620 | OMU  | O4-C4   | -2.84 | 1.19        | 1.24     |
| 3   | L3    | 1625 | OMG  | C8-N7   | -2.83 | 1.30        | 1.35     |
| 3   | L3    | 4370 | OMG  | C8-N7   | -2.81 | 1.30        | 1.35     |
| 3   | L3    | 4227 | OMU  | O4-C4   | -2.79 | 1.19        | 1.24     |
| 3   | L3    | 2787 | A2M  | O4'-C1' | 2.79  | 1.45        | 1.41     |
| 3   | L3    | 1524 | A2M  | O4'-C1' | 2.79  | 1.45        | 1.41     |
| 3   | L3    | 2415 | OMU  | O4-C4   | -2.78 | 1.19        | 1.24     |
| 3   | L3    | 3867 | A2M  | O4'-C1' | 2.78  | 1.45        | 1.41     |
| 3   | L3    | 2837 | OMU  | O4-C4   | -2.77 | 1.19        | 1.24     |
| 3   | L3    | 4637 | OMG  | C8-N7   | -2.77 | 1.30        | 1.35     |
| 3   | L3    | 3627 | OMG  | C8-N7   | -2.72 | 1.30        | 1.35     |
| 3   | L3    | 4623 | OMG  | C8-N7   | -2.72 | 1.30        | 1.35     |
| 3   | L3    | 4228 | OMG  | C5-C6   | -2.70 | 1.41        | 1.47     |
| 3   | L3    | 3744 | OMG  | C8-N7   | -2.70 | 1.30        | 1.35     |
| 3   | L3    | 4499 | OMG  | C8-N7   | -2.70 | 1.30        | 1.35     |
| 3   | L3    | 4498 | OMU  | O4-C4   | -2.68 | 1.19        | 1.24     |
| 3   | L3    | 2363 | A2M  | C8-N7   | -2.63 | 1.30        | 1.34     |
| 3   | L3    | 2424 | OMG  | C5-C6   | -2.61 | 1.42        | 1.47     |
| 3   | L3    | 4498 | OMU  | C2-N3   | 2.59  | 1.42        | 1.38     |
| 3   | L3    | 2787 | A2M  | C8-N7   | -2.58 | 1.30        | 1.34     |
| 3   | L3    | 4220 | 6MZ  | C8-N7   | -2.56 | 1.30        | 1.34     |
| 3   | L3    | 4530 | UR3  | C4-N3   | -2.54 | 1.34        | 1.40     |
| 3   | L3    | 4392 | OMG  | C5-C6   | -2.54 | 1.42        | 1.47     |
| 3   | L3    | 4370 | OMG  | C5-C6   | -2.53 | 1.42        | 1.47     |
| 3   | L3    | 1522 | OMG  | C5-C6   | -2.53 | 1.42        | 1.47     |
| 3   | L3    | 4494 | OMG  | C5-C6   | -2.52 | 1.42        | 1.47     |
| 3   | L3    | 1534 | A2M  | C8-N7   | -2.51 | 1.30        | 1.34     |
| 3   | L3    | 2815 | A2M  | C8-N7   | -2.50 | 1.30        | 1.34     |
| 3   | L3    | 3627 | OMG  | C5-C6   | -2.49 | 1.42        | 1.47     |
| 3   | L3    | 2837 | OMU  | C2-N3   | 2.48  | 1.42        | 1.38     |
| 3   | L3    | 3718 | A2M  | C8-N7   | -2.48 | 1.30        | 1.34     |
| 3   | L3    | 1316 | OMG  | C5-C6   | -2.48 | 1.42        | 1.47     |
| 3   | L3    | 4590 | A2M  | C8-N7   | -2.46 | 1.30        | 1.34     |
| 3   | L3    | 4571 | A2M  | C8-N7   | -2.45 | 1.30        | 1.34     |
| 3   | L3    | 3899 | OMG  | C5-C6   | -2.45 | 1.42        | 1.47     |
| 3   | L3    | 400  | A2M  | C8-N7   | -2.44 | 1.30        | 1.34     |
| 3   | L3    | 4523 | A2M  | C8-N7   | -2.44 | 1.30        | 1.34     |
| 3   | L3    | 398  | A2M  | C8-N7   | -2.44 | 1.30        | 1.34     |
| 3   | L3    | 2401 | A2M  | C8-N7   | -2.44 | 1.30        | 1.34     |
| 3   | L3    | 2364 | OMG  | C5-C6   | -2.44 | 1.42        | 1.47     |
| 3   | L3    | 1524 | A2M  | C8-N7   | -2.43 | 1.30        | 1.34     |
| 3   | L3    | 3724 | A2M  | C8-N7   | -2.43 | 1.30        | 1.34     |

*Continued on next page...*



Continued from previous page...

| Mol | Chain | Res  | Type | Atoms  | Z     | Observed(Å) | Ideal(Å) |
|-----|-------|------|------|--------|-------|-------------|----------|
| 3   | L3    | 3825 | A2M  | C8-N7  | -2.43 | 1.30        | 1.34     |
| 3   | L3    | 3867 | A2M  | C8-N7  | -2.42 | 1.30        | 1.34     |
| 3   | L3    | 4623 | OMG  | C5-C6  | -2.41 | 1.42        | 1.47     |
| 3   | L3    | 4637 | OMG  | C5-C6  | -2.41 | 1.42        | 1.47     |
| 2   | L1    | 75   | OMG  | C5-C6  | -2.41 | 1.42        | 1.47     |
| 3   | L3    | 4618 | OMG  | C5-C6  | -2.40 | 1.42        | 1.47     |
| 3   | L3    | 3744 | OMG  | C5-C6  | -2.40 | 1.42        | 1.47     |
| 3   | L3    | 3925 | OMU  | C2-N3  | 2.39  | 1.42        | 1.38     |
| 3   | L3    | 3830 | A2M  | C8-N7  | -2.39 | 1.30        | 1.34     |
| 3   | L3    | 1625 | OMG  | C5-C6  | -2.37 | 1.42        | 1.47     |
| 3   | L3    | 1326 | A2M  | C8-N7  | -2.37 | 1.30        | 1.34     |
| 3   | L3    | 4306 | OMU  | O2-C2  | -2.37 | 1.18        | 1.23     |
| 3   | L3    | 1871 | A2M  | C8-N7  | -2.35 | 1.30        | 1.34     |
| 3   | L3    | 2415 | OMU  | C2-N3  | 2.35  | 1.42        | 1.38     |
| 3   | L3    | 4227 | OMU  | C2-N3  | 2.33  | 1.42        | 1.38     |
| 3   | L3    | 2876 | OMG  | C5-C6  | -2.33 | 1.42        | 1.47     |
| 3   | L3    | 4499 | OMG  | C5-C6  | -2.33 | 1.42        | 1.47     |
| 3   | L3    | 4227 | OMU  | O2-C2  | -2.29 | 1.18        | 1.23     |
| 3   | L3    | 2415 | OMU  | O2-C2  | -2.27 | 1.18        | 1.23     |
| 3   | L3    | 4306 | OMU  | C2-N3  | 2.23  | 1.41        | 1.38     |
| 3   | L3    | 4530 | UR3  | C2-N3  | -2.21 | 1.34        | 1.39     |
| 3   | L3    | 3925 | OMU  | O2-C2  | -2.19 | 1.19        | 1.23     |
| 3   | L3    | 4620 | OMU  | O2-C2  | -2.17 | 1.19        | 1.23     |
| 3   | L3    | 2837 | OMU  | O2-C2  | -2.14 | 1.19        | 1.23     |
| 3   | L3    | 3718 | A2M  | C4-N3  | -2.07 | 1.32        | 1.35     |
| 3   | L3    | 4498 | OMU  | C4-N3  | 2.06  | 1.42        | 1.38     |
| 3   | L3    | 4370 | OMG  | C5-C4  | -2.06 | 1.37        | 1.43     |
| 3   | L3    | 4220 | 6MZ  | C6-N6  | 2.05  | 1.38        | 1.35     |
| 3   | L3    | 4620 | OMU  | C2-N3  | 2.02  | 1.41        | 1.38     |
| 23  | LN    | 245  | HIC  | CZ-NE2 | -2.02 | 1.42        | 1.48     |
| 3   | L3    | 4220 | 6MZ  | C4-N3  | -2.01 | 1.32        | 1.35     |
| 3   | L3    | 2837 | OMU  | C4-N3  | 2.01  | 1.42        | 1.38     |
| 3   | L3    | 4498 | OMU  | O2-C2  | -2.01 | 1.19        | 1.23     |

All (311) bond angle outliers are listed below:

| Mol | Chain | Res  | Type | Atoms    | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|----------|-------|-------------|----------|
| 3   | L3    | 4220 | 6MZ  | C2-N1-C6 | 5.20  | 121.05      | 116.59   |
| 3   | L3    | 2837 | OMU  | C4-N3-C2 | -5.15 | 119.78      | 126.58   |
| 3   | L3    | 4498 | OMU  | C4-N3-C2 | -5.11 | 119.84      | 126.58   |
| 3   | L3    | 3925 | OMU  | C4-N3-C2 | -5.06 | 119.91      | 126.58   |
| 3   | L3    | 4227 | OMU  | C4-N3-C2 | -5.03 | 119.95      | 126.58   |

Continued on next page...



*Continued from previous page...*

| Mol | Chain | Res  | Type | Atoms    | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|----------|-------|-------------|----------|
| 3   | L3    | 4306 | OMU  | C4-N3-C2 | -4.99 | 120.00      | 126.58   |
| 3   | L3    | 2415 | OMU  | C4-N3-C2 | -4.99 | 120.00      | 126.58   |
| 3   | L3    | 4296 | PSU  | C4-N3-C2 | -4.86 | 119.34      | 126.34   |
| 3   | L3    | 4299 | PSU  | C4-N3-C2 | -4.83 | 119.39      | 126.34   |
| 3   | L3    | 4636 | PSU  | C4-N3-C2 | -4.80 | 119.43      | 126.34   |
| 3   | L3    | 1582 | PSU  | C4-N3-C2 | -4.77 | 119.46      | 126.34   |
| 3   | L3    | 3637 | PSU  | C4-N3-C2 | -4.77 | 119.47      | 126.34   |
| 3   | L3    | 3637 | PSU  | N1-C2-N3 | 4.76  | 120.53      | 115.13   |
| 3   | L3    | 4299 | PSU  | N1-C2-N3 | 4.74  | 120.50      | 115.13   |
| 3   | L3    | 4532 | PSU  | C4-N3-C2 | -4.74 | 119.51      | 126.34   |
| 3   | L3    | 4689 | PSU  | N1-C2-N3 | 4.73  | 120.49      | 115.13   |
| 3   | L3    | 2508 | PSU  | C4-N3-C2 | -4.73 | 119.52      | 126.34   |
| 3   | L3    | 4312 | PSU  | C4-N3-C2 | -4.73 | 119.53      | 126.34   |
| 3   | L3    | 4431 | PSU  | C4-N3-C2 | -4.70 | 119.57      | 126.34   |
| 3   | L3    | 4403 | PSU  | C4-N3-C2 | -4.70 | 119.57      | 126.34   |
| 3   | L3    | 4353 | PSU  | C4-N3-C2 | -4.68 | 119.60      | 126.34   |
| 3   | L3    | 4689 | PSU  | C4-N3-C2 | -4.67 | 119.60      | 126.34   |
| 3   | L3    | 4353 | PSU  | N1-C2-N3 | 4.67  | 120.42      | 115.13   |
| 3   | L3    | 4312 | PSU  | N1-C2-N3 | 4.67  | 120.42      | 115.13   |
| 3   | L3    | 4532 | PSU  | N1-C2-N3 | 4.66  | 120.41      | 115.13   |
| 3   | L3    | 4636 | PSU  | N1-C2-N3 | 4.66  | 120.41      | 115.13   |
| 3   | L3    | 5010 | PSU  | C4-N3-C2 | -4.65 | 119.63      | 126.34   |
| 3   | L3    | 4296 | PSU  | N1-C2-N3 | 4.65  | 120.40      | 115.13   |
| 3   | L3    | 2632 | PSU  | C4-N3-C2 | -4.64 | 119.66      | 126.34   |
| 3   | L3    | 4576 | PSU  | N1-C2-N3 | 4.63  | 120.37      | 115.13   |
| 3   | L3    | 4457 | PSU  | N1-C2-N3 | 4.62  | 120.36      | 115.13   |
| 3   | L3    | 3844 | PSU  | C4-N3-C2 | -4.62 | 119.69      | 126.34   |
| 2   | L1    | 55   | PSU  | C4-N3-C2 | -4.61 | 119.70      | 126.34   |
| 3   | L3    | 4552 | PSU  | C4-N3-C2 | -4.61 | 119.70      | 126.34   |
| 3   | L3    | 1683 | PSU  | C4-N3-C2 | -4.60 | 119.71      | 126.34   |
| 3   | L3    | 4673 | PSU  | C4-N3-C2 | -4.60 | 119.71      | 126.34   |
| 3   | L3    | 4493 | PSU  | C4-N3-C2 | -4.60 | 119.72      | 126.34   |
| 3   | L3    | 1677 | PSU  | C4-N3-C2 | -4.58 | 119.73      | 126.34   |
| 3   | L3    | 4457 | PSU  | C4-N3-C2 | -4.58 | 119.74      | 126.34   |
| 3   | L3    | 3730 | PSU  | C4-N3-C2 | -4.58 | 119.74      | 126.34   |
| 3   | L3    | 2508 | PSU  | N1-C2-N3 | 4.58  | 120.32      | 115.13   |
| 3   | L3    | 3715 | PSU  | C4-N3-C2 | -4.58 | 119.74      | 126.34   |
| 3   | L3    | 4628 | PSU  | N1-C2-N3 | 4.58  | 120.31      | 115.13   |
| 3   | L3    | 5001 | PSU  | N1-C2-N3 | 4.57  | 120.31      | 115.13   |
| 3   | L3    | 3695 | PSU  | C4-N3-C2 | -4.57 | 119.75      | 126.34   |
| 3   | L3    | 4493 | PSU  | N1-C2-N3 | 4.56  | 120.30      | 115.13   |
| 3   | L3    | 3851 | PSU  | C4-N3-C2 | -4.56 | 119.77      | 126.34   |

*Continued on next page...*

*Continued from previous page...*

| Mol | Chain | Res  | Type | Atoms    | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|----------|-------|-------------|----------|
| 3   | L3    | 5010 | PSU  | N1-C2-N3 | 4.56  | 120.29      | 115.13   |
| 3   | L3    | 3844 | PSU  | N1-C2-N3 | 4.55  | 120.29      | 115.13   |
| 3   | L3    | 4521 | PSU  | C4-N3-C2 | -4.55 | 119.78      | 126.34   |
| 3   | L3    | 4576 | PSU  | C4-N3-C2 | -4.55 | 119.78      | 126.34   |
| 3   | L3    | 4403 | PSU  | N1-C2-N3 | 4.55  | 120.29      | 115.13   |
| 3   | L3    | 4530 | UR3  | C4-N3-C2 | -4.55 | 120.28      | 124.56   |
| 3   | L3    | 3639 | PSU  | N1-C2-N3 | 4.55  | 120.28      | 115.13   |
| 3   | L3    | 4972 | PSU  | C4-N3-C2 | -4.55 | 119.78      | 126.34   |
| 3   | L3    | 4471 | PSU  | C4-N3-C2 | -4.55 | 119.79      | 126.34   |
| 3   | L3    | 1792 | PSU  | C4-N3-C2 | -4.54 | 119.79      | 126.34   |
| 3   | L3    | 3639 | PSU  | C4-N3-C2 | -4.54 | 119.79      | 126.34   |
| 3   | L3    | 1860 | PSU  | C4-N3-C2 | -4.54 | 119.80      | 126.34   |
| 2   | L1    | 69   | PSU  | C4-N3-C2 | -4.54 | 119.80      | 126.34   |
| 3   | L3    | 1536 | PSU  | C4-N3-C2 | -4.54 | 119.80      | 126.34   |
| 3   | L3    | 4500 | PSU  | C4-N3-C2 | -4.54 | 119.80      | 126.34   |
| 3   | L3    | 4471 | PSU  | N1-C2-N3 | 4.53  | 120.26      | 115.13   |
| 3   | L3    | 4972 | PSU  | N1-C2-N3 | 4.53  | 120.26      | 115.13   |
| 3   | L3    | 3730 | PSU  | N1-C2-N3 | 4.52  | 120.25      | 115.13   |
| 3   | L3    | 3822 | PSU  | C4-N3-C2 | -4.52 | 119.83      | 126.34   |
| 3   | L3    | 3734 | PSU  | N1-C2-N3 | 4.52  | 120.25      | 115.13   |
| 3   | L3    | 3920 | PSU  | C4-N3-C2 | -4.51 | 119.84      | 126.34   |
| 3   | L3    | 2839 | PSU  | N1-C2-N3 | 4.51  | 120.24      | 115.13   |
| 3   | L3    | 3695 | PSU  | N1-C2-N3 | 4.51  | 120.24      | 115.13   |
| 3   | L3    | 3734 | PSU  | C4-N3-C2 | -4.51 | 119.84      | 126.34   |
| 3   | L3    | 5001 | PSU  | C4-N3-C2 | -4.51 | 119.84      | 126.34   |
| 3   | L3    | 1862 | PSU  | C4-N3-C2 | -4.51 | 119.85      | 126.34   |
| 3   | L3    | 3822 | PSU  | N1-C2-N3 | 4.51  | 120.23      | 115.13   |
| 3   | L3    | 3715 | PSU  | N1-C2-N3 | 4.50  | 120.23      | 115.13   |
| 3   | L3    | 4628 | PSU  | C4-N3-C2 | -4.50 | 119.86      | 126.34   |
| 3   | L3    | 4620 | OMU  | C4-N3-C2 | -4.50 | 120.65      | 126.58   |
| 3   | L3    | 3851 | PSU  | N1-C2-N3 | 4.49  | 120.22      | 115.13   |
| 3   | L3    | 1792 | PSU  | N1-C2-N3 | 4.49  | 120.22      | 115.13   |
| 3   | L3    | 4521 | PSU  | N1-C2-N3 | 4.48  | 120.21      | 115.13   |
| 3   | L3    | 4361 | PSU  | C4-N3-C2 | -4.48 | 119.88      | 126.34   |
| 3   | L3    | 1860 | PSU  | N1-C2-N3 | 4.48  | 120.20      | 115.13   |
| 3   | L3    | 4431 | PSU  | N1-C2-N3 | 4.48  | 120.20      | 115.13   |
| 3   | L3    | 4361 | PSU  | N1-C2-N3 | 4.47  | 120.20      | 115.13   |
| 2   | L1    | 69   | PSU  | N1-C2-N3 | 4.47  | 120.19      | 115.13   |
| 3   | L3    | 4673 | PSU  | N1-C2-N3 | 4.45  | 120.18      | 115.13   |
| 3   | L3    | 1862 | PSU  | N1-C2-N3 | 4.45  | 120.18      | 115.13   |
| 3   | L3    | 4500 | PSU  | N1-C2-N3 | 4.45  | 120.17      | 115.13   |
| 3   | L3    | 4552 | PSU  | N1-C2-N3 | 4.45  | 120.17      | 115.13   |

*Continued on next page...*

*Continued from previous page...*

| Mol | Chain | Res  | Type | Atoms    | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|----------|-------|-------------|----------|
| 3   | L3    | 4579 | PSU  | C4-N3-C2 | -4.44 | 119.94      | 126.34   |
| 3   | L3    | 2839 | PSU  | C4-N3-C2 | -4.43 | 119.96      | 126.34   |
| 3   | L3    | 1683 | PSU  | N1-C2-N3 | 4.43  | 120.15      | 115.13   |
| 3   | L3    | 1582 | PSU  | N1-C2-N3 | 4.43  | 120.14      | 115.13   |
| 3   | L3    | 4590 | A2M  | N3-C2-N1 | -4.41 | 121.78      | 128.68   |
| 3   | L3    | 4579 | PSU  | N1-C2-N3 | 4.41  | 120.12      | 115.13   |
| 2   | L1    | 55   | PSU  | N1-C2-N3 | 4.39  | 120.11      | 115.13   |
| 3   | L3    | 1536 | PSU  | N1-C2-N3 | 4.39  | 120.10      | 115.13   |
| 3   | L3    | 3884 | PSU  | N1-C2-N3 | 4.37  | 120.08      | 115.13   |
| 3   | L3    | 3884 | PSU  | C4-N3-C2 | -4.35 | 120.07      | 126.34   |
| 3   | L3    | 1677 | PSU  | N1-C2-N3 | 4.35  | 120.05      | 115.13   |
| 3   | L3    | 3920 | PSU  | N1-C2-N3 | 4.34  | 120.05      | 115.13   |
| 3   | L3    | 2632 | PSU  | N1-C2-N3 | 4.34  | 120.04      | 115.13   |
| 3   | L3    | 3853 | PSU  | C4-N3-C2 | -4.32 | 120.12      | 126.34   |
| 3   | L3    | 4293 | PSU  | N1-C2-N3 | 4.24  | 119.93      | 115.13   |
| 3   | L3    | 3853 | PSU  | N1-C2-N3 | 4.23  | 119.93      | 115.13   |
| 3   | L3    | 4306 | OMU  | N3-C2-N1 | 4.19  | 120.45      | 114.89   |
| 3   | L3    | 4293 | PSU  | C4-N3-C2 | -4.16 | 120.35      | 126.34   |
| 3   | L3    | 400  | A2M  | N3-C2-N1 | -4.15 | 122.19      | 128.68   |
| 3   | L3    | 3724 | A2M  | N3-C2-N1 | -4.13 | 122.22      | 128.68   |
| 3   | L3    | 398  | A2M  | N3-C2-N1 | -4.10 | 122.27      | 128.68   |
| 3   | L3    | 2363 | A2M  | N3-C2-N1 | -4.08 | 122.30      | 128.68   |
| 3   | L3    | 1524 | A2M  | N3-C2-N1 | -4.07 | 122.32      | 128.68   |
| 3   | L3    | 3825 | A2M  | N3-C2-N1 | -4.07 | 122.32      | 128.68   |
| 3   | L3    | 2401 | A2M  | N3-C2-N1 | -4.06 | 122.33      | 128.68   |
| 3   | L3    | 3830 | A2M  | N3-C2-N1 | -4.06 | 122.33      | 128.68   |
| 3   | L3    | 4523 | A2M  | N3-C2-N1 | -4.06 | 122.34      | 128.68   |
| 3   | L3    | 1871 | A2M  | N3-C2-N1 | -4.04 | 122.36      | 128.68   |
| 3   | L3    | 1326 | A2M  | N3-C2-N1 | -4.04 | 122.36      | 128.68   |
| 3   | L3    | 3867 | A2M  | N3-C2-N1 | -4.03 | 122.38      | 128.68   |
| 3   | L3    | 2815 | A2M  | N3-C2-N1 | -4.00 | 122.42      | 128.68   |
| 3   | L3    | 2837 | OMU  | N3-C2-N1 | 4.00  | 120.19      | 114.89   |
| 3   | L3    | 4571 | A2M  | N3-C2-N1 | -3.98 | 122.46      | 128.68   |
| 3   | L3    | 1534 | A2M  | N3-C2-N1 | -3.97 | 122.47      | 128.68   |
| 3   | L3    | 2415 | OMU  | N3-C2-N1 | 3.97  | 120.16      | 114.89   |
| 3   | L3    | 2787 | A2M  | N3-C2-N1 | -3.96 | 122.49      | 128.68   |
| 3   | L3    | 4220 | 6MZ  | N3-C2-N1 | -3.96 | 122.49      | 128.68   |
| 3   | L3    | 3925 | OMU  | N3-C2-N1 | 3.96  | 120.14      | 114.89   |
| 3   | L3    | 4498 | OMU  | N3-C2-N1 | 3.91  | 120.08      | 114.89   |
| 3   | L3    | 4227 | OMU  | N3-C2-N1 | 3.84  | 119.98      | 114.89   |
| 3   | L3    | 3718 | A2M  | N3-C2-N1 | -3.74 | 122.83      | 128.68   |
| 3   | L3    | 4620 | OMU  | N3-C2-N1 | 3.59  | 119.66      | 114.89   |

*Continued on next page...*

*Continued from previous page...*

| Mol | Chain | Res  | Type | Atoms    | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|----------|-------|-------------|----------|
| 3   | L3    | 4227 | OMU  | C5-C4-N3 | 3.58  | 120.20      | 114.84   |
| 3   | L3    | 3925 | OMU  | C5-C4-N3 | 3.52  | 120.10      | 114.84   |
| 3   | L3    | 4498 | OMU  | C5-C4-N3 | 3.49  | 120.06      | 114.84   |
| 3   | L3    | 2837 | OMU  | C5-C4-N3 | 3.47  | 120.03      | 114.84   |
| 3   | L3    | 2415 | OMU  | C5-C4-N3 | 3.44  | 119.98      | 114.84   |
| 3   | L3    | 4620 | OMU  | C5-C4-N3 | 3.39  | 119.92      | 114.84   |
| 3   | L3    | 4220 | 6MZ  | C9-N6-C6 | -3.38 | 119.96      | 122.87   |
| 3   | L3    | 4306 | OMU  | C5-C4-N3 | 3.34  | 119.84      | 114.84   |
| 3   | L3    | 2837 | OMU  | O4-C4-C5 | -2.97 | 119.94      | 125.16   |
| 3   | L3    | 3925 | OMU  | O4-C4-C5 | -2.97 | 119.94      | 125.16   |
| 3   | L3    | 4227 | OMU  | O4-C4-C5 | -2.94 | 119.99      | 125.16   |
| 3   | L3    | 3734 | PSU  | O2-C2-N1 | -2.92 | 119.58      | 122.79   |
| 3   | L3    | 2415 | OMU  | O4-C4-C5 | -2.88 | 120.09      | 125.16   |
| 3   | L3    | 4498 | OMU  | O4-C4-C5 | -2.86 | 120.13      | 125.16   |
| 3   | L3    | 4296 | PSU  | O2-C2-N1 | -2.85 | 119.65      | 122.79   |
| 3   | L3    | 3844 | PSU  | O2-C2-N1 | -2.80 | 119.71      | 122.79   |
| 3   | L3    | 4628 | PSU  | O2-C2-N1 | -2.79 | 119.71      | 122.79   |
| 2   | L1    | 69   | PSU  | O2-C2-N1 | -2.78 | 119.72      | 122.79   |
| 3   | L3    | 3730 | PSU  | O2-C2-N1 | -2.76 | 119.75      | 122.79   |
| 3   | L3    | 4620 | OMU  | O4-C4-C5 | -2.76 | 120.30      | 125.16   |
| 3   | L3    | 4500 | PSU  | O2-C2-N1 | -2.76 | 119.75      | 122.79   |
| 3   | L3    | 4532 | PSU  | O2-C2-N1 | -2.72 | 119.79      | 122.79   |
| 3   | L3    | 4306 | OMU  | O4-C4-C5 | -2.72 | 120.39      | 125.16   |
| 3   | L3    | 1677 | PSU  | O2-C2-N1 | -2.71 | 119.80      | 122.79   |
| 3   | L3    | 2839 | PSU  | O2-C2-N1 | -2.71 | 119.80      | 122.79   |
| 3   | L3    | 1536 | PSU  | O2-C2-N1 | -2.70 | 119.82      | 122.79   |
| 3   | L3    | 3639 | PSU  | O2-C2-N1 | -2.70 | 119.82      | 122.79   |
| 3   | L3    | 3695 | PSU  | O2-C2-N1 | -2.69 | 119.83      | 122.79   |
| 3   | L3    | 5001 | PSU  | O2-C2-N1 | -2.69 | 119.83      | 122.79   |
| 3   | L3    | 3853 | PSU  | O2-C2-N1 | -2.68 | 119.84      | 122.79   |
| 3   | L3    | 4579 | PSU  | O2-C2-N1 | -2.68 | 119.84      | 122.79   |
| 3   | L3    | 3822 | PSU  | O2-C2-N1 | -2.67 | 119.85      | 122.79   |
| 3   | L3    | 4312 | PSU  | O2-C2-N1 | -2.67 | 119.85      | 122.79   |
| 3   | L3    | 2508 | PSU  | O2-C2-N1 | -2.67 | 119.86      | 122.79   |
| 3   | L3    | 5010 | PSU  | O2-C2-N1 | -2.67 | 119.86      | 122.79   |
| 3   | L3    | 4299 | PSU  | O2-C2-N1 | -2.66 | 119.86      | 122.79   |
| 3   | L3    | 4576 | PSU  | O2-C2-N1 | -2.66 | 119.86      | 122.79   |
| 3   | L3    | 4972 | PSU  | O2-C2-N1 | -2.64 | 119.88      | 122.79   |
| 3   | L3    | 1862 | PSU  | O2-C2-N1 | -2.64 | 119.88      | 122.79   |
| 3   | L3    | 3884 | PSU  | O2-C2-N1 | -2.64 | 119.88      | 122.79   |
| 3   | L3    | 1860 | PSU  | O2-C2-N1 | -2.64 | 119.89      | 122.79   |
| 3   | L3    | 4689 | PSU  | O2-C2-N1 | -2.63 | 119.89      | 122.79   |

*Continued on next page...*

*Continued from previous page...*

| Mol | Chain | Res  | Type | Atoms     | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|-----------|-------|-------------|----------|
| 2   | L1    | 55   | PSU  | O2-C2-N1  | -2.62 | 119.90      | 122.79   |
| 3   | L3    | 4431 | PSU  | O2-C2-N1  | -2.62 | 119.91      | 122.79   |
| 3   | L3    | 3715 | PSU  | O2-C2-N1  | -2.61 | 119.91      | 122.79   |
| 3   | L3    | 4457 | PSU  | O2-C2-N1  | -2.61 | 119.91      | 122.79   |
| 3   | L3    | 4636 | PSU  | O2-C2-N1  | -2.61 | 119.92      | 122.79   |
| 3   | L3    | 3851 | PSU  | O2-C2-N1  | -2.60 | 119.93      | 122.79   |
| 3   | L3    | 1792 | PSU  | O2-C2-N1  | -2.60 | 119.93      | 122.79   |
| 3   | L3    | 1683 | PSU  | O2-C2-N1  | -2.60 | 119.93      | 122.79   |
| 3   | L3    | 3637 | PSU  | C6-C5-C4  | 2.59  | 120.01      | 118.20   |
| 3   | L3    | 4618 | OMG  | O6-C6-C5  | 2.59  | 129.43      | 124.37   |
| 3   | L3    | 4353 | PSU  | O2-C2-N1  | -2.57 | 119.96      | 122.79   |
| 3   | L3    | 3884 | PSU  | C6-N1-C2  | -2.55 | 120.07      | 122.68   |
| 3   | L3    | 4628 | PSU  | C6-N1-C2  | -2.55 | 120.08      | 122.68   |
| 3   | L3    | 4521 | PSU  | O2-C2-N1  | -2.55 | 119.98      | 122.79   |
| 3   | L3    | 4689 | PSU  | C6-N1-C2  | -2.55 | 120.08      | 122.68   |
| 3   | L3    | 4579 | PSU  | C6-N1-C2  | -2.52 | 120.10      | 122.68   |
| 3   | L3    | 4370 | OMG  | O6-C6-C5  | 2.51  | 129.27      | 124.37   |
| 3   | L3    | 4494 | OMG  | O6-C6-C5  | 2.51  | 129.27      | 124.37   |
| 3   | L3    | 4403 | PSU  | O2-C2-N1  | -2.51 | 120.03      | 122.79   |
| 3   | L3    | 4293 | PSU  | C6-N1-C2  | -2.50 | 120.13      | 122.68   |
| 3   | L3    | 1582 | PSU  | O2-C2-N1  | -2.48 | 120.06      | 122.79   |
| 3   | L3    | 4471 | PSU  | O2-C2-N1  | -2.48 | 120.06      | 122.79   |
| 3   | L3    | 5001 | PSU  | C6-N1-C2  | -2.48 | 120.15      | 122.68   |
| 3   | L3    | 3744 | OMG  | O6-C6-C5  | 2.47  | 129.19      | 124.37   |
| 3   | L3    | 1316 | OMG  | O6-C6-C5  | 2.44  | 129.13      | 124.37   |
| 3   | L3    | 3734 | PSU  | C6-N1-C2  | -2.43 | 120.20      | 122.68   |
| 3   | L3    | 4623 | OMG  | O6-C6-C5  | 2.43  | 129.12      | 124.37   |
| 3   | L3    | 3920 | PSU  | O2-C2-N1  | -2.42 | 120.13      | 122.79   |
| 3   | L3    | 2839 | PSU  | C6-N1-C2  | -2.41 | 120.22      | 122.68   |
| 3   | L3    | 4493 | PSU  | O2-C2-N1  | -2.40 | 120.15      | 122.79   |
| 3   | L3    | 4457 | PSU  | C6-N1-C2  | -2.40 | 120.23      | 122.68   |
| 3   | L3    | 2632 | PSU  | O2-C2-N1  | -2.39 | 120.16      | 122.79   |
| 3   | L3    | 4673 | PSU  | O2-C2-N1  | -2.39 | 120.16      | 122.79   |
| 3   | L3    | 4576 | PSU  | C6-N1-C2  | -2.39 | 120.24      | 122.68   |
| 3   | L3    | 4392 | OMG  | O6-C6-C5  | 2.38  | 129.02      | 124.37   |
| 3   | L3    | 2364 | OMG  | O6-C6-C5  | 2.37  | 129.00      | 124.37   |
| 3   | L3    | 1522 | OMG  | O6-C6-C5  | 2.37  | 129.00      | 124.37   |
| 3   | L3    | 4636 | PSU  | C6-C5-C4  | 2.36  | 119.85      | 118.20   |
| 3   | L3    | 4431 | PSU  | C6-C5-C4  | 2.36  | 119.85      | 118.20   |
| 3   | L3    | 4552 | PSU  | O2-C2-N1  | -2.35 | 120.20      | 122.79   |
| 3   | L3    | 4499 | OMG  | O6-C6-C5  | 2.35  | 128.96      | 124.37   |
| 3   | L3    | 2351 | OMC  | C1'-N1-C2 | 2.35  | 123.66      | 118.42   |

*Continued on next page...*

*Continued from previous page...*

| Mol | Chain | Res  | Type | Atoms       | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|-------------|-------|-------------|----------|
| 3   | L3    | 4637 | OMG  | O6-C6-C5    | 2.34  | 128.95      | 124.37   |
| 3   | L3    | 3639 | PSU  | C6-N1-C2    | -2.34 | 120.29      | 122.68   |
| 3   | L3    | 3730 | PSU  | C6-N1-C2    | -2.33 | 120.30      | 122.68   |
| 3   | L3    | 1860 | PSU  | C6-N1-C2    | -2.33 | 120.30      | 122.68   |
| 2   | L1    | 75   | OMG  | O6-C6-C5    | 2.33  | 128.91      | 124.37   |
| 3   | L3    | 4972 | PSU  | C6-N1-C2    | -2.32 | 120.31      | 122.68   |
| 3   | L3    | 4312 | PSU  | C6-N1-C2    | -2.31 | 120.32      | 122.68   |
| 3   | L3    | 4361 | PSU  | O2-C2-N1    | -2.30 | 120.25      | 122.79   |
| 3   | L3    | 3899 | OMG  | O6-C6-C5    | 2.29  | 128.85      | 124.37   |
| 3   | L3    | 2876 | OMG  | O6-C6-C5    | 2.29  | 128.85      | 124.37   |
| 3   | L3    | 4493 | PSU  | C6-N1-C2    | -2.29 | 120.34      | 122.68   |
| 3   | L3    | 3844 | PSU  | C6-N1-C2    | -2.28 | 120.35      | 122.68   |
| 3   | L3    | 4532 | PSU  | C6-C5-C4    | 2.28  | 119.80      | 118.20   |
| 2   | L1    | 69   | PSU  | C6-N1-C2    | -2.28 | 120.35      | 122.68   |
| 3   | L3    | 4361 | PSU  | C6-N1-C2    | -2.28 | 120.35      | 122.68   |
| 3   | L3    | 1625 | OMG  | O6-C6-C5    | 2.28  | 128.82      | 124.37   |
| 3   | L3    | 3695 | PSU  | C6-C5-C4    | 2.26  | 119.78      | 118.20   |
| 3   | L3    | 4500 | PSU  | C6-N1-C2    | -2.26 | 120.37      | 122.68   |
| 3   | L3    | 5010 | PSU  | C6-N1-C2    | -2.25 | 120.38      | 122.68   |
| 3   | L3    | 3627 | OMG  | O6-C6-C5    | 2.25  | 128.78      | 124.37   |
| 3   | L3    | 4471 | PSU  | C6-N1-C2    | -2.25 | 120.38      | 122.68   |
| 3   | L3    | 3822 | PSU  | C6-C5-C4    | 2.25  | 119.77      | 118.20   |
| 3   | L3    | 1862 | PSU  | C6-N1-C2    | -2.24 | 120.39      | 122.68   |
| 3   | L3    | 1792 | PSU  | C6-N1-C2    | -2.24 | 120.39      | 122.68   |
| 2   | L1    | 69   | PSU  | O4'-C1'-C2' | 2.24  | 108.30      | 105.14   |
| 3   | L3    | 2424 | OMG  | O6-C6-C5    | 2.24  | 128.74      | 124.37   |
| 3   | L3    | 4673 | PSU  | C6-N1-C2    | -2.23 | 120.40      | 122.68   |
| 3   | L3    | 3851 | PSU  | C6-N1-C2    | -2.23 | 120.40      | 122.68   |
| 3   | L3    | 4299 | PSU  | C6-N1-C2    | -2.23 | 120.40      | 122.68   |
| 3   | L3    | 2401 | A2M  | C4-C5-N7    | -2.23 | 107.08      | 109.40   |
| 3   | L3    | 4228 | OMG  | O6-C6-C5    | 2.22  | 128.70      | 124.37   |
| 3   | L3    | 4521 | PSU  | C6-N1-C2    | -2.22 | 120.42      | 122.68   |
| 3   | L3    | 4532 | PSU  | C6-N1-C2    | -2.21 | 120.42      | 122.68   |
| 3   | L3    | 1534 | A2M  | C4-C5-N7    | -2.21 | 107.10      | 109.40   |
| 3   | L3    | 3695 | PSU  | C6-N1-C2    | -2.21 | 120.43      | 122.68   |
| 3   | L3    | 2815 | A2M  | C4-C5-N7    | -2.20 | 107.10      | 109.40   |
| 3   | L3    | 1536 | PSU  | C6-N1-C2    | -2.20 | 120.43      | 122.68   |
| 3   | L3    | 4293 | PSU  | O2-C2-N1    | -2.20 | 120.37      | 122.79   |
| 2   | L1    | 55   | PSU  | C6-C5-C4    | 2.19  | 119.73      | 118.20   |
| 3   | L3    | 4403 | PSU  | C6-C5-C4    | 2.19  | 119.73      | 118.20   |
| 3   | L3    | 1524 | A2M  | C4-C5-N7    | -2.19 | 107.12      | 109.40   |
| 3   | L3    | 3822 | PSU  | C6-N1-C2    | -2.18 | 120.45      | 122.68   |

*Continued on next page...*

*Continued from previous page...*

| Mol | Chain | Res  | Type | Atoms       | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|-------------|-------|-------------|----------|
| 3   | L3    | 4353 | PSU  | C6-N1-C2    | -2.18 | 120.45      | 122.68   |
| 3   | L3    | 4296 | PSU  | C6-N1-C2    | -2.18 | 120.46      | 122.68   |
| 3   | L3    | 3830 | A2M  | C4-C5-N7    | -2.18 | 107.13      | 109.40   |
| 3   | L3    | 4296 | PSU  | C6-C5-C4    | 2.18  | 119.72      | 118.20   |
| 3   | L3    | 3853 | PSU  | C6-N1-C2    | -2.16 | 120.47      | 122.68   |
| 3   | L3    | 4552 | PSU  | C6-N1-C2    | -2.16 | 120.47      | 122.68   |
| 3   | L3    | 4576 | PSU  | C6-C5-C4    | 2.16  | 119.71      | 118.20   |
| 3   | L3    | 3715 | PSU  | C6-N1-C2    | -2.16 | 120.47      | 122.68   |
| 3   | L3    | 4353 | PSU  | C6-C5-C4    | 2.16  | 119.71      | 118.20   |
| 3   | L3    | 3637 | PSU  | C6-N1-C2    | -2.16 | 120.47      | 122.68   |
| 3   | L3    | 3920 | PSU  | C6-N1-C2    | -2.16 | 120.47      | 122.68   |
| 3   | L3    | 2787 | A2M  | C4-C5-N7    | -2.16 | 107.15      | 109.40   |
| 3   | L3    | 2508 | PSU  | C6-N1-C2    | -2.15 | 120.48      | 122.68   |
| 3   | L3    | 1326 | A2M  | C4-C5-N7    | -2.15 | 107.15      | 109.40   |
| 3   | L3    | 4299 | PSU  | C6-C5-C4    | 2.15  | 119.70      | 118.20   |
| 3   | L3    | 1677 | PSU  | C6-N1-C2    | -2.14 | 120.49      | 122.68   |
| 3   | L3    | 398  | A2M  | C4-C5-N7    | -2.14 | 107.17      | 109.40   |
| 3   | L3    | 2837 | OMU  | O2-C2-N1    | -2.14 | 119.94      | 122.79   |
| 3   | L3    | 4972 | PSU  | C6-C5-C4    | 2.13  | 119.69      | 118.20   |
| 3   | L3    | 4523 | A2M  | C4-C5-N7    | -2.12 | 107.19      | 109.40   |
| 3   | L3    | 3637 | PSU  | O2-C2-N1    | -2.12 | 120.46      | 122.79   |
| 3   | L3    | 400  | A2M  | C4-C5-N7    | -2.11 | 107.20      | 109.40   |
| 3   | L3    | 4590 | A2M  | C4-C5-N7    | -2.11 | 107.20      | 109.40   |
| 3   | L3    | 3925 | OMU  | O2-C2-N1    | -2.11 | 119.98      | 122.79   |
| 3   | L3    | 4403 | PSU  | C6-N1-C2    | -2.11 | 120.53      | 122.68   |
| 3   | L3    | 3844 | PSU  | C6-C5-C4    | 2.10  | 119.67      | 118.20   |
| 3   | L3    | 1860 | PSU  | O4'-C1'-C2' | 2.10  | 108.10      | 105.14   |
| 3   | L3    | 3825 | A2M  | C4-C5-N7    | -2.10 | 107.21      | 109.40   |
| 3   | L3    | 4220 | 6MZ  | C4-C5-N7    | -2.10 | 107.22      | 109.40   |
| 3   | L3    | 3715 | PSU  | O4'-C1'-C2' | 2.10  | 108.10      | 105.14   |
| 3   | L3    | 4628 | PSU  | O4'-C1'-C2' | 2.09  | 108.10      | 105.14   |
| 3   | L3    | 4636 | PSU  | C6-N1-C2    | -2.09 | 120.54      | 122.68   |
| 3   | L3    | 1683 | PSU  | C6-N1-C2    | -2.09 | 120.55      | 122.68   |
| 3   | L3    | 1862 | PSU  | C6-C5-C4    | 2.08  | 119.65      | 118.20   |
| 3   | L3    | 4498 | OMU  | O2-C2-N1    | -2.08 | 120.02      | 122.79   |
| 3   | L3    | 4431 | PSU  | C6-N1-C2    | -2.07 | 120.56      | 122.68   |
| 3   | L3    | 2632 | PSU  | C6-N1-C2    | -2.07 | 120.57      | 122.68   |
| 3   | L3    | 3639 | PSU  | C6-C5-C4    | 2.06  | 119.64      | 118.20   |
| 2   | L1    | 55   | PSU  | C6-N1-C2    | -2.06 | 120.58      | 122.68   |
| 3   | L3    | 3851 | PSU  | O4'-C1'-C2' | 2.06  | 108.05      | 105.14   |
| 3   | L3    | 3730 | PSU  | C6-C5-C4    | 2.06  | 119.64      | 118.20   |
| 3   | L3    | 4628 | PSU  | C6-C5-C4    | 2.06  | 119.64      | 118.20   |

*Continued on next page...*



*Continued from previous page...*

| Mol | Chain | Res  | Type | Atoms       | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|-------------|-------|-------------|----------|
| 3   | L3    | 1871 | A2M  | C4-C5-N7    | -2.05 | 107.26      | 109.40   |
| 3   | L3    | 3718 | A2M  | C4-C5-N7    | -2.05 | 107.26      | 109.40   |
| 3   | L3    | 3867 | A2M  | C4-C5-N7    | -2.05 | 107.26      | 109.40   |
| 3   | L3    | 5010 | PSU  | C6-C5-C4    | 2.05  | 119.63      | 118.20   |
| 3   | L3    | 4552 | PSU  | C6-C5-C4    | 2.04  | 119.62      | 118.20   |
| 3   | L3    | 1534 | A2M  | C3'-C2'-C1' | -2.04 | 99.06       | 102.89   |
| 3   | L3    | 4590 | A2M  | C2-N1-C6    | 2.03  | 122.23      | 118.75   |
| 3   | L3    | 3734 | PSU  | O4'-C1'-C2' | 2.03  | 108.00      | 105.14   |
| 3   | L3    | 4576 | PSU  | O4'-C1'-C2' | 2.02  | 108.00      | 105.14   |
| 3   | L3    | 3724 | A2M  | C4-C5-N7    | -2.01 | 107.31      | 109.40   |
| 3   | L3    | 2422 | OMC  | C1'-N1-C2   | 2.01  | 122.90      | 118.42   |
| 3   | L3    | 4636 | PSU  | O4'-C1'-C2' | 2.00  | 107.97      | 105.14   |

There are no chirality outliers.

All (90) torsion outliers are listed below:

| Mol | Chain | Res  | Type | Atoms           |
|-----|-------|------|------|-----------------|
| 2   | L1    | 75   | OMG  | C1'-C2'-O2'-CM2 |
| 3   | L3    | 398  | A2M  | C1'-C2'-O2'-CM' |
| 3   | L3    | 1316 | OMG  | C1'-C2'-O2'-CM2 |
| 3   | L3    | 1326 | A2M  | O4'-C4'-C5'-O5' |
| 3   | L3    | 1326 | A2M  | C3'-C4'-C5'-O5' |
| 3   | L3    | 1326 | A2M  | C1'-C2'-O2'-CM' |
| 3   | L3    | 1340 | OMC  | C1'-C2'-O2'-CM2 |
| 3   | L3    | 2364 | OMG  | C1'-C2'-O2'-CM2 |
| 3   | L3    | 2415 | OMU  | C1'-C2'-O2'-CM2 |
| 3   | L3    | 2422 | OMC  | C1'-C2'-O2'-CM2 |
| 3   | L3    | 2787 | A2M  | C3'-C4'-C5'-O5' |
| 3   | L3    | 2815 | A2M  | C1'-C2'-O2'-CM' |
| 3   | L3    | 2837 | OMU  | C1'-C2'-O2'-CM2 |
| 3   | L3    | 2861 | OMC  | C1'-C2'-O2'-CM2 |
| 3   | L3    | 3627 | OMG  | C1'-C2'-O2'-CM2 |
| 3   | L3    | 3701 | OMC  | C2'-C1'-N1-C2   |
| 3   | L3    | 3701 | OMC  | C2'-C1'-N1-C6   |
| 3   | L3    | 3718 | A2M  | C1'-C2'-O2'-CM' |
| 3   | L3    | 3724 | A2M  | C1'-C2'-O2'-CM' |
| 3   | L3    | 3744 | OMG  | C1'-C2'-O2'-CM2 |
| 3   | L3    | 3830 | A2M  | C1'-C2'-O2'-CM' |
| 3   | L3    | 3841 | OMC  | C1'-C2'-O2'-CM2 |
| 3   | L3    | 3867 | A2M  | C1'-C2'-O2'-CM' |
| 3   | L3    | 3887 | OMC  | C3'-C4'-C5'-O5' |
| 3   | L3    | 3887 | OMC  | O4'-C4'-C5'-O5' |

*Continued on next page...*



*Continued from previous page...*

| Mol | Chain | Res  | Type | Atoms           |
|-----|-------|------|------|-----------------|
| 3   | L3    | 3899 | OMG  | C1'-C2'-O2'-CM2 |
| 3   | L3    | 3925 | OMU  | C1'-C2'-O2'-CM2 |
| 3   | L3    | 4227 | OMU  | C1'-C2'-O2'-CM2 |
| 3   | L3    | 4392 | OMG  | C1'-C2'-O2'-CM2 |
| 3   | L3    | 4523 | A2M  | O4'-C4'-C5'-O5' |
| 3   | L3    | 4571 | A2M  | C1'-C2'-O2'-CM' |
| 3   | L3    | 4590 | A2M  | O4'-C4'-C5'-O5' |
| 3   | L3    | 4590 | A2M  | C3'-C4'-C5'-O5' |
| 3   | L3    | 4590 | A2M  | C1'-C2'-O2'-CM' |
| 3   | L3    | 4620 | OMU  | C1'-C2'-O2'-CM2 |
| 3   | L3    | 4637 | OMG  | O4'-C4'-C5'-O5' |
| 3   | L3    | 4637 | OMG  | C1'-C2'-O2'-CM2 |
| 23  | LN    | 245  | HIC  | CA-CB-CG-ND1    |
| 23  | LN    | 245  | HIC  | CA-CB-CG-CD2    |
| 3   | L3    | 2401 | A2M  | C3'-C4'-C5'-O5' |
| 3   | L3    | 4220 | 6MZ  | O4'-C4'-C5'-O5' |
| 3   | L3    | 4220 | 6MZ  | C3'-C4'-C5'-O5' |
| 3   | L3    | 4306 | OMU  | C3'-C4'-C5'-O5' |
| 3   | L3    | 4618 | OMG  | O4'-C4'-C5'-O5' |
| 3   | L3    | 4637 | OMG  | C3'-C4'-C5'-O5' |
| 3   | L3    | 2787 | A2M  | O4'-C4'-C5'-O5' |
| 3   | L3    | 4306 | OMU  | O4'-C4'-C5'-O5' |
| 3   | L3    | 4523 | A2M  | C3'-C4'-C5'-O5' |
| 3   | L3    | 4618 | OMG  | C3'-C4'-C5'-O5' |
| 3   | L3    | 4590 | A2M  | C4'-C5'-O5'-P   |
| 3   | L3    | 1677 | PSU  | C3'-C4'-C5'-O5' |
| 3   | L3    | 1677 | PSU  | O4'-C4'-C5'-O5' |
| 3   | L3    | 2401 | A2M  | O4'-C4'-C5'-O5' |
| 3   | L3    | 3701 | OMC  | O4'-C4'-C5'-O5' |
| 3   | L3    | 3701 | OMC  | C3'-C4'-C5'-O5' |
| 3   | L3    | 1625 | OMG  | C3'-C4'-C5'-O5' |
| 3   | L3    | 2876 | OMG  | C3'-C2'-O2'-CM2 |
| 3   | L3    | 1862 | PSU  | C3'-C4'-C5'-O5' |
| 3   | L3    | 1524 | A2M  | C3'-C2'-O2'-CM' |
| 3   | L3    | 4220 | 6MZ  | C4'-C5'-O5'-P   |
| 3   | L3    | 4306 | OMU  | C4'-C5'-O5'-P   |
| 3   | L3    | 2876 | OMG  | C3'-C4'-C5'-O5' |
| 3   | L3    | 3844 | PSU  | C4'-C5'-O5'-P   |
| 3   | L3    | 2351 | OMC  | C2'-C1'-N1-C6   |
| 3   | L3    | 3701 | OMC  | O4'-C1'-N1-C6   |
| 3   | L3    | 4636 | PSU  | C4'-C5'-O5'-P   |
| 3   | L3    | 2839 | PSU  | O4'-C1'-C5-C4   |

*Continued on next page...*

*Continued from previous page...*

| Mol | Chain | Res  | Type | Atoms           |
|-----|-------|------|------|-----------------|
| 3   | L3    | 4312 | PSU  | O4'-C1'-C5-C4   |
| 3   | L3    | 4521 | PSU  | O4'-C1'-C5-C4   |
| 3   | L3    | 4636 | PSU  | O4'-C1'-C5-C4   |
| 3   | L3    | 3724 | A2M  | C3'-C2'-O2'-CM' |
| 3   | L3    | 3830 | A2M  | C3'-C2'-O2'-CM' |
| 3   | L3    | 2422 | OMC  | O4'-C4'-C5'-O5' |
| 3   | L3    | 1862 | PSU  | O4'-C4'-C5'-O5' |
| 3   | L3    | 2876 | OMG  | O4'-C4'-C5'-O5' |
| 3   | L3    | 1316 | OMG  | C3'-C2'-O2'-CM2 |
| 3   | L3    | 2351 | OMC  | C3'-C2'-O2'-CM2 |
| 3   | L3    | 1625 | OMG  | O4'-C4'-C5'-O5' |
| 3   | L3    | 4636 | PSU  | O4'-C4'-C5'-O5' |
| 3   | L3    | 1677 | PSU  | O4'-C1'-C5-C6   |
| 3   | L3    | 2839 | PSU  | O4'-C1'-C5-C6   |
| 3   | L3    | 4521 | PSU  | O4'-C1'-C5-C6   |
| 3   | L3    | 4636 | PSU  | O4'-C1'-C5-C6   |
| 3   | L3    | 2351 | OMC  | C2'-C1'-N1-C2   |
| 3   | L3    | 4306 | OMU  | C2'-C1'-N1-C2   |
| 3   | L3    | 3701 | OMC  | O4'-C1'-N1-C2   |
| 3   | L3    | 4370 | OMG  | C3'-C2'-O2'-CM2 |
| 3   | L3    | 1534 | A2M  | O4'-C4'-C5'-O5' |
| 3   | L3    | 2351 | OMC  | O4'-C4'-C5'-O5' |
| 3   | L3    | 1534 | A2M  | C4'-C5'-O5'-P   |

There are no ring outliers.

51 monomers are involved in 80 short contacts:

| Mol | Chain | Res  | Type | Clashes | Symm-Clashes |
|-----|-------|------|------|---------|--------------|
| 3   | L3    | 1340 | OMC  | 1       | 0            |
| 3   | L3    | 4306 | OMU  | 3       | 0            |
| 3   | L3    | 3744 | OMG  | 1       | 0            |
| 3   | L3    | 3867 | A2M  | 1       | 0            |
| 3   | L3    | 4579 | PSU  | 1       | 0            |
| 3   | L3    | 1522 | OMG  | 1       | 0            |
| 3   | L3    | 3899 | OMG  | 1       | 0            |
| 3   | L3    | 2363 | A2M  | 1       | 0            |
| 3   | L3    | 3869 | OMC  | 1       | 0            |
| 3   | L3    | 2876 | OMG  | 2       | 0            |
| 3   | L3    | 4623 | OMG  | 1       | 0            |
| 3   | L3    | 1860 | PSU  | 1       | 0            |
| 3   | L3    | 4220 | 6MZ  | 2       | 0            |
| 3   | L3    | 4536 | OMC  | 1       | 0            |

*Continued on next page...*

*Continued from previous page...*

| Mol | Chain | Res  | Type | Clashes | Symm-Clashes |
|-----|-------|------|------|---------|--------------|
| 3   | L3    | 2364 | OMG  | 2       | 0            |
| 3   | L3    | 2861 | OMC  | 1       | 0            |
| 3   | L3    | 4457 | PSU  | 2       | 0            |
| 3   | L3    | 4620 | OMU  | 2       | 0            |
| 3   | L3    | 2815 | A2M  | 2       | 0            |
| 3   | L3    | 5001 | PSU  | 1       | 0            |
| 3   | L3    | 1534 | A2M  | 2       | 0            |
| 2   | L1    | 69   | PSU  | 2       | 0            |
| 3   | L3    | 3724 | A2M  | 1       | 0            |
| 2   | L1    | 75   | OMG  | 2       | 0            |
| 3   | L3    | 4576 | PSU  | 1       | 0            |
| 3   | L3    | 3715 | PSU  | 1       | 0            |
| 3   | L3    | 2632 | PSU  | 1       | 0            |
| 3   | L3    | 4500 | PSU  | 1       | 0            |
| 3   | L3    | 2422 | OMC  | 2       | 0            |
| 3   | L3    | 3718 | A2M  | 5       | 0            |
| 3   | L3    | 3841 | OMC  | 1       | 0            |
| 3   | L3    | 4636 | PSU  | 1       | 0            |
| 3   | L3    | 4618 | OMG  | 1       | 0            |
| 3   | L3    | 4530 | UR3  | 2       | 0            |
| 3   | L3    | 2351 | OMC  | 3       | 0            |
| 3   | L3    | 1524 | A2M  | 1       | 0            |
| 3   | L3    | 4431 | PSU  | 2       | 0            |
| 3   | L3    | 3925 | OMU  | 2       | 0            |
| 3   | L3    | 4403 | PSU  | 1       | 0            |
| 3   | L3    | 4637 | OMG  | 2       | 0            |
| 3   | L3    | 1326 | A2M  | 3       | 0            |
| 3   | L3    | 3734 | PSU  | 1       | 0            |
| 3   | L3    | 4370 | OMG  | 1       | 0            |
| 3   | L3    | 2837 | OMU  | 1       | 0            |
| 3   | L3    | 4227 | OMU  | 2       | 0            |
| 3   | L3    | 1677 | PSU  | 2       | 0            |
| 3   | L3    | 3920 | PSU  | 1       | 0            |
| 3   | L3    | 4312 | PSU  | 1       | 0            |
| 3   | L3    | 2415 | OMU  | 5       | 0            |
| 3   | L3    | 2839 | PSU  | 1       | 0            |
| 3   | L3    | 3627 | OMG  | 1       | 0            |

## 5.5 Carbohydrates

There are no monosaccharides in this entry.

## 5.6 Ligand geometry

Of 96 ligands modelled in this entry, 95 are monoatomic - leaving 1 for Mogul analysis.

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

| Mol | Type | Chain | Res  | Link  | Bond lengths |      |          | Bond angles |      |          |
|-----|------|-------|------|-------|--------------|------|----------|-------------|------|----------|
|     |      |       |      |       | Counts       | RMSZ | # Z  > 2 | Counts      | RMSZ | # Z  > 2 |
| 57  | GDP  | SR    | 1001 | 55,58 | 24,30,30     | 2.56 | 8 (33%)  | 30,47,47    | 1.75 | 9 (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   |
|-----|------|-------|------|-------|---------|------------|---------|
| 57  | GDP  | SR    | 1001 | 55,58 | -       | 0/12/32/32 | 0/3/3/3 |

All (8) bond length outliers are listed below:

| Mol | Chain | Res  | Type | Atoms   | Z     | Observed(Å) | Ideal(Å) |
|-----|-------|------|------|---------|-------|-------------|----------|
| 57  | SR    | 1001 | GDP  | O6-C6   | 8.36  | 1.40        | 1.23     |
| 57  | SR    | 1001 | GDP  | C2-N2   | 4.77  | 1.45        | 1.34     |
| 57  | SR    | 1001 | GDP  | O4'-C1' | 4.54  | 1.47        | 1.41     |
| 57  | SR    | 1001 | GDP  | C5-C4   | 2.42  | 1.49        | 1.43     |
| 57  | SR    | 1001 | GDP  | PB-O2B  | -2.24 | 1.46        | 1.54     |
| 57  | SR    | 1001 | GDP  | PB-O3B  | -2.19 | 1.46        | 1.54     |
| 57  | SR    | 1001 | GDP  | C2'-C3' | -2.01 | 1.47        | 1.53     |
| 57  | SR    | 1001 | GDP  | C2'-C1' | -2.00 | 1.50        | 1.53     |

All (9) bond angle outliers are listed below:

| Mol | Chain | Res  | Type | Atoms       | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|-------------|-------|-------------|----------|
| 57  | SR    | 1001 | GDP  | C3'-C2'-C1' | 4.27  | 107.41      | 100.98   |
| 57  | SR    | 1001 | GDP  | C5-C6-N1    | 3.26  | 119.71      | 113.95   |
| 57  | SR    | 1001 | GDP  | O2B-PB-O3A  | 2.93  | 114.47      | 104.64   |
| 57  | SR    | 1001 | GDP  | C2-N1-C6    | -2.88 | 119.80      | 125.10   |
| 57  | SR    | 1001 | GDP  | O3B-PB-O3A  | 2.71  | 113.72      | 104.64   |
| 57  | SR    | 1001 | GDP  | C2'-C3'-C4' | 2.70  | 107.89      | 102.64   |

*Continued on next page...*

Continued from previous page...

| Mol | Chain | Res  | Type | Atoms      | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|------------|-------|-------------|----------|
| 57  | SR    | 1001 | GDP  | PA-O3A-PB  | -2.43 | 124.50      | 132.83   |
| 57  | SR    | 1001 | GDP  | O2A-PA-O1A | -2.17 | 101.50      | 112.24   |
| 57  | SR    | 1001 | GDP  | O6-C6-C5   | -2.16 | 120.14      | 124.37   |

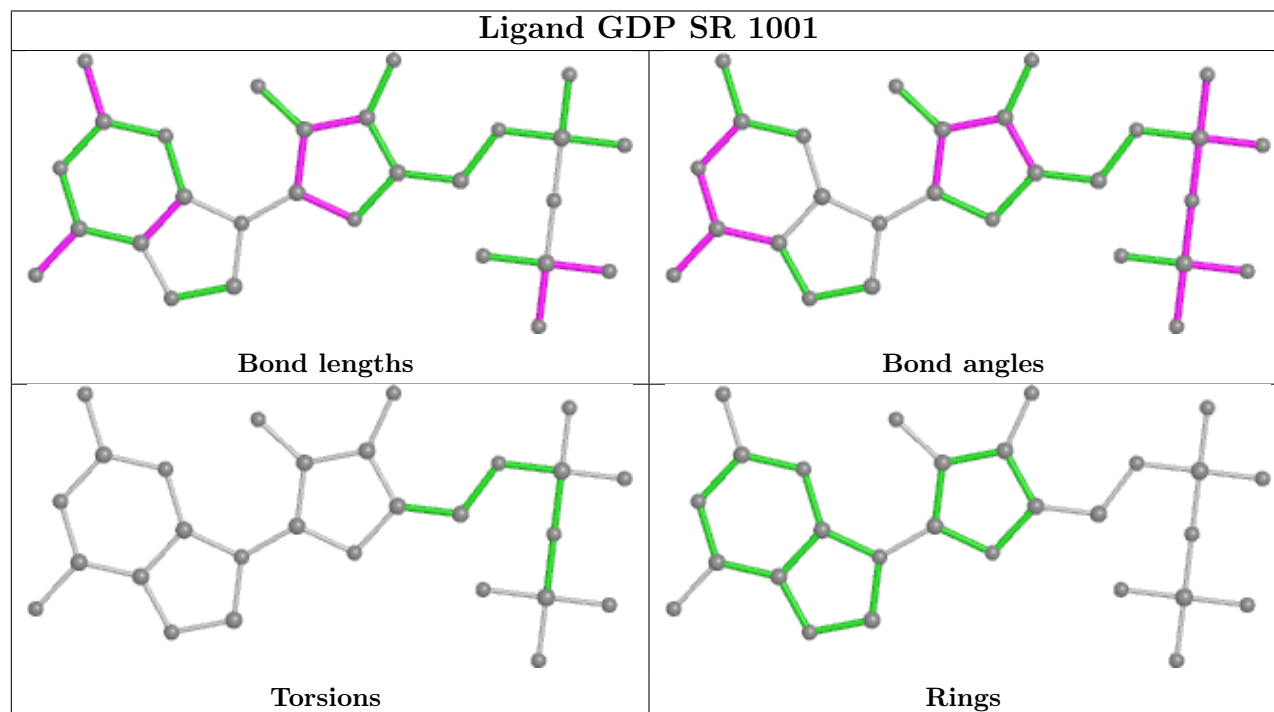
There are no chirality outliers.

There are no torsion outliers.

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.

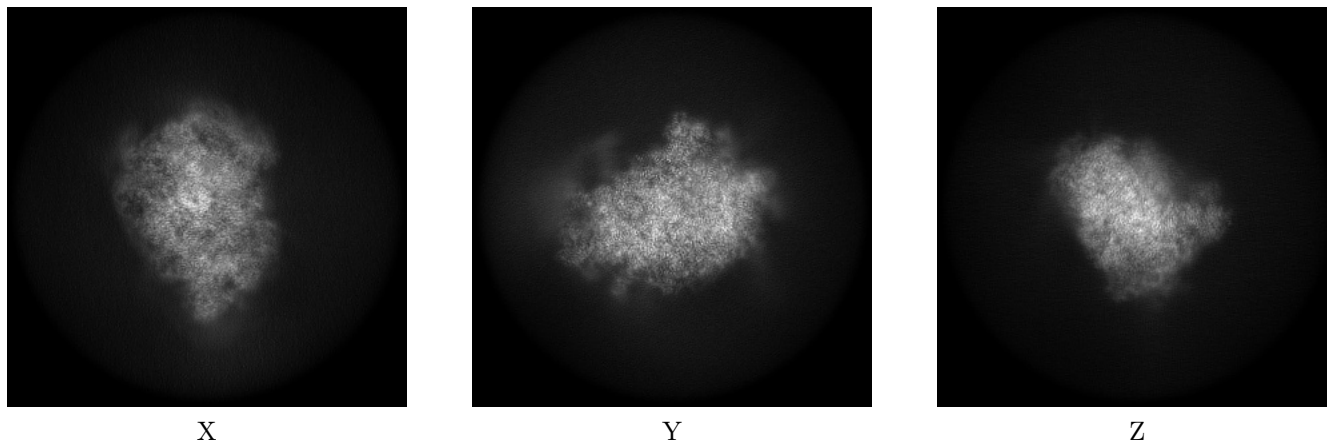
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-29269. These allow visual inspection of the internal detail of the map and identification of artifacts.

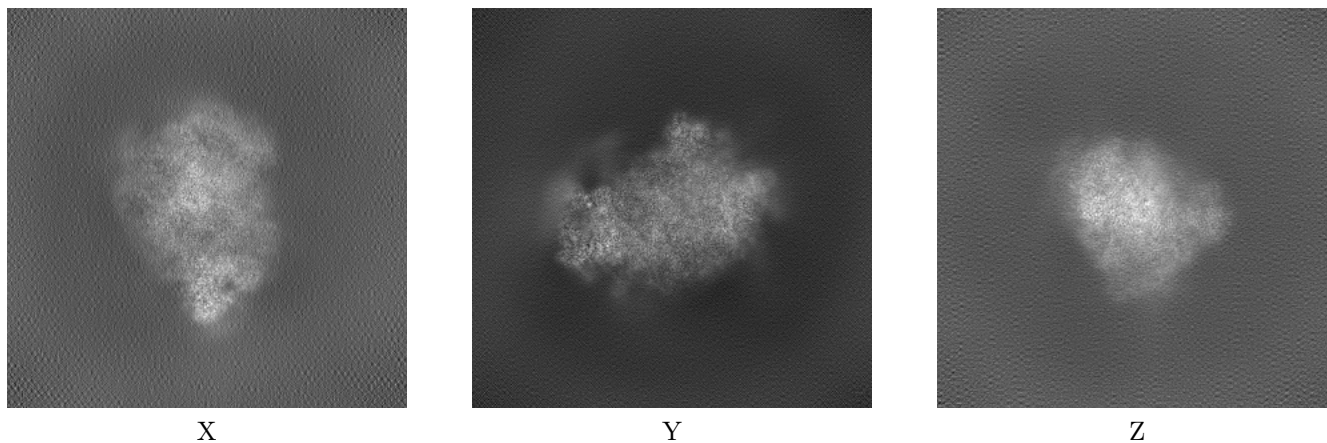
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

### 6.1 Orthogonal projections [i](#)

#### 6.1.1 Primary map



#### 6.1.2 Raw map

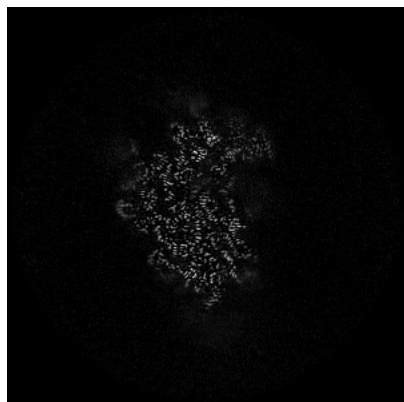


The images above show the map projected in three orthogonal directions.

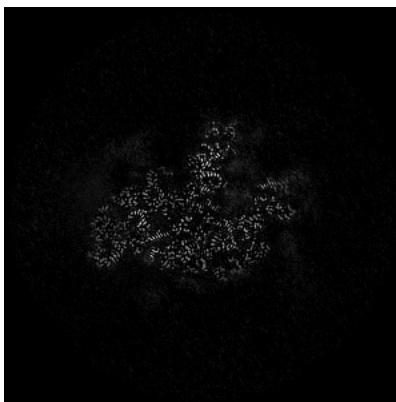


## 6.2 Central slices [i](#)

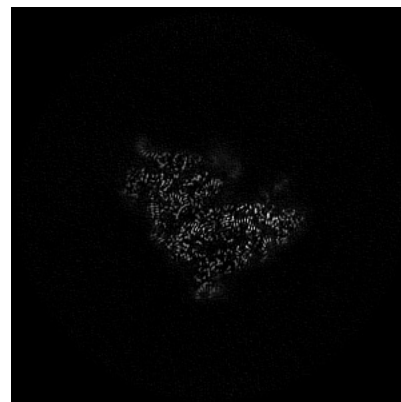
### 6.2.1 Primary map



X Index: 240

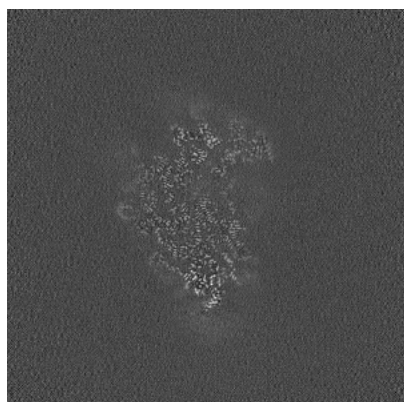


Y Index: 240

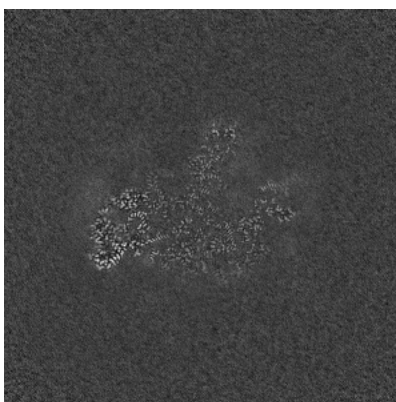


Z Index: 240

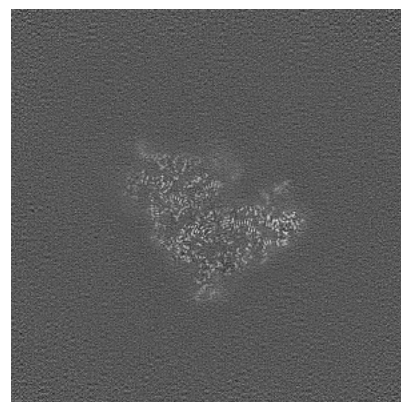
### 6.2.2 Raw map



X Index: 240



Y Index: 240



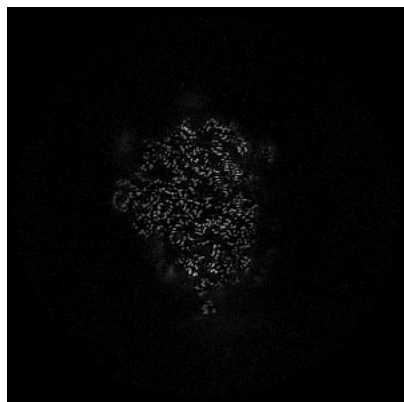
Z Index: 240

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

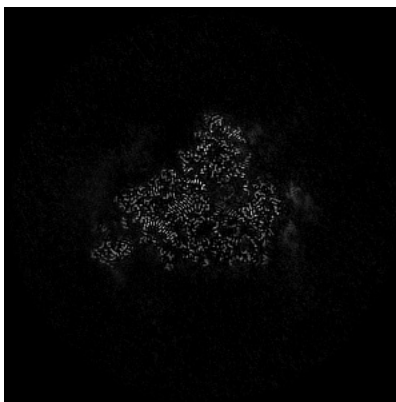


## 6.3 Largest variance slices [i](#)

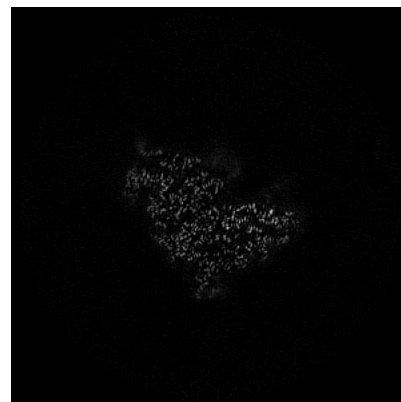
### 6.3.1 Primary map



X Index: 226

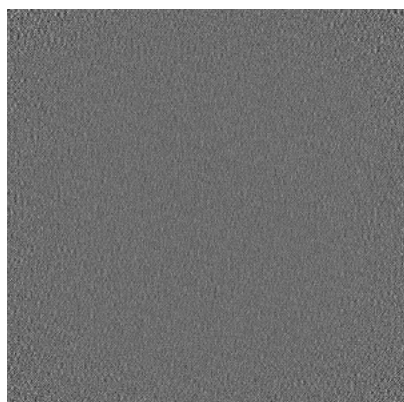


Y Index: 227

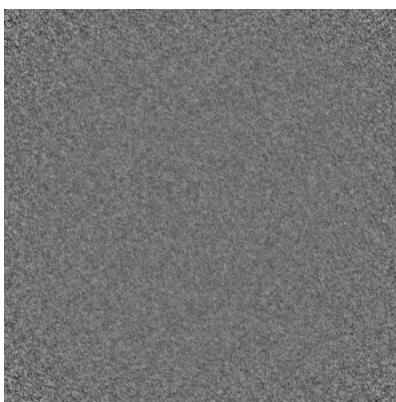


Z Index: 239

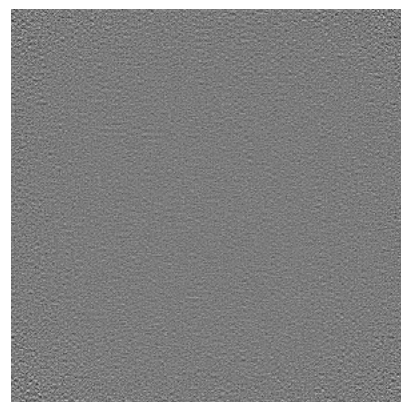
### 6.3.2 Raw map



X Index: 0



Y Index: 0

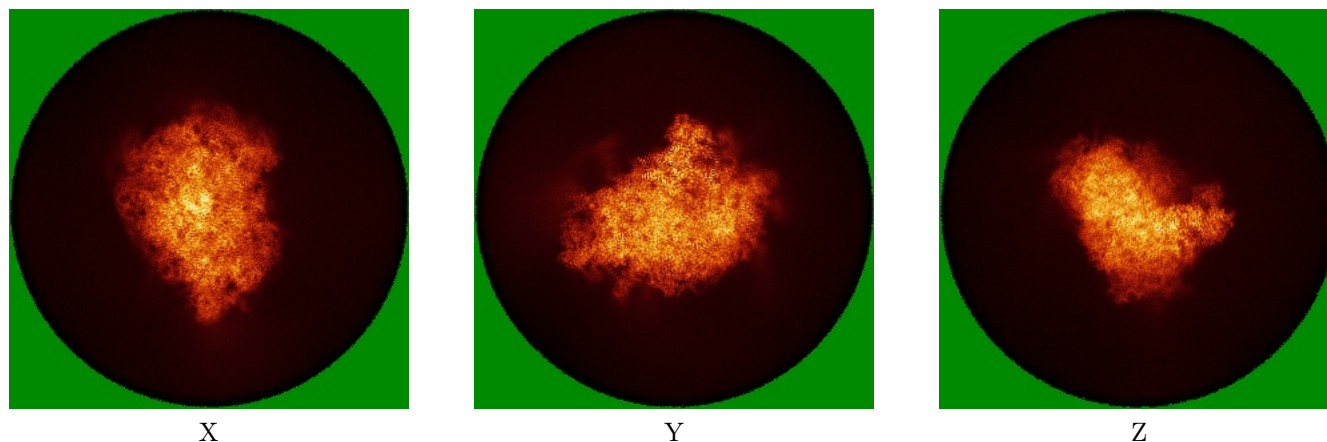


Z Index: 0

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

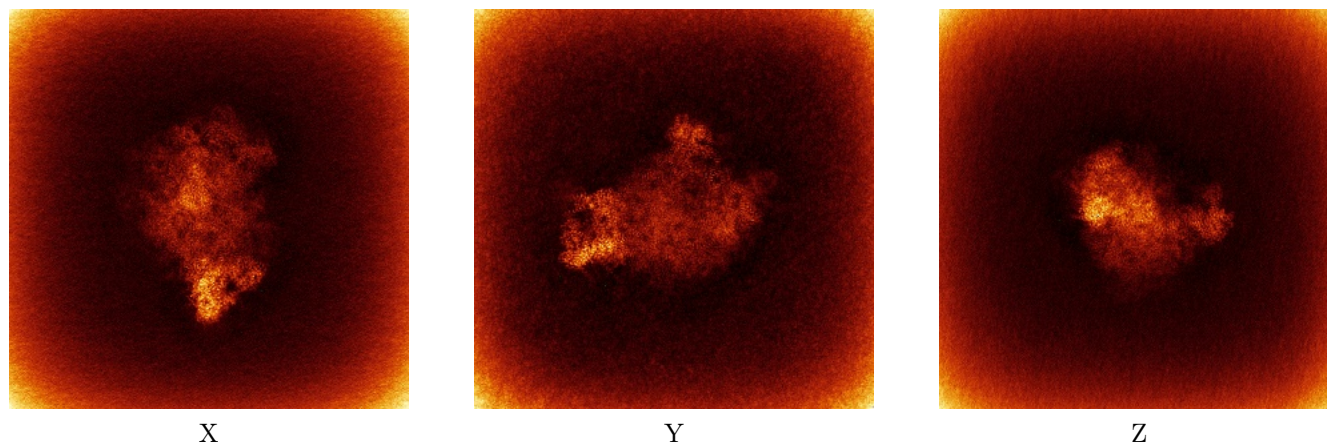


X

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.

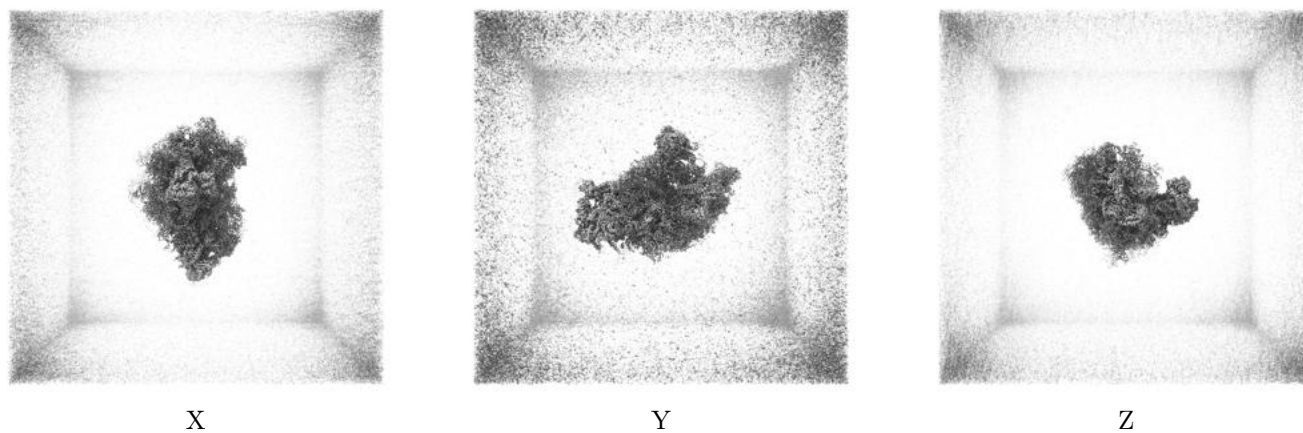
## 6.5 Orthogonal surface views [i](#)

### 6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.85. 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



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.

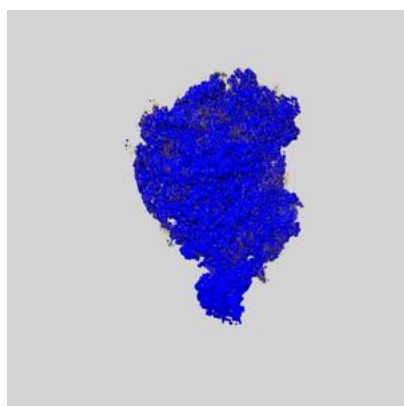
## 6.6 Mask visualisation [i](#)

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

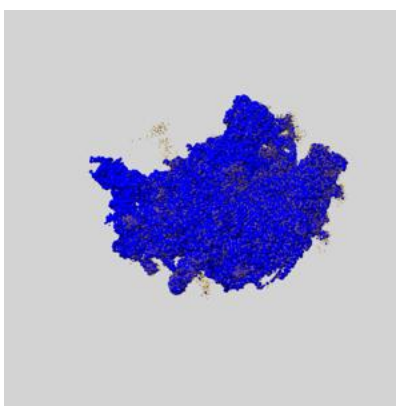
A mask typically either:

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

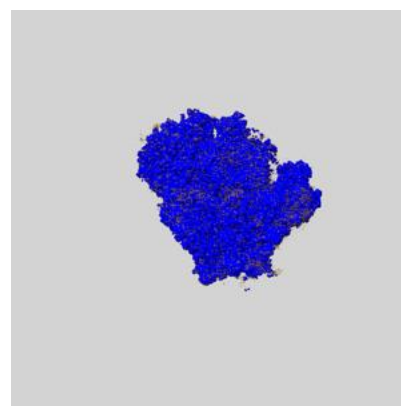
### 6.6.1 emd\_29269\_msk\_1.map [i](#)



X



Y

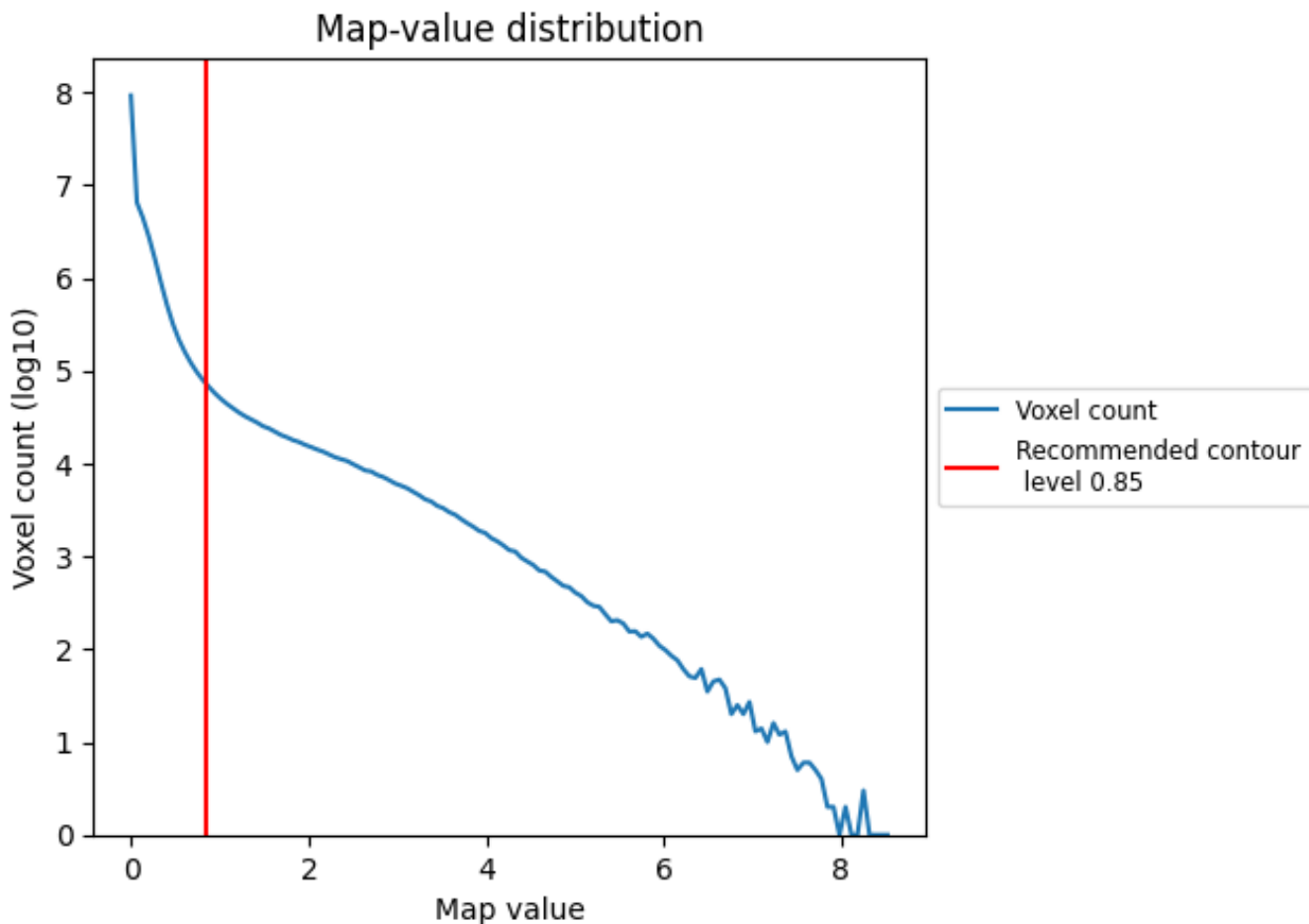


Z

## 7 Map analysis [i](#)

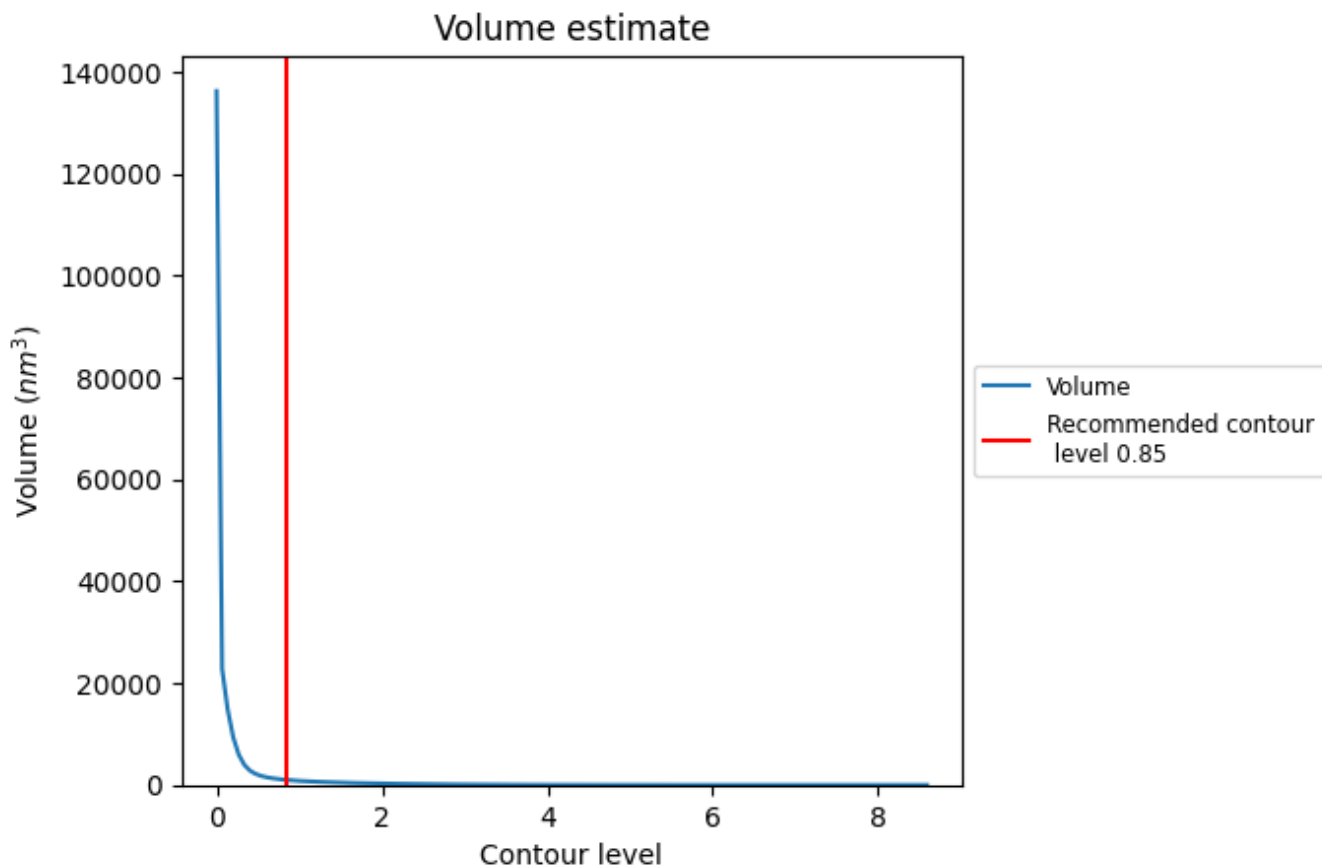
This section contains the results of statistical analysis of the map.

### 7.1 Map-value distribution [i](#)



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

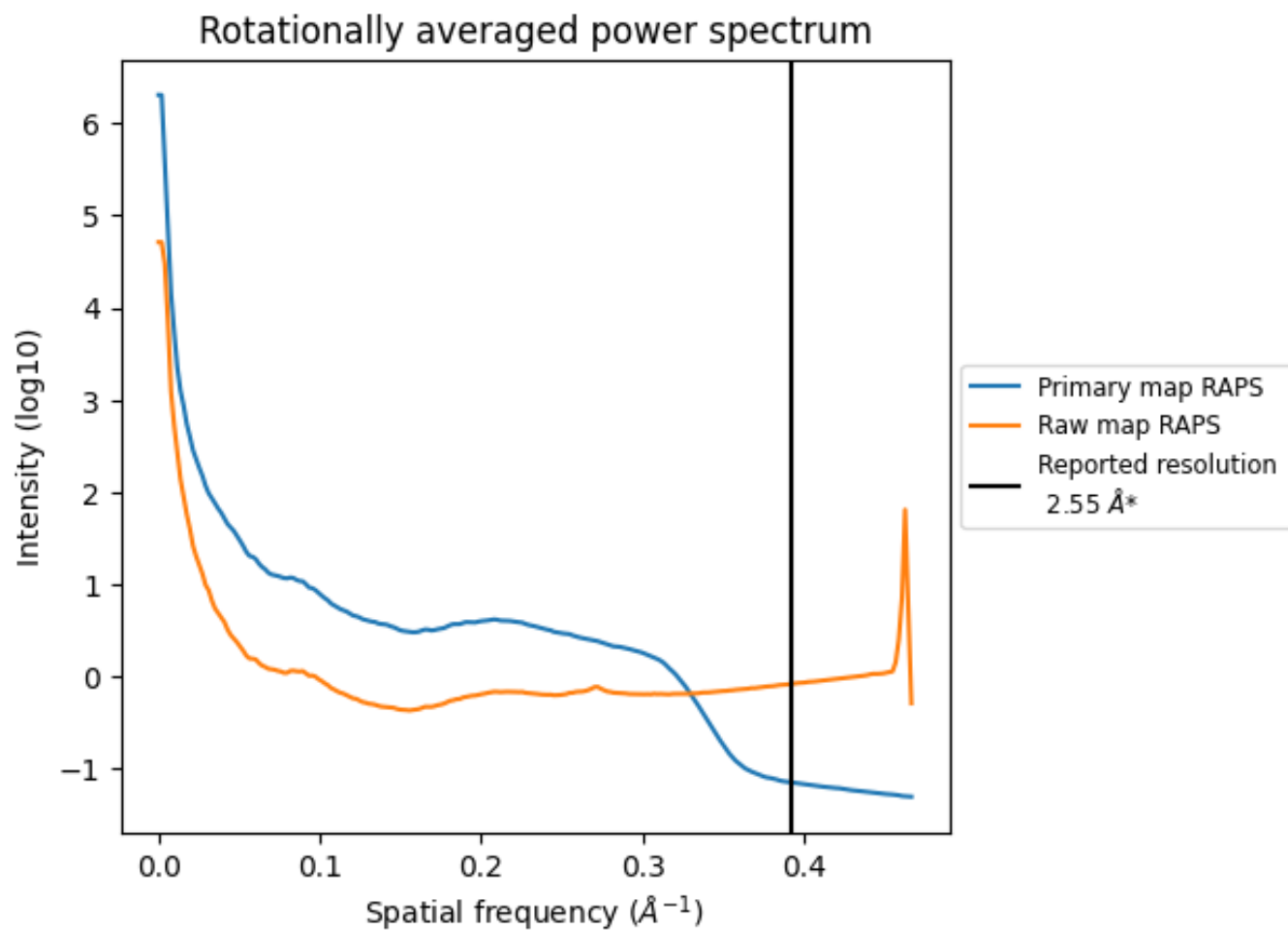
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 979 nm<sup>3</sup>; this corresponds to an approximate mass of 884 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



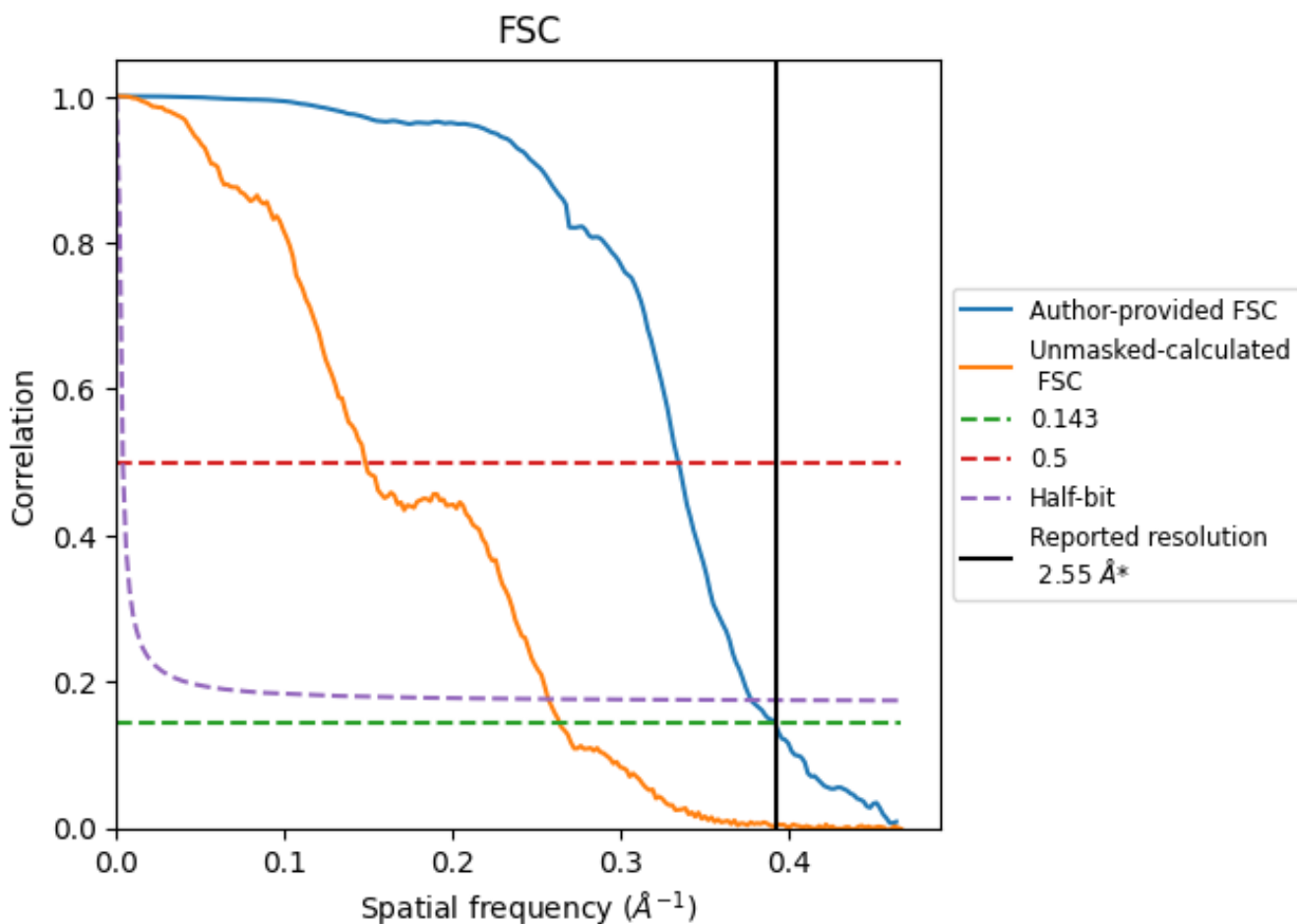
\*Reported resolution corresponds to spatial frequency of  $0.392 \text{ \AA}^{-1}$



## 8 Fourier-Shell correlation [i](#)

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

### 8.1 FSC [i](#)



\*Reported resolution corresponds to spatial frequency of 0.392 Å<sup>-1</sup>



## 8.2 Resolution estimates [i](#)

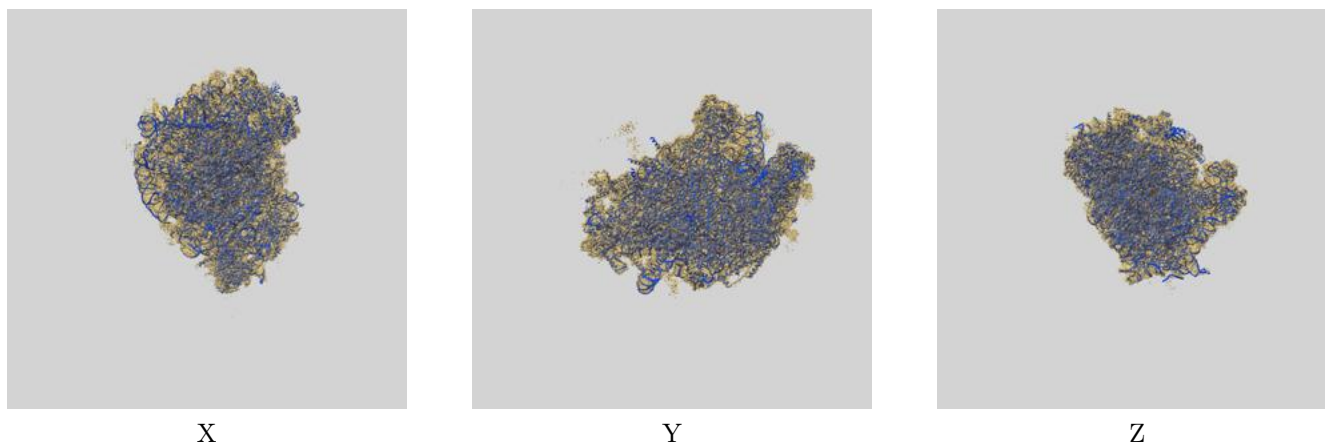
| Resolution estimate (Å)   | Estimation criterion (FSC cut-off) |      |          |
|---------------------------|------------------------------------|------|----------|
|                           | 0.143                              | 0.5  | Half-bit |
| Reported by author        | 2.55                               | -    | -        |
| Author-provided FSC curve | 2.55                               | 2.99 | 2.65     |
| Unmasked-calculated*      | 3.80                               | 6.76 | 3.90     |

\*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 3.80 differs from the reported value 2.55 by more than 10 %

## 9 Map-model fit [i](#)

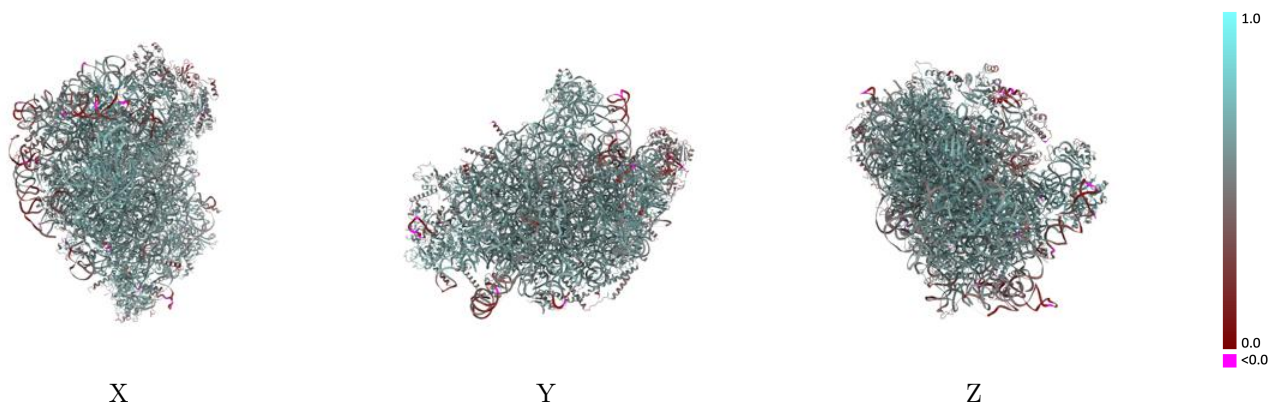
This section contains information regarding the fit between EMDB map EMD-29269 and PDB model 8FL7. Per-residue inclusion information can be found in section [3](#) on page [15](#).

### 9.1 Map-model overlay [i](#)



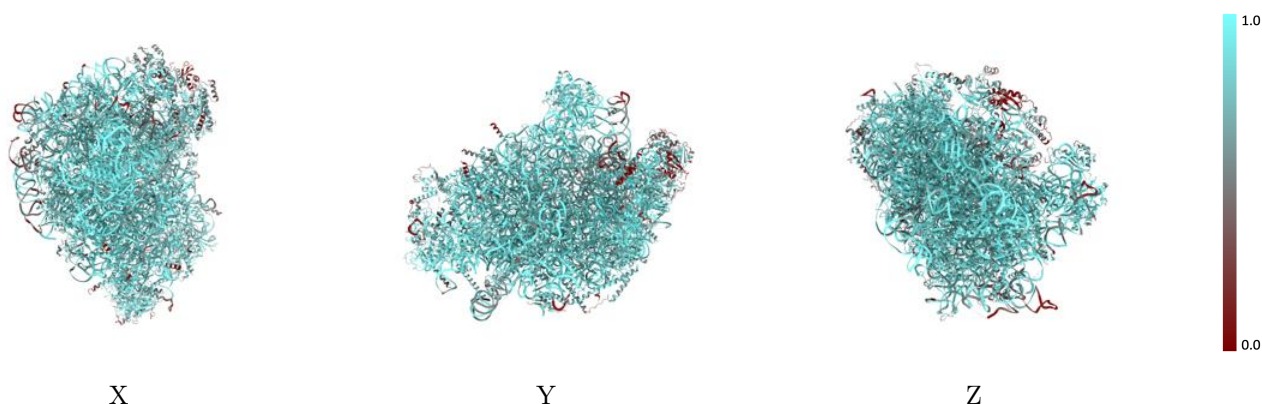
The images above show the 3D surface view of the map at the recommended contour level 0.85 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



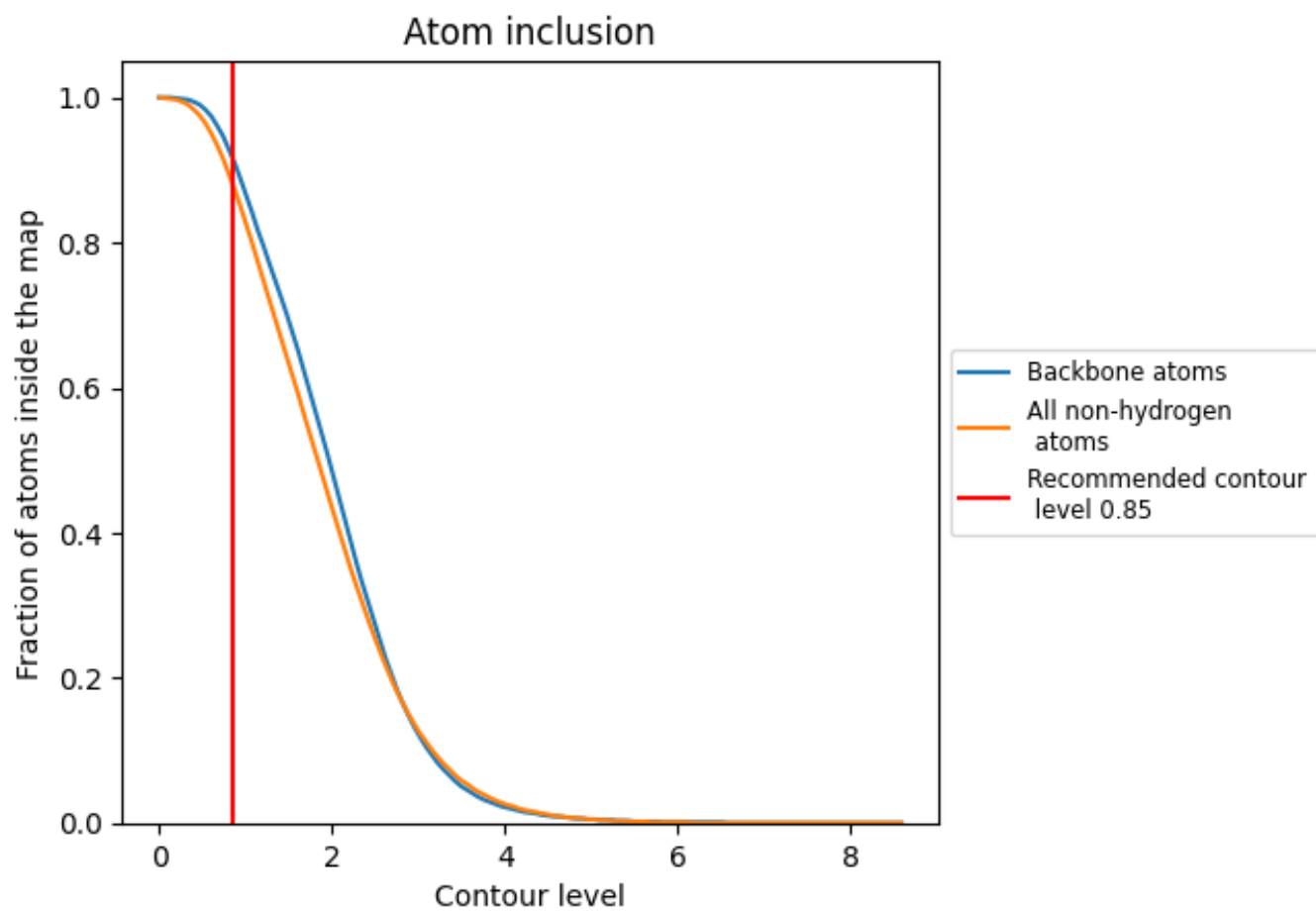
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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](#)



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 (0.85).







































































## 9.4 Atom inclusion [i](#)



At the recommended contour level, 92% of all backbone atoms, 88% 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 (0.85) and Q-score for the entire model and for each chain.

| Chain | Atom inclusion   | Q-score  |
|-------|--|--|
| All   |  0.8800   |  0.5700   |
| BA    |  0.3720   |  0.3380   |
| L1    |  0.9540   |  0.6100   |
| L3    |  0.9090   |  0.5590   |
| L4    |  0.9810   |  0.6210   |
| L5    |  0.8050   |  0.5410   |
| L6    |  0.8220   |  0.5660   |
| L7    |  0.9070   |  0.6160   |
| L8    |  0.9180   |  0.6070   |
| L9    |  0.9620   |  0.6400   |
| LA    |  0.8860   |  0.5960   |
| LB    |  0.9100   |  0.6100   |
| LC    |  0.9560   |  0.6440   |
| LD    |  0.8570   |  0.5760   |
| LE    |  0.8910  |  0.5810  |
| LF    |  0.8060 |  0.5490 |
| LG    |  0.8890 |  0.6090 |
| LH    |  0.8720 |  0.6060 |
| LI    |  0.8430 |  0.5710 |
| LJ    |  0.9300 |  0.6210 |
| LK    |  0.9200 |  0.6150 |
| LL    |  0.8750 |  0.5820 |
| LM    |  0.7380 |  0.5260 |
| LN    |  0.8990 |  0.6020 |
| LO    |  0.8100 |  0.5600 |
| LP    |  0.8460 |  0.5760 |
| LQ    |  0.8880 |  0.5960 |
| LR    |  0.9140 |  0.6080 |
| LS    |  0.8650 |  0.5890 |
| LT    |  0.9320 |  0.6140 |
| LU    |  0.7990 |  0.5570 |
| LV    |  0.8570 |  0.5990 |
| LW    |  0.9360 |  0.6150 |
| LX    |  0.8040 |  0.5670 |
| LY    |  0.7590 |  0.5590 |



*Continued on next page...*

Continued from previous page...

| Chain | Atom inclusion   | Q-score  |
|-------|--|--|
| LZ    |  0.9240   |  0.6130   |
| NC    |  0.0590   |  0.3230   |
| NF    |  0.7120   |  0.5510   |
| NK    |  0.6960   |  0.5190   |
| NL    |  0.8240   |  0.5680   |
| NP    |  0.8110   |  0.5620   |
| SA    |  0.8930   |  0.5970   |
| SB    |  0.8830   |  0.5900   |
| SC    |  0.7820   |  0.5360   |
| SD    |  0.8950   |  0.5950   |
| SE    |  0.8650   |  0.5910   |
| SF    |  0.9160   |  0.6160   |
| SG    |  0.9130   |  0.6140   |
| SH    |  0.6810   |  0.5000   |
| SI    |  0.7460   |  0.5260   |
| SK    |  0.8430   |  0.5750   |
| SM    |  0.9050   |  0.6150   |
| SQ    |  0.6070  |  0.4720  |
| SR    |  0.7590 |  0.5430 |
| SV    |  0.8390 |  0.5720 |