



## Full wwPDB EM Validation Report ⓘ

Aug 18, 2025 – 04:53 PM EDT

PDB ID : 9B50 / pdb\_00009b50  
EMDB ID : EMD-44193  
Title : E. coli 70S ribosome complex (unmethylated 16S A1408 + arbekacin)  
Authors : Mattingly, J.M.; Dey, D.; Zelinskaya, N.; Dunham, C.M.; Conn, G.L.  
Deposited on : 2024-03-21  
Resolution : 2.70 Å (reported)  
Based on initial models : 5JTE, 7K00

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>.

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

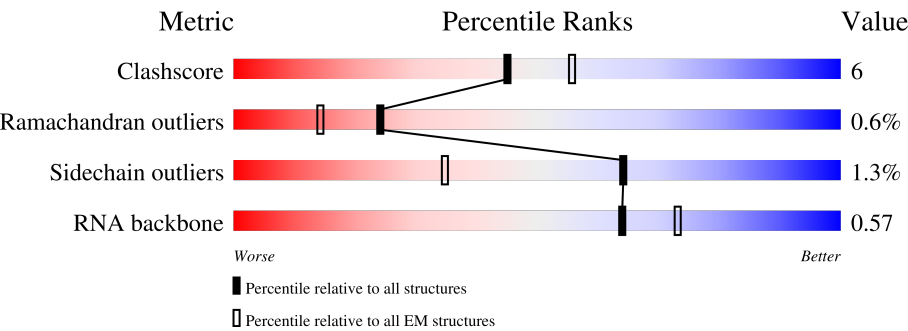
EMDB validation analysis : 0.0.1.dev126  
Mogul : 2022.3.0, CSD as543be (2022)  
MolProbity : 4-5-2 with Phenix2.0rc1  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
MapQ : 1.9.13  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.45.1

# 1 Overall quality at a glance i

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

The reported resolution of this entry is 2.70 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.



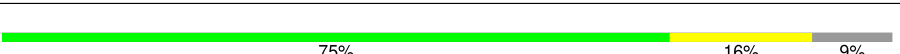
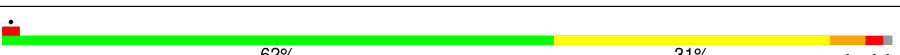
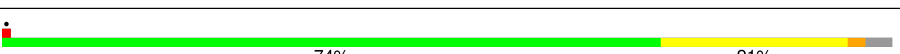
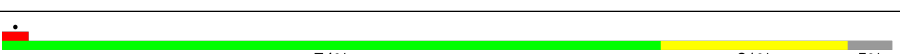
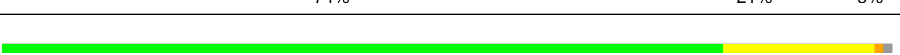
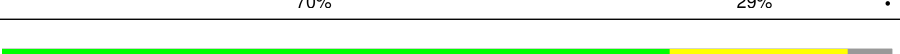
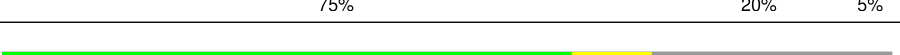
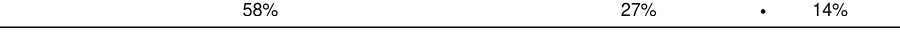
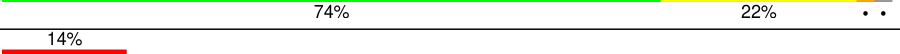
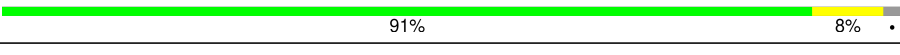
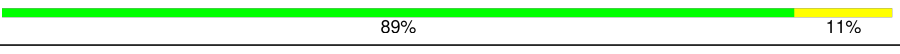
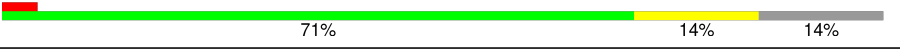
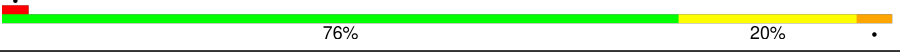
| Metric                | Whole archive (#Entries) | EM structures (#Entries) |
|-----------------------|--------------------------|--------------------------|
| Clashscore            | 210492                   | 15764                    |
| Ramachandran outliers | 207382                   | 16835                    |
| Sidechain outliers    | 206894                   | 16415                    |
| RNA backbone          | 6643                     | 2191                     |

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 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   | AA    | 1539   | <div><div>17%</div><div>68%</div><div>25%</div><div>7%</div></div>            |
| 2   | AB    | 240    | <div><div>67%</div><div>23%</div><div>9%</div></div>                          |
| 3   | AC    | 233    | <div><div>73%</div><div>16%</div><div>12%</div></div>                         |
| 4   | AD    | 206    | <div><div>17%</div><div>56%</div><div>38%</div><div>.</div><div>.</div></div> |
| 5   | AE    | 167    | <div><div>68%</div><div>22%</div><div>10%</div></div>                         |
| 6   | AF    | 135    | <div><div>58%</div><div>16%</div><div>.</div><div>26%</div></div>             |
| 7   | AG    | 179    | <div><div>68%</div><div>16%</div><div>.</div><div>16%</div></div>             |

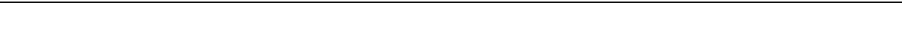
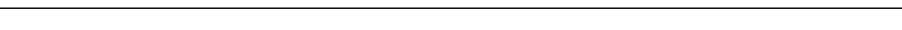
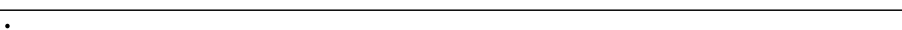
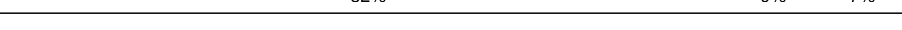
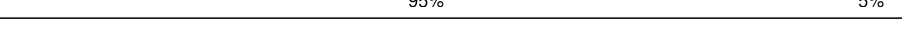
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| Mol | Chain | Length | Quality of chain                                                                     |
|-----|-------|--------|--------------------------------------------------------------------------------------|
| 8   | AH    | 130    |    |
| 9   | AI    | 130    |    |
| 10  | AJ    | 103    |    |
| 11  | AK    | 129    |    |
| 12  | AL    | 124    |    |
| 13  | AM    | 118    |    |
| 14  | AN    | 101    |    |
| 15  | AO    | 89     |    |
| 16  | AP    | 82     |    |
| 17  | AQ    | 84     |    |
| 18  | AR    | 75     |    |
| 19  | AS    | 92     |    |
| 20  | AT    | 87     |   |
| 21  | AU    | 71     |  |
| 22  | B0    | 57     |  |
| 23  | B1    | 55     |  |
| 24  | B2    | 46     |  |
| 25  | B3    | 65     |  |
| 26  | B4    | 38     |  |
| 27  | B5    | 70     |  |
| 28  | BA    | 2903   |  |
| 29  | BB    | 120    |  |
| 30  | BC    | 273    |  |
| 31  | BD    | 209    |  |
| 32  | BE    | 201    |  |

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| Mol | Chain | Length | Quality of chain                                                                     |
|-----|-------|--------|--------------------------------------------------------------------------------------|
| 33  | BF    | 179    |    |
| 34  | BG    | 177    |    |
| 35  | BH    | 149    |    |
| 36  | BJ    | 142    |    |
| 37  | BK    | 123    |    |
| 38  | BL    | 144    |    |
| 39  | BM    | 136    |    |
| 40  | BN    | 127    |    |
| 41  | BO    | 117    |    |
| 42  | BP    | 115    |    |
| 43  | BQ    | 118    |    |
| 44  | BR    | 103    |    |
| 45  | BS    | 110    |  |
| 46  | BT    | 100    |  |
| 47  | BU    | 104    |  |
| 48  | BV    | 94     |  |
| 49  | BW    | 85     |  |
| 50  | BX    | 78     |  |
| 51  | BY    | 63     |  |
| 52  | BZ    | 59     |  |

## 2 Entry composition

There are 55 unique types of molecules in this entry. The entry contains 141469 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a RNA chain called 16S ribosomal RNA.

| Mol | Chain | Residues | Atoms |       |      |       |      | AltConf | Trace |
|-----|-------|----------|-------|-------|------|-------|------|---------|-------|
| 1   | AA    | 1539     | Total | C     | N    | O     | P    | 0       | 0     |
|     |       |          | 33015 | 14725 | 6052 | 10699 | 1539 |         |       |

- Molecule 2 is a protein called 30S ribosomal protein S2.

| Mol | Chain | Residues | Atoms |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 2   | AB    | 218      | Total | C    | N   | O   | S | 0       | 0     |
|     |       |          | 1704  | 1081 | 305 | 311 | 7 |         |       |

- Molecule 3 is a protein called 30S ribosomal protein S3.

| Mol | Chain | Residues | Atoms |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 3   | AC    | 206      | Total | C    | N   | O   | S | 0       | 0     |
|     |       |          | 1624  | 1028 | 305 | 288 | 3 |         |       |

- Molecule 4 is a protein called 30S ribosomal protein S4.

| Mol | Chain | Residues | Atoms |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 4   | AD    | 205      | Total | C    | N   | O   | S | 0       | 0     |
|     |       |          | 1643  | 1026 | 315 | 298 | 4 |         |       |

- Molecule 5 is a protein called 30S ribosomal protein S5.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 5   | AE    | 150      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1105  | 687 | 211 | 201 | 6 |         |       |

- Molecule 6 is a protein called 30S ribosomal protein S6.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 6   | AF    | 100      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 817   | 515 | 148 | 148 | 6 |         |       |

- Molecule 7 is a protein called 30S ribosomal protein S7.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 7   | AG    | 151      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1181  | 735 | 227 | 215 | 4 |         |       |

- Molecule 8 is a protein called 30S ribosomal protein S8.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 8   | AH    | 129      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 979   | 616 | 173 | 184 | 6 |         |       |

- Molecule 9 is a protein called 30S ribosomal protein S9.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 9   | AI    | 127      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1022  | 634 | 206 | 179 | 3 |         |       |

- Molecule 10 is a protein called 30S ribosomal protein S10.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 10  | AJ    | 98       | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 786   | 493 | 150 | 142 | 1 |         |       |

- Molecule 11 is a protein called 30S ribosomal protein S11.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 11  | AK    | 117      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 877   | 540 | 174 | 160 | 3 |         |       |

- Molecule 12 is a protein called 30S ribosomal protein S12.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 12  | AL    | 123      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 955   | 590 | 196 | 165 | 4 |         |       |

- Molecule 13 is a protein called 30S ribosomal protein S13.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 13  | AM    | 114      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 883   | 546 | 178 | 156 | 3 |         |       |

- Molecule 14 is a protein called 30S ribosomal protein S14.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 14  | AN    | 96       | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 774   | 483 | 160 | 128 | 3 |         |       |

- Molecule 15 is a protein called 30S ribosomal protein S15.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 15  | AO    | 88       | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 710   | 437 | 143 | 129 | 1 |         |       |

- Molecule 16 is a protein called 30S ribosomal protein S16.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 16  | AP    | 82       | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 649   | 406 | 128 | 114 | 1 |         |       |

- Molecule 17 is a protein called 30S ribosomal protein S17.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 17  | AQ    | 80       | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 648   | 411 | 121 | 113 | 3 |         |       |

- Molecule 18 is a protein called 30S ribosomal protein S18.

| Mol | Chain | Residues | Atoms |     |    |    | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---------|-------|
| 18  | AR    | 55       | Total | C   | N  | O  | 0       | 0     |
|     |       |          | 455   | 288 | 86 | 81 |         |       |

- Molecule 19 is a protein called 30S ribosomal protein S19.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 19  | AS    | 79       | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 637   | 408 | 120 | 107 | 2 |         |       |

- Molecule 20 is a protein called 30S ribosomal protein S20.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 20  | AT    | 85       | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 665   | 411 | 137 | 114 | 3 |         |       |

- Molecule 21 is a protein called 30S ribosomal protein S21.

| Mol | Chain | Residues | Atoms |     |    |    |   | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 21  | AU    | 51       | Total | C   | N  | O  | S | 0       | 0     |
|     |       |          | 425   | 265 | 86 | 73 | 1 |         |       |

- Molecule 22 is a protein called 50S ribosomal protein L32.

| Mol | Chain | Residues | Atoms |     |    |    |   | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 22  | B0    | 56       | Total | C   | N  | O  | S | 0       | 0     |
|     |       |          | 444   | 269 | 94 | 80 | 1 |         |       |

- Molecule 23 is a protein called 50S ribosomal protein L33.

| Mol | Chain | Residues | Atoms |     |    |    |   | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 23  | B1    | 50       | Total | C   | N  | O  | S | 0       | 0     |
|     |       |          | 409   | 263 | 75 | 71 |   |         |       |

- Molecule 24 is a protein called 50S ribosomal protein L34.

| Mol | Chain | Residues | Atoms |     |    |    |   | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 24  | B2    | 46       | Total | C   | N  | O  | S | 0       | 0     |
|     |       |          | 377   | 228 | 90 | 57 | 2 |         |       |

- Molecule 25 is a protein called 50S ribosomal protein L35.

| Mol | Chain | Residues | Atoms |     |     |    |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|----|---|---------|-------|
| 25  | B3    | 64       | Total | C   | N   | O  | S | 0       | 0     |
|     |       |          | 504   | 323 | 105 | 74 | 2 |         |       |

- Molecule 26 is a protein called 50S ribosomal protein L36.

| Mol | Chain | Residues | Atoms |     |    |    |   | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 26  | B4    | 38       | Total | C   | N  | O  | S | 0       | 0     |
|     |       |          | 302   | 185 | 65 | 48 | 4 |         |       |

- Molecule 27 is a protein called 50S ribosomal protein L31.

| Mol | Chain | Residues | Atoms |     |    |    |   | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 27  | B5    | 60       | Total | C   | N  | O  | S | 0       | 0     |
|     |       |          | 480   | 299 | 90 | 85 | 6 |         |       |

- Molecule 28 is a RNA chain called 23S ribosomal RNA.

| Mol | Chain | Residues | Atoms |       |       |       |      | AltConf | Trace |
|-----|-------|----------|-------|-------|-------|-------|------|---------|-------|
| 28  | BA    | 2897     | Total | C     | N     | O     | P    | 0       | 0     |
|     |       |          | 62195 | 27745 | 11446 | 20107 | 2897 |         |       |

- Molecule 29 is a RNA chain called 5S ribosomal RNA.

| Mol | Chain | Residues | Atoms |      |     |     |     | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|-----|---------|-------|
| 29  | BB    | 118      | Total | C    | N   | O   | P   | 0       | 0     |
|     |       |          | 2529  | 1126 | 464 | 821 | 118 |         |       |

There is a discrepancy between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment  | Reference     |
|-------|---------|----------|--------|----------|---------------|
| BB    | 120     | A        | U      | conflict | GB 1370526515 |

- Molecule 30 is a protein called 50S ribosomal protein L2.

| Mol | Chain | Residues | Atoms |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 30  | BC    | 271      | Total | C    | N   | O   | S | 0       | 0     |
|     |       |          | 2082  | 1288 | 423 | 364 | 7 |         |       |

- Molecule 31 is a protein called 50S ribosomal protein L3.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 31  | BD    | 209      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1565  | 979 | 288 | 294 | 4 |         |       |

- Molecule 32 is a protein called 50S ribosomal protein L4.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 32  | BE    | 201      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1552  | 974 | 283 | 290 | 5 |         |       |

- Molecule 33 is a protein called 50S ribosomal protein L5.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 33  | BF    | 177      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1410  | 899 | 249 | 256 | 6 |         |       |

- Molecule 34 is a protein called 50S ribosomal protein L6.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 34  | BG    | 176      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1323  | 832 | 243 | 246 | 2 |         |       |

- Molecule 35 is a protein called 50S ribosomal protein L9.

| Mol | Chain | Residues | Atoms |     |    |    |   | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 35  | BH    | 47       | Total | C   | N  | O  | S | 0       | 0     |
|     |       |          | 359   | 233 | 62 | 63 | 1 |         |       |

- Molecule 36 is a protein called 50S ribosomal protein L13.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 36  | BJ    | 142      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1129  | 714 | 212 | 199 | 4 |         |       |

- Molecule 37 is a protein called 50S ribosomal protein L14.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 37  | BK    | 122      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 938   | 587 | 180 | 165 | 6 |         |       |

- Molecule 38 is a protein called 50S ribosomal protein L15.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 38  | BL    | 143      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1045  | 649 | 206 | 189 | 1 |         |       |

- Molecule 39 is a protein called 50S ribosomal protein L16.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 39  | BM    | 136      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1074  | 686 | 205 | 177 | 6 |         |       |

- Molecule 40 is a protein called 50S ribosomal protein L17.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 40  | BN    | 120      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 960   | 593 | 196 | 166 | 5 |         |       |

- Molecule 41 is a protein called 50S ribosomal protein L18.

| Mol | Chain | Residues | Atoms |     |     |     | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---------|-------|
| 41  | BO    | 116      | Total | C   | N   | O   | 0       | 0     |
|     |       |          | 892   | 552 | 178 | 162 |         |       |

- Molecule 42 is a protein called 50S ribosomal protein L19.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 42  | BP    | 114      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 917   | 574 | 179 | 163 | 1 |         |       |

- Molecule 43 is a protein called 50S ribosomal protein L20.

| Mol | Chain | Residues | Atoms |     |     |     | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---------|-------|
| 43  | BQ    | 117      | Total | C   | N   | O   | 0       | 0     |
|     |       |          | 947   | 604 | 192 | 151 |         |       |

- Molecule 44 is a protein called 50S ribosomal protein L21.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 44  | BR    | 103      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 816   | 516 | 153 | 145 | 2 |         |       |

- Molecule 45 is a protein called 50S ribosomal protein L22.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 45  | BS    | 110      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 857   | 532 | 166 | 156 | 3 |         |       |

- Molecule 46 is a protein called 50S ribosomal protein L23.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 46  | BT    | 93       | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 738   | 466 | 139 | 131 | 2 |         |       |

- Molecule 47 is a protein called 50S ribosomal protein L24.

| Mol | Chain | Residues | Atoms |     |     |     | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---------|-------|
| 47  | BU    | 102      | Total | C   | N   | O   | 0       | 0     |
|     |       |          | 779   | 492 | 146 | 141 |         |       |

- Molecule 48 is a protein called 50S ribosomal protein L25.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 48  | BV    | 94       | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 753   | 479 | 137 | 134 | 3 |         |       |

- Molecule 49 is a protein called 50S ribosomal protein L27.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 49  | BW    | 75       | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 569   | 353 | 113 | 102 | 1 |         |       |

- Molecule 50 is a protein called 50S ribosomal protein L28.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 50  | BX    | 77       | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 625   | 388 | 129 | 106 | 2 |         |       |

- Molecule 51 is a protein called 50S ribosomal protein L29.

| Mol | Chain | Residues | Atoms |     |    |    |   | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 51  | BY    | 63       | Total | C   | N  | O  | S | 0       | 0     |
|     |       |          | 509   | 313 | 99 | 95 | 2 |         |       |

- Molecule 52 is a protein called 50S ribosomal protein L30.

| Mol | Chain | Residues | Atoms |     |    |    |   | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 52  | BZ    | 58       | Total | C   | N  | O  | S | 0       | 0     |
|     |       |          | 449   | 281 | 87 | 79 | 2 |         |       |

- Molecule 53 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

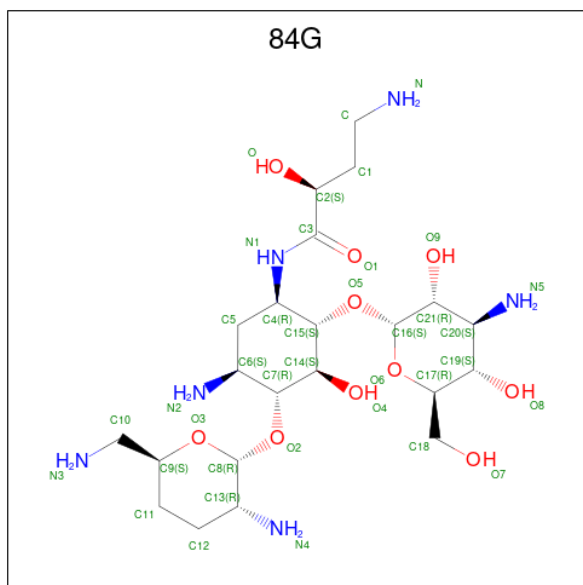
| Mol | Chain | Residues | Atoms |     | AltConf |
|-----|-------|----------|-------|-----|---------|
| 53  | AA    | 93       | Total | Mg  | 0       |
|     |       |          | 93    | 93  |         |
| 53  | B0    | 1        | Total | Mg  | 0       |
|     |       |          | 1     | 1   |         |
| 53  | BA    | 207      | Total | Mg  | 0       |
|     |       |          | 207   | 207 |         |
| 53  | BB    | 5        | Total | Mg  | 0       |
|     |       |          | 5     | 5   |         |
| 53  | BC    | 1        | Total | Mg  | 0       |
|     |       |          | 1     | 1   |         |
| 53  | BN    | 1        | Total | Mg  | 0       |
|     |       |          | 1     | 1   |         |

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| Mol | Chain | Residues | Atoms |    | AltConf |
|-----|-------|----------|-------|----|---------|
| 53  | BQ    | 1        | Total | Mg | 0       |
|     |       |          | 1     | 1  |         |

- Molecule 54 is Arbekacin (CCD ID: 84G) (formula:  $C_{22}H_{44}N_6O_{10}$ ) (labeled as "Ligand of Interest" by depositor).



| Mol | Chain | Residues | Atoms |    |   |    | AltConf |
|-----|-------|----------|-------|----|---|----|---------|
| 54  | AA    | 1        | Total | C  | N | O  | 0       |
|     |       |          | 38    | 22 | 6 | 10 |         |
| 54  | AA    | 1        | Total | C  | N | O  | 0       |
|     |       |          | 38    | 22 | 6 | 10 |         |

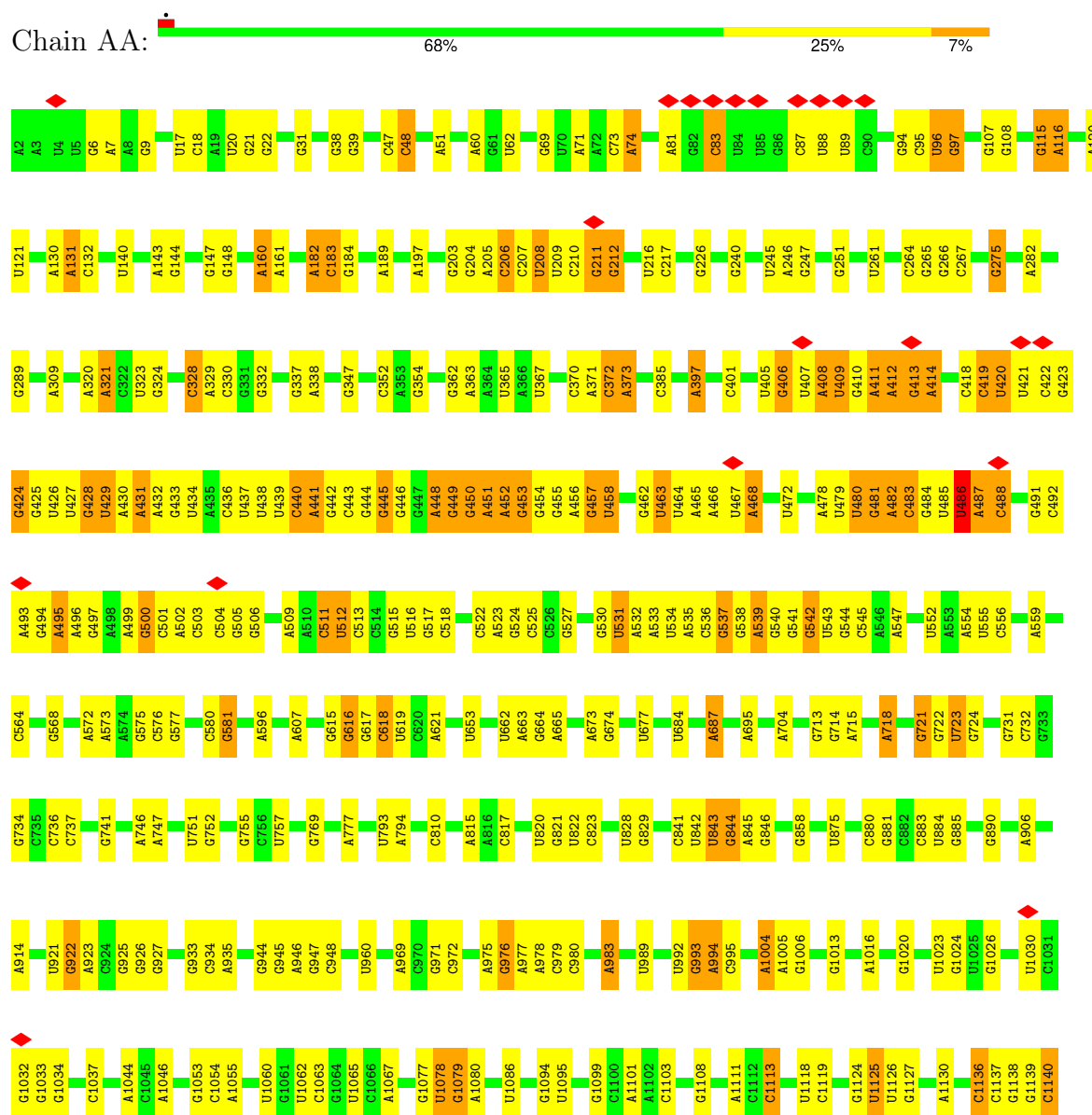
- Molecule 55 is ZINC ION (CCD ID: ZN) (formula: Zn).

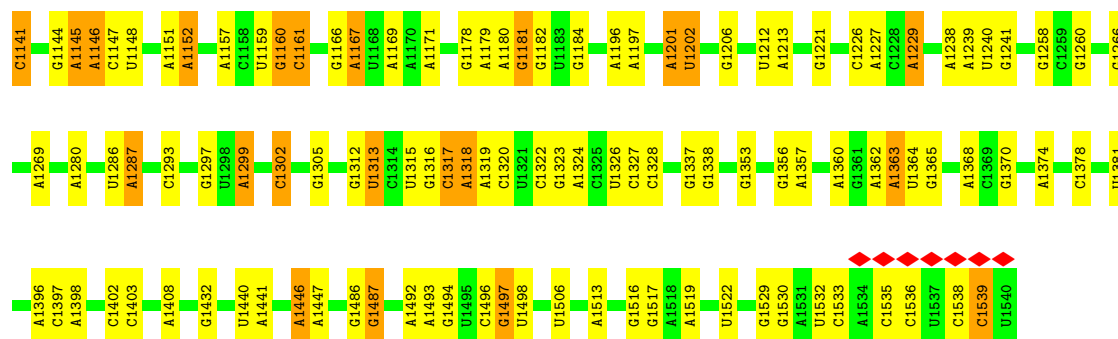
| Mol | Chain | Residues | Atoms |    | AltConf |
|-----|-------|----------|-------|----|---------|
| 55  | B4    | 1        | Total | Zn | 0       |
|     |       |          | 1     | 1  |         |
| 55  | B5    | 1        | Total | Zn | 0       |
|     |       |          | 1     | 1  |         |

### 3 Residue-property plots

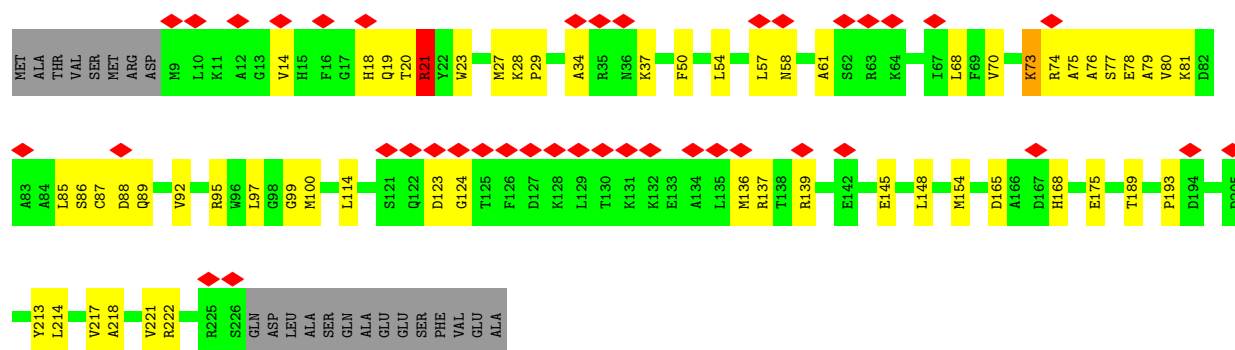
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion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

#### • Molecule 1: 16S ribosomal RNA

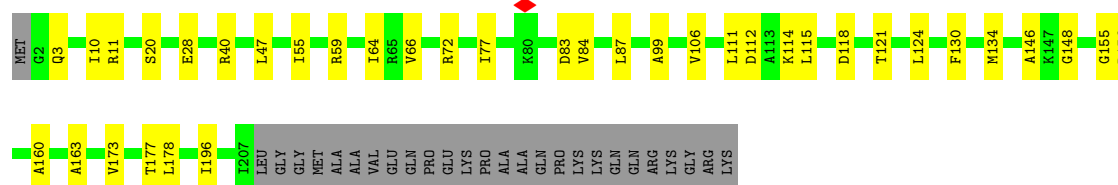




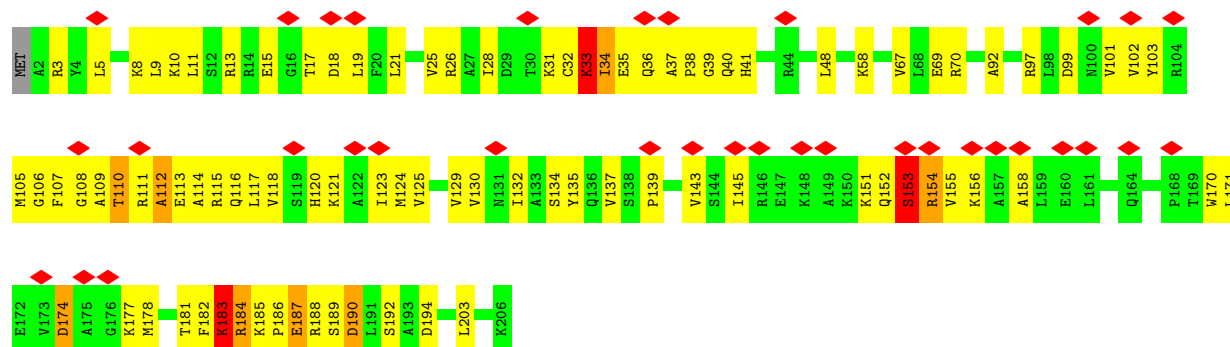
• Molecule 2: 30S ribosomal protein S2



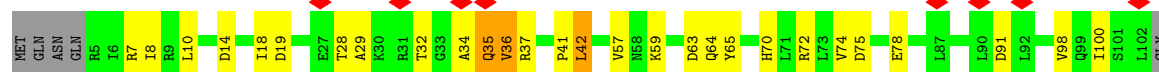
• Molecule 3: 30S ribosomal protein S3



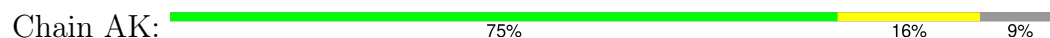
• Molecule 4: 30S ribosomal protein S4



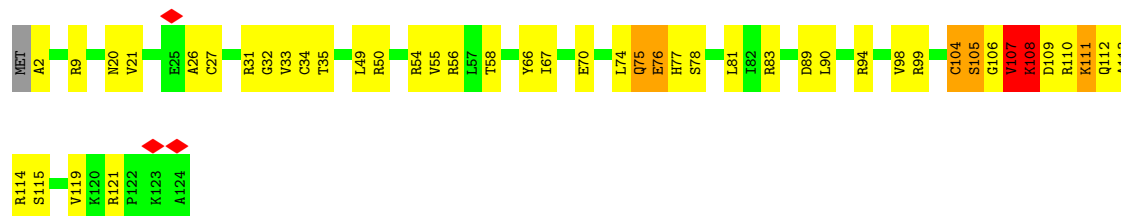




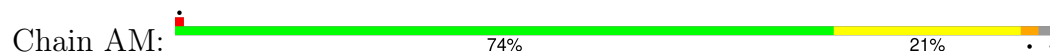
- Molecule 11: 30S ribosomal protein S11



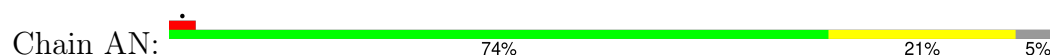
- Molecule 12: 30S ribosomal protein S12



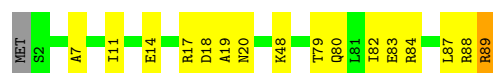
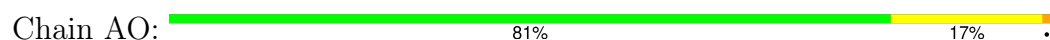
- Molecule 13: 30S ribosomal protein S13



- Molecule 14: 30S ribosomal protein S14

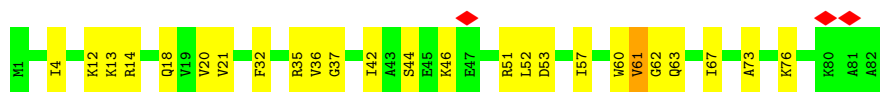


- Molecule 15: 30S ribosomal protein S15

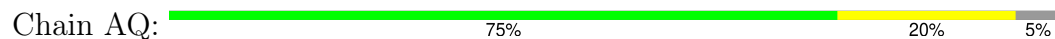


- Molecule 16: 30S ribosomal protein S16

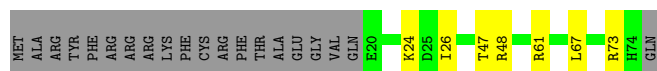




- Molecule 17: 30S ribosomal protein S17



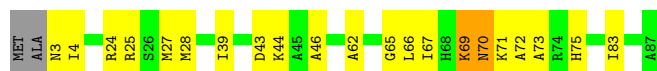
- Molecule 18: 30S ribosomal protein S18



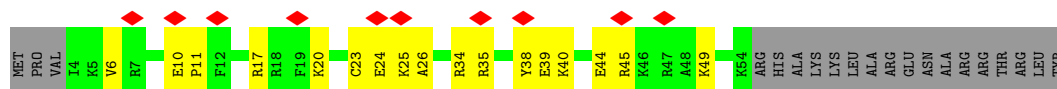
- Molecule 19: 30S ribosomal protein S19



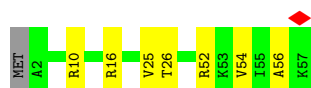
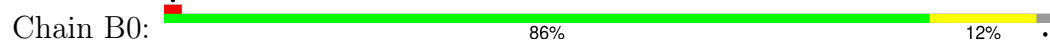
- Molecule 20: 30S ribosomal protein S20



- Molecule 21: 30S ribosomal protein S21

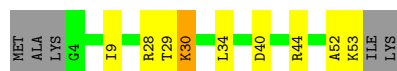


- Molecule 22: 50S ribosomal protein L32



- Molecule 23: 50S ribosomal protein L33

Chain B1:  75% 15% 9%



- Molecule 24: 50S ribosomal protein L34

Chain B2:  83% 17%



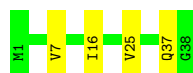
- Molecule 25: 50S ribosomal protein L35

Chain B3:  91% 8%



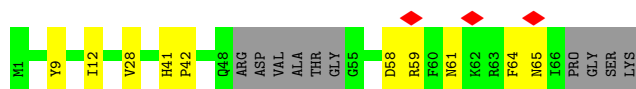
- Molecule 26: 50S ribosomal protein L36

Chain B4:  89% 11%



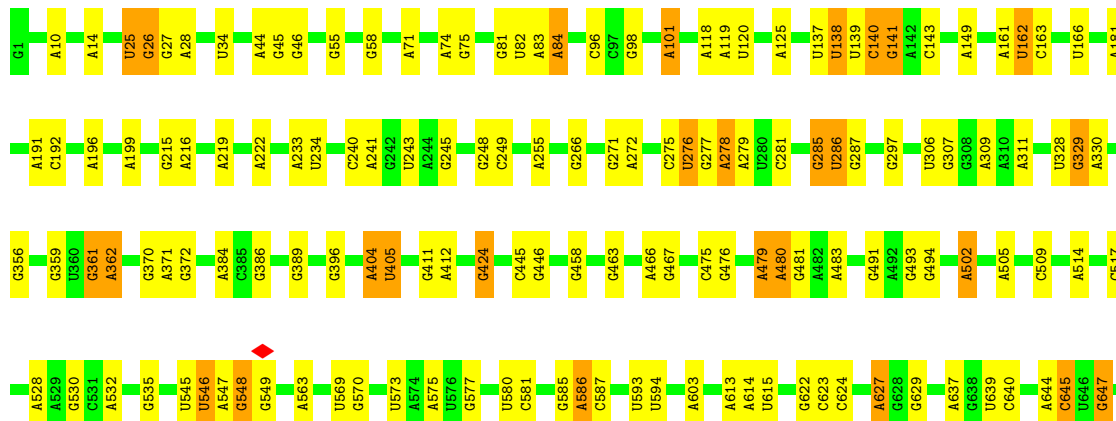
- Molecule 27: 50S ribosomal protein L31

Chain B5:  71% 14% 14%

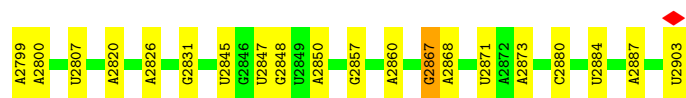


- Molecule 28: 23S ribosomal RNA

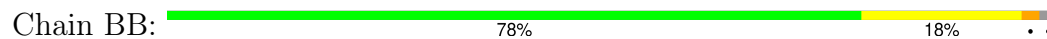
Chain BA:  76% 20%



|       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| G2567 | G2581 | G2582 | G2599 | A2602 | U2609 | U2613 | A2614 | U2615 | G2623 | U2629 | G2630 | C2636 | A2639 | C2646 | G2663 | G2683 | U2684 | U2687 | G2688 | U2689 | G2714 | C2715 | G2716 | U2720 | A2726 | G2732 | A2733 | A2748 | A2765 | U2778 | U2779 | G2780 | C2788 | G2789 | C2794 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| U2402 | A2406 | A2407 | G2413 | U2423 | C2424 | A2425 | G2428 | G2429 | A2430 | A2435 | U2441 | A2448 | A2459 | A2469 | C2475 | A2476 | G2481 | U2491 | C2496 | G2502 | A2503 | U2504 | G2505 | U2506 | C2507 | A2516 | C2517 | U2518 | C2520 | G2529 | G2532 | A2547 | U2548 | U2554 | G2557 | C2558 | A2566 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| G2238 | G2239 | U2243 | U2244 | G2250 | A2266 | A2267 | A2278 | A2281 | G2282 | C2283 | G2286 | A2287 | A2288 | U2291 | U2292 | A2297 | U2305 | C2306 | G2307 | G2308 | A2309 | C2310 | A2311 | U2321 | A2322 | G2323 | U2324 | G2325 | C2326 | A2327 | A2328 | U2329 | C2330 | G2331 | A2333 | U2334 | A2335 | C2347 | G2361 | C2380 | G2383 | U2384 | C2385 |       |       |       |       |       |       |       |       |       |       |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| C2143 | G2144 | C2145 | C2146 | A2147 | C2148 | U2149 | C2150 | U2151 | G2152 | G2156 | G2157 | A2158 | G2159 | G2162 | A2163 | C2164 | C2165 | U2166 | U2167 | G2168 | A2169 | A2170 | A2171 | U2172 | A2173 | C2174 | C2177 | C2178 | C2179 | U2180 | U2181 | U2182 | A2183 | A2184 | U2187 | U2188 | U2189 | G2190 | A2191 | U2192 | G2193 | U2194 | A2198 | G2204 | A2211 | A2212 | A2225 | C2226 | G2230 |       |       |       |       |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| G2056 | A2060 | G2061 | A2062 | C2063 | C2064 | C2065 | G2069 | A2070 | A2071 | C2072 | U2092 | U2098 | U2099 | G2100 | A2101 | C2102 | C2103 | U2104 | U2105 | U2106 | U2109 | G2110 | U2111 | G2112 | U2113 | A2114 | G2115 | G2116 | A2117 | U2118 | A2119 | G2120 | G2121 | U2122 | G2123 | G2124 | G2125 | A2126 | G2127 | G2128 | C2129 | U2130 | U2131 | U2132 | G2133 | A2134 | A2135 | G2136 | U2137 | G2138 | U2139 | G2140 | G2141 | A2142 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| C1920 | A1927 | A1928 | G1929 | G1930 | U1937 | C1942 | U1943 | U1944 | G1954 | U1955 | U1956 | C1965 | A1966 | C1967 | U1970 | U1971 | G1972 | C1990 | U1991 | G1992 | U1993 | C1997 | G2002 | G2012 | A2013 | A2014 | A2015 | U2022 | C2023 | G2027 | U2028 | G2029 | A2030 | A2031 | G2032 | A2033 | C2036 | A2037 | G2038 | U2039 | C2043 | A2052 | C2055 |       |       |       |       |       |       |       |       |       |       |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| A1548 | A1549 | A1566 | A1569 | U1578 | A1583 | U1584 | C1585 | C1604 | C1607 | A1608 | A1609 | A1610 | U1647 | U1648 | G1649 | G1667 | A1668 | A1669 | G1674 | G1675 | A1676 | A1677 | U1693 | C1694 | G1715 | U1720 | G1721 | C1728 | U1729 | C1730 | G1731 | C1732 | G1738 | G1743 | A1744 | A1746 | U1747 | A1754 | U1758 | C1764 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| A1773 | C1774 | U1775 | G1776 | U1779 | A1784 | A1785 | U1786 | C1787 | A1788 | U1789 | C1790 | A1791 | A1794 | C1795 | U1796 | C1797 | C1800 | A1801 | A1802 | A1803 | U1808 | C1816 | G1826 | A1829 | A1847 | A1848 | A1853 | A1854 | A1858 | G1869 | C1870 | A1871 | A1872 | C1881 | U1882 | G1903 | U1906 | A1913 | C1914 | A1918 | A1919 |       |       |       |       |       |       |       |       |       |       |       |       |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| A1392 | A1395 | U1405 | U1406 | G1416 | A1420 | C1428 | G1432 | A1433 | A1434 | C1447 | G1452 | G1456 | U1460 | A1469 | A1470 | G1475 | G1482 | G1483 | C1493 | A1494 | A1495 | A1496 | U1497 | C1498 | A1504 | A1508 | A1509 | G1510 | G1514 | A1515 | G1527 | C1533 | U1534 | A1535 | C1536 | G1537 | A1544 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| G1216 | G1236 | A1237 | G1238 | U1240 | A1241 | U1249 | G1250 | A1253 | A1254 | U1255 | G1256 | G1266 | G1271 | A1272 | U1273 | U1282 | G1283 | G1300 | A1301 | C1315 | C1319 | C1320 | A1328 | U1329 | C1330 | C1345 | C1351 | U1352 | G1360 | G1361 | A1365 | G1368 | G1369 | C1370 | G1371 | U1379 | A1383 | A1384 | C1385 | C1386 | A1387 |       |       |       |       |       |       |       |       |       |       |       |       |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| G1093 | U1094 | A1095 | A1096 | U1097 | A1098 | U1101 | C1102 | A1103 | C1104 | U1105 | G1106 | G1107 | G1110 | A1111 | G1112 | G1115 | G1116 | G1131 | U1132 | A1133 | U1134 | C1135 | G1136 | G1139 | C1140 | U1141 | A1142 | C1153 | G1154 | A1169 | C1170 | G1171 | C1172 | U1173 | U1174 | A1175 | U1176 | G1177 | C1178 | G1179 | U1180 | U1181 | U1182 | U1183 | U1199 | U1203 | A1204 | G1212 |       |       |       |       |       |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| C994  | C995  | A996  | A1009 | U1012 | C1013 | A1021 | G1022 | G1025 | G1026 | A1027 | A1028 | A1029 | U1033 | C1045 | A1046 | G1047 | G1056 | A1057 | U1058 | G1059 | U1060 | U1061 | G1062 | G1063 | C1064 | U1065 | U1066 | A1067 | G1068 | A1069 | U1070 | G1071 | C1072 | A1073 | G1074 | C1075 | C1076 | A1077 | U1078 | C1079 | A1080 | U1081 | U1082 | U1083 | A1084 | A1085 | A1086 | U1087 | A1088 | A1089 | C1092 |       |       |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| C948  | A949  | U950  | G956  | G957  | G958  | G959  | U971  | U972  | C976  | A977  | A978  | G983  | U984  | C985  | A     | U     | C     | C     | G     | A992  | A996  | C997  | A900  | A910  | G914  | C915  | G916  | G930  | U931  | A941  | C946  | A947  | C948  | C961  | A972  | U973  | A974  | U975  | U976  | U977  | U978  | U979  | U980  | U981  | U982  | U983  | U984  | U985  | U986  | U987  |       |       |       |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| G851  | U852  | U853  | A854  | A855  | U867  | A868  | A877  | U872  | U886  | U894  | G895  | U903  | G904  | A930  | G938  | G938  | A942  | A943  | G944  | G945  | G946  | G947  | G948  | G949  | G950  | G951  | G952  | G953  | G954  | G955  | G956  | G957  | G958  | G959  | G960  | G961  | G962  | G963  | G964  | G965  | G966  | G967  | G968  | G969  | G970  | G971  | G972  | G973  | G974  | G975  | G976  | G977  | G978  | G979  | G980 | G981 | G982 | G983 | G984 | G985 | G986 | G987 | G988 | G989 | G990 | G991 | G992 | G993 | G994 | G995 | G996 | G997 | G998 | G999 |



- Molecule 29: 5S ribosomal RNA



- Molecule 30: 50S ribosomal protein L2



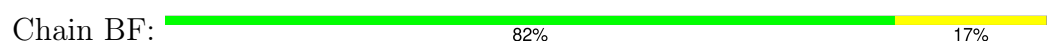
- Molecule 31: 50S ribosomal protein L3



- Molecule 32: 50S ribosomal protein L4



- Molecule 33: 50S ribosomal protein L5



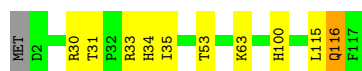
- Molecule 34: 50S ribosomal protein L6



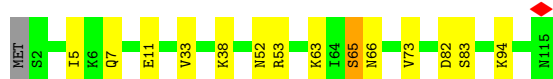
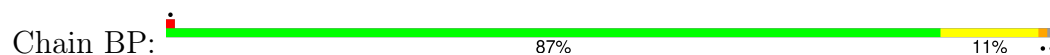
- Molecule 35: 50S ribosomal protein L9







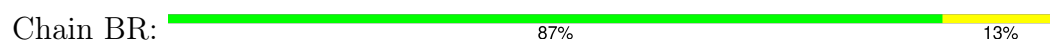
- Molecule 42: 50S ribosomal protein L19



- Molecule 43: 50S ribosomal protein L20



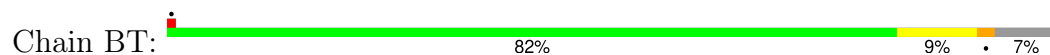
- Molecule 44: 50S ribosomal protein L21



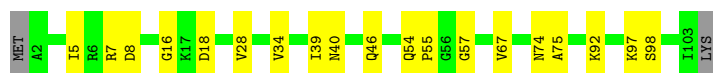
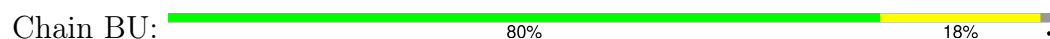
- Molecule 45: 50S ribosomal protein L22



- Molecule 46: 50S ribosomal protein L23



- Molecule 47: 50S ribosomal protein L24



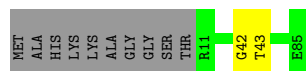
- Molecule 48: 50S ribosomal protein L25





- Molecule 49: 50S ribosomal protein L27

Chain BW: 86% 12%



- Molecule 50: 50S ribosomal protein L28

Chain BX: 86% 13%



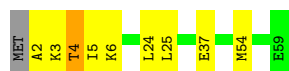
- Molecule 51: 50S ribosomal protein L29

Chain BY: 5% 86% 14%



- Molecule 52: 50S ribosomal protein L30

Chain BZ: 83% 14% 3%



## 4 Experimental information

| Property                             | Value                                   | Source    |
|--------------------------------------|-----------------------------------------|-----------|
| EM reconstruction method             | SINGLE PARTICLE                         | Depositor |
| Imposed symmetry                     | POINT, Not provided                     |           |
| Number of particles used             | 470397                                  | Depositor |
| Resolution determination method      | FSC 0.143 CUT-OFF                       | Depositor |
| CTF correction method                | PHASE FLIPPING AND AMPLITUDE CORRECTION | Depositor |
| Microscope                           | TFS KRIOS                               | Depositor |
| Voltage (kV)                         | 300                                     | Depositor |
| Electron dose ( $e^-/\text{\AA}^2$ ) | 52.16                                   | Depositor |
| Minimum defocus (nm)                 | 800                                     | Depositor |
| Maximum defocus (nm)                 | 2000                                    | Depositor |
| Magnification                        | 81000                                   | Depositor |
| Image detector                       | GATAN K3 BIOQUANTUM (6k x 4k)           | Depositor |
| Maximum map value                    | 28.698                                  | Depositor |
| Minimum map value                    | -10.798                                 | Depositor |
| Average map value                    | -0.000                                  | Depositor |
| Map value standard deviation         | 1.000                                   | Depositor |
| Recommended contour level            | 2.5                                     | Depositor |
| Map size ( $\text{\AA}$ )            | 427.6, 427.6, 427.6                     | wwPDB     |
| Map dimensions                       | 400, 400, 400                           | wwPDB     |
| Map angles ( $^\circ$ )              | 90.0, 90.0, 90.0                        | wwPDB     |
| Pixel spacing ( $\text{\AA}$ )       | 1.069, 1.069, 1.069                     | Depositor |

## 5 Model quality ⓘ

### 5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: 84G, MG, ZN

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   | AA    | 0.27         | 0/36966       | 0.31        | 1/57666 (0.0%) |
| 2   | AB    | 0.30         | 0/1735        | 0.48        | 2/2338 (0.1%)  |
| 3   | AC    | 0.19         | 0/1651        | 0.31        | 0/2225         |
| 4   | AD    | 0.39         | 0/1665        | 0.61        | 3/2227 (0.1%)  |
| 5   | AE    | 0.25         | 0/1118        | 0.38        | 0/1504         |
| 6   | AF    | 0.20         | 0/835         | 0.34        | 0/1128         |
| 7   | AG    | 0.30         | 1/1195 (0.1%) | 0.35        | 1/1602 (0.1%)  |
| 8   | AH    | 0.31         | 0/989         | 0.36        | 0/1326         |
| 9   | AI    | 0.40         | 0/1034        | 0.47        | 0/1375         |
| 10  | AJ    | 0.19         | 0/796         | 0.34        | 0/1077         |
| 11  | AK    | 0.32         | 0/893         | 0.42        | 0/1205         |
| 12  | AL    | 0.57         | 0/969         | 0.72        | 3/1300 (0.2%)  |
| 13  | AM    | 0.35         | 0/892         | 0.47        | 0/1193         |
| 14  | AN    | 0.19         | 0/785         | 0.36        | 0/1043         |
| 15  | AO    | 0.33         | 0/718         | 0.30        | 0/959          |
| 16  | AP    | 0.41         | 0/659         | 0.47        | 1/884 (0.1%)   |
| 17  | AQ    | 0.45         | 0/657         | 0.54        | 0/881          |
| 18  | AR    | 0.22         | 0/462         | 0.31        | 0/621          |
| 19  | AS    | 0.37         | 0/652         | 0.47        | 0/877          |
| 20  | AT    | 0.58         | 0/671         | 0.42        | 0/888          |
| 21  | AU    | 0.20         | 0/430         | 0.50        | 0/570          |
| 22  | B0    | 0.50         | 0/450         | 0.42        | 0/599          |
| 23  | B1    | 0.41         | 0/416         | 0.40        | 0/554          |
| 24  | B2    | 0.32         | 0/380         | 0.32        | 0/498          |
| 25  | B3    | 0.28         | 0/513         | 0.29        | 0/676          |
| 26  | B4    | 0.26         | 0/303         | 0.26        | 0/397          |
| 27  | B5    | 0.17         | 0/488         | 0.37        | 0/649          |
| 28  | BA    | 0.32         | 0/69659       | 0.30        | 0/108672       |
| 29  | BB    | 0.26         | 0/2828        | 0.25        | 0/4410         |
| 30  | BC    | 0.52         | 0/2121        | 0.44        | 0/2852         |
| 31  | BD    | 0.43         | 0/1586        | 0.48        | 3/2134 (0.1%)  |
| 32  | BE    | 0.26         | 0/1571        | 0.29        | 0/2113         |

| Mol | Chain | Bond lengths |                 | Bond angles |                  |
|-----|-------|--------------|-----------------|-------------|------------------|
|     |       | RMSZ         | # Z  >5         | RMSZ        | # Z  >5          |
| 33  | BF    | 0.20         | 0/1434          | 0.32        | 0/1926           |
| 34  | BG    | 0.19         | 0/1343          | 0.31        | 0/1816           |
| 35  | BH    | 0.20         | 0/364           | 0.41        | 0/490            |
| 36  | BJ    | 0.36         | 0/1152          | 0.32        | 0/1551           |
| 37  | BK    | 0.26         | 0/947           | 0.34        | 0/1268           |
| 38  | BL    | 0.28         | 0/1054          | 0.39        | 0/1403           |
| 39  | BM    | 0.26         | 0/1093          | 0.31        | 0/1460           |
| 40  | BN    | 0.44         | 0/973           | 0.42        | 0/1301           |
| 41  | BO    | 0.36         | 0/902           | 0.38        | 0/1209           |
| 42  | BP    | 0.34         | 0/929           | 0.35        | 0/1242           |
| 43  | BQ    | 0.30         | 0/960           | 0.28        | 0/1278           |
| 44  | BR    | 0.27         | 0/829           | 0.37        | 0/1107           |
| 45  | BS    | 0.27         | 0/864           | 0.30        | 0/1156           |
| 46  | BT    | 0.32         | 0/744           | 0.31        | 0/994            |
| 47  | BU    | 0.24         | 0/787           | 0.35        | 0/1051           |
| 48  | BV    | 0.25         | 0/766           | 0.26        | 0/1025           |
| 49  | BW    | 0.28         | 0/576           | 0.31        | 0/762            |
| 50  | BX    | 0.28         | 0/635           | 0.28        | 0/848            |
| 51  | BY    | 0.23         | 0/510           | 0.28        | 0/677            |
| 52  | BZ    | 0.53         | 0/453           | 0.47        | 0/605            |
| All | All   | 0.31         | 1/153402 (0.0%) | 0.33        | 14/229612 (0.0%) |

All (1) bond length outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z     | Observed(Å) | Ideal(Å) |
|-----|-------|-----|------|-------|-------|-------------|----------|
| 7   | AG    | 109 | ARG  | C-N   | -7.08 | 1.22        | 1.33     |

All (14) bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms       | Z     | Observed(°) | Ideal(°) |
|-----|-------|-----|------|-------------|-------|-------------|----------|
| 2   | AB    | 80  | VAL  | N-CA-C      | -7.82 | 104.27      | 113.42   |
| 31  | BD    | 151 | THR  | CA-C-N      | -7.62 | 111.32      | 119.24   |
| 31  | BD    | 151 | THR  | C-N-CA      | -7.62 | 111.32      | 119.24   |
| 4   | AD    | 112 | ALA  | CA-C-N      | -7.45 | 110.30      | 120.28   |
| 4   | AD    | 112 | ALA  | C-N-CA      | -7.45 | 110.30      | 120.28   |
| 16  | AP    | 63  | GLN  | N-CA-C      | -6.73 | 104.28      | 113.30   |
| 12  | AL    | 105 | SER  | N-CA-C      | 6.70  | 120.36      | 107.44   |
| 12  | AL    | 76  | GLU  | N-CA-C      | -6.13 | 102.01      | 110.35   |
| 1   | AA    | 486 | U    | C2'-C3'-O3' | -6.08 | 104.57      | 113.70   |
| 7   | AG    | 109 | ARG  | O-C-N       | -6.05 | 115.14      | 122.22   |
| 31  | BD    | 152 | PRO  | N-CA-C      | -5.92 | 104.19      | 113.78   |
| 12  | AL    | 111 | LYS  | N-CA-C      | -5.47 | 107.61      | 114.56   |

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| Mol | Chain | Res | Type | Atoms  | Z     | Observed(°) | Ideal(°) |
|-----|-------|-----|------|--------|-------|-------------|----------|
| 4   | AD    | 33  | LYS  | N-CA-C | -5.29 | 105.47      | 112.24   |
| 2   | AB    | 21  | ARG  | N-CA-C | -5.26 | 106.76      | 114.39   |

There are no chirality outliers.

There are no planarity outliers.

## 5.2 Too-close contacts ⓘ

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   | AA    | 33015 | 0        | 16617    | 415     | 0            |
| 2   | AB    | 1704  | 0        | 1732     | 38      | 0            |
| 3   | AC    | 1624  | 0        | 1696     | 27      | 0            |
| 4   | AD    | 1643  | 0        | 1707     | 130     | 0            |
| 5   | AE    | 1105  | 0        | 1148     | 32      | 0            |
| 6   | AF    | 817   | 0        | 808      | 15      | 0            |
| 7   | AG    | 1181  | 0        | 1238     | 20      | 0            |
| 8   | AH    | 979   | 0        | 1031     | 10      | 0            |
| 9   | AI    | 1022  | 0        | 1070     | 33      | 0            |
| 10  | AJ    | 786   | 0        | 828      | 26      | 0            |
| 11  | AK    | 877   | 0        | 887      | 17      | 0            |
| 12  | AL    | 955   | 0        | 1016     | 47      | 0            |
| 13  | AM    | 883   | 0        | 941      | 24      | 0            |
| 14  | AN    | 774   | 0        | 824      | 18      | 0            |
| 15  | AO    | 710   | 0        | 728      | 10      | 0            |
| 16  | AP    | 649   | 0        | 666      | 21      | 0            |
| 17  | AQ    | 648   | 0        | 691      | 12      | 0            |
| 18  | AR    | 455   | 0        | 478      | 8       | 0            |
| 19  | AS    | 637   | 0        | 665      | 31      | 0            |
| 20  | AT    | 665   | 0        | 714      | 17      | 0            |
| 21  | AU    | 425   | 0        | 449      | 16      | 0            |
| 22  | B0    | 444   | 0        | 458      | 7       | 0            |
| 23  | B1    | 409   | 0        | 440      | 5       | 0            |
| 24  | B2    | 377   | 0        | 418      | 7       | 0            |
| 25  | B3    | 504   | 0        | 572      | 5       | 0            |
| 26  | B4    | 302   | 0        | 340      | 4       | 0            |
| 27  | B5    | 480   | 0        | 478      | 8       | 0            |

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| Mol | Chain | Non-H  | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|--------|----------|----------|---------|--------------|
| 28  | BA    | 62195  | 0        | 31279    | 320     | 0            |
| 29  | BB    | 2529   | 0        | 1281     | 12      | 0            |
| 30  | BC    | 2082   | 0        | 2154     | 15      | 0            |
| 31  | BD    | 1565   | 0        | 1616     | 15      | 0            |
| 32  | BE    | 1552   | 0        | 1619     | 13      | 0            |
| 33  | BF    | 1410   | 0        | 1444     | 24      | 0            |
| 34  | BG    | 1323   | 0        | 1371     | 8       | 0            |
| 35  | BH    | 359    | 0        | 381      | 11      | 0            |
| 36  | BJ    | 1129   | 0        | 1162     | 10      | 0            |
| 37  | BK    | 938    | 0        | 1012     | 12      | 0            |
| 38  | BL    | 1045   | 0        | 1117     | 22      | 0            |
| 39  | BM    | 1074   | 0        | 1157     | 13      | 0            |
| 40  | BN    | 960    | 0        | 1000     | 11      | 0            |
| 41  | BO    | 892    | 0        | 923      | 8       | 0            |
| 42  | BP    | 917    | 0        | 962      | 13      | 0            |
| 43  | BQ    | 947    | 0        | 1019     | 10      | 0            |
| 44  | BR    | 816    | 0        | 839      | 13      | 0            |
| 45  | BS    | 857    | 0        | 922      | 5       | 0            |
| 46  | BT    | 738    | 0        | 807      | 8       | 0            |
| 47  | BU    | 779    | 0        | 831      | 15      | 0            |
| 48  | BV    | 753    | 0        | 780      | 4       | 0            |
| 49  | BW    | 569    | 0        | 581      | 3       | 0            |
| 50  | BX    | 625    | 0        | 652      | 7       | 0            |
| 51  | BY    | 509    | 0        | 543      | 6       | 0            |
| 52  | BZ    | 449    | 0        | 488      | 6       | 0            |
| 53  | AA    | 93     | 0        | 0        | 0       | 0            |
| 53  | B0    | 1      | 0        | 0        | 0       | 0            |
| 53  | BA    | 207    | 0        | 0        | 0       | 0            |
| 53  | BB    | 5      | 0        | 0        | 0       | 0            |
| 53  | BC    | 1      | 0        | 0        | 0       | 0            |
| 53  | BN    | 1      | 0        | 0        | 0       | 0            |
| 53  | BQ    | 1      | 0        | 0        | 0       | 0            |
| 54  | AA    | 76     | 0        | 0        | 3       | 0            |
| 55  | B4    | 1      | 0        | 0        | 0       | 0            |
| 55  | B5    | 1      | 0        | 0        | 0       | 0            |
| All | All   | 141469 | 0        | 94580    | 1393    | 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 6.

All (1393) 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:AD:110:THR:HG22 | 4:AD:113:GLU:H    | 1.20                     | 0.99              |
| 9:AI:65:ILE:HD12  | 9:AI:79:ILE:HD12  | 1.46                     | 0.94              |
| 1:AA:449:G:H1     | 1:AA:486:U:H1'    | 1.34                     | 0.92              |
| 7:AG:111:ARG:HD2  | 7:AG:123:GLU:HG2  | 1.52                     | 0.91              |
| 1:AA:502:A:P      | 12:AL:113:ALA:HA  | 2.10                     | 0.90              |
| 28:BA:1115:G:O2'  | 28:BA:1116:G:O5'  | 1.90                     | 0.90              |
| 1:AA:500:G:H1     | 1:AA:544:G:H1     | 1.18                     | 0.90              |
| 28:BA:947:A:HO2'  | 28:BA:984:A:H2    | 1.19                     | 0.90              |
| 1:AA:442:G:H2'    | 1:AA:443:C:C6     | 2.10                     | 0.86              |
| 4:AD:139:PRO:HB3  | 4:AD:183:LYS:N    | 1.90                     | 0.85              |
| 1:AA:438:U:H5''   | 4:AD:120:HIS:CD2  | 2.12                     | 0.85              |
| 1:AA:478:A:O2'    | 1:AA:479:U:O4'    | 1.95                     | 0.84              |
| 28:BA:1096:A:O2'  | 28:BA:1097:U:O4'  | 1.94                     | 0.83              |
| 4:AD:110:THR:HG22 | 4:AD:113:GLU:N    | 1.92                     | 0.83              |
| 1:AA:424:G:H3'    | 1:AA:425:G:C8     | 2.14                     | 0.83              |
| 28:BA:2109:U:O2'  | 28:BA:2110:G:OP1  | 1.96                     | 0.83              |
| 12:AL:34:CYS:H    | 12:AL:55:VAL:HG13 | 1.46                     | 0.81              |
| 28:BA:137:U:H5'   | 28:BA:138:U:C4    | 2.16                     | 0.81              |
| 19:AS:13:LEU:H    | 19:AS:13:LEU:HD23 | 1.46                     | 0.80              |
| 28:BA:1871:A:O2'  | 28:BA:1872:A:O5'  | 1.99                     | 0.80              |
| 1:AA:449:G:N1     | 1:AA:486:U:H1'    | 1.97                     | 0.80              |
| 40:BN:37:THR:HG22 | 40:BN:39:PRO:HD2  | 1.65                     | 0.79              |
| 28:BA:1095:A:O2'  | 28:BA:1096:A:OP1  | 2.01                     | 0.78              |
| 28:BA:361:G:O2'   | 28:BA:362:A:O5'   | 2.02                     | 0.78              |
| 28:BA:1047:G:HO2' | 28:BA:1110:G:H1   | 1.31                     | 0.76              |
| 1:AA:424:G:H3'    | 1:AA:425:G:H8     | 1.50                     | 0.76              |
| 1:AA:438:U:H5''   | 4:AD:120:HIS:HD2  | 1.51                     | 0.76              |
| 4:AD:34:ILE:O     | 4:AD:35:GLU:HG2   | 1.85                     | 0.76              |
| 1:AA:500:G:H22    | 1:AA:544:G:H22    | 1.34                     | 0.76              |
| 1:AA:418:C:H42    | 1:AA:425:G:H1     | 1.34                     | 0.76              |
| 28:BA:1942:C:N4   | 28:BA:1943:U:O4   | 2.18                     | 0.76              |
| 1:AA:446:G:H1     | 1:AA:488:C:H42    | 1.31                     | 0.76              |
| 14:AN:41:ARG:NH2  | 14:AN:42:TRP:O    | 2.19                     | 0.75              |
| 12:AL:77:HIS:O    | 12:AL:78:SER:OG   | 2.04                     | 0.75              |
| 1:AA:517:G:N2     | 1:AA:530:G:OP1    | 2.20                     | 0.75              |
| 15:AO:17:ARG:NH1  | 15:AO:18:ASP:OD1  | 2.18                     | 0.75              |
| 1:AA:449:G:H22    | 1:AA:486:U:H1'    | 1.52                     | 0.75              |
| 28:BA:2147:A:H2'  | 28:BA:2148:G:H1'  | 1.68                     | 0.75              |
| 45:BS:28:LYS:O    | 45:BS:30:SER:N    | 2.20                     | 0.74              |
| 1:AA:429:U:OP1    | 4:AD:13:ARG:NH1   | 2.20                     | 0.74              |
| 4:AD:13:ARG:NH2   | 4:AD:37:ALA:O     | 2.20                     | 0.74              |
| 4:AD:109:ALA:N    | 4:AD:113:GLU:OE1  | 2.20                     | 0.74              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 28:BA:140:C:H6    | 28:BA:141:G:H1    | 1.35                     | 0.74              |
| 28:BA:1067:A:OP1  | 28:BA:1069:A:N6   | 2.21                     | 0.74              |
| 17:AQ:69:LYS:O    | 17:AQ:70:THR:OG1  | 2.02                     | 0.74              |
| 1:AA:436:C:O3'    | 4:AD:152:GLN:NE2  | 2.20                     | 0.73              |
| 8:AH:26:THR:HG22  | 8:AH:58:GLU:OE2   | 1.88                     | 0.73              |
| 28:BA:137:U:H5'   | 28:BA:138:U:O4    | 1.88                     | 0.73              |
| 4:AD:151:LYS:HA   | 4:AD:155:VAL:HB   | 1.71                     | 0.73              |
| 30:BC:29:PRO:HG2  | 30:BC:34:LEU:HD11 | 1.71                     | 0.73              |
| 1:AA:418:C:H2'    | 1:AA:419:C:C6     | 2.23                     | 0.73              |
| 1:AA:1160:G:O2'   | 1:AA:1161:C:O5'   | 2.07                     | 0.72              |
| 4:AD:112:ALA:HA   | 4:AD:115:ARG:HB3  | 1.71                     | 0.72              |
| 12:AL:99:ARG:HH21 | 12:AL:106:GLY:C   | 1.97                     | 0.72              |
| 4:AD:101:VAL:HG21 | 4:AD:182:PHE:HZ   | 1.54                     | 0.72              |
| 1:AA:6:G:O6       | 5:AE:100:SER:N    | 2.22                     | 0.72              |
| 4:AD:21:LEU:HD13  | 4:AD:111:ARG:HE   | 1.55                     | 0.71              |
| 44:BR:25:LEU:HD13 | 44:BR:27:ILE:HD12 | 1.73                     | 0.71              |
| 1:AA:480:U:H4'    | 1:AA:481:G:OP1    | 1.91                     | 0.71              |
| 4:AD:170:TRP:C    | 4:AD:183:LYS:HZ1  | 2.00                     | 0.70              |
| 5:AE:13:GLU:HG2   | 5:AE:39:VAL:HG12  | 1.74                     | 0.70              |
| 40:BN:56:LYS:HE2  | 40:BN:87:PHE:O    | 1.91                     | 0.70              |
| 37:BK:70:ARG:NH1  | 37:BK:74:GLY:O    | 2.24                     | 0.70              |
| 28:BA:585:G:N7    | 43:BQ:6:ARG:NH2   | 2.40                     | 0.69              |
| 1:AA:718:A:O5'    | 11:AK:119:ASN:ND2 | 2.26                     | 0.69              |
| 7:AG:78:ARG:HE    | 7:AG:87:VAL:HG11  | 1.55                     | 0.69              |
| 1:AA:1055:A:N3    | 3:AC:156:ARG:NH2  | 2.40                     | 0.69              |
| 1:AA:617:G:O2'    | 16:AP:14:ARG:NH2  | 2.25                     | 0.69              |
| 1:AA:449:G:N2     | 1:AA:486:U:H1'    | 2.08                     | 0.68              |
| 4:AD:121:LYS:O    | 4:AD:124:MET:HE3  | 1.93                     | 0.68              |
| 7:AG:129:GLU:OE1  | 7:AG:131:LYS:NZ   | 2.26                     | 0.68              |
| 9:AI:91:ASP:OD1   | 9:AI:93:SER:N     | 2.25                     | 0.68              |
| 15:AO:14:GLU:OE2  | 15:AO:84:ARG:NH2  | 2.26                     | 0.68              |
| 20:AT:69:LYS:HG2  | 20:AT:70:ASN:HD22 | 1.57                     | 0.68              |
| 21:AU:44:GLU:OE1  | 21:AU:45:ARG:NH1  | 2.27                     | 0.68              |
| 28:BA:84:A:H62    | 28:BA:101:A:H2    | 1.42                     | 0.68              |
| 7:AG:5:ARG:CZ     | 7:AG:7:ILE:HG22   | 2.23                     | 0.68              |
| 28:BA:27:G:O2'    | 28:BA:28:A:OP2    | 2.12                     | 0.68              |
| 1:AA:1111:A:N1    | 3:AC:177:THR:HG22 | 2.09                     | 0.68              |
| 1:AA:481:G:C2     | 1:AA:482:A:N6     | 2.62                     | 0.68              |
| 1:AA:500:G:OP1    | 12:AL:121:ARG:NH1 | 2.26                     | 0.68              |
| 13:AM:11:ASP:OD1  | 13:AM:12:HIS:N    | 2.27                     | 0.68              |
| 1:AA:418:C:N4     | 1:AA:425:G:H1     | 1.91                     | 0.67              |

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| Atom-1            | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|--------------------|--------------------------|-------------------|
| 4:AD:40:GLN:OE1   | 4:AD:41:HIS:NE2    | 2.26                     | 0.67              |
| 28:BA:2311:A:N3   | 33:BF:85:ILE:HD11  | 2.09                     | 0.67              |
| 1:AA:502:A:OP2    | 12:AL:114:ARG:N    | 2.27                     | 0.67              |
| 4:AD:114:ALA:O    | 4:AD:118:VAL:HG23  | 1.95                     | 0.67              |
| 9:AI:52:LEU:HD13  | 9:AI:57:MET:HE3    | 1.75                     | 0.67              |
| 1:AA:1152:A:OP1   | 10:AJ:70:HIS:ND1   | 2.27                     | 0.67              |
| 28:BA:2308:G:O2'  | 28:BA:2309:A:OP1   | 2.11                     | 0.67              |
| 1:AA:1144:G:N2    | 1:AA:1146:A:H62    | 1.92                     | 0.66              |
| 1:AA:443:C:C4     | 1:AA:444:G:N7      | 2.64                     | 0.66              |
| 2:AB:73:LYS:H     | 2:AB:73:LYS:HZ3    | 1.41                     | 0.66              |
| 44:BR:25:LEU:HG   | 44:BR:94:THR:HG21  | 1.76                     | 0.66              |
| 24:B2:12:ARG:HE   | 24:B2:44:VAL:HG21  | 1.58                     | 0.66              |
| 28:BA:627:A:OP1   | 38:BL:78:ARG:NH1   | 2.26                     | 0.66              |
| 36:BJ:125:TYR:HH  | 36:BJ:132:HIS:HE2  | 1.36                     | 0.66              |
| 3:AC:3:GLN:N      | 3:AC:3:GLN:OE1     | 2.29                     | 0.66              |
| 1:AA:408:A:H5'    | 4:AD:110:THR:OG1   | 1.95                     | 0.66              |
| 28:BA:2147:A:H2'  | 28:BA:2148:G:C1'   | 2.26                     | 0.66              |
| 31:BD:105:LYS:HA  | 31:BD:177:VAL:HG12 | 1.78                     | 0.66              |
| 40:BN:12:ARG:NH1  | 40:BN:20:MET:SD    | 2.69                     | 0.66              |
| 1:AA:439:U:C4'    | 4:AD:121:LYS:HE2   | 2.27                     | 0.65              |
| 28:BA:1179:G:C2   | 28:BA:1180:U:H4'   | 2.31                     | 0.65              |
| 13:AM:7:ILE:HD11  | 33:BF:112:ARG:HH21 | 1.62                     | 0.65              |
| 28:BA:947:A:O2'   | 28:BA:984:A:H2     | 1.78                     | 0.65              |
| 43:BQ:86:ALA:O    | 43:BQ:87:SER:OG    | 2.14                     | 0.65              |
| 1:AA:492:C:H2'    | 1:AA:493:A:C8      | 2.31                     | 0.65              |
| 3:AC:83:ASP:OD1   | 3:AC:84:VAL:N      | 2.29                     | 0.65              |
| 28:BA:2162:G:O2'  | 28:BA:2164:C:N4    | 2.29                     | 0.65              |
| 1:AA:1316:G:N1    | 1:AA:1319:A:OP2    | 2.30                     | 0.65              |
| 16:AP:18:GLN:NE2  | 16:AP:37:GLY:O     | 2.30                     | 0.65              |
| 28:BA:1847:A:O2'  | 28:BA:1848:A:O5'   | 2.14                     | 0.65              |
| 32:BE:171:ASP:OD1 | 32:BE:172:ALA:N    | 2.28                     | 0.65              |
| 27:B5:58:ASP:OD1  | 27:B5:59:ARG:N     | 2.29                     | 0.65              |
| 28:BA:276:U:O2'   | 28:BA:278:A:N6     | 2.29                     | 0.65              |
| 36:BJ:17:VAL:HG23 | 36:BJ:137:PRO:HB2  | 1.78                     | 0.65              |
| 1:AA:481:G:N2     | 1:AA:482:A:N1      | 2.45                     | 0.65              |
| 16:AP:60:TRP:C    | 16:AP:62:GLY:H     | 2.03                     | 0.65              |
| 33:BF:105:THR:OG1 | 33:BF:106:ILE:HD12 | 1.97                     | 0.65              |
| 1:AA:81:A:N7      | 1:AA:83:C:N4       | 2.45                     | 0.64              |
| 8:AH:54:ASP:OD1   | 8:AH:55:THR:N      | 2.29                     | 0.64              |
| 28:BA:1250:G:N7   | 38:BL:18:ARG:NH2   | 2.44                     | 0.64              |
| 1:AA:31:G:O2'     | 1:AA:48:C:N4       | 2.30                     | 0.64              |

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| Atom-1            | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|--------------------|--------------------------|-------------------|
| 4:AD:152:GLN:O    | 4:AD:154:ARG:N     | 2.30                     | 0.64              |
| 28:BA:1154:G:OP2  | 43:BQ:58:ARG:NH1   | 2.30                     | 0.64              |
| 1:AA:980:C:O2'    | 14:AN:13:ARG:NH1   | 2.31                     | 0.64              |
| 20:AT:3:ASN:OD1   | 20:AT:4:ILE:N      | 2.30                     | 0.64              |
| 28:BA:1080:A:H61  | 28:BA:1087:G:H5''  | 1.63                     | 0.64              |
| 1:AA:373:A:C4     | 1:AA:482:A:N6      | 2.66                     | 0.64              |
| 4:AD:181:THR:HG22 | 4:AD:182:PHE:N     | 2.12                     | 0.64              |
| 28:BA:286:U:H2'   | 28:BA:287:G:H8     | 1.62                     | 0.64              |
| 47:BU:16:GLY:O    | 47:BU:18:ASP:N     | 2.31                     | 0.64              |
| 14:AN:91:GLY:O    | 14:AN:93:ILE:N     | 2.30                     | 0.64              |
| 1:AA:540:G:H2'    | 1:AA:541:G:C8      | 2.33                     | 0.64              |
| 36:BJ:125:TYR:OH  | 36:BJ:132:HIS:NE2  | 2.24                     | 0.64              |
| 6:AF:5:GLU:OE2    | 18:AR:24:LYS:NZ    | 2.30                     | 0.63              |
| 1:AA:737:C:OP1    | 6:AF:91:ARG:N      | 2.28                     | 0.63              |
| 1:AA:736:C:OP1    | 18:AR:61:ARG:NH2   | 2.31                     | 0.63              |
| 5:AE:105:ILE:HG22 | 5:AE:105:ILE:O     | 1.96                     | 0.63              |
| 13:AM:19:LEU:O    | 13:AM:22:ILE:HG13  | 1.97                     | 0.63              |
| 28:BA:140:C:H1'   | 28:BA:141:G:N1     | 2.12                     | 0.63              |
| 16:AP:4:ILE:HG13  | 16:AP:21:VAL:HG22  | 1.80                     | 0.63              |
| 9:AI:106:ARG:NH1  | 9:AI:107:ASP:O     | 2.32                     | 0.63              |
| 3:AC:40:ARG:NH1   | 3:AC:55:ILE:O      | 2.31                     | 0.63              |
| 28:BA:2119:A:H61  | 28:BA:2167:U:H1'   | 1.63                     | 0.63              |
| 35:BH:38:PRO:O    | 35:BH:43:ASN:ND2   | 2.31                     | 0.63              |
| 31:BD:151:THR:O   | 31:BD:152:PRO:C    | 2.39                     | 0.62              |
| 10:AJ:34:ALA:O    | 10:AJ:36:VAL:N     | 2.32                     | 0.62              |
| 28:BA:475:C:O2    | 28:BA:479:A:N6     | 2.31                     | 0.62              |
| 46:BT:38:ALA:O    | 46:BT:39:THR:OG1   | 2.12                     | 0.62              |
| 1:AA:436:C:H2'    | 1:AA:437:U:C6      | 2.34                     | 0.62              |
| 22:B0:54:VAL:O    | 22:B0:56:ALA:N     | 2.32                     | 0.62              |
| 1:AA:673:A:H2'    | 1:AA:674:G:C8      | 2.34                     | 0.62              |
| 28:BA:1177:G:H2'  | 28:BA:1178:C:O4'   | 1.99                     | 0.62              |
| 1:AA:442:G:C2     | 1:AA:443:C:C4      | 2.88                     | 0.62              |
| 28:BA:877:A:O2'   | 28:BA:900:A:N6     | 2.32                     | 0.62              |
| 36:BJ:49:ASP:OD1  | 36:BJ:121:LYS:NZ   | 2.26                     | 0.62              |
| 1:AA:439:U:H4'    | 4:AD:121:LYS:HE2   | 1.81                     | 0.62              |
| 4:AD:101:VAL:HG21 | 4:AD:182:PHE:CZ    | 2.34                     | 0.62              |
| 30:BC:129:THR:OG1 | 30:BC:191:THR:HG22 | 2.00                     | 0.62              |
| 1:AA:446:G:H1     | 1:AA:488:C:N4      | 1.98                     | 0.62              |
| 9:AI:47:VAL:HG11  | 9:AI:76:ALA:HB1    | 1.80                     | 0.62              |
| 13:AM:58:ASP:OD1  | 13:AM:59:GLU:N     | 2.33                     | 0.62              |
| 13:AM:68:ASP:OD1  | 13:AM:69:LEU:N     | 2.33                     | 0.62              |

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| Atom-1            | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|--------------------|--------------------------|-------------------|
| 40:BN:30:ARG:NH1  | 40:BN:74:GLU:OE1   | 2.33                     | 0.61              |
| 1:AA:412:A:H62    | 1:AA:431:A:H2      | 1.46                     | 0.61              |
| 37:BK:99:ILE:HD11 | 37:BK:119:ALA:HB2  | 1.82                     | 0.61              |
| 5:AE:76:LEU:HD11  | 5:AE:120:VAL:HG12  | 1.82                     | 0.61              |
| 14:AN:47:LYS:HZ3  | 19:AS:13:LEU:HD22  | 1.64                     | 0.61              |
| 30:BC:258:ARG:NH1 | 30:BC:264:ASP:OD1  | 2.33                     | 0.61              |
| 5:AE:115:LEU:HD13 | 5:AE:123:VAL:HG21  | 1.82                     | 0.61              |
| 1:AA:363:A:OP2    | 12:AL:31:ARG:NH1   | 2.34                     | 0.61              |
| 48:BV:6:ALA:HB1   | 48:BV:40:ILE:HG23  | 1.82                     | 0.61              |
| 1:AA:204:G:H3'    | 1:AA:205:A:H8      | 1.65                     | 0.61              |
| 28:BA:1447:C:O2'  | 28:BA:1544:A:N3    | 2.34                     | 0.61              |
| 52:BZ:2:ALA:O     | 52:BZ:3:LYS:C      | 2.43                     | 0.61              |
| 38:BL:81:ASP:O    | 38:BL:83:ALA:N     | 2.34                     | 0.61              |
| 28:BA:1056:G:H21  | 28:BA:1103:A:H62   | 1.48                     | 0.61              |
| 28:BA:1249:U:H4'  | 43:BQ:4:VAL:HG21   | 1.81                     | 0.61              |
| 4:AD:101:VAL:HG13 | 4:AD:171:LEU:HD22  | 1.82                     | 0.61              |
| 28:BA:137:U:C5'   | 28:BA:138:U:C4     | 2.84                     | 0.61              |
| 1:AA:542:G:OP1    | 4:AD:10:LYS:NZ     | 2.30                     | 0.60              |
| 1:AA:948:C:OP1    | 13:AM:108:THR:HG22 | 2.02                     | 0.60              |
| 28:BA:1080:A:N6   | 28:BA:1088:A:OP2   | 2.35                     | 0.60              |
| 34:BG:2:SER:OG    | 34:BG:3:ARG:N      | 2.33                     | 0.60              |
| 50:BX:6:GLN:O     | 50:BX:74:ARG:NH2   | 2.34                     | 0.60              |
| 7:AG:5:ARG:NH1    | 7:AG:7:ILE:HG22    | 2.15                     | 0.60              |
| 47:BU:97:LYS:O    | 47:BU:98:SER:OG    | 2.18                     | 0.60              |
| 1:AA:479:U:O2'    | 1:AA:480:U:H5'     | 2.00                     | 0.60              |
| 3:AC:10:ILE:HG23  | 3:AC:11:ARG:HD2    | 1.83                     | 0.60              |
| 52:BZ:4:THR:OG1   | 52:BZ:37:GLU:HG2   | 2.02                     | 0.60              |
| 28:BA:137:U:H5''  | 28:BA:138:U:N3     | 2.17                     | 0.60              |
| 28:BA:2469:A:N6   | 28:BA:2481:G:O2'   | 2.33                     | 0.60              |
| 21:AU:6:VAL:HG23  | 21:AU:6:VAL:O      | 2.01                     | 0.60              |
| 21:AU:17:ARG:O    | 21:AU:17:ARG:HG2   | 2.01                     | 0.60              |
| 28:BA:140:C:H4'   | 28:BA:140:C:OP1    | 2.01                     | 0.60              |
| 28:BA:1093:G:H21  | 28:BA:1098:A:H62   | 1.48                     | 0.60              |
| 1:AA:481:G:H4'    | 1:AA:482:A:O5'     | 2.00                     | 0.59              |
| 28:BA:1179:G:H3'  | 28:BA:1180:U:H5''  | 1.84                     | 0.59              |
| 51:BY:2:LYS:HZ3   | 51:BY:6:LEU:HD22   | 1.66                     | 0.59              |
| 4:AD:106:GLY:C    | 4:AD:108:GLY:H     | 2.10                     | 0.59              |
| 28:BA:389:G:C8    | 28:BA:2413:G:H4'   | 2.37                     | 0.59              |
| 28:BA:2683:C:O2   | 37:BK:70:ARG:NH2   | 2.35                     | 0.59              |
| 1:AA:449:G:C2     | 1:AA:486:U:H1'     | 2.37                     | 0.59              |
| 49:BW:43:THR:O    | 49:BW:43:THR:HG23  | 2.01                     | 0.59              |

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| Atom-1            | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|--------------------|--------------------------|-------------------|
| 14:AN:3:LYS:O     | 14:AN:6:MET:N      | 2.33                     | 0.59              |
| 33:BF:136:ILE:HA  | 33:BF:141:ILE:HD11 | 1.83                     | 0.59              |
| 28:BA:286:U:H2'   | 28:BA:287:G:C8     | 2.37                     | 0.59              |
| 7:AG:111:ARG:HH11 | 7:AG:123:GLU:HG2   | 1.67                     | 0.59              |
| 28:BA:1074:G:N7   | 28:BA:1075:C:N4    | 2.51                     | 0.59              |
| 1:AA:1126:U:OP1   | 10:AJ:7:ARG:NH2    | 2.34                     | 0.59              |
| 1:AA:1119:C:OP2   | 9:AI:11:ARG:NH2    | 2.36                     | 0.59              |
| 1:AA:1522:U:OP1   | 11:AK:128:ARG:NH1  | 2.36                     | 0.59              |
| 4:AD:151:LYS:CA   | 4:AD:155:VAL:HB    | 2.32                     | 0.59              |
| 38:BL:29:LYS:O    | 38:BL:30:THR:OG1   | 2.17                     | 0.59              |
| 1:AA:440:C:H2'    | 1:AA:441:A:O4'     | 2.03                     | 0.59              |
| 1:AA:442:G:H2'    | 1:AA:443:C:C5      | 2.37                     | 0.59              |
| 1:AA:442:G:H1     | 1:AA:492:C:H42     | 1.51                     | 0.59              |
| 1:AA:442:G:H2'    | 1:AA:443:C:H6      | 1.64                     | 0.58              |
| 2:AB:114:LEU:HD11 | 2:AB:145:GLU:OE2   | 2.03                     | 0.58              |
| 12:AL:21:VAL:HG23 | 12:AL:21:VAL:O     | 2.03                     | 0.58              |
| 28:BA:1795:C:O2   | 30:BC:253:LYS:NZ   | 2.36                     | 0.58              |
| 28:BA:2306:C:OP2  | 28:BA:2307:G:O2'   | 2.11                     | 0.58              |
| 5:AE:115:LEU:HD22 | 5:AE:120:VAL:HG21  | 1.86                     | 0.58              |
| 8:AH:77:ARG:NH1   | 8:AH:79:SER:O      | 2.36                     | 0.58              |
| 1:AA:502:A:O5'    | 12:AL:113:ALA:HA   | 2.03                     | 0.58              |
| 3:AC:28:GLU:OE1   | 3:AC:28:GLU:N      | 2.36                     | 0.58              |
| 4:AD:120:HIS:O    | 4:AD:120:HIS:ND1   | 2.37                     | 0.58              |
| 17:AQ:16:LYS:HD2  | 17:AQ:16:LYS:O     | 2.03                     | 0.58              |
| 1:AA:1077:G:N2    | 1:AA:1080:A:OP2    | 2.31                     | 0.58              |
| 50:BX:33:LEU:HD12 | 50:BX:50:ARG:HG2   | 1.85                     | 0.58              |
| 4:AD:185:LYS:HD3  | 4:AD:186:PRO:HD2   | 1.85                     | 0.58              |
| 7:AG:78:ARG:HG2   | 7:AG:80:VAL:HG13   | 1.86                     | 0.58              |
| 52:BZ:24:LEU:HD11 | 52:BZ:54:MET:HE3   | 1.85                     | 0.58              |
| 1:AA:1086:U:H3    | 1:AA:1099:G:H22    | 1.50                     | 0.58              |
| 1:AA:478:A:O2'    | 1:AA:479:U:O5'     | 2.21                     | 0.58              |
| 3:AC:111:LEU:HD22 | 3:AC:146:ALA:HB2   | 1.85                     | 0.58              |
| 4:AD:143:VAL:O    | 4:AD:143:VAL:HG13  | 2.04                     | 0.58              |
| 28:BA:219:A:N3    | 28:BA:234:U:O2'    | 2.34                     | 0.58              |
| 28:BA:2118:U:H5'' | 28:BA:2147:A:H1'   | 1.85                     | 0.58              |
| 2:AB:79:ALA:O     | 2:AB:214:LEU:HD13  | 2.04                     | 0.58              |
| 1:AA:410:G:C6     | 1:AA:429:U:H1'     | 2.39                     | 0.57              |
| 28:BA:2230:G:H1'  | 50:BX:32:ASN:HB3   | 1.86                     | 0.57              |
| 2:AB:27:MET:HE3   | 2:AB:193:PRO:HD3   | 1.87                     | 0.57              |
| 22:B0:25:VAL:O    | 22:B0:26:THR:HG22  | 2.05                     | 0.57              |
| 28:BA:2135:A:N6   | 28:BA:2156:G:O2'   | 2.37                     | 0.57              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 28:BA:2144:G:H1'   | 28:BA:2147:A:H61   | 1.69                     | 0.57              |
| 16:AP:61:VAL:HG21  | 16:AP:67:ILE:HD11  | 1.86                     | 0.57              |
| 46:BT:11:LEU:O     | 51:BY:29:ARG:NH1   | 2.36                     | 0.57              |
| 9:AI:30:ILE:HG12   | 9:AI:65:ILE:HD11   | 1.85                     | 0.57              |
| 5:AE:70:ASN:ND2    | 5:AE:70:ASN:O      | 2.37                     | 0.57              |
| 37:BK:35:VAL:HG22  | 37:BK:69:VAL:HG12  | 1.86                     | 0.57              |
| 10:AJ:19:ASP:OD1   | 10:AJ:72:ARG:NH1   | 2.37                     | 0.57              |
| 2:AB:97:LEU:HD12   | 2:AB:97:LEU:O      | 2.04                     | 0.57              |
| 15:AO:7:ALA:O      | 15:AO:11:ILE:HD12  | 2.05                     | 0.57              |
| 1:AA:204:G:H3'     | 1:AA:205:A:C8      | 2.40                     | 0.57              |
| 1:AA:449:G:H1      | 1:AA:486:U:C1'     | 2.13                     | 0.57              |
| 1:AA:481:G:N3      | 1:AA:482:A:N6      | 2.52                     | 0.57              |
| 29:BB:42:C:C5      | 33:BF:66:LEU:HD22  | 2.40                     | 0.57              |
| 1:AA:823:C:HO2'    | 8:AH:2:SER:N       | 2.02                     | 0.57              |
| 42:BP:33:VAL:HG22  | 42:BP:38:LYS:HG2   | 1.86                     | 0.57              |
| 1:AA:482:A:H5'     | 1:AA:482:A:H8      | 1.69                     | 0.57              |
| 33:BF:141:ILE:HD12 | 33:BF:146:VAL:HG11 | 1.87                     | 0.57              |
| 4:AD:121:LYS:C     | 4:AD:124:MET:HE3   | 2.30                     | 0.56              |
| 1:AA:439:U:C5'     | 4:AD:121:LYS:HE2   | 2.36                     | 0.56              |
| 4:AD:33:LYS:HG2    | 4:AD:36:GLN:OE1    | 2.05                     | 0.56              |
| 6:AF:2:ARG:NH1     | 6:AF:92:THR:OG1    | 2.39                     | 0.56              |
| 12:AL:99:ARG:NH2   | 12:AL:105:SER:C    | 2.63                     | 0.56              |
| 25:B3:54:ASP:HB3   | 38:BL:57:LEU:HD22  | 1.86                     | 0.56              |
| 28:BA:1062:G:O2'   | 28:BA:1063:G:O4'   | 2.18                     | 0.56              |
| 30:BC:107:PRO:HD2  | 30:BC:110:LEU:HD22 | 1.87                     | 0.56              |
| 9:AI:52:LEU:HD13   | 9:AI:57:MET:CE     | 2.35                     | 0.56              |
| 28:BA:84:A:N1      | 28:BA:98:G:O2'     | 2.26                     | 0.56              |
| 28:BA:1062:G:H2'   | 28:BA:1063:G:C8    | 2.40                     | 0.56              |
| 28:BA:1583:A:O2'   | 28:BA:1584:U:O5'   | 2.20                     | 0.56              |
| 1:AA:536:C:C2      | 1:AA:537:G:N7      | 2.74                     | 0.56              |
| 4:AD:181:THR:HG22  | 4:AD:182:PHE:H     | 1.69                     | 0.56              |
| 12:AL:81:LEU:HD23  | 12:AL:98:VAL:HG11  | 1.86                     | 0.56              |
| 7:AG:84:THR:HG23   | 7:AG:84:THR:O      | 2.05                     | 0.56              |
| 2:AB:27:MET:HA     | 2:AB:27:MET:HE2    | 1.87                     | 0.56              |
| 5:AE:94:VAL:HG13   | 5:AE:111:MET:HE1   | 1.88                     | 0.56              |
| 4:AD:117:LEU:O     | 4:AD:123:ILE:N     | 2.34                     | 0.56              |
| 17:AQ:15:ASP:HA    | 17:AQ:21:ILE:HG22  | 1.88                     | 0.56              |
| 40:BN:117:ASP:OD1  | 40:BN:118:ARG:N    | 2.39                     | 0.56              |
| 28:BA:644:A:H2'    | 28:BA:645:C:O4'    | 2.06                     | 0.56              |
| 28:BA:2720:U:OP1   | 42:BP:53:ARG:NH2   | 2.39                     | 0.56              |
| 30:BC:61:ALA:O     | 30:BC:63:ARG:NH1   | 2.39                     | 0.56              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 1:AA:880:C:OP1     | 12:AL:9:ARG:NH1    | 2.40                     | 0.55              |
| 4:AD:105:MET:HE2   | 4:AD:171:LEU:HD23  | 1.88                     | 0.55              |
| 8:AH:72:VAL:O      | 8:AH:72:VAL:HG13   | 2.06                     | 0.55              |
| 1:AA:842:U:O3'     | 1:AA:844:G:N2      | 2.40                     | 0.55              |
| 34:BG:86:LYS:HD2   | 34:BG:132:VAL:HG22 | 1.88                     | 0.55              |
| 1:AA:1138:G:H2'    | 1:AA:1140:C:H5'    | 1.87                     | 0.55              |
| 4:AD:124:MET:O     | 4:AD:143:VAL:HG23  | 2.05                     | 0.55              |
| 28:BA:297:G:OP1    | 47:BU:92:LYS:NZ    | 2.34                     | 0.55              |
| 28:BA:2646:C:OP2   | 28:BA:2732:G:O2'   | 2.23                     | 0.55              |
| 1:AA:1006:G:O6     | 1:AA:1023:U:O2     | 2.24                     | 0.55              |
| 1:AA:492:C:N3      | 1:AA:493:A:N6      | 2.55                     | 0.55              |
| 1:AA:617:G:H2'     | 1:AA:618:C:O4'     | 2.06                     | 0.55              |
| 1:AA:1013:G:N2     | 1:AA:1016:A:OP2    | 2.35                     | 0.55              |
| 3:AC:111:LEU:CD2   | 3:AC:146:ALA:HB2   | 2.37                     | 0.55              |
| 28:BA:1847:A:HO2'  | 28:BA:1848:A:P     | 2.30                     | 0.55              |
| 1:AA:309:A:O2'     | 1:AA:607:A:N1      | 2.36                     | 0.55              |
| 1:AA:429:U:C5'     | 4:AD:9:LEU:HD12    | 2.37                     | 0.55              |
| 2:AB:18:HIS:CD2    | 2:AB:19:GLN:H      | 2.25                     | 0.55              |
| 10:AJ:35:GLN:O     | 10:AJ:36:VAL:HG12  | 2.07                     | 0.55              |
| 33:BF:43:ALA:HA    | 33:BF:49:LEU:HD11  | 1.89                     | 0.55              |
| 37:BK:99:ILE:HG12  | 37:BK:118:LEU:HB3  | 1.89                     | 0.55              |
| 47:BU:28:VAL:HG12  | 47:BU:34:VAL:HG12  | 1.89                     | 0.55              |
| 28:BA:2286:G:H4'   | 28:BA:2287:A:O5'   | 2.06                     | 0.55              |
| 4:AD:139:PRO:HB3   | 4:AD:183:LYS:H     | 1.69                     | 0.55              |
| 11:AK:16:VAL:O     | 11:AK:17:SER:OG    | 2.18                     | 0.55              |
| 11:AK:46:THR:HG23  | 11:AK:49:GLY:H     | 1.72                     | 0.55              |
| 31:BD:177:VAL:HG13 | 31:BD:177:VAL:O    | 2.06                     | 0.55              |
| 38:BL:93:ASN:O     | 38:BL:94:THR:OG1   | 2.19                     | 0.55              |
| 1:AA:1005:A:N6     | 1:AA:1024:G:O2'    | 2.40                     | 0.54              |
| 28:BA:2190:G:H2'   | 28:BA:2191:A:O4'   | 2.07                     | 0.54              |
| 1:AA:515:G:O2'     | 1:AA:516:U:O4'     | 2.25                     | 0.54              |
| 1:AA:401:C:OP2     | 4:AD:70:ARG:NH1    | 2.40                     | 0.54              |
| 13:AM:90:ARG:HB3   | 13:AM:97:VAL:HG12  | 1.89                     | 0.54              |
| 24:B2:12:ARG:NE    | 24:B2:44:VAL:HG21  | 2.22                     | 0.54              |
| 1:AA:442:G:C6      | 1:AA:443:C:N4      | 2.75                     | 0.54              |
| 19:AS:9:PRO:HD3    | 27:B5:64:PHE:CZ    | 2.43                     | 0.54              |
| 19:AS:19:VAL:HG21  | 19:AS:44:MET:HB3   | 1.89                     | 0.54              |
| 44:BR:25:LEU:CD1   | 44:BR:27:ILE:HD12  | 2.38                     | 0.54              |
| 4:AD:110:THR:HG22  | 4:AD:112:ALA:N     | 2.22                     | 0.54              |
| 28:BA:2100:G:C6    | 28:BA:2190:G:C6    | 2.95                     | 0.54              |
| 51:BY:36:GLN:N     | 51:BY:36:GLN:OE1   | 2.40                     | 0.54              |

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| Atom-1            | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|--------------------|--------------------------|-------------------|
| 1:AA:539:A:H2'    | 1:AA:540:G:C8      | 2.43                     | 0.54              |
| 46:BT:28:ASN:ND2  | 46:BT:88:LYS:O     | 2.40                     | 0.54              |
| 5:AE:102:GLY:O    | 5:AE:103:THR:OG1   | 2.19                     | 0.54              |
| 19:AS:44:MET:O    | 19:AS:62:VAL:HG11  | 2.07                     | 0.54              |
| 28:BA:1141:U:H4'  | 28:BA:1142:A:O4'   | 2.07                     | 0.54              |
| 28:BA:2831:G:OP1  | 31:BD:56:LYS:NZ    | 2.37                     | 0.54              |
| 37:BK:76:VAL:HG12 | 42:BP:73:VAL:CG2   | 2.38                     | 0.54              |
| 47:BU:46:GLN:N    | 47:BU:46:GLN:OE1   | 2.40                     | 0.54              |
| 1:AA:425:G:H3'    | 1:AA:426:U:C5      | 2.42                     | 0.54              |
| 28:BA:1058:U:N3   | 28:BA:1059:G:N7    | 2.55                     | 0.54              |
| 28:BA:1604:C:O2'  | 28:BA:1610:A:N1    | 2.39                     | 0.54              |
| 28:BA:2162:G:HO2' | 28:BA:2164:C:N4    | 2.05                     | 0.54              |
| 29:BB:13:G:O2'    | 29:BB:15:A:OP2     | 2.26                     | 0.54              |
| 32:BE:3:LEU:HD13  | 32:BE:120:VAL:HG21 | 1.88                     | 0.54              |
| 1:AA:933:G:O6     | 7:AG:3:ARG:NH2     | 2.41                     | 0.54              |
| 28:BA:837:C:N3    | 28:BA:941:A:N6     | 2.56                     | 0.54              |
| 1:AA:513:C:H42    | 1:AA:538:G:H1      | 1.55                     | 0.53              |
| 3:AC:10:ILE:HG23  | 3:AC:11:ARG:CD     | 2.38                     | 0.53              |
| 4:AD:145:ILE:HD12 | 4:AD:178:MET:HE3   | 1.90                     | 0.53              |
| 33:BF:56:ASP:OD2  | 33:BF:150:ARG:NH1  | 2.41                     | 0.53              |
| 1:AA:517:G:C2     | 1:AA:531:U:O4'     | 2.61                     | 0.53              |
| 1:AA:1408:A:N1    | 54:AA:1694:84G:N3  | 2.56                     | 0.53              |
| 46:BT:37:ASP:OD1  | 46:BT:38:ALA:N     | 2.34                     | 0.53              |
| 1:AA:411:A:N6     | 1:AA:413:G:N3      | 2.56                     | 0.53              |
| 1:AA:443:C:C5     | 1:AA:444:G:N7      | 2.76                     | 0.53              |
| 13:AM:13:LYS:O    | 13:AM:14:HIS:CG    | 2.61                     | 0.53              |
| 28:BA:275:C:O2'   | 28:BA:362:A:N6     | 2.41                     | 0.53              |
| 7:AG:15:ASP:OD1   | 7:AG:44:TYR:OH     | 2.20                     | 0.53              |
| 9:AI:36:GLU:HA    | 9:AI:40:GLY:HA3    | 1.91                     | 0.53              |
| 33:BF:44:ILE:HD11 | 33:BF:79:ILE:HG22  | 1.89                     | 0.53              |
| 34:BG:149:ARG:HA  | 34:BG:162:VAL:HG13 | 1.90                     | 0.53              |
| 39:BM:26:VAL:CG1  | 39:BM:133:LYS:HA   | 2.38                     | 0.53              |
| 1:AA:410:G:H2'    | 1:AA:429:U:C4      | 2.44                     | 0.53              |
| 26:B4:16:ILE:HD13 | 26:B4:25:VAL:HG22  | 1.90                     | 0.53              |
| 28:BA:652:U:OP1   | 28:BA:654:A:N6     | 2.40                     | 0.53              |
| 28:BA:1092:C:H2'  | 28:BA:1093:G:O4'   | 2.09                     | 0.53              |
| 39:BM:34:LYS:HD2  | 39:BM:131:VAL:HG11 | 1.89                     | 0.53              |
| 1:AA:972:C:OP2    | 10:AJ:59:LYS:NZ    | 2.38                     | 0.53              |
| 1:AA:1060:U:OP1   | 14:AN:85:ARG:NH2   | 2.42                     | 0.53              |
| 16:AP:57:ILE:O    | 16:AP:61:VAL:HG23  | 2.08                     | 0.53              |
| 28:BA:1779:U:OP2  | 28:BA:1784:A:N6    | 2.41                     | 0.53              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 28:BA:2331:G:O2'  | 49:BW:43:THR:HG22 | 2.09                     | 0.53              |
| 1:AA:501:C:OP1    | 12:AL:114:ARG:NH2 | 2.42                     | 0.53              |
| 4:AD:34:ILE:HD12  | 4:AD:34:ILE:H     | 1.74                     | 0.53              |
| 28:BA:577:G:O2'   | 28:BA:1254:A:OP1  | 2.27                     | 0.53              |
| 28:BA:1871:A:O2'  | 28:BA:1872:A:H8   | 1.92                     | 0.53              |
| 1:AA:448:A:N6     | 1:AA:487:A:O4'    | 2.41                     | 0.53              |
| 28:BA:1942:C:C5   | 28:BA:1943:U:C4   | 2.97                     | 0.53              |
| 28:BA:2183:A:N1   | 28:BA:2184:A:N6   | 2.57                     | 0.53              |
| 1:AA:436:C:H1'    | 4:AD:154:ARG:HD3  | 1.91                     | 0.53              |
| 2:AB:123:ASP:OD1  | 2:AB:124:GLY:N    | 2.42                     | 0.53              |
| 15:AO:89:ARG:OXT  | 15:AO:89:ARG:CG   | 2.57                     | 0.53              |
| 34:BG:42:GLU:OE2  | 34:BG:55:ARG:NH2  | 2.41                     | 0.53              |
| 1:AA:451:A:C5     | 1:AA:481:G:O6     | 2.63                     | 0.52              |
| 1:AA:502:A:P      | 12:AL:113:ALA:CA  | 2.92                     | 0.52              |
| 1:AA:523:A:N6     | 12:AL:89:ASP:OD2  | 2.42                     | 0.52              |
| 1:AA:1078:U:HO2'  | 1:AA:1079:G:P     | 2.32                     | 0.52              |
| 1:AA:1269:A:N1    | 1:AA:1312:G:O2'   | 2.38                     | 0.52              |
| 3:AC:124:LEU:HD21 | 3:AC:196:ILE:HG21 | 1.92                     | 0.52              |
| 12:AL:20:ASN:O    | 12:AL:94:ARG:HD3  | 2.10                     | 0.52              |
| 20:AT:43:ASP:OD1  | 20:AT:46:ALA:N    | 2.40                     | 0.52              |
| 28:BA:2119:A:N6   | 28:BA:2167:U:H1'  | 2.24                     | 0.52              |
| 45:BS:66:ILE:H    | 45:BS:66:ILE:HD12 | 1.74                     | 0.52              |
| 1:AA:96:U:O2'     | 1:AA:97:G:P       | 2.67                     | 0.52              |
| 1:AA:1178:G:OP2   | 9:AI:99:ARG:NH1   | 2.43                     | 0.52              |
| 4:AD:110:THR:CG2  | 4:AD:112:ALA:H    | 2.22                     | 0.52              |
| 28:BA:1789:A:OP2  | 30:BC:221:ARG:NH1 | 2.42                     | 0.52              |
| 1:AA:264:C:O2'    | 17:AQ:66:PRO:O    | 2.28                     | 0.52              |
| 28:BA:1076:C:H2'  | 28:BA:1077:A:C5   | 2.45                     | 0.52              |
| 1:AA:1004:A:H2'   | 1:AA:1005:A:O4'   | 2.09                     | 0.52              |
| 2:AB:87:CYS:O     | 2:AB:89:GLN:N     | 2.43                     | 0.52              |
| 19:AS:50:ALA:HB1  | 19:AS:57:HIS:HB3  | 1.92                     | 0.52              |
| 28:BA:1534:U:HO2' | 28:BA:1537:G:H1   | 1.56                     | 0.52              |
| 47:BU:8:ASP:OD1   | 47:BU:8:ASP:O     | 2.27                     | 0.52              |
| 1:AA:451:A:N6     | 1:AA:481:G:C5     | 2.78                     | 0.52              |
| 1:AA:454:G:C4     | 1:AA:455:G:C8     | 2.98                     | 0.52              |
| 1:AA:1144:G:H21   | 1:AA:1146:A:H62   | 1.58                     | 0.52              |
| 15:AO:79:THR:O    | 15:AO:82:ILE:N    | 2.43                     | 0.52              |
| 44:BR:47:VAL:O    | 44:BR:47:VAL:HG13 | 2.09                     | 0.52              |
| 1:AA:412:A:O2'    | 1:AA:414:A:H5'    | 2.10                     | 0.52              |
| 22:B0:16:ARG:NH1  | 28:BA:1266:G:OP1  | 2.43                     | 0.52              |
| 1:AA:617:G:O4'    | 16:AP:46:LYS:NZ   | 2.43                     | 0.52              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 1:AA:890:G:O2'    | 1:AA:906:A:N6     | 2.43                     | 0.52              |
| 4:AD:110:THR:O    | 4:AD:113:GLU:N    | 2.43                     | 0.52              |
| 28:BA:2623:G:OP1  | 28:BA:2826:A:O2'  | 2.23                     | 0.52              |
| 38:BL:85:VAL:HG21 | 38:BL:90:VAL:HG12 | 1.91                     | 0.52              |
| 41:BO:33:ARG:O    | 41:BO:34:HIS:HB2  | 2.09                     | 0.52              |
| 1:AA:406:G:N3     | 4:AD:116:GLN:NE2  | 2.40                     | 0.52              |
| 1:AA:995:C:N3     | 1:AA:1046:A:O2'   | 2.38                     | 0.52              |
| 2:AB:14:VAL:HG23  | 2:AB:14:VAL:O     | 2.09                     | 0.52              |
| 9:AI:57:MET:SD    | 9:AI:61:LEU:HB2   | 2.50                     | 0.52              |
| 19:AS:9:PRO:HD3   | 27:B5:64:PHE:CE1  | 2.45                     | 0.52              |
| 29:BB:51:G:OP1    | 41:BO:63:LYS:NZ   | 2.39                     | 0.52              |
| 4:AD:11:LEU:HD12  | 4:AD:19:LEU:HD12  | 1.91                     | 0.51              |
| 44:BR:49:ILE:HB   | 44:BR:52:PRO:HA   | 1.92                     | 0.51              |
| 1:AA:204:G:H1     | 1:AA:206:C:H41    | 1.56                     | 0.51              |
| 1:AA:1266:G:N2    | 1:AA:1269:A:OP2   | 2.38                     | 0.51              |
| 6:AF:9:MET:HE3    | 6:AF:86:ARG:HB3   | 1.93                     | 0.51              |
| 28:BA:645:C:H2'   | 28:BA:647:G:C8    | 2.45                     | 0.51              |
| 28:BA:2144:G:H1'  | 28:BA:2147:A:N6   | 2.23                     | 0.51              |
| 35:BH:2:GLN:O     | 35:BH:3:VAL:HG22  | 2.11                     | 0.51              |
| 1:AA:993:G:O2'    | 1:AA:994:A:N7     | 2.43                     | 0.51              |
| 2:AB:57:LEU:HD13  | 2:AB:217:VAL:HG23 | 1.91                     | 0.51              |
| 1:AA:500:G:H22    | 1:AA:544:G:N2     | 2.07                     | 0.51              |
| 1:AA:503:C:O2'    | 1:AA:504:C:H5'    | 2.10                     | 0.51              |
| 1:AA:552:U:O2'    | 12:AL:83:ARG:O    | 2.28                     | 0.51              |
| 1:AA:1221:G:O3'   | 19:AS:77:THR:HG21 | 2.11                     | 0.51              |
| 28:BA:161:A:H3'   | 28:BA:162:U:H5''  | 1.91                     | 0.51              |
| 33:BF:140:GLU:OE1 | 33:BF:140:GLU:N   | 2.43                     | 0.51              |
| 38:BL:81:ASP:C    | 38:BL:83:ALA:N    | 2.67                     | 0.51              |
| 1:AA:443:C:C4     | 1:AA:444:G:C5     | 2.99                     | 0.51              |
| 1:AA:502:A:OP2    | 12:AL:113:ALA:HA  | 2.10                     | 0.51              |
| 7:AG:15:ASP:OD2   | 7:AG:23:LEU:HD22  | 2.10                     | 0.51              |
| 19:AS:36:ARG:NH2  | 19:AS:75:ALA:O    | 2.43                     | 0.51              |
| 28:BA:1075:C:H2'  | 28:BA:1076:C:N1   | 2.24                     | 0.51              |
| 1:AA:1287:A:N3    | 1:AA:1353:G:O2'   | 2.34                     | 0.51              |
| 28:BA:1179:G:N3   | 28:BA:1180:U:H4'  | 2.26                     | 0.51              |
| 28:BA:2191:A:H2'  | 28:BA:2192:U:O4'  | 2.11                     | 0.51              |
| 28:BA:2328:A:H2'  | 28:BA:2329:U:C6   | 2.46                     | 0.51              |
| 36:BJ:125:TYR:HH  | 36:BJ:132:HIS:CD2 | 2.27                     | 0.51              |
| 1:AA:436:C:O2'    | 4:AD:152:GLN:OE1  | 2.28                     | 0.51              |
| 1:AA:1125:U:P     | 10:AJ:37:ARG:HH22 | 2.33                     | 0.51              |
| 11:AK:88:GLY:O    | 11:AK:93:ARG:NH1  | 2.43                     | 0.51              |

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| Atom-1            | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|--------------------|--------------------------|-------------------|
| 28:BA:856:G:H2'   | 28:BA:857:G:C8     | 2.45                     | 0.51              |
| 1:AA:410:G:H1'    | 1:AA:432:A:H61     | 1.76                     | 0.51              |
| 1:AA:425:G:H8     | 1:AA:425:G:P       | 2.34                     | 0.51              |
| 2:AB:50:PHE:O     | 2:AB:54:LEU:HD23   | 2.10                     | 0.51              |
| 4:AD:139:PRO:HB3  | 4:AD:183:LYS:CA    | 2.40                     | 0.51              |
| 29:BB:45:A:O4'    | 33:BF:92:ARG:NH1   | 2.44                     | 0.51              |
| 32:BE:15:SER:N    | 32:BE:197:GLU:OE2  | 2.43                     | 0.51              |
| 1:AA:500:G:N2     | 1:AA:544:G:H22     | 2.04                     | 0.51              |
| 1:AA:875:U:O2'    | 8:AH:15:ARG:NH1    | 2.40                     | 0.51              |
| 4:AD:171:LEU:HD12 | 4:AD:181:THR:O     | 2.10                     | 0.51              |
| 7:AG:69:VAL:HG23  | 7:AG:100:ALA:HB1   | 1.93                     | 0.51              |
| 1:AA:246:A:C2     | 1:AA:282:A:C5      | 3.00                     | 0.50              |
| 1:AA:410:G:OP2    | 4:AD:26:ARG:NH1    | 2.44                     | 0.50              |
| 1:AA:429:U:H5''   | 4:AD:9:LEU:HD12    | 1.92                     | 0.50              |
| 5:AE:76:LEU:CD1   | 5:AE:120:VAL:HG12  | 2.40                     | 0.50              |
| 1:AA:466:A:C6     | 1:AA:468:A:C5      | 3.00                     | 0.50              |
| 7:AG:97:ASN:OD1   | 7:AG:98:ALA:N      | 2.44                     | 0.50              |
| 28:BA:137:U:H3'   | 28:BA:138:U:C5     | 2.47                     | 0.50              |
| 28:BA:1433:A:H2'  | 28:BA:1434:A:O4'   | 2.11                     | 0.50              |
| 28:BA:1791:A:C2   | 28:BA:1829:A:H4'   | 2.46                     | 0.50              |
| 38:BL:77:ILE:HD11 | 38:BL:95:LEU:HD13  | 1.92                     | 0.50              |
| 46:BT:72:GLN:O    | 46:BT:72:GLN:NE2   | 2.44                     | 0.50              |
| 28:BA:2278:A:OP1  | 39:BM:10:ARG:NH2   | 2.44                     | 0.50              |
| 4:AD:25:VAL:HG23  | 4:AD:26:ARG:N      | 2.26                     | 0.50              |
| 12:AL:99:ARG:NH2  | 12:AL:105:SER:O    | 2.44                     | 0.50              |
| 28:BA:1779:U:H5   | 28:BA:1784:A:N7    | 2.10                     | 0.50              |
| 5:AE:61:GLN:O     | 5:AE:65:GLU:OE1    | 2.29                     | 0.50              |
| 20:AT:69:LYS:HG2  | 20:AT:70:ASN:ND2   | 2.25                     | 0.50              |
| 35:BH:1:MET:O     | 35:BH:20:ASN:ND2   | 2.43                     | 0.50              |
| 45:BS:4:ILE:HG12  | 45:BS:106:VAL:HG22 | 1.93                     | 0.50              |
| 2:AB:70:VAL:HG12  | 2:AB:92:VAL:HB     | 1.93                     | 0.50              |
| 12:AL:35:THR:N    | 12:AL:54:ARG:O     | 2.45                     | 0.50              |
| 28:BA:1240:U:O2'  | 28:BA:1241:A:O5'   | 2.27                     | 0.50              |
| 1:AA:439:U:O3'    | 4:AD:121:LYS:HE2   | 2.12                     | 0.50              |
| 1:AA:537:G:H4'    | 12:AL:70:GLU:OE1   | 2.11                     | 0.50              |
| 16:AP:60:TRP:C    | 16:AP:62:GLY:N     | 2.67                     | 0.50              |
| 28:BA:2146:C:OP2  | 28:BA:2146:C:H6    | 1.95                     | 0.50              |
| 28:BA:2532:G:N2   | 28:BA:2663:G:O2'   | 2.45                     | 0.50              |
| 37:BK:87:LEU:HB3  | 37:BK:92:GLU:HA    | 1.93                     | 0.50              |
| 38:BL:77:ILE:N    | 38:BL:109:LYS:O    | 2.41                     | 0.50              |
| 3:AC:64:ILE:HD11  | 3:AC:99:ALA:HB2    | 1.93                     | 0.50              |

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| Atom-1            | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|--------------------|--------------------------|-------------------|
| 10:AJ:10:LEU:HB3  | 10:AJ:18:ILE:HD11  | 1.94                     | 0.50              |
| 26:B4:37:GLN:O    | 26:B4:37:GLN:HG2   | 2.12                     | 0.50              |
| 28:BA:1070:A:N7   | 28:BA:1096:A:O2'   | 2.44                     | 0.50              |
| 1:AA:412:A:N6     | 1:AA:431:A:H2      | 2.10                     | 0.50              |
| 4:AD:105:MET:HE2  | 4:AD:171:LEU:CD2   | 2.42                     | 0.50              |
| 38:BL:124:GLY:O   | 38:BL:125:LEU:HD23 | 2.11                     | 0.50              |
| 1:AA:522:C:OP2    | 12:AL:66:TYR:OH    | 2.28                     | 0.49              |
| 28:BA:1075:C:H2'  | 28:BA:1076:C:C6    | 2.47                     | 0.49              |
| 30:BC:207:LYS:HG3 | 30:BC:210:ALA:H    | 1.77                     | 0.49              |
| 38:BL:141:LYS:NZ  | 38:BL:143:GLU:OE2  | 2.38                     | 0.49              |
| 1:AA:418:C:N3     | 1:AA:425:G:N2      | 2.55                     | 0.49              |
| 1:AA:1140:C:O2'   | 1:AA:1141:C:H6     | 1.95                     | 0.49              |
| 2:AB:68:LEU:HD21  | 2:AB:154:MET:CE    | 2.42                     | 0.49              |
| 28:BA:1496:A:H2'  | 28:BA:1498:C:C5    | 2.47                     | 0.49              |
| 28:BA:1566:A:O4'  | 30:BC:213:TRP:CD1  | 2.64                     | 0.49              |
| 28:BA:2092:U:OP2  | 35:BH:27:ARG:NH1   | 2.46                     | 0.49              |
| 1:AA:439:U:H5''   | 4:AD:121:LYS:HE2   | 1.94                     | 0.49              |
| 10:AJ:10:LEU:CD1  | 10:AJ:98:VAL:HG12  | 2.43                     | 0.49              |
| 10:AJ:28:THR:O    | 10:AJ:32:THR:HG22  | 2.13                     | 0.49              |
| 12:AL:76:GLU:O    | 12:AL:77:HIS:HB2   | 2.13                     | 0.49              |
| 15:AO:19:ALA:O    | 15:AO:20:ASN:OD1   | 2.30                     | 0.49              |
| 25:B3:32:ILE:HG22 | 25:B3:32:ILE:O     | 2.11                     | 0.49              |
| 32:BE:52:VAL:HG21 | 32:BE:81:GLY:HA2   | 1.94                     | 0.49              |
| 35:BH:2:GLN:O     | 35:BH:3:VAL:O      | 2.30                     | 0.49              |
| 39:BM:106:ASP:OD1 | 39:BM:107:GLY:N    | 2.44                     | 0.49              |
| 1:AA:407:U:O2'    | 4:AD:113:GLU:HG2   | 2.12                     | 0.49              |
| 1:AA:1317:C:O2'   | 1:AA:1318:A:OP1    | 2.28                     | 0.49              |
| 3:AC:148:GLY:O    | 3:AC:173:VAL:HG22  | 2.13                     | 0.49              |
| 9:AI:91:ASP:OD1   | 9:AI:92:GLU:N      | 2.45                     | 0.49              |
| 13:AM:64:VAL:HG12 | 13:AM:69:LEU:HB2   | 1.95                     | 0.49              |
| 28:BA:1826:G:O2'  | 28:BA:1971:U:OP2   | 2.31                     | 0.49              |
| 31:BD:26:VAL:HG21 | 42:BP:5:ILE:HD13   | 1.94                     | 0.49              |
| 46:BT:4:GLU:HG2   | 46:BT:49:LYS:HE3   | 1.94                     | 0.49              |
| 1:AA:505:G:OP2    | 1:AA:534:U:H2'     | 2.11                     | 0.49              |
| 1:AA:1113:C:H1'   | 3:AC:178:LEU:HD13  | 1.94                     | 0.49              |
| 1:AA:1226:C:OP2   | 13:AM:90:ARG:NH2   | 2.45                     | 0.49              |
| 1:AA:1368:A:H5''  | 9:AI:114:LYS:HG3   | 1.94                     | 0.49              |
| 12:AL:49:LEU:HD12 | 12:AL:49:LEU:O     | 2.13                     | 0.49              |
| 28:BA:1069:A:N1   | 28:BA:1073:A:N6    | 2.60                     | 0.49              |
| 28:BA:1071:G:OP1  | 28:BA:1089:A:N6    | 2.45                     | 0.49              |
| 28:BA:2850:A:N7   | 28:BA:2868:A:O2'   | 2.32                     | 0.49              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 47:BU:40:ASN:OD1  | 47:BU:40:ASN:O    | 2.31                     | 0.49              |
| 1:AA:1239:A:H62   | 1:AA:1299:A:N6    | 2.10                     | 0.49              |
| 3:AC:130:PHE:HD1  | 3:AC:134:MET:HE2  | 1.78                     | 0.49              |
| 10:AJ:41:PRO:O    | 10:AJ:42:LEU:HG   | 2.13                     | 0.49              |
| 24:B2:34:ARG:HD3  | 28:BA:467:G:OP2   | 2.12                     | 0.49              |
| 28:BA:1179:G:H3'  | 28:BA:1180:U:C5'  | 2.41                     | 0.49              |
| 5:AE:105:ILE:HD11 | 5:AE:121:HIS:HA   | 1.95                     | 0.49              |
| 28:BA:2250:G:O2'  | 28:BA:2496:C:OP1  | 2.26                     | 0.49              |
| 1:AA:140:U:O2     | 1:AA:183:C:N4     | 2.46                     | 0.49              |
| 4:AD:111:ARG:O    | 4:AD:115:ARG:N    | 2.42                     | 0.49              |
| 9:AI:44:ALA:O     | 9:AI:47:VAL:HG12  | 2.13                     | 0.49              |
| 10:AJ:35:GLN:HG2  | 10:AJ:36:VAL:H    | 1.77                     | 0.49              |
| 28:BA:476:G:N1    | 28:BA:479:A:OP2   | 2.43                     | 0.49              |
| 38:BL:81:ASP:OD1  | 38:BL:82:LEU:N    | 2.39                     | 0.49              |
| 1:AA:1239:A:H62   | 1:AA:1299:A:H61   | 1.61                     | 0.49              |
| 3:AC:72:ARG:O     | 3:AC:72:ARG:HG3   | 2.12                     | 0.49              |
| 11:AK:124:PRO:O   | 21:AU:35:ARG:N    | 2.45                     | 0.49              |
| 20:AT:70:ASN:HD22 | 20:AT:70:ASN:N    | 2.10                     | 0.49              |
| 24:B2:22:MET:HE2  | 24:B2:31:LEU:HD12 | 1.94                     | 0.49              |
| 28:BA:245:G:O2'   | 28:BA:384:A:N1    | 2.41                     | 0.49              |
| 29:BB:29:A:H2'    | 29:BB:30:C:O4'    | 2.13                     | 0.49              |
| 1:AA:62:U:OP1     | 1:AA:385:C:O2'    | 2.31                     | 0.48              |
| 1:AA:439:U:OP1    | 4:AD:120:HIS:NE2  | 2.46                     | 0.48              |
| 15:AO:89:ARG:OXT  | 15:AO:89:ARG:HG2  | 2.11                     | 0.48              |
| 28:BA:306:U:H2'   | 28:BA:307:G:O4'   | 2.13                     | 0.48              |
| 28:BA:404:A:H1'   | 28:BA:405:U:OP2   | 2.13                     | 0.48              |
| 28:BA:1386:C:H2'  | 28:BA:1387:A:C8   | 2.48                     | 0.48              |
| 44:BR:49:ILE:HG22 | 44:BR:54:VAL:N    | 2.27                     | 0.48              |
| 1:AA:401:C:O2'    | 1:AA:621:A:N3     | 2.38                     | 0.48              |
| 1:AA:1201:A:H1'   | 1:AA:1202:U:OP2   | 2.13                     | 0.48              |
| 1:AA:1498:U:O4    | 54:AA:1694:84G:N  | 2.46                     | 0.48              |
| 1:AA:1532:U:O4    | 1:AA:1533:C:N4    | 2.45                     | 0.48              |
| 28:BA:137:U:C5'   | 28:BA:138:U:N3    | 2.75                     | 0.48              |
| 28:BA:1790:C:H2'  | 28:BA:1791:A:C8   | 2.47                     | 0.48              |
| 45:BS:72:THR:HG21 | 45:BS:108:SER:OG  | 2.13                     | 0.48              |
| 1:AA:203:G:N2     | 1:AA:204:G:N7     | 2.62                     | 0.48              |
| 1:AA:438:U:OP1    | 1:AA:438:U:H3'    | 2.13                     | 0.48              |
| 1:AA:511:C:O3'    | 4:AD:41:HIS:ND1   | 2.45                     | 0.48              |
| 4:AD:125:VAL:HA   | 4:AD:143:VAL:HA   | 1.96                     | 0.48              |
| 24:B2:44:VAL:HG13 | 24:B2:44:VAL:O    | 2.12                     | 0.48              |
| 35:BH:4:ILE:N     | 35:BH:37:VAL:O    | 2.44                     | 0.48              |

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| Atom-1             | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|-------------------|--------------------------|-------------------|
| 39:BM:42:THR:HG22  | 39:BM:93:VAL:HG12 | 1.95                     | 0.48              |
| 1:AA:424:G:C3'     | 1:AA:425:G:C8     | 2.93                     | 0.48              |
| 1:AA:450:G:C6      | 1:AA:481:G:N1     | 2.82                     | 0.48              |
| 1:AA:481:G:C4      | 1:AA:483:C:N4     | 2.81                     | 0.48              |
| 1:AA:1178:G:N2     | 1:AA:1181:G:OP2   | 2.38                     | 0.48              |
| 4:AD:120:HIS:O     | 4:AD:120:HIS:CG   | 2.66                     | 0.48              |
| 4:AD:154:ARG:C     | 4:AD:156:LYS:N    | 2.70                     | 0.48              |
| 23:B1:29:THR:HG22  | 23:B1:30:LYS:HG2  | 1.94                     | 0.48              |
| 39:BM:69:PRO:O     | 39:BM:70:ASP:OD2  | 2.31                     | 0.48              |
| 45:BS:29:VAL:HG13  | 45:BS:55:ILE:HD11 | 1.95                     | 0.48              |
| 47:BU:7:ARG:HG3    | 47:BU:8:ASP:N     | 2.29                     | 0.48              |
| 1:AA:443:C:N4      | 1:AA:444:G:C6     | 2.81                     | 0.48              |
| 1:AA:542:G:H5'     | 4:AD:39:GLY:HA3   | 1.96                     | 0.48              |
| 1:AA:1130:A:OP1    | 9:AI:18:ARG:NH2   | 2.47                     | 0.48              |
| 1:AA:1356:G:H2'    | 1:AA:1357:A:C8    | 2.48                     | 0.48              |
| 1:AA:1374:A:O3'    | 7:AG:28:ASN:ND2   | 2.47                     | 0.48              |
| 2:AB:97:LEU:HG     | 2:AB:100:MET:HE2  | 1.95                     | 0.48              |
| 11:AK:113:VAL:HG12 | 18:AR:73:ARG:NH1  | 2.28                     | 0.48              |
| 19:AS:27:ASP:O     | 19:AS:27:ASP:OD2  | 2.31                     | 0.48              |
| 28:BA:2291:U:H2'   | 28:BA:2292:U:C6   | 2.48                     | 0.48              |
| 38:BL:50:PHE:CZ    | 38:BL:52:GLY:O    | 2.65                     | 0.48              |
| 1:AA:539:A:C8      | 1:AA:539:A:OP2    | 2.67                     | 0.48              |
| 1:AA:820:U:H4'     | 1:AA:821:G:OP2    | 2.13                     | 0.48              |
| 12:AL:110:ARG:HH21 | 12:AL:113:ALA:HB3 | 1.78                     | 0.48              |
| 20:AT:25:ARG:HG3   | 20:AT:66:LEU:HD11 | 1.94                     | 0.48              |
| 22:B0:16:ARG:HD2   | 28:BA:1266:G:OP1  | 2.14                     | 0.48              |
| 28:BA:137:U:H2'    | 28:BA:138:U:C2    | 2.48                     | 0.48              |
| 29:BB:37:C:O2      | 41:BO:100:HIS:NE2 | 2.43                     | 0.48              |
| 33:BF:20:PHE:O     | 33:BF:21:ASN:OD1  | 2.32                     | 0.48              |
| 1:AA:439:U:O4'     | 4:AD:120:HIS:HA   | 2.12                     | 0.48              |
| 1:AA:568:G:O6      | 12:AL:2:ALA:HB2   | 2.14                     | 0.48              |
| 1:AA:1062:U:H2'    | 1:AA:1063:C:C6    | 2.48                     | 0.48              |
| 1:AA:1493:A:N3     | 28:BA:1913:A:H2   | 2.12                     | 0.48              |
| 28:BA:784:G:O2'    | 28:BA:785:G:P     | 2.72                     | 0.48              |
| 36:BJ:114:LEU:HG   | 36:BJ:118:MET:HE3 | 1.95                     | 0.48              |
| 38:BL:68:SER:O     | 38:BL:69:ARG:HB3  | 2.13                     | 0.48              |
| 4:AD:132:ILE:HG21  | 4:AD:135:TYR:HB2  | 1.95                     | 0.48              |
| 22:B0:52:ARG:CZ    | 22:B0:54:VAL:HG12 | 2.43                     | 0.48              |
| 28:BA:645:C:H2'    | 28:BA:647:G:N7    | 2.28                     | 0.48              |
| 4:AD:34:ILE:C      | 4:AD:35:GLU:HG2   | 2.38                     | 0.48              |
| 6:AF:32:ALA:O      | 6:AF:33:GLU:HG3   | 2.14                     | 0.48              |

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| Atom-1            | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|--------------------|--------------------------|-------------------|
| 14:AN:21:PHE:O    | 14:AN:22:ALA:HB3   | 2.13                     | 0.48              |
| 28:BA:1009:A:N3   | 28:BA:1153:C:O2'   | 2.43                     | 0.48              |
| 28:BA:1199:U:H1'  | 43:BQ:4:VAL:HG12   | 1.96                     | 0.48              |
| 28:BA:2103:C:H2'  | 28:BA:2104:C:C1'   | 2.44                     | 0.48              |
| 32:BE:164:LEU:HB2 | 32:BE:167:VAL:HG22 | 1.96                     | 0.48              |
| 1:AA:502:A:H2'    | 1:AA:503:C:O4'     | 2.13                     | 0.48              |
| 1:AA:538:G:H2'    | 1:AA:539:A:C8      | 2.49                     | 0.48              |
| 2:AB:61:ALA:HB2   | 2:AB:221:VAL:HG23  | 1.96                     | 0.48              |
| 16:AP:53:ASP:O    | 16:AP:57:ILE:HD12  | 2.13                     | 0.48              |
| 26:B4:7:VAL:CG1   | 26:B4:25:VAL:HG23  | 2.44                     | 0.48              |
| 28:BA:1075:C:H2'  | 28:BA:1076:C:C2    | 2.48                     | 0.48              |
| 28:BA:1405:U:H2'  | 28:BA:1406:U:C6    | 2.48                     | 0.48              |
| 28:BA:2100:G:C6   | 28:BA:2101:A:C6    | 3.02                     | 0.48              |
| 28:BA:2847:U:H2'  | 28:BA:2848:G:O4'   | 2.14                     | 0.48              |
| 31:BD:184:ARG:NH1 | 42:BP:7:GLN:OE1    | 2.45                     | 0.48              |
| 1:AA:502:A:OP2    | 12:AL:113:ALA:CA   | 2.62                     | 0.47              |
| 1:AA:1226:C:H2'   | 13:AM:102:THR:HG22 | 1.94                     | 0.47              |
| 4:AD:106:GLY:O    | 4:AD:158:ALA:HB1   | 2.14                     | 0.47              |
| 28:BA:2117:A:H61  | 28:BA:2170:A:N6    | 2.12                     | 0.47              |
| 29:BB:14:U:OP2    | 29:BB:70:C:O2'     | 2.31                     | 0.47              |
| 1:AA:449:G:O6     | 1:AA:486:U:C2      | 2.66                     | 0.47              |
| 14:AN:47:LYS:NZ   | 19:AS:13:LEU:HB3   | 2.29                     | 0.47              |
| 47:BU:18:ASP:OD2  | 47:BU:39:ILE:O     | 2.32                     | 0.47              |
| 1:AA:450:G:H5''   | 1:AA:451:A:H2'     | 1.96                     | 0.47              |
| 1:AA:554:A:H5'    | 12:AL:26:ALA:HB1   | 1.96                     | 0.47              |
| 1:AA:945:G:C2     | 1:AA:946:A:C8      | 3.02                     | 0.47              |
| 1:AA:1145:A:HO2'  | 1:AA:1146:A:P      | 2.37                     | 0.47              |
| 1:AA:1157:A:C2    | 1:AA:1181:G:C4     | 3.01                     | 0.47              |
| 1:AA:1312:G:O3'   | 19:AS:6:LYS:HE2    | 2.14                     | 0.47              |
| 2:AB:20:THR:HG23  | 2:AB:37:LYS:O      | 2.13                     | 0.47              |
| 2:AB:136:MET:SD   | 2:AB:137:ARG:N     | 2.86                     | 0.47              |
| 9:AI:19:VAL:HA    | 9:AI:65:ILE:HG22   | 1.95                     | 0.47              |
| 20:AT:43:ASP:OD1  | 20:AT:44:LYS:N     | 2.47                     | 0.47              |
| 51:BY:2:LYS:HE2   | 51:BY:56:LEU:HD11  | 1.96                     | 0.47              |
| 1:AA:433:G:H2'    | 1:AA:434:U:C6      | 2.49                     | 0.47              |
| 1:AA:500:G:C2'    | 1:AA:501:C:O5'     | 2.63                     | 0.47              |
| 4:AD:109:ALA:HB3  | 4:AD:113:GLU:OE1   | 2.15                     | 0.47              |
| 12:AL:32:GLY:HA3  | 12:AL:55:VAL:HG12  | 1.95                     | 0.47              |
| 28:BA:285:G:C5    | 28:BA:356:G:C6     | 3.02                     | 0.47              |
| 28:BA:2002:G:OP1  | 40:BN:17:ARG:NH2   | 2.39                     | 0.47              |
| 28:BA:2281:A:O2'  | 28:BA:2282:G:H5'   | 2.15                     | 0.47              |

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| Atom-1             | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|-------------------|--------------------------|-------------------|
| 48:BV:1:MET:N      | 48:BV:59:GLU:OE2  | 2.46                     | 0.47              |
| 1:AA:428:G:H4'     | 1:AA:429:U:O5'    | 2.12                     | 0.47              |
| 1:AA:1125:U:C2     | 1:AA:1127:G:C8    | 3.02                     | 0.47              |
| 4:AD:129:VAL:HG13  | 4:AD:129:VAL:O    | 2.14                     | 0.47              |
| 12:AL:107:VAL:HG12 | 12:AL:108:LYS:N   | 2.29                     | 0.47              |
| 24:B2:24:THR:HG23  | 24:B2:27:GLY:H    | 1.78                     | 0.47              |
| 32:BE:5:LEU:HD11   | 32:BE:8:ALA:HB3   | 1.97                     | 0.47              |
| 38:BL:85:VAL:HG12  | 38:BL:85:VAL:O    | 2.14                     | 0.47              |
| 1:AA:362:G:N2      | 1:AA:365:U:OP2    | 2.47                     | 0.47              |
| 1:AA:411:A:H8      | 4:AD:31:LYS:NZ    | 2.12                     | 0.47              |
| 1:AA:479:U:C2'     | 1:AA:480:U:H5'    | 2.43                     | 0.47              |
| 1:AA:1313:U:P      | 19:AS:6:LYS:CE    | 3.02                     | 0.47              |
| 5:AE:14:LYS:NZ     | 5:AE:116:GLU:OE1  | 2.48                     | 0.47              |
| 14:AN:6:MET:HE2    | 14:AN:6:MET:HA    | 1.96                     | 0.47              |
| 15:AO:79:THR:O     | 15:AO:83:GLU:OE1  | 2.33                     | 0.47              |
| 17:AQ:76:VAL:O     | 17:AQ:77:ARG:C    | 2.57                     | 0.47              |
| 26:B4:37:GLN:O     | 26:B4:37:GLN:CG   | 2.62                     | 0.47              |
| 28:BA:930:G:H1'    | 52:BZ:25:LEU:HD21 | 1.96                     | 0.47              |
| 28:BA:1068:G:H2'   | 28:BA:1069:A:O4'  | 2.14                     | 0.47              |
| 28:BA:1942:C:OP2   | 28:BA:1943:U:O2'  | 2.17                     | 0.47              |
| 28:BA:1942:C:H5''  | 28:BA:1943:U:H2'  | 1.95                     | 0.47              |
| 1:AA:418:C:H2'     | 1:AA:419:C:H6     | 1.75                     | 0.47              |
| 1:AA:1166:G:N1     | 1:AA:1169:A:OP2   | 2.47                     | 0.47              |
| 1:AA:1229:A:OP2    | 13:AM:113:ARG:NH2 | 2.46                     | 0.47              |
| 4:AD:102:VAL:HG12  | 4:AD:114:ALA:HB1  | 1.95                     | 0.47              |
| 14:AN:34:VAL:O     | 14:AN:34:VAL:HG13 | 2.14                     | 0.47              |
| 28:BA:826:U:O2'    | 38:BL:53:GLY:HA3  | 2.15                     | 0.47              |
| 28:BA:1095:A:HO2'  | 28:BA:1096:A:P    | 2.33                     | 0.47              |
| 28:BA:1527:G:N1    | 28:BA:1544:A:OP2  | 2.41                     | 0.47              |
| 28:BA:2119:A:N6    | 28:BA:2167:U:O2'  | 2.48                     | 0.47              |
| 46:BT:38:ALA:C     | 46:BT:39:THR:HG1  | 2.18                     | 0.47              |
| 48:BV:6:ALA:HB1    | 48:BV:40:ILE:CG2  | 2.45                     | 0.47              |
| 1:AA:677:U:H3      | 1:AA:713:G:H22    | 1.62                     | 0.47              |
| 4:AD:105:MET:HG2   | 4:AD:107:PHE:CZ   | 2.50                     | 0.47              |
| 4:AD:124:MET:SD    | 4:AD:129:VAL:HA   | 2.54                     | 0.47              |
| 11:AK:126:LYS:HA   | 21:AU:34:ARG:HD2  | 1.96                     | 0.47              |
| 19:AS:13:LEU:H     | 19:AS:13:LEU:CD2  | 2.21                     | 0.47              |
| 1:AA:373:A:C4      | 1:AA:482:A:C6     | 3.03                     | 0.47              |
| 11:AK:50:SER:OG    | 11:AK:69:ARG:NH1  | 2.48                     | 0.47              |
| 11:AK:93:ARG:O     | 11:AK:97:ILE:HD12 | 2.14                     | 0.47              |
| 23:B1:52:ALA:O     | 23:B1:53:LYS:C    | 2.58                     | 0.47              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 28:BA:514:A:N3    | 28:BA:581:C:O2'   | 2.44                     | 0.47              |
| 28:BA:2119:A:C5   | 28:BA:2170:A:N1   | 2.83                     | 0.47              |
| 40:BN:70:THR:O    | 40:BN:71:ARG:C    | 2.57                     | 0.47              |
| 42:BP:65:SER:O    | 42:BP:66:ASN:C    | 2.56                     | 0.47              |
| 1:AA:275:G:O5'    | 17:AQ:16:LYS:NZ   | 2.38                     | 0.47              |
| 1:AA:363:A:N6     | 12:AL:27:CYS:SG   | 2.88                     | 0.47              |
| 1:AA:1315:U:O2'   | 1:AA:1360:A:N3    | 2.46                     | 0.47              |
| 18:AR:26:ILE:HD11 | 18:AR:67:LEU:HG   | 1.96                     | 0.47              |
| 28:BA:2098:U:H2'  | 28:BA:2099:U:O4'  | 2.14                     | 0.47              |
| 33:BF:49:LEU:HD12 | 33:BF:50:LEU:N    | 2.30                     | 0.47              |
| 38:BL:81:ASP:C    | 38:BL:83:ALA:H    | 2.22                     | 0.47              |
| 1:AA:96:U:O2'     | 1:AA:97:G:O5'     | 2.32                     | 0.46              |
| 1:AA:409:U:H5'    | 4:AD:25:VAL:HG22  | 1.96                     | 0.46              |
| 1:AA:757:U:OP1    | 1:AA:822:U:O2'    | 2.33                     | 0.46              |
| 10:AJ:35:GLN:O    | 10:AJ:36:VAL:O    | 2.32                     | 0.46              |
| 14:AN:24:ARG:O    | 14:AN:24:ARG:HG3  | 2.15                     | 0.46              |
| 28:BA:545:U:H2'   | 28:BA:546:U:O3'   | 2.15                     | 0.46              |
| 28:BA:2038:G:H2'  | 28:BA:2039:U:O4'  | 2.14                     | 0.46              |
| 28:BA:2062:A:N1   | 28:BA:2503:A:N6   | 2.64                     | 0.46              |
| 28:BA:2121:G:H2'  | 28:BA:2122:U:O4'  | 2.15                     | 0.46              |
| 44:BR:38:VAL:HG11 | 44:BR:41:ILE:HD11 | 1.96                     | 0.46              |
| 1:AA:328:C:H2'    | 1:AA:328:C:O2     | 2.15                     | 0.46              |
| 1:AA:427:U:H3'    | 1:AA:428:G:H2'    | 1.97                     | 0.46              |
| 1:AA:443:C:N4     | 1:AA:444:G:O6     | 2.49                     | 0.46              |
| 1:AA:450:G:C3'    | 1:AA:451:A:H5''   | 2.46                     | 0.46              |
| 1:AA:505:G:OP2    | 1:AA:535:A:H5'    | 2.15                     | 0.46              |
| 2:AB:68:LEU:HD21  | 2:AB:154:MET:HE1  | 1.98                     | 0.46              |
| 3:AC:112:ASP:OD2  | 3:AC:115:LEU:HD23 | 2.14                     | 0.46              |
| 12:AL:98:VAL:O    | 12:AL:98:VAL:HG13 | 2.16                     | 0.46              |
| 28:BA:1315:C:O2'  | 28:BA:1392:A:N3   | 2.41                     | 0.46              |
| 28:BA:1720:U:H2'  | 28:BA:1721:G:O4'  | 2.15                     | 0.46              |
| 41:BO:35:ILE:H    | 41:BO:53:THR:HG22 | 1.79                     | 0.46              |
| 1:AA:60:A:N1      | 1:AA:107:G:O2'    | 2.38                     | 0.46              |
| 1:AA:425:G:H3'    | 1:AA:426:U:C6     | 2.50                     | 0.46              |
| 1:AA:441:A:H2'    | 1:AA:442:G:C8     | 2.50                     | 0.46              |
| 1:AA:746:A:H2'    | 1:AA:747:A:C8     | 2.50                     | 0.46              |
| 1:AA:1078:U:O2'   | 1:AA:1079:G:OP1   | 2.32                     | 0.46              |
| 4:AD:130:VAL:HG23 | 4:AD:130:VAL:O    | 2.16                     | 0.46              |
| 12:AL:109:ASP:O   | 12:AL:110:ARG:C   | 2.57                     | 0.46              |
| 16:AP:18:GLN:NE2  | 16:AP:35:ARG:NE   | 2.64                     | 0.46              |
| 28:BA:703:U:H2'   | 28:BA:704:G:O4'   | 2.14                     | 0.46              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 31:BD:181:ASP:OD2  | 31:BD:184:ARG:NE   | 2.40                     | 0.46              |
| 40:BN:79:LEU:O     | 40:BN:80:PHE:HB2   | 2.14                     | 0.46              |
| 1:AA:451:A:C6      | 1:AA:481:G:O6      | 2.68                     | 0.46              |
| 1:AA:1516:G:N2     | 1:AA:1519:A:OP2    | 2.45                     | 0.46              |
| 17:AQ:69:LYS:O     | 17:AQ:70:THR:CB    | 2.63                     | 0.46              |
| 28:BA:2111:U:O4    | 28:BA:2146:C:H5'   | 2.15                     | 0.46              |
| 33:BF:38:MET:HE3   | 33:BF:53:ALA:HB1   | 1.96                     | 0.46              |
| 1:AA:424:G:C3'     | 1:AA:425:G:H8      | 2.24                     | 0.46              |
| 1:AA:515:G:H2'     | 1:AA:516:U:C6      | 2.50                     | 0.46              |
| 3:AC:20:SER:OG     | 3:AC:40:ARG:NH2    | 2.48                     | 0.46              |
| 28:BA:1176:U:H2'   | 28:BA:1177:G:C8    | 2.50                     | 0.46              |
| 28:BA:1182:G:H2'   | 28:BA:1183:U:O4'   | 2.15                     | 0.46              |
| 28:BA:2243:U:H2'   | 28:BA:2244:U:C6    | 2.51                     | 0.46              |
| 34:BG:22:GLN:NE2   | 34:BG:38:ASN:O     | 2.49                     | 0.46              |
| 44:BR:94:THR:HG23  | 44:BR:94:THR:O     | 2.14                     | 0.46              |
| 1:AA:438:U:C2      | 1:AA:496:A:N7      | 2.84                     | 0.46              |
| 1:AA:449:G:H22     | 1:AA:486:U:C1'     | 2.26                     | 0.46              |
| 1:AA:1160:G:HO2'   | 1:AA:1161:C:P      | 2.39                     | 0.46              |
| 1:AA:1368:A:OP2    | 9:AI:114:LYS:HG3   | 2.15                     | 0.46              |
| 4:AD:9:LEU:HD22    | 4:AD:32:CYS:SG     | 2.56                     | 0.46              |
| 4:AD:21:LEU:HD13   | 4:AD:111:ARG:HG3   | 1.98                     | 0.46              |
| 11:AK:113:VAL:HG12 | 18:AR:73:ARG:HH11  | 1.78                     | 0.46              |
| 12:AL:99:ARG:HH22  | 12:AL:105:SER:C    | 2.24                     | 0.46              |
| 19:AS:64:ASP:OD2   | 19:AS:64:ASP:C     | 2.59                     | 0.46              |
| 28:BA:587:C:OP2    | 38:BL:21:ARG:NH1   | 2.44                     | 0.46              |
| 37:BK:99:ILE:HD13  | 37:BK:115:ILE:HG23 | 1.98                     | 0.46              |
| 39:BM:63:ILE:HD11  | 39:BM:105:MET:HE2  | 1.98                     | 0.46              |
| 2:AB:86:SER:OG     | 2:AB:87:CYS:N      | 2.45                     | 0.46              |
| 4:AD:32:CYS:SG     | 4:AD:34:ILE:HG13   | 2.56                     | 0.46              |
| 4:AD:153:SER:O     | 4:AD:156:LYS:HB2   | 2.16                     | 0.46              |
| 9:AI:47:VAL:CG1    | 9:AI:76:ALA:HB1    | 2.46                     | 0.46              |
| 28:BA:1047:G:O2'   | 28:BA:1110:G:N1    | 2.36                     | 0.46              |
| 29:BB:48:U:P       | 41:BO:30:ARG:HH22  | 2.38                     | 0.46              |
| 30:BC:260:ASN:C    | 30:BC:260:ASN:HD22 | 2.24                     | 0.46              |
| 1:AA:411:A:C8      | 4:AD:31:LYS:CE     | 2.99                     | 0.46              |
| 1:AA:500:G:H2'     | 1:AA:501:C:O5'     | 2.15                     | 0.46              |
| 1:AA:533:A:C6      | 1:AA:536:C:C2      | 3.04                     | 0.46              |
| 12:AL:75:GLN:O     | 12:AL:76:GLU:C     | 2.58                     | 0.46              |
| 16:AP:57:ILE:HD12  | 16:AP:57:ILE:H     | 1.81                     | 0.46              |
| 19:AS:32:ARG:O     | 19:AS:32:ARG:HG2   | 2.16                     | 0.46              |
| 20:AT:72:ALA:O     | 20:AT:73:ALA:C     | 2.59                     | 0.46              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 1:AA:439:U:H5'    | 4:AD:120:HIS:O    | 2.16                     | 0.46              |
| 4:AD:187:GLU:HG2  | 4:AD:190:ASP:OD2  | 2.16                     | 0.46              |
| 1:AA:406:G:C2'    | 4:AD:116:GLN:HE21 | 2.28                     | 0.46              |
| 1:AA:438:U:C6     | 1:AA:494:G:C6     | 3.04                     | 0.46              |
| 1:AA:664:G:H22    | 1:AA:741:G:H1     | 1.63                     | 0.46              |
| 1:AA:1103:C:OP1   | 2:AB:95:ARG:NH2   | 2.49                     | 0.46              |
| 1:AA:1313:U:OP1   | 19:AS:6:LYS:NZ    | 2.42                     | 0.46              |
| 12:AL:34:CYS:SG   | 12:AL:77:HIS:O    | 2.74                     | 0.46              |
| 19:AS:5:LEU:O     | 19:AS:6:LYS:HG2   | 2.16                     | 0.46              |
| 28:BA:1087:G:H22  | 28:BA:1102:C:H42  | 1.63                     | 0.46              |
| 28:BA:1790:C:H2'  | 28:BA:1791:A:N7   | 2.31                     | 0.46              |
| 28:BA:2144:G:N2   | 28:BA:2146:C:H1'  | 2.31                     | 0.46              |
| 29:BB:66:A:H61    | 29:BB:107:G:H2'   | 1.81                     | 0.46              |
| 50:BX:12:PRO:HB3  | 50:BX:30:LEU:HD23 | 1.98                     | 0.46              |
| 1:AA:38:G:H22     | 1:AA:397:A:H5'    | 1.80                     | 0.45              |
| 1:AA:722:G:H3'    | 1:AA:722:G:N3     | 2.31                     | 0.45              |
| 25:B3:6:THR:HG21  | 28:BA:243:U:OP1   | 2.16                     | 0.45              |
| 28:BA:1216:G:OP1  | 43:BQ:11:ARG:NH1  | 2.48                     | 0.45              |
| 28:BA:1871:A:HO2' | 28:BA:1872:A:H8   | 1.63                     | 0.45              |
| 28:BA:2099:U:H2'  | 28:BA:2100:G:C8   | 2.51                     | 0.45              |
| 47:BU:74:ASN:O    | 47:BU:75:ALA:HB3  | 2.15                     | 0.45              |
| 4:AD:21:LEU:HD13  | 4:AD:111:ARG:NE   | 2.27                     | 0.45              |
| 4:AD:103:TYR:CD2  | 4:AD:111:ARG:HD3  | 2.51                     | 0.45              |
| 4:AD:185:LYS:HB2  | 4:AD:185:LYS:HE3  | 1.56                     | 0.45              |
| 32:BE:52:VAL:HG11 | 32:BE:81:GLY:HA2  | 1.97                     | 0.45              |
| 1:AA:411:A:H4'    | 1:AA:412:A:OP1    | 2.15                     | 0.45              |
| 1:AA:451:A:C1'    | 1:AA:452:A:C8     | 2.99                     | 0.45              |
| 1:AA:481:G:C2     | 1:AA:482:A:C6     | 3.05                     | 0.45              |
| 1:AA:491:G:H2'    | 1:AA:492:C:C6     | 2.51                     | 0.45              |
| 1:AA:944:G:N1     | 1:AA:1338:G:OP2   | 2.46                     | 0.45              |
| 1:AA:1145:A:O2'   | 1:AA:1146:A:O5'   | 2.32                     | 0.45              |
| 1:AA:1302:C:H41   | 13:AM:14:HIS:CD2  | 2.34                     | 0.45              |
| 1:AA:1313:U:P     | 19:AS:6:LYS:HE3   | 2.56                     | 0.45              |
| 4:AD:139:PRO:HA   | 4:AD:182:PHE:CB   | 2.46                     | 0.45              |
| 7:AG:15:ASP:O     | 7:AG:19:GLY:N     | 2.47                     | 0.45              |
| 9:AI:114:LYS:HE2  | 9:AI:114:LYS:HB2  | 1.46                     | 0.45              |
| 28:BA:1383:A:O2'  | 28:BA:1384:A:O5'  | 2.28                     | 0.45              |
| 31:BD:26:VAL:HG21 | 42:BP:5:ILE:CD1   | 2.47                     | 0.45              |
| 39:BM:27:SER:N    | 39:BM:104:GLU:OE2 | 2.48                     | 0.45              |
| 1:AA:1315:U:H2'   | 1:AA:1316:G:O4'   | 2.16                     | 0.45              |
| 7:AG:140:ASP:OD1  | 7:AG:143:ARG:NH1  | 2.48                     | 0.45              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 10:AJ:74:VAL:HG23  | 10:AJ:75:ASP:N     | 2.31                     | 0.45              |
| 13:AM:3:ARG:O      | 13:AM:4:ILE:O      | 2.34                     | 0.45              |
| 47:BU:54:GLN:N     | 47:BU:55:PRO:HD3   | 2.32                     | 0.45              |
| 52:BZ:24:LEU:HD11  | 52:BZ:54:MET:CE    | 2.45                     | 0.45              |
| 1:AA:478:A:C4      | 1:AA:479:U:N3      | 2.85                     | 0.45              |
| 4:AD:187:GLU:O     | 4:AD:188:ARG:C     | 2.57                     | 0.45              |
| 9:AI:105:THR:HG23  | 9:AI:105:THR:O     | 2.15                     | 0.45              |
| 16:AP:51:ARG:C     | 16:AP:52:LEU:HD12  | 2.40                     | 0.45              |
| 28:BA:25:U:HO2'    | 28:BA:26:G:P       | 2.40                     | 0.45              |
| 28:BA:2190:G:C6    | 28:BA:2191:A:C6    | 3.05                     | 0.45              |
| 39:BM:8:LYS:HG3    | 39:BM:9:PHE:CD2    | 2.52                     | 0.45              |
| 1:AA:457:G:N3      | 1:AA:457:G:H2'     | 2.32                     | 0.45              |
| 1:AA:1055:A:C6     | 1:AA:1206:G:C5     | 3.04                     | 0.45              |
| 1:AA:1147:C:H1'    | 9:AI:18:ARG:NH1    | 2.31                     | 0.45              |
| 1:AA:1368:A:H5''   | 9:AI:114:LYS:CG    | 2.46                     | 0.45              |
| 33:BF:25:VAL:O     | 33:BF:28:VAL:HG12  | 2.16                     | 0.45              |
| 35:BH:30:LEU:O     | 35:BH:34:GLY:O     | 2.35                     | 0.45              |
| 47:BU:34:VAL:HG13  | 47:BU:67:VAL:HG22  | 1.99                     | 0.45              |
| 12:AL:107:VAL:HB   | 12:AL:119:VAL:CG2  | 2.47                     | 0.45              |
| 18:AR:67:LEU:HD23  | 18:AR:67:LEU:H     | 1.81                     | 0.45              |
| 28:BA:2857:G:N2    | 28:BA:2860:A:OP2   | 2.38                     | 0.45              |
| 32:BE:105:LEU:HD23 | 32:BE:200:LEU:HD21 | 1.98                     | 0.45              |
| 1:AA:687:A:C2      | 1:AA:704:A:C5      | 3.05                     | 0.45              |
| 1:AA:1160:G:C2     | 1:AA:1161:C:C6     | 3.05                     | 0.45              |
| 14:AN:45:VAL:HG13  | 14:AN:46:LEU:N     | 2.31                     | 0.45              |
| 27:B5:61:ASN:O     | 27:B5:64:PHE:O     | 2.35                     | 0.45              |
| 39:BM:34:LYS:CD    | 39:BM:131:VAL:HG11 | 2.47                     | 0.45              |
| 1:AA:411:A:H62     | 1:AA:413:G:H21     | 1.65                     | 0.45              |
| 1:AA:428:G:H8      | 1:AA:428:G:OP1     | 2.00                     | 0.45              |
| 1:AA:442:G:N1      | 1:AA:443:C:N4      | 2.65                     | 0.45              |
| 1:AA:615:G:C6      | 1:AA:616:G:C5      | 3.05                     | 0.45              |
| 1:AA:1136:C:O2     | 1:AA:1136:C:O4'    | 2.34                     | 0.45              |
| 1:AA:1328:C:H5''   | 13:AM:28:THR:HG21  | 1.98                     | 0.45              |
| 11:AK:109:ASN:OD1  | 11:AK:110:ILE:N    | 2.50                     | 0.45              |
| 28:BA:947:A:H2'    | 28:BA:948:C:C6     | 2.52                     | 0.45              |
| 44:BR:6:GLN:OE1    | 44:BR:10:LYS:N     | 2.50                     | 0.45              |
| 1:AA:449:G:O5'     | 1:AA:449:G:H8      | 2.00                     | 0.45              |
| 1:AA:504:C:C2      | 1:AA:542:G:N2      | 2.85                     | 0.45              |
| 1:AA:684:U:O2      | 11:AK:41:ALA:HB3   | 2.17                     | 0.45              |
| 1:AA:842:U:N3      | 1:AA:843:U:O2'     | 2.48                     | 0.45              |
| 1:AA:1125:U:O2'    | 1:AA:1126:U:H2'    | 2.18                     | 0.45              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 17:AQ:75:LEU:HD12 | 17:AQ:75:LEU:C    | 2.42                     | 0.45              |
| 21:AU:25:LYS:HG3  | 21:AU:26:ALA:N    | 2.32                     | 0.45              |
| 28:BA:528:A:C2    | 28:BA:2043:C:H4'  | 2.52                     | 0.45              |
| 28:BA:593:U:H2'   | 28:BA:594:U:C6    | 2.51                     | 0.45              |
| 28:BA:784:G:O2'   | 28:BA:785:G:OP2   | 2.30                     | 0.45              |
| 28:BA:876:C:H2'   | 28:BA:877:A:O4'   | 2.17                     | 0.45              |
| 28:BA:1199:U:C1'  | 43:BQ:4:VAL:HG12  | 2.47                     | 0.45              |
| 28:BA:1847:A:O2'  | 28:BA:1848:A:H8   | 2.00                     | 0.45              |
| 1:AA:411:A:H8     | 4:AD:31:LYS:HZ1   | 1.65                     | 0.44              |
| 1:AA:1124:G:C3'   | 10:AJ:37:ARG:HH12 | 2.31                     | 0.44              |
| 2:AB:148:LEU:O    | 2:AB:148:LEU:HG   | 2.17                     | 0.44              |
| 4:AD:106:GLY:C    | 4:AD:108:GLY:N    | 2.73                     | 0.44              |
| 5:AE:15:LEU:HD23  | 5:AE:15:LEU:H     | 1.82                     | 0.44              |
| 8:AH:50:LYS:HD2   | 8:AH:60:GLU:HB3   | 1.99                     | 0.44              |
| 11:AK:35:THR:HG22 | 11:AK:41:ALA:H    | 1.82                     | 0.44              |
| 12:AL:90:LEU:HD23 | 12:AL:90:LEU:H    | 1.81                     | 0.44              |
| 27:B5:9:TYR:OH    | 33:BF:102:ARG:NH2 | 2.50                     | 0.44              |
| 28:BA:1913:A:H4'  | 28:BA:1914:C:O5'  | 2.17                     | 0.44              |
| 28:BA:2014:A:H2'  | 28:BA:2015:A:C8   | 2.51                     | 0.44              |
| 33:BF:175:PHE:HD2 | 33:BF:177:PHE:CE1 | 2.35                     | 0.44              |
| 37:BK:76:VAL:HG12 | 42:BP:73:VAL:HG22 | 1.98                     | 0.44              |
| 1:AA:407:U:H1'    | 4:AD:154:ARG:HH12 | 1.83                     | 0.44              |
| 1:AA:440:C:H2'    | 1:AA:441:A:C8     | 2.52                     | 0.44              |
| 1:AA:1151:A:O4'   | 10:AJ:41:PRO:HB2  | 2.17                     | 0.44              |
| 1:AA:1381:U:O2'   | 7:AG:79:ARG:O     | 2.23                     | 0.44              |
| 3:AC:106:VAL:HG23 | 3:AC:106:VAL:O    | 2.16                     | 0.44              |
| 3:AC:156:ARG:HD2  | 3:AC:160:ALA:O    | 2.17                     | 0.44              |
| 4:AD:48:LEU:H     | 4:AD:48:LEU:HD23  | 1.82                     | 0.44              |
| 4:AD:181:THR:CG2  | 4:AD:182:PHE:N    | 2.79                     | 0.44              |
| 4:AD:188:ARG:HA   | 4:AD:188:ARG:HD2  | 1.72                     | 0.44              |
| 28:BA:285:G:C6    | 28:BA:286:U:C4    | 3.05                     | 0.44              |
| 28:BA:2516:A:O2'  | 28:BA:2517:C:H5'  | 2.18                     | 0.44              |
| 28:BA:2799:A:O2'  | 28:BA:2800:A:H5'' | 2.17                     | 0.44              |
| 42:BP:82:ASP:O    | 42:BP:83:SER:C    | 2.60                     | 0.44              |
| 1:AA:1319:A:OP2   | 19:AS:5:LEU:HD11  | 2.17                     | 0.44              |
| 5:AE:80:THR:OG1   | 5:AE:98:PRO:O     | 2.30                     | 0.44              |
| 6:AF:26:THR:HG22  | 6:AF:36:ILE:HD13  | 2.00                     | 0.44              |
| 28:BA:2162:G:N2   | 28:BA:2163:A:N3   | 2.65                     | 0.44              |
| 35:BH:44:ILE:HA   | 35:BH:47:PHE:CE2  | 2.52                     | 0.44              |
| 39:BM:53:MET:HE1  | 39:BM:103:TYR:CD1 | 2.52                     | 0.44              |
| 1:AA:426:U:H2'    | 1:AA:427:U:C5     | 2.53                     | 0.44              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 1:AA:462:G:C4    | 1:AA:463:U:C5     | 3.05                     | 0.44              |
| 1:AA:481:G:N3    | 1:AA:483:C:C4     | 2.86                     | 0.44              |
| 1:AA:921:U:O2    | 5:AE:24:THR:CG2   | 2.65                     | 0.44              |
| 2:AB:21:ARG:C    | 2:AB:23:TRP:N     | 2.76                     | 0.44              |
| 28:BA:547:A:H3'  | 28:BA:548:G:C5'   | 2.47                     | 0.44              |
| 28:BA:613:A:H3'  | 28:BA:614:A:H5'   | 1.99                     | 0.44              |
| 28:BA:1170:C:O2  | 28:BA:1171:G:N7   | 2.50                     | 0.44              |
| 28:BA:1360:G:N7  | 28:BA:1361:G:C8   | 2.85                     | 0.44              |
| 28:BA:1383:A:H2' | 28:BA:1384:A:C8   | 2.53                     | 0.44              |
| 28:BA:2321:U:H5' | 28:BA:2322:A:OP2  | 2.17                     | 0.44              |
| 28:BA:2788:C:H2' | 28:BA:2789:C:C6   | 2.52                     | 0.44              |
| 31:BD:104:VAL:O  | 31:BD:105:LYS:HG2 | 2.17                     | 0.44              |
| 1:AA:419:C:OP2   | 1:AA:513:C:H1'    | 2.16                     | 0.44              |
| 1:AA:442:G:C4    | 1:AA:443:C:C5     | 3.06                     | 0.44              |
| 1:AA:463:U:H2'   | 1:AA:464:U:O4'    | 2.18                     | 0.44              |
| 1:AA:713:G:H2'   | 1:AA:714:G:C8     | 2.53                     | 0.44              |
| 1:AA:769:G:H4'   | 1:AA:1513:A:H4'   | 1.99                     | 0.44              |
| 1:AA:1125:U:O2'  | 1:AA:1126:U:O5'   | 2.31                     | 0.44              |
| 6:AF:63:ASN:HD21 | 6:AF:96:VAL:HG13  | 1.82                     | 0.44              |
| 11:AK:126:LYS:HA | 21:AU:34:ARG:CD   | 2.47                     | 0.44              |
| 19:AS:4:SER:OG   | 19:AS:5:LEU:HD12  | 2.18                     | 0.44              |
| 20:AT:71:LYS:HE2 | 20:AT:75:HIS:NE2  | 2.32                     | 0.44              |
| 28:BA:1913:A:H1' | 28:BA:1914:C:OP2  | 2.17                     | 0.44              |
| 1:AA:441:A:H2'   | 1:AA:442:G:O4'    | 2.17                     | 0.44              |
| 1:AA:448:A:H62   | 1:AA:486:U:H2'    | 1.81                     | 0.44              |
| 2:AB:165:ASP:OD1 | 2:AB:168:HIS:N    | 2.41                     | 0.44              |
| 4:AD:15:GLU:OE1  | 4:AD:17:THR:N     | 2.51                     | 0.44              |
| 14:AN:18:ASP:C   | 14:AN:18:ASP:OD1  | 2.60                     | 0.44              |
| 19:AS:46:GLY:H   | 19:AS:62:VAL:HG13 | 1.82                     | 0.44              |
| 28:BA:2071:A:H2' | 28:BA:2072:C:C6   | 2.53                     | 0.44              |
| 28:BA:2581:G:OP2 | 28:BA:2581:G:N2   | 2.50                     | 0.44              |
| 30:BC:9:THR:O    | 30:BC:10:SER:CB   | 2.65                     | 0.44              |
| 39:BM:53:MET:HG3 | 39:BM:120:ALA:HB2 | 2.00                     | 0.44              |
| 44:BR:49:ILE:HB  | 44:BR:51:VAL:O    | 2.18                     | 0.44              |
| 1:AA:430:A:C2    | 1:AA:431:A:C8     | 3.05                     | 0.44              |
| 1:AA:438:U:C5'   | 4:AD:120:HIS:HD2  | 2.25                     | 0.44              |
| 1:AA:515:G:H2'   | 1:AA:516:U:O4'    | 2.17                     | 0.44              |
| 1:AA:1147:C:H1'  | 9:AI:18:ARG:HH12  | 1.81                     | 0.44              |
| 1:AA:1323:G:H2'  | 1:AA:1324:A:C8    | 2.53                     | 0.44              |
| 5:AE:35:ALA:O    | 5:AE:50:TYR:O     | 2.36                     | 0.44              |
| 12:AL:50:ARG:NH1 | 12:AL:89:ASP:OD2  | 2.50                     | 0.44              |

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| Atom-1            | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|--------------------|--------------------------|-------------------|
| 13:AM:28:THR:HG23 | 13:AM:29:ARG:N     | 2.32                     | 0.44              |
| 20:AT:69:LYS:HB2  | 20:AT:69:LYS:HE3   | 1.77                     | 0.44              |
| 28:BA:1046:A:H3'  | 28:BA:1047:G:C5'   | 2.47                     | 0.44              |
| 28:BA:1420:A:C5   | 28:BA:2211:A:C5    | 3.05                     | 0.44              |
| 47:BU:18:ASP:N    | 47:BU:18:ASP:OD1   | 2.50                     | 0.44              |
| 1:AA:131:A:H2'    | 1:AA:132:C:C6      | 2.53                     | 0.44              |
| 3:AC:59:ARG:HG2   | 3:AC:64:ILE:HG22   | 2.00                     | 0.44              |
| 4:AD:33:LYS:O     | 4:AD:34:ILE:C      | 2.60                     | 0.44              |
| 4:AD:110:THR:CG2  | 4:AD:113:GLU:H     | 2.10                     | 0.44              |
| 5:AE:105:ILE:O    | 5:AE:106:ILE:C     | 2.61                     | 0.44              |
| 25:B3:12:LYS:NZ   | 28:BA:249:C:O2     | 2.48                     | 0.44              |
| 28:BA:1329:U:OP2  | 28:BA:1330:C:N4    | 2.49                     | 0.44              |
| 1:AA:412:A:N7     | 1:AA:431:A:N1      | 2.66                     | 0.44              |
| 1:AA:480:U:H2'    | 1:AA:481:G:C8      | 2.53                     | 0.44              |
| 1:AA:493:A:H2'    | 1:AA:494:G:O4'     | 2.18                     | 0.44              |
| 1:AA:511:C:O2'    | 1:AA:512:U:OP2     | 2.30                     | 0.44              |
| 9:AI:87:LEU:HG    | 9:AI:94:LEU:HD11   | 2.00                     | 0.44              |
| 10:AJ:14:ASP:N    | 10:AJ:14:ASP:OD1   | 2.51                     | 0.44              |
| 13:AM:16:VAL:O    | 13:AM:20:THR:HG23  | 2.18                     | 0.44              |
| 28:BA:2330:G:H21  | 49:BW:42:GLY:HA2   | 1.81                     | 0.44              |
| 32:BE:3:LEU:CD1   | 32:BE:120:VAL:HG21 | 2.47                     | 0.44              |
| 34:BG:149:ARG:HA  | 34:BG:162:VAL:CG1  | 2.47                     | 0.44              |
| 1:AA:211:G:C2'    | 1:AA:212:G:O4'     | 2.66                     | 0.43              |
| 1:AA:732:C:OP2    | 21:AU:38:TYR:OH    | 2.32                     | 0.43              |
| 1:AA:946:A:H2'    | 1:AA:947:G:C8      | 2.53                     | 0.43              |
| 3:AC:155:GLY:O    | 3:AC:196:ILE:HG12  | 2.18                     | 0.43              |
| 4:AD:34:ILE:O     | 4:AD:35:GLU:CG     | 2.62                     | 0.43              |
| 28:BA:1715:G:O2'  | 28:BA:1743:G:O6    | 2.21                     | 0.43              |
| 28:BA:2599:G:C8   | 30:BC:236:GLU:HG2  | 2.52                     | 0.43              |
| 28:BA:2687:U:H2'  | 28:BA:2688:G:O4'   | 2.18                     | 0.43              |
| 33:BF:135:GLN:HG2 | 33:BF:141:ILE:HD13 | 2.00                     | 0.43              |
| 34:BG:155:GLU:OE2 | 34:BG:158:LYS:N    | 2.51                     | 0.43              |
| 4:AD:11:LEU:CD1   | 4:AD:19:LEU:HD12   | 2.49                     | 0.43              |
| 10:AJ:8:ILE:HB    | 10:AJ:74:VAL:HG22  | 2.00                     | 0.43              |
| 20:AT:62:ALA:HA   | 20:AT:67:ILE:HG13  | 1.99                     | 0.43              |
| 28:BA:44:A:H2'    | 28:BA:45:G:O4'     | 2.18                     | 0.43              |
| 28:BA:141:G:H3'   | 28:BA:141:G:N3     | 2.33                     | 0.43              |
| 28:BA:1171:G:N1   | 28:BA:1178:C:O2    | 2.50                     | 0.43              |
| 28:BA:1730:C:O2'  | 28:BA:1731:G:C5    | 2.71                     | 0.43              |
| 28:BA:1918:A:O2'  | 28:BA:1920:C:N4    | 2.51                     | 0.43              |
| 28:BA:1954:G:O2'  | 28:BA:1956:U:O4    | 2.34                     | 0.43              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 28:BA:2323:G:H2'  | 28:BA:2324:U:O4'  | 2.18                     | 0.43              |
| 44:BR:51:VAL:HG13 | 44:BR:52:PRO:HD2  | 2.00                     | 0.43              |
| 1:AA:616:G:C2     | 1:AA:617:G:C5     | 3.06                     | 0.43              |
| 1:AA:948:C:P      | 13:AM:105:ASN:O   | 2.76                     | 0.43              |
| 1:AA:1496:C:H2'   | 1:AA:1497:G:O4'   | 2.18                     | 0.43              |
| 2:AB:58:ASN:C     | 2:AB:58:ASN:HD22  | 2.27                     | 0.43              |
| 2:AB:74:ARG:O     | 2:AB:75:ALA:HB3   | 2.19                     | 0.43              |
| 4:AD:181:THR:CG2  | 4:AD:182:PHE:H    | 2.32                     | 0.43              |
| 9:AI:52:LEU:HD22  | 9:AI:57:MET:CE    | 2.48                     | 0.43              |
| 19:AS:28:LYS:HG3  | 19:AS:29:LYS:N    | 2.31                     | 0.43              |
| 21:AU:20:LYS:O    | 21:AU:25:LYS:HB2  | 2.19                     | 0.43              |
| 28:BA:493:G:H2'   | 28:BA:494:G:O4'   | 2.18                     | 0.43              |
| 28:BA:586:A:N1    | 28:BA:809:G:O2'   | 2.45                     | 0.43              |
| 36:BJ:19:ASP:OD1  | 36:BJ:58:ASN:ND2  | 2.49                     | 0.43              |
| 38:BL:86:GLU:O    | 38:BL:86:GLU:CD   | 2.62                     | 0.43              |
| 1:AA:455:G:H2'    | 1:AA:456:A:C8     | 2.53                     | 0.43              |
| 1:AA:481:G:N3     | 1:AA:482:A:C6     | 2.86                     | 0.43              |
| 1:AA:540:G:H2'    | 1:AA:541:G:H8     | 1.81                     | 0.43              |
| 6:AF:18:VAL:HG11  | 6:AF:58:HIS:CE1   | 2.54                     | 0.43              |
| 12:AL:114:ARG:O   | 12:AL:115:SER:C   | 2.61                     | 0.43              |
| 13:AM:48:LEU:HD12 | 13:AM:52:GLN:OE1  | 2.18                     | 0.43              |
| 16:AP:36:VAL:HG12 | 16:AP:36:VAL:O    | 2.19                     | 0.43              |
| 28:BA:137:U:H5''  | 28:BA:138:U:H3    | 1.83                     | 0.43              |
| 28:BA:993:G:OP1   | 43:BQ:50:ARG:NH1  | 2.50                     | 0.43              |
| 28:BA:2101:A:H3'  | 28:BA:2102:G:C5'  | 2.48                     | 0.43              |
| 50:BX:39:TRP:NE1  | 50:BX:41:GLU:OE2  | 2.49                     | 0.43              |
| 1:AA:445:G:N3     | 1:AA:445:G:H2'    | 2.34                     | 0.43              |
| 1:AA:454:G:H2'    | 1:AA:455:G:H8     | 1.82                     | 0.43              |
| 1:AA:555:U:H2'    | 1:AA:556:C:C6     | 2.53                     | 0.43              |
| 1:AA:616:G:O2'    | 16:AP:46:LYS:NZ   | 2.42                     | 0.43              |
| 5:AE:72:ILE:HD11  | 5:AE:141:ILE:HG23 | 1.99                     | 0.43              |
| 5:AE:94:VAL:CG1   | 5:AE:111:MET:HE1  | 2.48                     | 0.43              |
| 8:AH:52:GLU:O     | 8:AH:57:PRO:HA    | 2.18                     | 0.43              |
| 10:AJ:63:ASP:OD2  | 10:AJ:65:TYR:OH   | 2.22                     | 0.43              |
| 27:B5:64:PHE:CG   | 27:B5:65:ASN:N    | 2.86                     | 0.43              |
| 28:BA:972:A:OP2   | 28:BA:973:A:O2'   | 2.33                     | 0.43              |
| 28:BA:1173:U:H3'  | 28:BA:1174:U:H4'  | 1.99                     | 0.43              |
| 28:BA:1668:A:H4'  | 28:BA:1669:A:O5'  | 2.18                     | 0.43              |
| 1:AA:411:A:H8     | 4:AD:31:LYS:CE    | 2.31                     | 0.43              |
| 1:AA:1538:C:O2'   | 1:AA:1539:C:O5'   | 2.33                     | 0.43              |
| 2:AB:218:ALA:O    | 2:AB:221:VAL:HG12 | 2.19                     | 0.43              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 5:AE:79:GLY:O    | 5:AE:121:HIS:N    | 2.45                     | 0.43              |
| 5:AE:106:ILE:O   | 5:AE:106:ILE:HG13 | 2.17                     | 0.43              |
| 12:AL:99:ARG:NH1 | 12:AL:104:CYS:SG  | 2.91                     | 0.43              |
| 17:AQ:50:ASN:O   | 17:AQ:51:ASN:C    | 2.62                     | 0.43              |
| 19:AS:12:ASP:HB3 | 19:AS:14:HIS:CD2  | 2.54                     | 0.43              |
| 23:B1:40:ASP:O   | 23:B1:44:ARG:N    | 2.43                     | 0.43              |
| 28:BA:613:A:H3'  | 28:BA:614:A:C5'   | 2.48                     | 0.43              |
| 28:BA:1791:A:C2  | 28:BA:1829:A:C4'  | 3.02                     | 0.43              |
| 28:BA:1853:A:H2' | 28:BA:1854:A:C8   | 2.54                     | 0.43              |
| 28:BA:1881:C:H2' | 28:BA:1882:U:O4'  | 2.18                     | 0.43              |
| 28:BA:2189:U:N3  | 28:BA:2190:G:N7   | 2.66                     | 0.43              |
| 1:AA:407:U:O2'   | 4:AD:154:ARG:NH2  | 2.52                     | 0.43              |
| 1:AA:492:C:C2'   | 1:AA:493:A:C8     | 3.00                     | 0.43              |
| 1:AA:1179:A:H2'  | 1:AA:1180:A:O4'   | 2.18                     | 0.43              |
| 4:AD:110:THR:HB  | 4:AD:113:GLU:HG3  | 2.00                     | 0.43              |
| 4:AD:183:LYS:HZ2 | 4:AD:183:LYS:HG2  | 1.68                     | 0.43              |
| 21:AU:23:CYS:SG  | 21:AU:24:GLU:OE1  | 2.77                     | 0.43              |
| 28:BA:784:G:HO2' | 28:BA:785:G:P     | 2.40                     | 0.43              |
| 28:BA:1063:G:H2' | 28:BA:1064:C:O5'  | 2.18                     | 0.43              |
| 28:BA:1179:G:C4  | 28:BA:1180:U:H4'  | 2.53                     | 0.43              |
| 28:BA:1871:A:O2' | 28:BA:1872:A:P    | 2.77                     | 0.43              |
| 28:BA:2848:G:O2' | 28:BA:2867:G:N2   | 2.39                     | 0.43              |
| 1:AA:337:G:H2'   | 1:AA:338:A:C8     | 2.54                     | 0.43              |
| 1:AA:616:G:O2'   | 16:AP:46:LYS:HD2  | 2.19                     | 0.43              |
| 1:AA:925:G:C2    | 1:AA:927:G:C8     | 3.07                     | 0.43              |
| 1:AA:1146:A:N3   | 1:AA:1146:A:H2'   | 2.32                     | 0.43              |
| 4:AD:139:PRO:HA  | 4:AD:182:PHE:HB3  | 2.01                     | 0.43              |
| 5:AE:95:PHE:O    | 5:AE:125:ALA:O    | 2.36                     | 0.43              |
| 6:AF:12:PRO:HD2  | 6:AF:54:LEU:HD11  | 1.99                     | 0.43              |
| 9:AI:114:LYS:HG3 | 9:AI:114:LYS:O    | 2.18                     | 0.43              |
| 12:AL:94:ARG:HG2 | 12:AL:94:ARG:O    | 2.19                     | 0.43              |
| 19:AS:12:ASP:O   | 19:AS:13:LEU:C    | 2.61                     | 0.43              |
| 28:BA:792:A:N3   | 28:BA:2072:C:O2'  | 2.46                     | 0.43              |
| 28:BA:1802:A:H2' | 28:BA:1803:A:C8   | 2.53                     | 0.43              |
| 1:AA:512:U:O5'   | 4:AD:41:HIS:HE1   | 2.02                     | 0.43              |
| 4:AD:3:ARG:NH1   | 4:AD:5:LEU:HG     | 2.34                     | 0.43              |
| 1:AA:438:U:N3    | 1:AA:495:A:C8     | 2.86                     | 0.43              |
| 1:AA:449:G:N2    | 1:AA:486:U:O2'    | 2.52                     | 0.43              |
| 4:AD:183:LYS:HZ3 | 4:AD:184:ARG:NH1  | 2.16                     | 0.43              |
| 7:AG:108:ALA:HA  | 7:AG:111:ARG:HG3  | 2.01                     | 0.43              |
| 9:AI:87:LEU:HG   | 9:AI:87:LEU:O     | 2.19                     | 0.43              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 14:AN:93:ILE:HG21 | 14:AN:96:LEU:CD1  | 2.49                     | 0.43              |
| 16:AP:36:VAL:CG1  | 16:AP:57:ILE:HD11 | 2.49                     | 0.43              |
| 28:BA:25:U:O2'    | 28:BA:26:G:P      | 2.77                     | 0.43              |
| 28:BA:445:C:H2'   | 28:BA:446:G:O4'   | 2.18                     | 0.43              |
| 28:BA:1282:U:H2'  | 28:BA:1283:G:O4'  | 2.18                     | 0.43              |
| 35:BH:47:PHE:CD1  | 35:BH:47:PHE:C    | 2.96                     | 0.43              |
| 37:BK:93:GLN:O    | 37:BK:94:PRO:C    | 2.62                     | 0.43              |
| 50:BX:5:CYS:HA    | 50:BX:33:LEU:HD11 | 2.01                     | 0.43              |
| 1:AA:88:U:C2      | 1:AA:89:U:C5      | 3.07                     | 0.42              |
| 1:AA:147:G:H2'    | 1:AA:148:G:C8     | 2.54                     | 0.42              |
| 1:AA:1229:A:P     | 13:AM:113:ARG:NH2 | 2.92                     | 0.42              |
| 1:AA:1446:A:O2'   | 1:AA:1447:A:H5'   | 2.19                     | 0.42              |
| 2:AB:21:ARG:C     | 2:AB:23:TRP:H     | 2.27                     | 0.42              |
| 2:AB:213:TYR:O    | 2:AB:217:VAL:HG12 | 2.19                     | 0.42              |
| 6:AF:5:GLU:HA     | 6:AF:63:ASN:HA    | 2.01                     | 0.42              |
| 6:AF:9:MET:SD     | 6:AF:59:TYR:CZ    | 3.12                     | 0.42              |
| 6:AF:26:THR:HG22  | 6:AF:36:ILE:CD1   | 2.48                     | 0.42              |
| 12:AL:33:VAL:HG22 | 12:AL:56:ARG:HB3  | 2.01                     | 0.42              |
| 16:AP:73:ALA:O    | 16:AP:76:LYS:HG2  | 2.19                     | 0.42              |
| 18:AR:47:THR:O    | 18:AR:48:ARG:C    | 2.62                     | 0.42              |
| 28:BA:2291:U:OP1  | 28:BA:2380:C:O2'  | 2.32                     | 0.42              |
| 1:AA:275:G:C5'    | 17:AQ:16:LYS:NZ   | 2.82                     | 0.42              |
| 1:AA:515:G:C2'    | 1:AA:516:U:O4'    | 2.67                     | 0.42              |
| 1:AA:714:G:H2'    | 1:AA:715:A:C8     | 2.55                     | 0.42              |
| 1:AA:1067:A:N1    | 1:AA:1108:G:O2'   | 2.27                     | 0.42              |
| 1:AA:1124:G:O2'   | 1:AA:1127:G:O6    | 2.37                     | 0.42              |
| 1:AA:1326:U:C2    | 1:AA:1327:C:C5    | 3.07                     | 0.42              |
| 1:AA:1402:C:H2'   | 1:AA:1403:C:O4'   | 2.18                     | 0.42              |
| 4:AD:13:ARG:C     | 4:AD:38:PRO:HG3   | 2.44                     | 0.42              |
| 13:AM:3:ARG:NH2   | 13:AM:7:ILE:HG22  | 2.33                     | 0.42              |
| 14:AN:47:LYS:NZ   | 19:AS:13:LEU:HD22 | 2.32                     | 0.42              |
| 23:B1:34:LEU:HB3  | 23:B1:52:ALA:HB2  | 2.02                     | 0.42              |
| 28:BA:370:G:O2'   | 28:BA:424:G:OP1   | 2.34                     | 0.42              |
| 28:BA:1796:U:H2'  | 28:BA:1797:G:H8   | 1.84                     | 0.42              |
| 29:BB:41:G:O6     | 33:BF:69:LYS:NZ   | 2.47                     | 0.42              |
| 1:AA:502:A:O2'    | 1:AA:503:C:H5'    | 2.19                     | 0.42              |
| 1:AA:505:G:H2'    | 1:AA:506:G:C8     | 2.54                     | 0.42              |
| 28:BA:191:A:H2'   | 28:BA:192:C:C6    | 2.54                     | 0.42              |
| 28:BA:859:G:O2'   | 28:BA:916:G:O6    | 2.35                     | 0.42              |
| 31:BD:105:LYS:O   | 31:BD:106:LYS:HG3 | 2.20                     | 0.42              |
| 1:AA:442:G:O2'    | 1:AA:443:C:H5'    | 2.19                     | 0.42              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 1:AA:516:U:H2'    | 1:AA:517:G:O4'    | 2.19                     | 0.42              |
| 2:AB:99:GLY:N     | 2:AB:175:GLU:OE2  | 2.48                     | 0.42              |
| 5:AE:111:MET:HA   | 5:AE:114:VAL:HG12 | 2.01                     | 0.42              |
| 9:AI:28:ILE:CD1   | 9:AI:63:LEU:HD23  | 2.49                     | 0.42              |
| 15:AO:79:THR:O    | 15:AO:80:GLN:C    | 2.63                     | 0.42              |
| 17:AQ:80:GLU:O    | 17:AQ:80:GLU:OE1  | 2.37                     | 0.42              |
| 20:AT:43:ASP:CG   | 20:AT:46:ALA:HB3  | 2.45                     | 0.42              |
| 28:BA:667:U:H2'   | 28:BA:668:A:O4'   | 2.19                     | 0.42              |
| 28:BA:1774:C:O2   | 28:BA:1774:C:H2'  | 2.18                     | 0.42              |
| 1:AA:115:G:H4'    | 1:AA:116:A:O5'    | 2.18                     | 0.42              |
| 1:AA:205:A:N3     | 1:AA:206:C:C4     | 2.87                     | 0.42              |
| 1:AA:450:G:C6     | 1:AA:481:G:C6     | 3.07                     | 0.42              |
| 1:AA:486:U:C2     | 1:AA:486:U:P      | 3.12                     | 0.42              |
| 1:AA:1356:G:H2'   | 1:AA:1357:A:H8    | 1.84                     | 0.42              |
| 4:AD:97:ARG:HE    | 4:AD:134:SER:HA   | 1.85                     | 0.42              |
| 19:AS:5:LEU:C     | 19:AS:7:LYS:H     | 2.28                     | 0.42              |
| 23:B1:9:ILE:HG22  | 23:B1:53:LYS:HB2  | 2.02                     | 0.42              |
| 28:BA:240:C:OP2   | 28:BA:241:A:O2'   | 2.34                     | 0.42              |
| 28:BA:623:C:H2'   | 28:BA:624:C:C6    | 2.55                     | 0.42              |
| 28:BA:1794:A:H2'  | 28:BA:1795:C:C6   | 2.55                     | 0.42              |
| 28:BA:2029:G:N1   | 28:BA:2033:A:OP2  | 2.39                     | 0.42              |
| 32:BE:3:LEU:O     | 32:BE:3:LEU:HD12  | 2.19                     | 0.42              |
| 44:BR:23:GLU:O    | 44:BR:94:THR:HG22 | 2.20                     | 0.42              |
| 50:BX:32:ASN:OD1  | 50:BX:32:ASN:O    | 2.37                     | 0.42              |
| 1:AA:20:U:H2'     | 1:AA:21:G:O4'     | 2.19                     | 0.42              |
| 1:AA:216:U:H2'    | 1:AA:217:C:C6     | 2.54                     | 0.42              |
| 1:AA:443:C:H3'    | 1:AA:444:G:H8     | 1.84                     | 0.42              |
| 1:AA:1119:C:OP1   | 9:AI:85:ARG:NH1   | 2.52                     | 0.42              |
| 1:AA:1396:A:H2    | 5:AE:24:THR:HG21  | 1.84                     | 0.42              |
| 14:AN:93:ILE:HG21 | 14:AN:96:LEU:HD12 | 2.00                     | 0.42              |
| 28:BA:1028:A:H2'  | 28:BA:1029:A:C8   | 2.54                     | 0.42              |
| 28:BA:1171:G:O3'  | 28:BA:1172:C:O4'  | 2.37                     | 0.42              |
| 28:BA:1203:U:OP2  | 28:BA:1204:A:O2'  | 2.27                     | 0.42              |
| 28:BA:1754:A:C8   | 42:BP:94:LYS:HE3  | 2.54                     | 0.42              |
| 28:BA:2064:C:H2'  | 28:BA:2065:C:C6   | 2.54                     | 0.42              |
| 28:BA:2266:A:H4'  | 28:BA:2267:A:O5'  | 2.19                     | 0.42              |
| 29:BB:5:U:OP1     | 29:BB:61:G:O2'    | 2.31                     | 0.42              |
| 42:BP:73:VAL:O    | 42:BP:73:VAL:HG23 | 2.20                     | 0.42              |
| 1:AA:751:U:H2'    | 1:AA:752:G:O4'    | 2.20                     | 0.42              |
| 1:AA:1167:A:N6    | 1:AA:1169:A:N1    | 2.67                     | 0.42              |
| 4:AD:154:ARG:H    | 4:AD:154:ARG:HG2  | 1.57                     | 0.42              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 5:AE:23:LYS:C      | 5:AE:24:THR:HG22   | 2.44                     | 0.42              |
| 10:AJ:10:LEU:HD11  | 10:AJ:98:VAL:HG12  | 2.01                     | 0.42              |
| 12:AL:81:LEU:O     | 12:AL:98:VAL:HG12  | 2.18                     | 0.42              |
| 14:AN:18:ASP:OD1   | 14:AN:19:LYS:N     | 2.53                     | 0.42              |
| 28:BA:1328:A:H2'   | 28:BA:1330:C:C4    | 2.54                     | 0.42              |
| 28:BA:2190:G:H2'   | 28:BA:2191:A:C8    | 2.54                     | 0.42              |
| 28:BA:2406:A:C2    | 38:BL:69:ARG:NH2   | 2.87                     | 0.42              |
| 31:BD:180:VAL:HG22 | 31:BD:187:LEU:HD12 | 2.02                     | 0.42              |
| 1:AA:323:U:H2'     | 1:AA:324:G:O4'     | 2.19                     | 0.42              |
| 1:AA:406:G:H2'     | 4:AD:116:GLN:NE2   | 2.35                     | 0.42              |
| 1:AA:478:A:C8      | 1:AA:479:U:C4      | 3.08                     | 0.42              |
| 1:AA:512:U:O5'     | 4:AD:41:HIS:CE1    | 2.73                     | 0.42              |
| 1:AA:722:G:H5'     | 21:AU:49:LYS:HZ1   | 1.84                     | 0.42              |
| 2:AB:218:ALA:O     | 2:AB:222:ARG:HG2   | 2.20                     | 0.42              |
| 3:AC:47:LEU:HD21   | 3:AC:87:LEU:HD11   | 2.02                     | 0.42              |
| 4:AD:67:VAL:HG22   | 4:AD:97:ARG:HH12   | 1.84                     | 0.42              |
| 4:AD:137:VAL:HG13  | 4:AD:137:VAL:O     | 2.18                     | 0.42              |
| 9:AI:57:MET:O      | 9:AI:60:LYS:HG3    | 2.19                     | 0.42              |
| 16:AP:12:LYS:HG2   | 16:AP:13:LYS:HG2   | 2.02                     | 0.42              |
| 16:AP:20:VAL:HG21  | 16:AP:32:PHE:CG    | 2.55                     | 0.42              |
| 33:BF:20:PHE:C     | 33:BF:21:ASN:OD1   | 2.62                     | 0.42              |
| 1:AA:17:U:H2'      | 1:AA:18:C:C6       | 2.54                     | 0.42              |
| 1:AA:419:C:C2'     | 1:AA:420:U:H5'     | 2.50                     | 0.42              |
| 1:AA:881:G:OP2     | 12:AL:9:ARG:NH2    | 2.53                     | 0.42              |
| 4:AD:58:LYS:HD3    | 4:AD:203:LEU:HD23  | 2.02                     | 0.42              |
| 5:AE:13:GLU:OE1    | 5:AE:68:ARG:NH2    | 2.49                     | 0.42              |
| 8:AH:113:ASP:N     | 8:AH:113:ASP:OD1   | 2.50                     | 0.42              |
| 16:AP:42:ILE:O     | 16:AP:44:SER:N     | 2.52                     | 0.42              |
| 19:AS:13:LEU:O     | 19:AS:14:HIS:C     | 2.60                     | 0.42              |
| 25:B3:19:LYS:HG3   | 28:BA:651:G:H5'    | 2.01                     | 0.42              |
| 28:BA:140:C:H1'    | 28:BA:141:G:C2     | 2.55                     | 0.42              |
| 28:BA:742:A:H2'    | 28:BA:743:A:C8     | 2.55                     | 0.42              |
| 28:BA:2101:A:H3'   | 28:BA:2102:G:H5''  | 2.02                     | 0.42              |
| 28:BA:2189:U:C2    | 28:BA:2190:G:N7    | 2.88                     | 0.42              |
| 30:BC:30:PHE:HD2   | 30:BC:33:LEU:HD12  | 1.85                     | 0.42              |
| 31:BD:3:GLY:C      | 31:BD:4:LEU:HD22   | 2.45                     | 0.42              |
| 41:BO:34:HIS:HA    | 41:BO:53:THR:CG2   | 2.50                     | 0.42              |
| 41:BO:116:GLN:HE21 | 41:BO:116:GLN:HB3  | 1.64                     | 0.42              |
| 1:AA:537:G:C6      | 1:AA:538:G:C5      | 3.08                     | 0.42              |
| 1:AA:978:A:C4      | 1:AA:1319:A:C2     | 3.08                     | 0.42              |
| 1:AA:1486:G:H2'    | 1:AA:1487:G:O4'    | 2.20                     | 0.42              |

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| Atom-1             | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|-------------------|--------------------------|-------------------|
| 4:AD:17:THR:HG22   | 4:AD:18:ASP:N     | 2.35                     | 0.42              |
| 4:AD:99:ASP:N      | 4:AD:99:ASP:OD1   | 2.50                     | 0.42              |
| 5:AE:102:GLY:C     | 5:AE:103:THR:HG1  | 2.19                     | 0.42              |
| 6:AF:19:PRO:O      | 6:AF:23:GLU:OE1   | 2.37                     | 0.42              |
| 9:AI:52:LEU:HB3    | 9:AI:57:MET:HE2   | 2.01                     | 0.42              |
| 10:AJ:91:ASP:OD1   | 10:AJ:91:ASP:N    | 2.53                     | 0.42              |
| 13:AM:64:VAL:HG13  | 13:AM:68:ASP:CG   | 2.45                     | 0.42              |
| 20:AT:65:GLY:O     | 20:AT:66:LEU:C    | 2.61                     | 0.42              |
| 28:BA:479:A:H4'    | 28:BA:480:A:OP1   | 2.19                     | 0.42              |
| 28:BA:483:A:O2'    | 47:BU:57:GLY:N    | 2.46                     | 0.42              |
| 28:BA:1583:A:HO2'  | 28:BA:1584:U:P    | 2.42                     | 0.42              |
| 29:BB:42:C:N3      | 33:BF:90:THR:HG22 | 2.34                     | 0.42              |
| 33:BF:106:ILE:HG21 | 33:BF:139:PRO:HG3 | 2.02                     | 0.42              |
| 1:AA:491:G:C6      | 1:AA:492:C:N4     | 2.88                     | 0.41              |
| 1:AA:524:G:H2'     | 1:AA:525:C:C6     | 2.54                     | 0.41              |
| 1:AA:722:G:O3'     | 21:AU:49:LYS:NZ   | 2.47                     | 0.41              |
| 4:AD:188:ARG:O     | 4:AD:189:SER:C    | 2.62                     | 0.41              |
| 8:AH:95:VAL:O      | 8:AH:99:LEU:O     | 2.38                     | 0.41              |
| 11:AK:42:LEU:CD1   | 11:AK:79:ILE:HD11 | 2.50                     | 0.41              |
| 16:AP:61:VAL:CG2   | 16:AP:67:ILE:HD11 | 2.50                     | 0.41              |
| 20:AT:28:MET:HE1   | 20:AT:67:ILE:HG21 | 2.02                     | 0.41              |
| 28:BA:871:U:H2'    | 28:BA:872:U:C6    | 2.54                     | 0.41              |
| 28:BA:1319:C:O2'   | 28:BA:1320:C:H5'  | 2.20                     | 0.41              |
| 28:BA:1469:A:H2'   | 28:BA:1470:A:C8   | 2.55                     | 0.41              |
| 28:BA:1548:A:H2'   | 28:BA:1549:A:C8   | 2.55                     | 0.41              |
| 37:BK:99:ILE:CD1   | 37:BK:119:ALA:HB2 | 2.47                     | 0.41              |
| 47:BU:5:ILE:HD11   | 47:BU:67:VAL:HG13 | 2.02                     | 0.41              |
| 48:BV:65:VAL:O     | 48:BV:65:VAL:HG13 | 2.20                     | 0.41              |
| 1:AA:504:C:C2      | 1:AA:542:G:C2     | 3.08                     | 0.41              |
| 4:AD:8:LYS:HD2     | 4:AD:8:LYS:C      | 2.44                     | 0.41              |
| 20:AT:24:ARG:HE    | 20:AT:27:MET:HE3  | 1.83                     | 0.41              |
| 28:BA:81:G:H2'     | 28:BA:82:U:O4'    | 2.19                     | 0.41              |
| 28:BA:1025:G:H4'   | 28:BA:1026:G:OP2  | 2.19                     | 0.41              |
| 28:BA:1083:U:O2'   | 28:BA:1085:A:N6   | 2.51                     | 0.41              |
| 28:BA:1746:A:H2'   | 28:BA:1747:U:C6   | 2.55                     | 0.41              |
| 28:BA:1847:A:O2'   | 28:BA:1848:A:P    | 2.78                     | 0.41              |
| 28:BA:1928:A:H2'   | 28:BA:1929:G:O4'  | 2.19                     | 0.41              |
| 28:BA:2286:G:H5''  | 28:BA:2287:A:OP1  | 2.20                     | 0.41              |
| 28:BA:2639:A:O3'   | 36:BJ:96:ARG:NH1  | 2.53                     | 0.41              |
| 37:BK:118:LEU:O    | 37:BK:119:ALA:HB3 | 2.20                     | 0.41              |
| 38:BL:92:LEU:HD11  | 38:BL:106:GLU:O   | 2.21                     | 0.41              |

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| Atom-1            | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|--------------------|--------------------------|-------------------|
| 52:BZ:6:LYS:HD2   | 52:BZ:37:GLU:HG3   | 2.02                     | 0.41              |
| 1:AA:182:A:C4     | 1:AA:184:G:C8      | 3.08                     | 0.41              |
| 1:AA:371:A:H2'    | 1:AA:372:C:O4'     | 2.21                     | 0.41              |
| 1:AA:412:A:N6     | 1:AA:431:A:C2      | 2.81                     | 0.41              |
| 1:AA:449:G:N1     | 1:AA:486:U:C1'     | 2.78                     | 0.41              |
| 1:AA:453:G:H2'    | 1:AA:454:G:C8      | 2.55                     | 0.41              |
| 1:AA:580:C:H2'    | 1:AA:581:G:O4'     | 2.20                     | 0.41              |
| 1:AA:1078:U:O2'   | 1:AA:1079:G:P      | 2.77                     | 0.41              |
| 1:AA:1140:C:HO2'  | 1:AA:1141:C:H6     | 1.65                     | 0.41              |
| 1:AA:1363:A:O2'   | 1:AA:1365:G:N7     | 2.46                     | 0.41              |
| 2:AB:19:GLN:HB2   | 2:AB:189:THR:OG1   | 2.21                     | 0.41              |
| 3:AC:155:GLY:HA2  | 3:AC:163:ALA:HB1   | 2.02                     | 0.41              |
| 19:AS:47:LEU:O    | 19:AS:62:VAL:HG12  | 2.20                     | 0.41              |
| 19:AS:58:VAL:HG13 | 19:AS:58:VAL:O     | 2.20                     | 0.41              |
| 28:BA:1667:G:O2'  | 28:BA:1991:U:O4    | 2.30                     | 0.41              |
| 30:BC:30:PHE:CE2  | 30:BC:32:PRO:HG2   | 2.55                     | 0.41              |
| 34:BG:25:THR:CG2  | 34:BG:32:GLU:OE2   | 2.68                     | 0.41              |
| 51:BY:26:PHE:CE1  | 51:BY:30:MET:HE3   | 2.55                     | 0.41              |
| 1:AA:492:C:C3'    | 1:AA:493:A:C8      | 3.03                     | 0.41              |
| 1:AA:1103:C:H4'   | 2:AB:97:LEU:HD13   | 2.02                     | 0.41              |
| 1:AA:1160:G:O6    | 1:AA:1182:G:O6     | 2.39                     | 0.41              |
| 5:AE:134:ILE:HD12 | 5:AE:134:ILE:H     | 1.85                     | 0.41              |
| 9:AI:52:LEU:HD22  | 9:AI:57:MET:HE2    | 2.03                     | 0.41              |
| 10:AJ:29:ALA:HA   | 10:AJ:32:THR:HG22  | 2.02                     | 0.41              |
| 28:BA:1990:C:H2'  | 28:BA:1991:U:O4'   | 2.20                     | 0.41              |
| 28:BA:2547:A:H2'  | 28:BA:2548:U:C6    | 2.54                     | 0.41              |
| 1:AA:207:C:H2'    | 1:AA:208:U:O4'     | 2.21                     | 0.41              |
| 1:AA:261:U:OP2    | 20:AT:71:LYS:HE3   | 2.20                     | 0.41              |
| 1:AA:481:G:H1'    | 1:AA:483:C:C5      | 2.54                     | 0.41              |
| 1:AA:976:G:N1     | 1:AA:1362:A:O2'    | 2.50                     | 0.41              |
| 7:AG:57:SER:N     | 7:AG:60:GLU:OE2    | 2.54                     | 0.41              |
| 28:BA:285:G:H2'   | 28:BA:285:G:N3     | 2.36                     | 0.41              |
| 28:BA:629:G:N3    | 28:BA:639:U:O2'    | 2.53                     | 0.41              |
| 28:BA:639:U:H2'   | 28:BA:640:C:C6     | 2.55                     | 0.41              |
| 28:BA:1509:A:O2'  | 28:BA:1510:G:P     | 2.78                     | 0.41              |
| 28:BA:1754:A:N1   | 28:BA:2716:C:O2'   | 2.41                     | 0.41              |
| 32:BE:155:GLU:OE1 | 32:BE:155:GLU:N    | 2.41                     | 0.41              |
| 41:BO:115:LEU:HA  | 41:BO:115:LEU:HD12 | 1.81                     | 0.41              |
| 44:BR:41:ILE:CD1  | 44:BR:54:VAL:HG11  | 2.51                     | 0.41              |
| 1:AA:437:U:H6     | 1:AA:437:U:O5'     | 2.03                     | 0.41              |
| 1:AA:545:C:H5'    | 4:AD:69:GLU:HB2    | 2.03                     | 0.41              |

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| Atom-1            | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|--------------------|--------------------------|-------------------|
| 1:AA:1125:U:C5'   | 10:AJ:37:ARG:NH1   | 2.84                     | 0.41              |
| 2:AB:214:LEU:HA   | 2:AB:217:VAL:HG12  | 2.02                     | 0.41              |
| 3:AC:77:ILE:O     | 3:AC:77:ILE:HG22   | 2.20                     | 0.41              |
| 5:AE:106:ILE:HD11 | 5:AE:124:LEU:CD2   | 2.50                     | 0.41              |
| 6:AF:22:ILE:O     | 6:AF:26:THR:HG23   | 2.20                     | 0.41              |
| 10:AJ:8:ILE:HD12  | 10:AJ:100:ILE:HD13 | 2.01                     | 0.41              |
| 28:BA:1495:A:N3   | 28:BA:1578:U:O2'   | 2.46                     | 0.41              |
| 51:BY:24:GLU:HB3  | 51:BY:46:VAL:HG21  | 2.02                     | 0.41              |
| 1:AA:536:C:O2'    | 1:AA:537:G:H5'     | 2.20                     | 0.41              |
| 1:AA:1147:C:H2'   | 1:AA:1148:U:C6     | 2.56                     | 0.41              |
| 1:AA:1368:A:OP1   | 10:AJ:64:GLN:NE2   | 2.51                     | 0.41              |
| 4:AD:92:ALA:HB1   | 4:AD:185:LYS:HD2   | 2.01                     | 0.41              |
| 4:AD:145:ILE:HD12 | 4:AD:178:MET:CE    | 2.51                     | 0.41              |
| 28:BA:1093:G:N2   | 28:BA:1098:A:H62   | 2.16                     | 0.41              |
| 28:BA:1432:G:H2'  | 28:BA:1433:A:C8    | 2.56                     | 0.41              |
| 28:BA:2191:A:O2'  | 28:BA:2192:U:H5'   | 2.21                     | 0.41              |
| 28:BA:2557:G:H2'  | 28:BA:2558:C:C6    | 2.56                     | 0.41              |
| 28:BA:2845:U:H5'' | 42:BP:52:ASN:O     | 2.20                     | 0.41              |
| 40:BN:38:LEU:HB3  | 40:BN:39:PRO:HD3   | 2.03                     | 0.41              |
| 1:AA:208:U:N3     | 1:AA:212:G:C6      | 2.89                     | 0.41              |
| 1:AA:211:G:H2'    | 1:AA:212:G:O4'     | 2.20                     | 0.41              |
| 2:AB:70:VAL:HG23  | 2:AB:70:VAL:O      | 2.21                     | 0.41              |
| 13:AM:71:ARG:NH2  | 33:BF:113:ASP:OD1  | 2.50                     | 0.41              |
| 17:AQ:25:ILE:HG22 | 17:AQ:26:GLU:N     | 2.36                     | 0.41              |
| 28:BA:463:G:N2    | 28:BA:466:A:OP2    | 2.40                     | 0.41              |
| 28:BA:1068:G:H21  | 28:BA:1096:A:P     | 2.44                     | 0.41              |
| 31:BD:148:GLN:HB2 | 31:BD:152:PRO:HG2  | 2.00                     | 0.41              |
| 1:AA:264:C:H2'    | 1:AA:265:G:O4'     | 2.21                     | 0.41              |
| 1:AA:420:U:H1'    | 1:AA:424:G:N2      | 2.36                     | 0.41              |
| 1:AA:481:G:N2     | 1:AA:482:A:C6      | 2.89                     | 0.41              |
| 1:AA:482:A:H2'    | 1:AA:483:C:O4'     | 2.21                     | 0.41              |
| 1:AA:721:G:H4'    | 1:AA:722:G:O4'     | 2.21                     | 0.41              |
| 1:AA:983:A:N3     | 1:AA:983:A:C2'     | 2.83                     | 0.41              |
| 1:AA:1297:G:H21   | 7:AG:114:LYS:HG3   | 1.86                     | 0.41              |
| 1:AA:1494:G:N7    | 54:AA:1694:84G:N2  | 2.68                     | 0.41              |
| 3:AC:114:LYS:O    | 3:AC:118:ASP:OD1   | 2.39                     | 0.41              |
| 4:AD:174:ASP:OD2  | 4:AD:177:LYS:HB3   | 2.21                     | 0.41              |
| 4:AD:190:ASP:OD1  | 4:AD:190:ASP:N     | 2.53                     | 0.41              |
| 5:AE:24:THR:HA    | 5:AE:29:ARG:HA     | 2.03                     | 0.41              |
| 10:AJ:34:ALA:O    | 10:AJ:78:GLU:OE1   | 2.38                     | 0.41              |
| 12:AL:32:GLY:HA3  | 12:AL:55:VAL:CG1   | 2.50                     | 0.41              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 12:AL:110:ARG:HG3  | 12:AL:112:GLN:O    | 2.21                     | 0.41              |
| 18:AR:48:ARG:H     | 18:AR:48:ARG:HD3   | 1.86                     | 0.41              |
| 21:AU:6:VAL:O      | 21:AU:6:VAL:CG2    | 2.69                     | 0.41              |
| 21:AU:38:TYR:O     | 21:AU:39:GLU:HG2   | 2.21                     | 0.41              |
| 24:B2:38:GLY:O     | 28:BA:458:G:H2'    | 2.21                     | 0.41              |
| 28:BA:25:U:C2'     | 28:BA:26:G:O5'     | 2.68                     | 0.41              |
| 28:BA:569:U:H2'    | 28:BA:570:G:O4'    | 2.21                     | 0.41              |
| 28:BA:857:G:H2'    | 28:BA:858:G:O4'    | 2.20                     | 0.41              |
| 28:BA:1351:C:H2'   | 28:BA:1352:U:O4'   | 2.21                     | 0.41              |
| 28:BA:1370:C:H2'   | 28:BA:1371:G:O4'   | 2.21                     | 0.41              |
| 28:BA:1607:C:H4'   | 28:BA:1608:A:O5'   | 2.21                     | 0.41              |
| 28:BA:2140:G:H2'   | 28:BA:2141:G:C8    | 2.56                     | 0.41              |
| 28:BA:2636:C:O2'   | 31:BD:45:TYR:OH    | 2.34                     | 0.41              |
| 35:BH:41:LYS:O     | 35:BH:44:ILE:HG12  | 2.20                     | 0.41              |
| 39:BM:135:VAL:HG23 | 39:BM:135:VAL:O    | 2.21                     | 0.41              |
| 1:AA:73:C:O2'      | 1:AA:74:A:O5'      | 2.37                     | 0.41              |
| 1:AA:160:A:H2'     | 1:AA:161:A:O4'     | 2.20                     | 0.41              |
| 1:AA:511:C:O2'     | 1:AA:512:U:P       | 2.79                     | 0.41              |
| 1:AA:536:C:H2'     | 1:AA:537:G:H8      | 1.86                     | 0.41              |
| 1:AA:1125:U:HO2'   | 1:AA:1126:U:H2'    | 1.86                     | 0.41              |
| 2:AB:50:PHE:CE2    | 2:AB:54:LEU:HD21   | 2.55                     | 0.41              |
| 5:AE:30:ILE:HG13   | 5:AE:30:ILE:O      | 2.20                     | 0.41              |
| 13:AM:13:LYS:O     | 13:AM:14:HIS:CD2   | 2.74                     | 0.41              |
| 15:AO:48:LYS:O     | 15:AO:48:LYS:HG2   | 2.21                     | 0.41              |
| 22:B0:10:ARG:NH1   | 28:BA:517:C:OP2    | 2.53                     | 0.41              |
| 28:BA:137:U:H3'    | 28:BA:138:U:C6     | 2.56                     | 0.41              |
| 28:BA:849:A:H2'    | 28:BA:850:U:C6     | 2.56                     | 0.41              |
| 28:BA:2118:U:C5'   | 28:BA:2147:A:H1'   | 2.50                     | 0.41              |
| 36:BJ:142:ILE:OXT  | 36:BJ:142:ILE:HG23 | 2.20                     | 0.41              |
| 1:AA:320:A:H2'     | 1:AA:321:A:O4'     | 2.21                     | 0.40              |
| 1:AA:718:A:C5'     | 11:AK:119:ASN:HD21 | 2.34                     | 0.40              |
| 1:AA:723:U:P       | 21:AU:49:LYS:HZ3   | 2.43                     | 0.40              |
| 1:AA:883:C:O2'     | 1:AA:884:U:H5'     | 2.21                     | 0.40              |
| 3:AC:118:ASP:HA    | 3:AC:121:THR:HG22  | 2.04                     | 0.40              |
| 4:AD:152:GLN:O     | 4:AD:153:SER:C     | 2.63                     | 0.40              |
| 6:AF:38:ARG:O      | 6:AF:62:MET:O      | 2.39                     | 0.40              |
| 28:BA:328:U:H2'    | 28:BA:329:G:OP1    | 2.21                     | 0.40              |
| 28:BA:476:G:H4'    | 28:BA:502:A:N1     | 2.36                     | 0.40              |
| 28:BA:1022:G:N2    | 28:BA:1142:A:C2    | 2.89                     | 0.40              |
| 32:BE:42:GLY:O     | 32:BE:89:PRO:HA    | 2.22                     | 0.40              |
| 40:BN:66:ALA:O     | 40:BN:69:ARG:O     | 2.38                     | 0.40              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 1:AA:370:C:HO2'   | 1:AA:482:A:C4'    | 2.34                     | 0.40              |
| 1:AA:451:A:C6     | 1:AA:481:G:N7     | 2.88                     | 0.40              |
| 1:AA:662:U:H2'    | 1:AA:663:A:C8     | 2.56                     | 0.40              |
| 1:AA:979:C:C6     | 1:AA:1318:A:N1    | 2.89                     | 0.40              |
| 9:AI:75:GLN:O     | 9:AI:79:ILE:HG12  | 2.21                     | 0.40              |
| 28:BA:2099:U:H2'  | 28:BA:2100:G:O4'  | 2.22                     | 0.40              |
| 1:AA:96:U:H2'     | 1:AA:97:G:C8      | 2.56                     | 0.40              |
| 1:AA:458:U:O2     | 1:AA:458:U:H2'    | 2.20                     | 0.40              |
| 1:AA:922:G:H2'    | 1:AA:923:A:C8     | 2.56                     | 0.40              |
| 1:AA:1118:U:H1'   | 1:AA:1179:A:C5    | 2.56                     | 0.40              |
| 2:AB:28:LYS:N     | 2:AB:29:PRO:HD2   | 2.37                     | 0.40              |
| 20:AT:39:ILE:HD12 | 20:AT:83:ILE:CG1  | 2.52                     | 0.40              |
| 28:BA:994:C:OP2   | 43:BQ:54:LYS:NZ   | 2.54                     | 0.40              |
| 28:BA:1131:G:OP1  | 36:BJ:82:GLY:HA2  | 2.21                     | 0.40              |
| 28:BA:2191:A:H2'  | 28:BA:2192:U:C6   | 2.56                     | 0.40              |
| 30:BC:91:ILE:HD12 | 30:BC:103:TYR:CD1 | 2.56                     | 0.40              |
| 33:BF:49:LEU:HD12 | 33:BF:49:LEU:C    | 2.47                     | 0.40              |
| 35:BH:2:GLN:O     | 35:BH:19:VAL:O    | 2.40                     | 0.40              |
| 46:BT:54:GLU:OE1  | 46:BT:54:GLU:N    | 2.54                     | 0.40              |
| 1:AA:456:A:H2'    | 1:AA:457:G:C1'    | 2.51                     | 0.40              |
| 1:AA:537:G:C4     | 1:AA:538:G:C8     | 3.09                     | 0.40              |
| 2:AB:136:MET:HA   | 2:AB:139:ARG:HG2  | 2.03                     | 0.40              |
| 19:AS:9:PRO:HB3   | 19:AS:39:THR:HG21 | 2.03                     | 0.40              |
| 27:B5:12:ILE:HD13 | 27:B5:28:VAL:CG2  | 2.51                     | 0.40              |
| 27:B5:41:HIS:O    | 27:B5:42:PRO:C    | 2.63                     | 0.40              |
| 28:BA:547:A:H3'   | 28:BA:548:G:H5'   | 2.03                     | 0.40              |
| 28:BA:580:U:O3'   | 43:BQ:31:VAL:HG13 | 2.20                     | 0.40              |
| 28:BA:2190:G:O2'  | 28:BA:2191:A:H5'  | 2.22                     | 0.40              |
| 31:BD:184:ARG:NH1 | 42:BP:11:GLU:OE2  | 2.42                     | 0.40              |
| 1:AA:1078:U:C2'   | 1:AA:1079:G:O5'   | 2.70                     | 0.40              |
| 14:AN:25:ALA:HA   | 14:AN:28:LYS:HE2  | 2.03                     | 0.40              |
| 21:AU:10:GLU:N    | 21:AU:11:PRO:CD   | 2.85                     | 0.40              |
| 22:B0:25:VAL:HG23 | 22:B0:26:THR:N    | 2.37                     | 0.40              |
| 28:BA:974:G:H8    | 28:BA:990:A:H62   | 1.66                     | 0.40              |
| 28:BA:1169:A:H2'  | 28:BA:1170:C:O4'  | 2.22                     | 0.40              |
| 28:BA:1266:G:O2'  | 28:BA:2012:G:O6   | 2.36                     | 0.40              |
| 28:BA:1475:G:O2'  | 28:BA:1514:G:O6   | 2.38                     | 0.40              |
| 32:BE:4:VAL:HG13  | 32:BE:4:VAL:O     | 2.20                     | 0.40              |
| 40:BN:22:ARG:HG3  | 40:BN:70:THR:HA   | 2.04                     | 0.40              |

There are no symmetry-related clashes.

## 5.3 Torsion angles ⓘ

### 5.3.1 Protein backbone ⓘ

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

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

| Mol | Chain | Analysed      | Favoured  | Allowed  | Outliers | Percentiles |     |
|-----|-------|---------------|-----------|----------|----------|-------------|-----|
| 2   | AB    | 216/240 (90%) | 189 (88%) | 24 (11%) | 3 (1%)   | 9           | 24  |
| 3   | AC    | 204/233 (88%) | 183 (90%) | 20 (10%) | 1 (0%)   | 25          | 49  |
| 4   | AD    | 203/206 (98%) | 175 (86%) | 23 (11%) | 5 (2%)   | 4           | 12  |
| 5   | AE    | 148/167 (89%) | 125 (84%) | 23 (16%) | 0        | 100         | 100 |
| 6   | AF    | 98/135 (73%)  | 83 (85%)  | 14 (14%) | 1 (1%)   | 13          | 33  |
| 7   | AG    | 149/179 (83%) | 143 (96%) | 6 (4%)   | 0        | 100         | 100 |
| 8   | AH    | 127/130 (98%) | 121 (95%) | 6 (5%)   | 0        | 100         | 100 |
| 9   | AI    | 125/130 (96%) | 103 (82%) | 19 (15%) | 3 (2%)   | 5           | 13  |
| 10  | AJ    | 96/103 (93%)  | 86 (90%)  | 6 (6%)   | 4 (4%)   | 2           | 5   |
| 11  | AK    | 115/129 (89%) | 102 (89%) | 13 (11%) | 0        | 100         | 100 |
| 12  | AL    | 121/124 (98%) | 103 (85%) | 16 (13%) | 2 (2%)   | 7           | 20  |
| 13  | AM    | 112/118 (95%) | 99 (88%)  | 12 (11%) | 1 (1%)   | 14          | 35  |
| 14  | AN    | 92/101 (91%)  | 79 (86%)  | 12 (13%) | 1 (1%)   | 12          | 30  |
| 15  | AO    | 86/89 (97%)   | 79 (92%)  | 6 (7%)   | 1 (1%)   | 11          | 28  |
| 16  | AP    | 80/82 (98%)   | 68 (85%)  | 11 (14%) | 1 (1%)   | 10          | 26  |
| 17  | AQ    | 78/84 (93%)   | 66 (85%)  | 12 (15%) | 0        | 100         | 100 |
| 18  | AR    | 53/75 (71%)   | 51 (96%)  | 2 (4%)   | 0        | 100         | 100 |
| 19  | AS    | 77/92 (84%)   | 69 (90%)  | 8 (10%)  | 0        | 100         | 100 |
| 20  | AT    | 83/87 (95%)   | 77 (93%)  | 6 (7%)   | 0        | 100         | 100 |
| 21  | AU    | 49/71 (69%)   | 35 (71%)  | 13 (26%) | 1 (2%)   | 6           | 16  |
| 22  | B0    | 54/57 (95%)   | 50 (93%)  | 4 (7%)   | 0        | 100         | 100 |
| 23  | B1    | 48/55 (87%)   | 44 (92%)  | 4 (8%)   | 0        | 100         | 100 |
| 24  | B2    | 44/46 (96%)   | 42 (96%)  | 2 (4%)   | 0        | 100         | 100 |
| 25  | B3    | 62/65 (95%)   | 59 (95%)  | 3 (5%)   | 0        | 100         | 100 |
| 26  | B4    | 36/38 (95%)   | 34 (94%)  | 2 (6%)   | 0        | 100         | 100 |

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| Mol | Chain | Analysed        | Favoured   | Allowed  | Outliers | Percentiles |     |
|-----|-------|-----------------|------------|----------|----------|-------------|-----|
| 27  | B5    | 56/70 (80%)     | 49 (88%)   | 7 (12%)  | 0        | 100         | 100 |
| 30  | BC    | 269/273 (98%)   | 256 (95%)  | 11 (4%)  | 2 (1%)   | 19          | 42  |
| 31  | BD    | 207/209 (99%)   | 195 (94%)  | 12 (6%)  | 0        | 100         | 100 |
| 32  | BE    | 199/201 (99%)   | 191 (96%)  | 7 (4%)   | 1 (0%)   | 25          | 49  |
| 33  | BF    | 175/179 (98%)   | 161 (92%)  | 14 (8%)  | 0        | 100         | 100 |
| 34  | BG    | 174/177 (98%)   | 169 (97%)  | 5 (3%)   | 0        | 100         | 100 |
| 35  | BH    | 45/149 (30%)    | 35 (78%)   | 8 (18%)  | 2 (4%)   | 2           | 4   |
| 36  | BJ    | 140/142 (99%)   | 136 (97%)  | 4 (3%)   | 0        | 100         | 100 |
| 37  | BK    | 120/123 (98%)   | 108 (90%)  | 11 (9%)  | 1 (1%)   | 16          | 38  |
| 38  | BL    | 141/144 (98%)   | 123 (87%)  | 15 (11%) | 3 (2%)   | 5           | 15  |
| 39  | BM    | 134/136 (98%)   | 124 (92%)  | 10 (8%)  | 0        | 100         | 100 |
| 40  | BN    | 118/127 (93%)   | 107 (91%)  | 11 (9%)  | 0        | 100         | 100 |
| 41  | BO    | 114/117 (97%)   | 109 (96%)  | 5 (4%)   | 0        | 100         | 100 |
| 42  | BP    | 112/115 (97%)   | 101 (90%)  | 11 (10%) | 0        | 100         | 100 |
| 43  | BQ    | 115/118 (98%)   | 114 (99%)  | 1 (1%)   | 0        | 100         | 100 |
| 44  | BR    | 101/103 (98%)   | 86 (85%)   | 15 (15%) | 0        | 100         | 100 |
| 45  | BS    | 108/110 (98%)   | 98 (91%)   | 9 (8%)   | 1 (1%)   | 14          | 35  |
| 46  | BT    | 91/100 (91%)    | 86 (94%)   | 4 (4%)   | 1 (1%)   | 12          | 30  |
| 47  | BU    | 100/104 (96%)   | 89 (89%)   | 11 (11%) | 0        | 100         | 100 |
| 48  | BV    | 92/94 (98%)     | 89 (97%)   | 3 (3%)   | 0        | 100         | 100 |
| 49  | BW    | 73/85 (86%)     | 70 (96%)   | 3 (4%)   | 0        | 100         | 100 |
| 50  | BX    | 75/78 (96%)     | 74 (99%)   | 1 (1%)   | 0        | 100         | 100 |
| 51  | BY    | 61/63 (97%)     | 57 (93%)   | 4 (7%)   | 0        | 100         | 100 |
| 52  | BZ    | 56/59 (95%)     | 55 (98%)   | 1 (2%)   | 0        | 100         | 100 |
| All | All   | 5432/5912 (92%) | 4947 (91%) | 450 (8%) | 35 (1%)  | 24          | 45  |

All (35) Ramachandran outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 2   | AB    | 34  | ALA  |
| 2   | AB    | 76  | ALA  |
| 4   | AD    | 153 | SER  |
| 9   | AI    | 55  | VAL  |
| 10  | AJ    | 35  | GLN  |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 10  | AJ    | 36  | VAL  |
| 12  | AL    | 107 | VAL  |
| 12  | AL    | 108 | LYS  |
| 21  | AU    | 40  | LYS  |
| 35  | BH    | 3   | VAL  |
| 38  | BL    | 82  | LEU  |
| 38  | BL    | 111 | ILE  |
| 6   | AF    | 91  | ARG  |
| 10  | AJ    | 57  | VAL  |
| 13  | AM    | 4   | ILE  |
| 15  | AO    | 88  | ARG  |
| 35  | BH    | 9   | VAL  |
| 37  | BK    | 35  | VAL  |
| 38  | BL    | 29  | LYS  |
| 46  | BT    | 38  | ALA  |
| 2   | AB    | 88  | ASP  |
| 4   | AD    | 183 | LYS  |
| 9   | AI    | 58  | VAL  |
| 16  | AP    | 61  | VAL  |
| 4   | AD    | 28  | ILE  |
| 14  | AN    | 92  | GLU  |
| 30  | BC    | 240 | PHE  |
| 3   | AC    | 66  | VAL  |
| 10  | AJ    | 42  | LEU  |
| 4   | AD    | 174 | ASP  |
| 9   | AI    | 121 | ALA  |
| 32  | BE    | 83  | VAL  |
| 45  | BS    | 29  | VAL  |
| 4   | AD    | 34  | ILE  |
| 30  | BC    | 10  | SER  |

### 5.3.2 Protein sidechains ⓘ

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

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

| Mol | Chain | Analysed      | Rotameric | Outliers | Percentiles |
|-----|-------|---------------|-----------|----------|-------------|
| 2   | AB    | 180/198 (91%) | 174 (97%) | 6 (3%)   | 33 62       |

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| Mol | Chain | Analysed       | Rotameric  | Outliers | Percentiles |     |
|-----|-------|----------------|------------|----------|-------------|-----|
| 3   | AC    | 170/190 (90%)  | 170 (100%) | 0        | 100         | 100 |
| 4   | AD    | 172/173 (99%)  | 162 (94%)  | 10 (6%)  | 17          | 39  |
| 5   | AE    | 113/126 (90%)  | 113 (100%) | 0        | 100         | 100 |
| 6   | AF    | 87/116 (75%)   | 87 (100%)  | 0        | 100         | 100 |
| 7   | AG    | 124/147 (84%)  | 121 (98%)  | 3 (2%)   | 44          | 73  |
| 8   | AH    | 104/105 (99%)  | 102 (98%)  | 2 (2%)   | 52          | 79  |
| 9   | AI    | 105/107 (98%)  | 103 (98%)  | 2 (2%)   | 52          | 79  |
| 10  | AJ    | 86/90 (96%)    | 86 (100%)  | 0        | 100         | 100 |
| 11  | AK    | 90/99 (91%)    | 90 (100%)  | 0        | 100         | 100 |
| 12  | AL    | 103/104 (99%)  | 95 (92%)   | 8 (8%)   | 10          | 26  |
| 13  | AM    | 92/96 (96%)    | 91 (99%)   | 1 (1%)   | 70          | 87  |
| 14  | AN    | 79/84 (94%)    | 79 (100%)  | 0        | 100         | 100 |
| 15  | AO    | 75/77 (97%)    | 73 (97%)   | 2 (3%)   | 40          | 69  |
| 16  | AP    | 65/65 (100%)   | 65 (100%)  | 0        | 100         | 100 |
| 17  | AQ    | 74/78 (95%)    | 71 (96%)   | 3 (4%)   | 26          | 54  |
| 18  | AR    | 48/65 (74%)    | 48 (100%)  | 0        | 100         | 100 |
| 19  | AS    | 70/79 (89%)    | 68 (97%)   | 2 (3%)   | 37          | 67  |
| 20  | AT    | 65/66 (98%)    | 63 (97%)   | 2 (3%)   | 35          | 64  |
| 21  | AU    | 44/61 (72%)    | 44 (100%)  | 0        | 100         | 100 |
| 22  | B0    | 47/48 (98%)    | 47 (100%)  | 0        | 100         | 100 |
| 23  | B1    | 45/49 (92%)    | 43 (96%)   | 2 (4%)   | 24          | 51  |
| 24  | B2    | 38/38 (100%)   | 38 (100%)  | 0        | 100         | 100 |
| 25  | B3    | 51/52 (98%)    | 51 (100%)  | 0        | 100         | 100 |
| 26  | B4    | 34/34 (100%)   | 34 (100%)  | 0        | 100         | 100 |
| 27  | B5    | 55/62 (89%)    | 55 (100%)  | 0        | 100         | 100 |
| 30  | BC    | 216/218 (99%)  | 215 (100%) | 1 (0%)   | 86          | 95  |
| 31  | BD    | 164/164 (100%) | 161 (98%)  | 3 (2%)   | 54          | 80  |
| 32  | BE    | 165/165 (100%) | 165 (100%) | 0        | 100         | 100 |
| 33  | BF    | 148/150 (99%)  | 148 (100%) | 0        | 100         | 100 |
| 34  | BG    | 137/138 (99%)  | 137 (100%) | 0        | 100         | 100 |
| 35  | BH    | 38/114 (33%)   | 38 (100%)  | 0        | 100         | 100 |

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| Mol | Chain | Analysed        | Rotameric  | Outliers | Percentiles |     |
|-----|-------|-----------------|------------|----------|-------------|-----|
| 36  | BJ    | 116/116 (100%)  | 115 (99%)  | 1 (1%)   | 75          | 90  |
| 37  | BK    | 103/104 (99%)   | 103 (100%) | 0        | 100         | 100 |
| 38  | BL    | 102/103 (99%)   | 102 (100%) | 0        | 100         | 100 |
| 39  | BM    | 109/109 (100%)  | 109 (100%) | 0        | 100         | 100 |
| 40  | BN    | 100/103 (97%)   | 99 (99%)   | 1 (1%)   | 73          | 89  |
| 41  | BO    | 86/87 (99%)     | 84 (98%)   | 2 (2%)   | 45          | 74  |
| 42  | BP    | 99/100 (99%)    | 97 (98%)   | 2 (2%)   | 50          | 78  |
| 43  | BQ    | 89/90 (99%)     | 89 (100%)  | 0        | 100         | 100 |
| 44  | BR    | 84/84 (100%)    | 84 (100%)  | 0        | 100         | 100 |
| 45  | BS    | 93/93 (100%)    | 93 (100%)  | 0        | 100         | 100 |
| 46  | BT    | 80/84 (95%)     | 78 (98%)   | 2 (2%)   | 42          | 72  |
| 47  | BU    | 83/85 (98%)     | 83 (100%)  | 0        | 100         | 100 |
| 48  | BV    | 78/78 (100%)    | 78 (100%)  | 0        | 100         | 100 |
| 49  | BW    | 56/63 (89%)     | 56 (100%)  | 0        | 100         | 100 |
| 50  | BX    | 67/68 (98%)     | 67 (100%)  | 0        | 100         | 100 |
| 51  | BY    | 55/55 (100%)    | 55 (100%)  | 0        | 100         | 100 |
| 52  | BZ    | 48/49 (98%)     | 46 (96%)   | 2 (4%)   | 25          | 53  |
| All | All   | 4532/4829 (94%) | 4475 (99%) | 57 (1%)  | 64          | 85  |

All (57) residues with a non-rotameric sidechain are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 2   | AB    | 21  | ARG  |
| 2   | AB    | 73  | LYS  |
| 2   | AB    | 77  | SER  |
| 2   | AB    | 78  | GLU  |
| 2   | AB    | 81  | LYS  |
| 2   | AB    | 85  | LEU  |
| 4   | AD    | 33  | LYS  |
| 4   | AD    | 110 | THR  |
| 4   | AD    | 153 | SER  |
| 4   | AD    | 154 | ARG  |
| 4   | AD    | 183 | LYS  |
| 4   | AD    | 184 | ARG  |
| 4   | AD    | 187 | GLU  |
| 4   | AD    | 190 | ASP  |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 4   | AD    | 192 | SER  |
| 4   | AD    | 194 | ASP  |
| 7   | AG    | 113 | ASP  |
| 7   | AG    | 114 | LYS  |
| 7   | AG    | 115 | SER  |
| 8   | AH    | 50  | LYS  |
| 8   | AH    | 52  | GLU  |
| 9   | AI    | 111 | VAL  |
| 9   | AI    | 114 | LYS  |
| 12  | AL    | 58  | THR  |
| 12  | AL    | 67  | ILE  |
| 12  | AL    | 74  | LEU  |
| 12  | AL    | 75  | GLN  |
| 12  | AL    | 104 | CYS  |
| 12  | AL    | 107 | VAL  |
| 12  | AL    | 108 | LYS  |
| 12  | AL    | 111 | LYS  |
| 13  | AM    | 22  | ILE  |
| 15  | AO    | 87  | LEU  |
| 15  | AO    | 89  | ARG  |
| 17  | AQ    | 5   | ILE  |
| 17  | AQ    | 6   | ARG  |
| 17  | AQ    | 7   | THR  |
| 19  | AS    | 11  | ILE  |
| 19  | AS    | 13  | LEU  |
| 20  | AT    | 69  | LYS  |
| 20  | AT    | 70  | ASN  |
| 23  | B1    | 28  | ARG  |
| 23  | B1    | 30  | LYS  |
| 30  | BC    | 100 | GLU  |
| 31  | BD    | 98  | VAL  |
| 31  | BD    | 100 | LEU  |
| 31  | BD    | 150 | GLN  |
| 36  | BJ    | 37  | ARG  |
| 40  | BN    | 89  | SER  |
| 41  | BO    | 31  | THR  |
| 41  | BO    | 116 | GLN  |
| 42  | BP    | 63  | LYS  |
| 42  | BP    | 65  | SER  |
| 46  | BT    | 1   | MET  |
| 46  | BT    | 4   | GLU  |
| 52  | BZ    | 4   | THR  |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 52  | BZ    | 5   | ILE  |

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (33) such sidechains are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 2   | AB    | 18  | HIS  |
| 2   | AB    | 39  | HIS  |
| 2   | AB    | 170 | HIS  |
| 2   | AB    | 177 | ASN  |
| 4   | AD    | 71  | GLN  |
| 4   | AD    | 131 | ASN  |
| 4   | AD    | 152 | GLN  |
| 9   | AI    | 37  | GLN  |
| 11  | AK    | 118 | HIS  |
| 11  | AK    | 119 | ASN  |
| 16  | AP    | 18  | GLN  |
| 16  | AP    | 63  | GLN  |
| 17  | AQ    | 9   | GLN  |
| 20  | AT    | 61  | GLN  |
| 20  | AT    | 70  | ASN  |
| 27  | B5    | 41  | HIS  |
| 27  | B5    | 61  | ASN  |
| 30  | BC    | 243 | HIS  |
| 31  | BD    | 42  | ASN  |
| 31  | BD    | 173 | GLN  |
| 32  | BE    | 165 | HIS  |
| 35  | BH    | 2   | GLN  |
| 35  | BH    | 20  | ASN  |
| 36  | BJ    | 67  | ASN  |
| 41  | BO    | 98  | GLN  |
| 41  | BO    | 116 | GLN  |
| 42  | BP    | 52  | ASN  |
| 42  | BP    | 66  | ASN  |
| 43  | BQ    | 44  | GLN  |
| 43  | BQ    | 72  | ASN  |
| 48  | BV    | 12  | GLN  |
| 50  | BX    | 34  | HIS  |
| 50  | BX    | 36  | HIS  |

### 5.3.3 RNA ⓘ

| Mol | Chain | Analysed        | Backbone Outliers | Pucker Outliers |
|-----|-------|-----------------|-------------------|-----------------|
| 1   | AA    | 1538/1539 (99%) | 244 (15%)         | 14 (0%)         |
| 28  | BA    | 2895/2903 (99%) | 408 (14%)         | 19 (0%)         |
| 29  | BB    | 117/120 (97%)   | 12 (10%)          | 1 (0%)          |
| All | All   | 4550/4562 (99%) | 664 (14%)         | 34 (0%)         |

All (664) RNA backbone outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | AA    | 7   | A    |
| 1   | AA    | 9   | G    |
| 1   | AA    | 22  | G    |
| 1   | AA    | 39  | G    |
| 1   | AA    | 47  | C    |
| 1   | AA    | 48  | C    |
| 1   | AA    | 51  | A    |
| 1   | AA    | 69  | G    |
| 1   | AA    | 71  | A    |
| 1   | AA    | 74  | A    |
| 1   | AA    | 83  | C    |
| 1   | AA    | 87  | C    |
| 1   | AA    | 94  | G    |
| 1   | AA    | 95  | C    |
| 1   | AA    | 97  | G    |
| 1   | AA    | 108 | G    |
| 1   | AA    | 116 | A    |
| 1   | AA    | 120 | A    |
| 1   | AA    | 121 | U    |
| 1   | AA    | 130 | A    |
| 1   | AA    | 131 | A    |
| 1   | AA    | 143 | A    |
| 1   | AA    | 144 | G    |
| 1   | AA    | 160 | A    |
| 1   | AA    | 182 | A    |
| 1   | AA    | 183 | C    |
| 1   | AA    | 189 | A    |
| 1   | AA    | 197 | A    |
| 1   | AA    | 206 | C    |
| 1   | AA    | 208 | U    |
| 1   | AA    | 209 | U    |
| 1   | AA    | 210 | C    |
| 1   | AA    | 211 | G    |
| 1   | AA    | 212 | G    |
| 1   | AA    | 226 | G    |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | AA    | 240 | G    |
| 1   | AA    | 245 | U    |
| 1   | AA    | 247 | G    |
| 1   | AA    | 251 | G    |
| 1   | AA    | 266 | G    |
| 1   | AA    | 267 | C    |
| 1   | AA    | 275 | G    |
| 1   | AA    | 289 | G    |
| 1   | AA    | 321 | A    |
| 1   | AA    | 328 | C    |
| 1   | AA    | 329 | A    |
| 1   | AA    | 330 | C    |
| 1   | AA    | 332 | G    |
| 1   | AA    | 347 | G    |
| 1   | AA    | 352 | C    |
| 1   | AA    | 354 | G    |
| 1   | AA    | 367 | U    |
| 1   | AA    | 372 | C    |
| 1   | AA    | 373 | A    |
| 1   | AA    | 397 | A    |
| 1   | AA    | 405 | U    |
| 1   | AA    | 406 | G    |
| 1   | AA    | 408 | A    |
| 1   | AA    | 409 | U    |
| 1   | AA    | 411 | A    |
| 1   | AA    | 412 | A    |
| 1   | AA    | 413 | G    |
| 1   | AA    | 414 | A    |
| 1   | AA    | 419 | C    |
| 1   | AA    | 420 | U    |
| 1   | AA    | 421 | U    |
| 1   | AA    | 422 | C    |
| 1   | AA    | 423 | G    |
| 1   | AA    | 424 | G    |
| 1   | AA    | 428 | G    |
| 1   | AA    | 429 | U    |
| 1   | AA    | 431 | A    |
| 1   | AA    | 440 | C    |
| 1   | AA    | 441 | A    |
| 1   | AA    | 445 | G    |
| 1   | AA    | 448 | A    |
| 1   | AA    | 449 | G    |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | AA    | 450 | G    |
| 1   | AA    | 451 | A    |
| 1   | AA    | 452 | A    |
| 1   | AA    | 453 | G    |
| 1   | AA    | 457 | G    |
| 1   | AA    | 458 | U    |
| 1   | AA    | 463 | U    |
| 1   | AA    | 465 | A    |
| 1   | AA    | 467 | U    |
| 1   | AA    | 468 | A    |
| 1   | AA    | 472 | U    |
| 1   | AA    | 480 | U    |
| 1   | AA    | 481 | G    |
| 1   | AA    | 482 | A    |
| 1   | AA    | 483 | C    |
| 1   | AA    | 484 | G    |
| 1   | AA    | 485 | U    |
| 1   | AA    | 486 | U    |
| 1   | AA    | 487 | A    |
| 1   | AA    | 488 | C    |
| 1   | AA    | 495 | A    |
| 1   | AA    | 497 | G    |
| 1   | AA    | 499 | A    |
| 1   | AA    | 500 | G    |
| 1   | AA    | 509 | A    |
| 1   | AA    | 511 | C    |
| 1   | AA    | 512 | U    |
| 1   | AA    | 518 | C    |
| 1   | AA    | 527 | G    |
| 1   | AA    | 531 | U    |
| 1   | AA    | 532 | A    |
| 1   | AA    | 537 | G    |
| 1   | AA    | 539 | A    |
| 1   | AA    | 542 | G    |
| 1   | AA    | 543 | U    |
| 1   | AA    | 547 | A    |
| 1   | AA    | 559 | A    |
| 1   | AA    | 564 | C    |
| 1   | AA    | 572 | A    |
| 1   | AA    | 573 | A    |
| 1   | AA    | 576 | C    |
| 1   | AA    | 577 | G    |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | AA    | 581 | G    |
| 1   | AA    | 596 | A    |
| 1   | AA    | 616 | G    |
| 1   | AA    | 618 | C    |
| 1   | AA    | 619 | U    |
| 1   | AA    | 653 | U    |
| 1   | AA    | 665 | A    |
| 1   | AA    | 687 | A    |
| 1   | AA    | 695 | A    |
| 1   | AA    | 718 | A    |
| 1   | AA    | 721 | G    |
| 1   | AA    | 723 | U    |
| 1   | AA    | 724 | G    |
| 1   | AA    | 731 | G    |
| 1   | AA    | 734 | G    |
| 1   | AA    | 755 | G    |
| 1   | AA    | 777 | A    |
| 1   | AA    | 793 | U    |
| 1   | AA    | 794 | A    |
| 1   | AA    | 810 | C    |
| 1   | AA    | 815 | A    |
| 1   | AA    | 817 | C    |
| 1   | AA    | 828 | U    |
| 1   | AA    | 829 | G    |
| 1   | AA    | 841 | C    |
| 1   | AA    | 843 | U    |
| 1   | AA    | 844 | G    |
| 1   | AA    | 845 | A    |
| 1   | AA    | 846 | G    |
| 1   | AA    | 858 | G    |
| 1   | AA    | 885 | G    |
| 1   | AA    | 914 | A    |
| 1   | AA    | 922 | G    |
| 1   | AA    | 926 | G    |
| 1   | AA    | 934 | C    |
| 1   | AA    | 935 | A    |
| 1   | AA    | 960 | U    |
| 1   | AA    | 969 | A    |
| 1   | AA    | 971 | G    |
| 1   | AA    | 975 | A    |
| 1   | AA    | 976 | G    |
| 1   | AA    | 977 | A    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 1   | AA    | 983  | A    |
| 1   | AA    | 989  | U    |
| 1   | AA    | 992  | U    |
| 1   | AA    | 993  | G    |
| 1   | AA    | 994  | A    |
| 1   | AA    | 1004 | A    |
| 1   | AA    | 1020 | G    |
| 1   | AA    | 1026 | G    |
| 1   | AA    | 1030 | U    |
| 1   | AA    | 1032 | G    |
| 1   | AA    | 1033 | G    |
| 1   | AA    | 1034 | G    |
| 1   | AA    | 1037 | C    |
| 1   | AA    | 1044 | A    |
| 1   | AA    | 1053 | G    |
| 1   | AA    | 1054 | C    |
| 1   | AA    | 1065 | U    |
| 1   | AA    | 1079 | G    |
| 1   | AA    | 1094 | G    |
| 1   | AA    | 1095 | U    |
| 1   | AA    | 1101 | A    |
| 1   | AA    | 1113 | C    |
| 1   | AA    | 1125 | U    |
| 1   | AA    | 1136 | C    |
| 1   | AA    | 1137 | C    |
| 1   | AA    | 1139 | G    |
| 1   | AA    | 1140 | C    |
| 1   | AA    | 1141 | C    |
| 1   | AA    | 1145 | A    |
| 1   | AA    | 1146 | A    |
| 1   | AA    | 1152 | A    |
| 1   | AA    | 1159 | U    |
| 1   | AA    | 1160 | G    |
| 1   | AA    | 1161 | C    |
| 1   | AA    | 1167 | A    |
| 1   | AA    | 1171 | A    |
| 1   | AA    | 1181 | G    |
| 1   | AA    | 1184 | G    |
| 1   | AA    | 1196 | A    |
| 1   | AA    | 1197 | A    |
| 1   | AA    | 1202 | U    |
| 1   | AA    | 1212 | U    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 1   | AA    | 1213 | A    |
| 1   | AA    | 1227 | A    |
| 1   | AA    | 1229 | A    |
| 1   | AA    | 1238 | A    |
| 1   | AA    | 1240 | U    |
| 1   | AA    | 1241 | G    |
| 1   | AA    | 1258 | G    |
| 1   | AA    | 1260 | G    |
| 1   | AA    | 1280 | A    |
| 1   | AA    | 1286 | U    |
| 1   | AA    | 1287 | A    |
| 1   | AA    | 1293 | C    |
| 1   | AA    | 1299 | A    |
| 1   | AA    | 1302 | C    |
| 1   | AA    | 1305 | G    |
| 1   | AA    | 1313 | U    |
| 1   | AA    | 1317 | C    |
| 1   | AA    | 1318 | A    |
| 1   | AA    | 1320 | C    |
| 1   | AA    | 1322 | C    |
| 1   | AA    | 1337 | G    |
| 1   | AA    | 1363 | A    |
| 1   | AA    | 1364 | U    |
| 1   | AA    | 1370 | G    |
| 1   | AA    | 1378 | C    |
| 1   | AA    | 1397 | C    |
| 1   | AA    | 1398 | A    |
| 1   | AA    | 1432 | G    |
| 1   | AA    | 1440 | U    |
| 1   | AA    | 1441 | A    |
| 1   | AA    | 1446 | A    |
| 1   | AA    | 1487 | G    |
| 1   | AA    | 1492 | A    |
| 1   | AA    | 1497 | G    |
| 1   | AA    | 1506 | U    |
| 1   | AA    | 1517 | G    |
| 1   | AA    | 1529 | G    |
| 1   | AA    | 1530 | G    |
| 1   | AA    | 1535 | C    |
| 1   | AA    | 1536 | C    |
| 1   | AA    | 1539 | C    |
| 28  | BA    | 10   | A    |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 28  | BA    | 14  | A    |
| 28  | BA    | 26  | G    |
| 28  | BA    | 34  | U    |
| 28  | BA    | 46  | G    |
| 28  | BA    | 55  | G    |
| 28  | BA    | 58  | G    |
| 28  | BA    | 71  | A    |
| 28  | BA    | 74  | A    |
| 28  | BA    | 75  | G    |
| 28  | BA    | 83  | A    |
| 28  | BA    | 84  | A    |
| 28  | BA    | 96  | C    |
| 28  | BA    | 101 | A    |
| 28  | BA    | 118 | A    |
| 28  | BA    | 119 | A    |
| 28  | BA    | 120 | U    |
| 28  | BA    | 125 | A    |
| 28  | BA    | 138 | U    |
| 28  | BA    | 139 | U    |
| 28  | BA    | 140 | C    |
| 28  | BA    | 141 | G    |
| 28  | BA    | 143 | C    |
| 28  | BA    | 149 | A    |
| 28  | BA    | 162 | U    |
| 28  | BA    | 163 | C    |
| 28  | BA    | 166 | U    |
| 28  | BA    | 181 | A    |
| 28  | BA    | 196 | A    |
| 28  | BA    | 199 | A    |
| 28  | BA    | 215 | G    |
| 28  | BA    | 216 | A    |
| 28  | BA    | 222 | A    |
| 28  | BA    | 233 | A    |
| 28  | BA    | 248 | G    |
| 28  | BA    | 255 | A    |
| 28  | BA    | 266 | G    |
| 28  | BA    | 272 | A    |
| 28  | BA    | 276 | U    |
| 28  | BA    | 277 | G    |
| 28  | BA    | 278 | A    |
| 28  | BA    | 279 | A    |
| 28  | BA    | 281 | C    |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 28  | BA    | 285 | G    |
| 28  | BA    | 286 | U    |
| 28  | BA    | 309 | A    |
| 28  | BA    | 311 | A    |
| 28  | BA    | 329 | G    |
| 28  | BA    | 330 | A    |
| 28  | BA    | 359 | G    |
| 28  | BA    | 361 | G    |
| 28  | BA    | 362 | A    |
| 28  | BA    | 371 | A    |
| 28  | BA    | 372 | G    |
| 28  | BA    | 386 | G    |
| 28  | BA    | 396 | G    |
| 28  | BA    | 405 | U    |
| 28  | BA    | 411 | G    |
| 28  | BA    | 412 | A    |
| 28  | BA    | 424 | G    |
| 28  | BA    | 480 | A    |
| 28  | BA    | 481 | G    |
| 28  | BA    | 491 | G    |
| 28  | BA    | 502 | A    |
| 28  | BA    | 505 | A    |
| 28  | BA    | 509 | C    |
| 28  | BA    | 530 | G    |
| 28  | BA    | 532 | A    |
| 28  | BA    | 535 | G    |
| 28  | BA    | 546 | U    |
| 28  | BA    | 548 | G    |
| 28  | BA    | 549 | G    |
| 28  | BA    | 563 | A    |
| 28  | BA    | 573 | U    |
| 28  | BA    | 575 | A    |
| 28  | BA    | 586 | A    |
| 28  | BA    | 603 | A    |
| 28  | BA    | 615 | U    |
| 28  | BA    | 622 | G    |
| 28  | BA    | 627 | A    |
| 28  | BA    | 637 | A    |
| 28  | BA    | 645 | C    |
| 28  | BA    | 647 | G    |
| 28  | BA    | 654 | A    |
| 28  | BA    | 655 | A    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 28  | BA    | 677  | A    |
| 28  | BA    | 686  | U    |
| 28  | BA    | 694  | U    |
| 28  | BA    | 695  | G    |
| 28  | BA    | 730  | A    |
| 28  | BA    | 738  | G    |
| 28  | BA    | 747  | U    |
| 28  | BA    | 764  | A    |
| 28  | BA    | 775  | G    |
| 28  | BA    | 776  | G    |
| 28  | BA    | 782  | A    |
| 28  | BA    | 784  | G    |
| 28  | BA    | 785  | G    |
| 28  | BA    | 805  | G    |
| 28  | BA    | 812  | C    |
| 28  | BA    | 819  | A    |
| 28  | BA    | 827  | U    |
| 28  | BA    | 828  | U    |
| 28  | BA    | 830  | G    |
| 28  | BA    | 844  | A    |
| 28  | BA    | 845  | A    |
| 28  | BA    | 846  | U    |
| 28  | BA    | 847  | U    |
| 28  | BA    | 858  | G    |
| 28  | BA    | 878  | A    |
| 28  | BA    | 883  | G    |
| 28  | BA    | 896  | A    |
| 28  | BA    | 897  | C    |
| 28  | BA    | 910  | A    |
| 28  | BA    | 914  | G    |
| 28  | BA    | 931  | U    |
| 28  | BA    | 941  | A    |
| 28  | BA    | 946  | C    |
| 28  | BA    | 961  | C    |
| 28  | BA    | 974  | G    |
| 28  | BA    | 983  | A    |
| 28  | BA    | 984  | A    |
| 28  | BA    | 985  | C    |
| 28  | BA    | 995  | C    |
| 28  | BA    | 996  | A    |
| 28  | BA    | 1012 | U    |
| 28  | BA    | 1013 | C    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 28  | BA    | 1021 | A    |
| 28  | BA    | 1026 | G    |
| 28  | BA    | 1033 | U    |
| 28  | BA    | 1045 | C    |
| 28  | BA    | 1046 | A    |
| 28  | BA    | 1047 | G    |
| 28  | BA    | 1056 | G    |
| 28  | BA    | 1057 | A    |
| 28  | BA    | 1060 | U    |
| 28  | BA    | 1061 | U    |
| 28  | BA    | 1062 | G    |
| 28  | BA    | 1063 | G    |
| 28  | BA    | 1064 | C    |
| 28  | BA    | 1065 | U    |
| 28  | BA    | 1066 | U    |
| 28  | BA    | 1068 | G    |
| 28  | BA    | 1070 | A    |
| 28  | BA    | 1071 | G    |
| 28  | BA    | 1072 | C    |
| 28  | BA    | 1082 | U    |
| 28  | BA    | 1083 | U    |
| 28  | BA    | 1085 | A    |
| 28  | BA    | 1088 | A    |
| 28  | BA    | 1089 | A    |
| 28  | BA    | 1092 | C    |
| 28  | BA    | 1096 | A    |
| 28  | BA    | 1098 | A    |
| 28  | BA    | 1101 | U    |
| 28  | BA    | 1104 | C    |
| 28  | BA    | 1106 | G    |
| 28  | BA    | 1107 | G    |
| 28  | BA    | 1111 | A    |
| 28  | BA    | 1112 | G    |
| 28  | BA    | 1116 | G    |
| 28  | BA    | 1132 | U    |
| 28  | BA    | 1133 | A    |
| 28  | BA    | 1135 | C    |
| 28  | BA    | 1136 | G    |
| 28  | BA    | 1139 | G    |
| 28  | BA    | 1142 | A    |
| 28  | BA    | 1172 | C    |
| 28  | BA    | 1173 | U    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 28  | BA    | 1174 | U    |
| 28  | BA    | 1175 | A    |
| 28  | BA    | 1176 | U    |
| 28  | BA    | 1179 | G    |
| 28  | BA    | 1180 | U    |
| 28  | BA    | 1212 | G    |
| 28  | BA    | 1236 | G    |
| 28  | BA    | 1238 | G    |
| 28  | BA    | 1241 | A    |
| 28  | BA    | 1250 | G    |
| 28  | BA    | 1253 | A    |
| 28  | BA    | 1256 | G    |
| 28  | BA    | 1266 | G    |
| 28  | BA    | 1271 | G    |
| 28  | BA    | 1272 | A    |
| 28  | BA    | 1273 | U    |
| 28  | BA    | 1300 | G    |
| 28  | BA    | 1301 | A    |
| 28  | BA    | 1345 | C    |
| 28  | BA    | 1352 | U    |
| 28  | BA    | 1365 | A    |
| 28  | BA    | 1368 | G    |
| 28  | BA    | 1379 | U    |
| 28  | BA    | 1383 | A    |
| 28  | BA    | 1384 | A    |
| 28  | BA    | 1395 | A    |
| 28  | BA    | 1416 | G    |
| 28  | BA    | 1428 | C    |
| 28  | BA    | 1452 | G    |
| 28  | BA    | 1456 | G    |
| 28  | BA    | 1460 | U    |
| 28  | BA    | 1482 | G    |
| 28  | BA    | 1483 | G    |
| 28  | BA    | 1493 | C    |
| 28  | BA    | 1494 | A    |
| 28  | BA    | 1504 | A    |
| 28  | BA    | 1508 | A    |
| 28  | BA    | 1509 | A    |
| 28  | BA    | 1510 | G    |
| 28  | BA    | 1515 | A    |
| 28  | BA    | 1533 | C    |
| 28  | BA    | 1535 | A    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 28  | BA    | 1536 | C    |
| 28  | BA    | 1537 | G    |
| 28  | BA    | 1566 | A    |
| 28  | BA    | 1569 | A    |
| 28  | BA    | 1578 | U    |
| 28  | BA    | 1584 | U    |
| 28  | BA    | 1585 | C    |
| 28  | BA    | 1607 | C    |
| 28  | BA    | 1608 | A    |
| 28  | BA    | 1610 | A    |
| 28  | BA    | 1647 | U    |
| 28  | BA    | 1648 | U    |
| 28  | BA    | 1649 | G    |
| 28  | BA    | 1674 | G    |
| 28  | BA    | 1675 | C    |
| 28  | BA    | 1677 | A    |
| 28  | BA    | 1693 | U    |
| 28  | BA    | 1694 | C    |
| 28  | BA    | 1715 | G    |
| 28  | BA    | 1728 | C    |
| 28  | BA    | 1729 | U    |
| 28  | BA    | 1730 | C    |
| 28  | BA    | 1732 | C    |
| 28  | BA    | 1738 | G    |
| 28  | BA    | 1744 | A    |
| 28  | BA    | 1758 | U    |
| 28  | BA    | 1764 | C    |
| 28  | BA    | 1773 | A    |
| 28  | BA    | 1776 | G    |
| 28  | BA    | 1784 | A    |
| 28  | BA    | 1786 | A    |
| 28  | BA    | 1787 | A    |
| 28  | BA    | 1800 | C    |
| 28  | BA    | 1801 | A    |
| 28  | BA    | 1802 | A    |
| 28  | BA    | 1808 | A    |
| 28  | BA    | 1816 | C    |
| 28  | BA    | 1829 | A    |
| 28  | BA    | 1848 | A    |
| 28  | BA    | 1858 | A    |
| 28  | BA    | 1869 | G    |
| 28  | BA    | 1870 | C    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 28  | BA    | 1871 | A    |
| 28  | BA    | 1872 | A    |
| 28  | BA    | 1903 | G    |
| 28  | BA    | 1906 | G    |
| 28  | BA    | 1913 | A    |
| 28  | BA    | 1914 | C    |
| 28  | BA    | 1919 | A    |
| 28  | BA    | 1927 | A    |
| 28  | BA    | 1929 | G    |
| 28  | BA    | 1930 | G    |
| 28  | BA    | 1937 | A    |
| 28  | BA    | 1944 | U    |
| 28  | BA    | 1955 | U    |
| 28  | BA    | 1965 | C    |
| 28  | BA    | 1967 | C    |
| 28  | BA    | 1970 | A    |
| 28  | BA    | 1971 | U    |
| 28  | BA    | 1972 | G    |
| 28  | BA    | 1991 | U    |
| 28  | BA    | 1993 | U    |
| 28  | BA    | 1997 | C    |
| 28  | BA    | 2022 | U    |
| 28  | BA    | 2023 | C    |
| 28  | BA    | 2027 | G    |
| 28  | BA    | 2031 | A    |
| 28  | BA    | 2033 | A    |
| 28  | BA    | 2036 | C    |
| 28  | BA    | 2043 | C    |
| 28  | BA    | 2052 | A    |
| 28  | BA    | 2055 | C    |
| 28  | BA    | 2056 | G    |
| 28  | BA    | 2060 | A    |
| 28  | BA    | 2061 | G    |
| 28  | BA    | 2062 | A    |
| 28  | BA    | 2069 | G    |
| 28  | BA    | 2100 | G    |
| 28  | BA    | 2102 | G    |
| 28  | BA    | 2110 | G    |
| 28  | BA    | 2111 | U    |
| 28  | BA    | 2112 | G    |
| 28  | BA    | 2113 | U    |
| 28  | BA    | 2114 | A    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 28  | BA    | 2115 | G    |
| 28  | BA    | 2117 | A    |
| 28  | BA    | 2118 | U    |
| 28  | BA    | 2119 | A    |
| 28  | BA    | 2120 | G    |
| 28  | BA    | 2121 | G    |
| 28  | BA    | 2125 | G    |
| 28  | BA    | 2126 | A    |
| 28  | BA    | 2127 | G    |
| 28  | BA    | 2129 | C    |
| 28  | BA    | 2131 | U    |
| 28  | BA    | 2132 | U    |
| 28  | BA    | 2133 | G    |
| 28  | BA    | 2135 | A    |
| 28  | BA    | 2137 | U    |
| 28  | BA    | 2140 | G    |
| 28  | BA    | 2145 | C    |
| 28  | BA    | 2146 | C    |
| 28  | BA    | 2147 | A    |
| 28  | BA    | 2148 | G    |
| 28  | BA    | 2157 | G    |
| 28  | BA    | 2158 | A    |
| 28  | BA    | 2159 | G    |
| 28  | BA    | 2162 | G    |
| 28  | BA    | 2164 | C    |
| 28  | BA    | 2170 | A    |
| 28  | BA    | 2171 | A    |
| 28  | BA    | 2172 | U    |
| 28  | BA    | 2177 | C    |
| 28  | BA    | 2178 | C    |
| 28  | BA    | 2183 | A    |
| 28  | BA    | 2187 | U    |
| 28  | BA    | 2190 | G    |
| 28  | BA    | 2194 | U    |
| 28  | BA    | 2198 | A    |
| 28  | BA    | 2204 | G    |
| 28  | BA    | 2211 | A    |
| 28  | BA    | 2212 | A    |
| 28  | BA    | 2225 | A    |
| 28  | BA    | 2226 | C    |
| 28  | BA    | 2238 | G    |
| 28  | BA    | 2239 | G    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 28  | BA    | 2250 | G    |
| 28  | BA    | 2278 | A    |
| 28  | BA    | 2283 | C    |
| 28  | BA    | 2287 | A    |
| 28  | BA    | 2288 | A    |
| 28  | BA    | 2297 | A    |
| 28  | BA    | 2305 | U    |
| 28  | BA    | 2309 | A    |
| 28  | BA    | 2311 | A    |
| 28  | BA    | 2322 | A    |
| 28  | BA    | 2325 | G    |
| 28  | BA    | 2327 | A    |
| 28  | BA    | 2333 | A    |
| 28  | BA    | 2335 | A    |
| 28  | BA    | 2347 | C    |
| 28  | BA    | 2361 | G    |
| 28  | BA    | 2383 | G    |
| 28  | BA    | 2385 | C    |
| 28  | BA    | 2402 | U    |
| 28  | BA    | 2406 | A    |
| 28  | BA    | 2407 | A    |
| 28  | BA    | 2423 | U    |
| 28  | BA    | 2425 | A    |
| 28  | BA    | 2428 | G    |
| 28  | BA    | 2429 | G    |
| 28  | BA    | 2430 | A    |
| 28  | BA    | 2435 | A    |
| 28  | BA    | 2441 | U    |
| 28  | BA    | 2448 | A    |
| 28  | BA    | 2459 | A    |
| 28  | BA    | 2475 | C    |
| 28  | BA    | 2476 | A    |
| 28  | BA    | 2491 | U    |
| 28  | BA    | 2502 | G    |
| 28  | BA    | 2505 | G    |
| 28  | BA    | 2507 | C    |
| 28  | BA    | 2518 | A    |
| 28  | BA    | 2520 | C    |
| 28  | BA    | 2529 | G    |
| 28  | BA    | 2547 | A    |
| 28  | BA    | 2554 | U    |
| 28  | BA    | 2566 | A    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 28  | BA    | 2567 | G    |
| 28  | BA    | 2582 | G    |
| 28  | BA    | 2602 | A    |
| 28  | BA    | 2609 | U    |
| 28  | BA    | 2613 | U    |
| 28  | BA    | 2615 | U    |
| 28  | BA    | 2629 | U    |
| 28  | BA    | 2630 | G    |
| 28  | BA    | 2663 | G    |
| 28  | BA    | 2684 | U    |
| 28  | BA    | 2689 | U    |
| 28  | BA    | 2690 | U    |
| 28  | BA    | 2714 | G    |
| 28  | BA    | 2726 | A    |
| 28  | BA    | 2733 | A    |
| 28  | BA    | 2748 | A    |
| 28  | BA    | 2765 | A    |
| 28  | BA    | 2778 | A    |
| 28  | BA    | 2780 | G    |
| 28  | BA    | 2794 | C    |
| 28  | BA    | 2807 | U    |
| 28  | BA    | 2820 | A    |
| 28  | BA    | 2867 | G    |
| 28  | BA    | 2871 | U    |
| 28  | BA    | 2873 | A    |
| 28  | BA    | 2880 | C    |
| 28  | BA    | 2884 | U    |
| 28  | BA    | 2887 | A    |
| 28  | BA    | 2903 | U    |
| 29  | BB    | 15   | A    |
| 29  | BB    | 35   | C    |
| 29  | BB    | 42   | C    |
| 29  | BB    | 44   | G    |
| 29  | BB    | 45   | A    |
| 29  | BB    | 56   | G    |
| 29  | BB    | 88   | C    |
| 29  | BB    | 89   | U    |
| 29  | BB    | 90   | C    |
| 29  | BB    | 91   | C    |
| 29  | BB    | 99   | A    |
| 29  | BB    | 109  | A    |

All (34) RNA pucker outliers are listed below:

| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 1   | AA    | 96   | U    |
| 1   | AA    | 115  | G    |
| 1   | AA    | 411  | A    |
| 1   | AA    | 428  | G    |
| 1   | AA    | 451  | A    |
| 1   | AA    | 480  | U    |
| 1   | AA    | 481  | G    |
| 1   | AA    | 484  | G    |
| 1   | AA    | 575  | G    |
| 1   | AA    | 1078 | U    |
| 1   | AA    | 1145 | A    |
| 1   | AA    | 1201 | A    |
| 1   | AA    | 1317 | C    |
| 1   | AA    | 1397 | C    |
| 28  | BA    | 25   | U    |
| 28  | BA    | 138  | U    |
| 28  | BA    | 271  | G    |
| 28  | BA    | 361  | G    |
| 28  | BA    | 404  | A    |
| 28  | BA    | 479  | A    |
| 28  | BA    | 784  | G    |
| 28  | BA    | 846  | U    |
| 28  | BA    | 984  | A    |
| 28  | BA    | 1084 | A    |
| 28  | BA    | 1095 | A    |
| 28  | BA    | 1240 | U    |
| 28  | BA    | 1583 | A    |
| 28  | BA    | 1847 | A    |
| 28  | BA    | 1913 | A    |
| 28  | BA    | 2109 | U    |
| 28  | BA    | 2147 | A    |
| 28  | BA    | 2286 | G    |
| 28  | BA    | 2308 | G    |
| 29  | BB    | 44   | G    |

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

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

## 5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

## 5.6 Ligand geometry

Of 313 ligands modelled in this entry, 311 are monoatomic - leaving 2 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 |
| 54  | 84G  | AA    | 1694 | -    | 39,40,40     | 1.83 | 8 (20%)  | 48,57,57    | 1.18 | 5 (10%)  |
| 54  | 84G  | AA    | 1695 | -    | 39,40,40     | 0.55 | 1 (2%)   | 48,57,57    | 1.05 | 3 (6%)   |

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   |
|-----|------|-------|------|------|---------|------------|---------|
| 54  | 84G  | AA    | 1694 | -    | -       | 3/23/76/76 | 0/3/3/3 |
| 54  | 84G  | AA    | 1695 | -    | -       | 3/23/76/76 | 0/3/3/3 |

All (9) bond length outliers are listed below:

| Mol | Chain | Res  | Type | Atoms   | Z     | Observed(Å) | Ideal(Å) |
|-----|-------|------|------|---------|-------|-------------|----------|
| 54  | AA    | 1694 | 84G  | C3-N1   | 6.55  | 1.48        | 1.34     |
| 54  | AA    | 1694 | 84G  | C21-C20 | -3.85 | 1.48        | 1.53     |
| 54  | AA    | 1694 | 84G  | O6-C16  | 3.60  | 1.51        | 1.41     |
| 54  | AA    | 1694 | 84G  | C11-C12 | -3.10 | 1.45        | 1.52     |
| 54  | AA    | 1694 | 84G  | O1-C3   | -3.03 | 1.17        | 1.23     |
| 54  | AA    | 1694 | 84G  | C19-C20 | -2.82 | 1.50        | 1.53     |
| 54  | AA    | 1694 | 84G  | C20-N5  | 2.48  | 1.51        | 1.47     |
| 54  | AA    | 1694 | 84G  | O3-C9   | 2.16  | 1.47        | 1.44     |
| 54  | AA    | 1695 | 84G  | C2-C3   | -2.10 | 1.50        | 1.52     |

All (8) bond angle outliers are listed below:

| Mol | Chain | Res  | Type | Atoms    | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|----------|-------|-------------|----------|
| 54  | AA    | 1694 | 84G  | C-C1-C2  | -3.00 | 108.42      | 112.52   |
| 54  | AA    | 1694 | 84G  | C5-C4-N1 | -2.74 | 106.58      | 110.78   |

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| Mol | Chain | Res  | Type | Atoms       | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|-------------|-------|-------------|----------|
| 54  | AA    | 1695 | 84G  | C-C1-C2     | -2.52 | 109.07      | 112.52   |
| 54  | AA    | 1695 | 84G  | C4-N1-C3    | -2.46 | 118.97      | 123.25   |
| 54  | AA    | 1694 | 84G  | C4-N1-C3    | -2.16 | 119.50      | 123.25   |
| 54  | AA    | 1695 | 84G  | C17-C19-C20 | -2.15 | 108.29      | 110.67   |
| 54  | AA    | 1694 | 84G  | C11-C9-C10  | -2.13 | 108.77      | 112.83   |
| 54  | AA    | 1694 | 84G  | C7-C14-C15  | 2.13  | 113.42      | 109.11   |

There are no chirality outliers.

All (6) torsion outliers are listed below:

| Mol | Chain | Res  | Type | Atoms          |
|-----|-------|------|------|----------------|
| 54  | AA    | 1694 | 84G  | N3-C10-C9-O3   |
| 54  | AA    | 1695 | 84G  | C14-C7-O2-C8   |
| 54  | AA    | 1694 | 84G  | O6-C17-C18-O7  |
| 54  | AA    | 1694 | 84G  | C19-C17-C18-O7 |
| 54  | AA    | 1695 | 84G  | N-C-C1-C2      |
| 54  | AA    | 1695 | 84G  | C6-C7-O2-C8    |

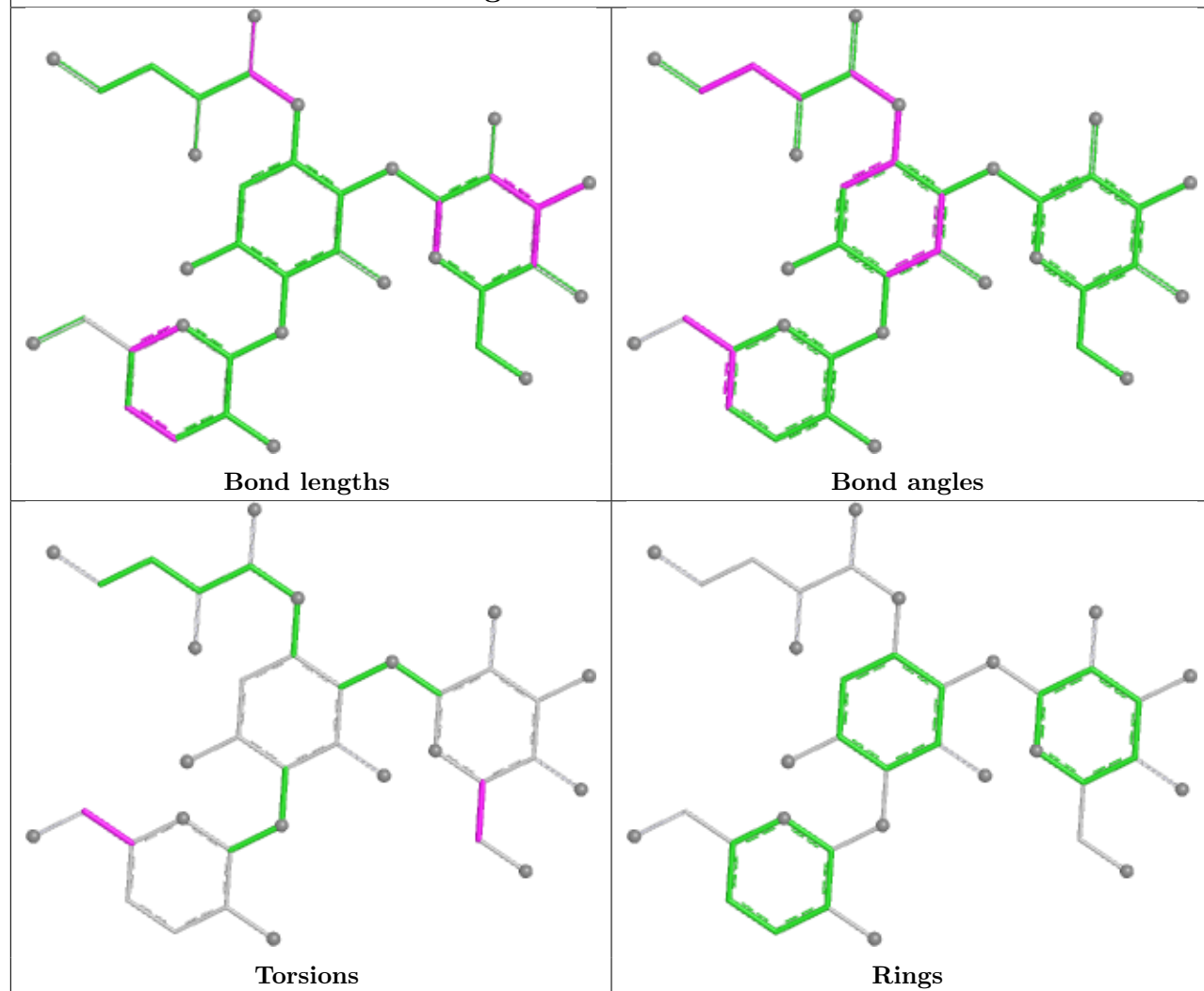
There are no ring outliers.

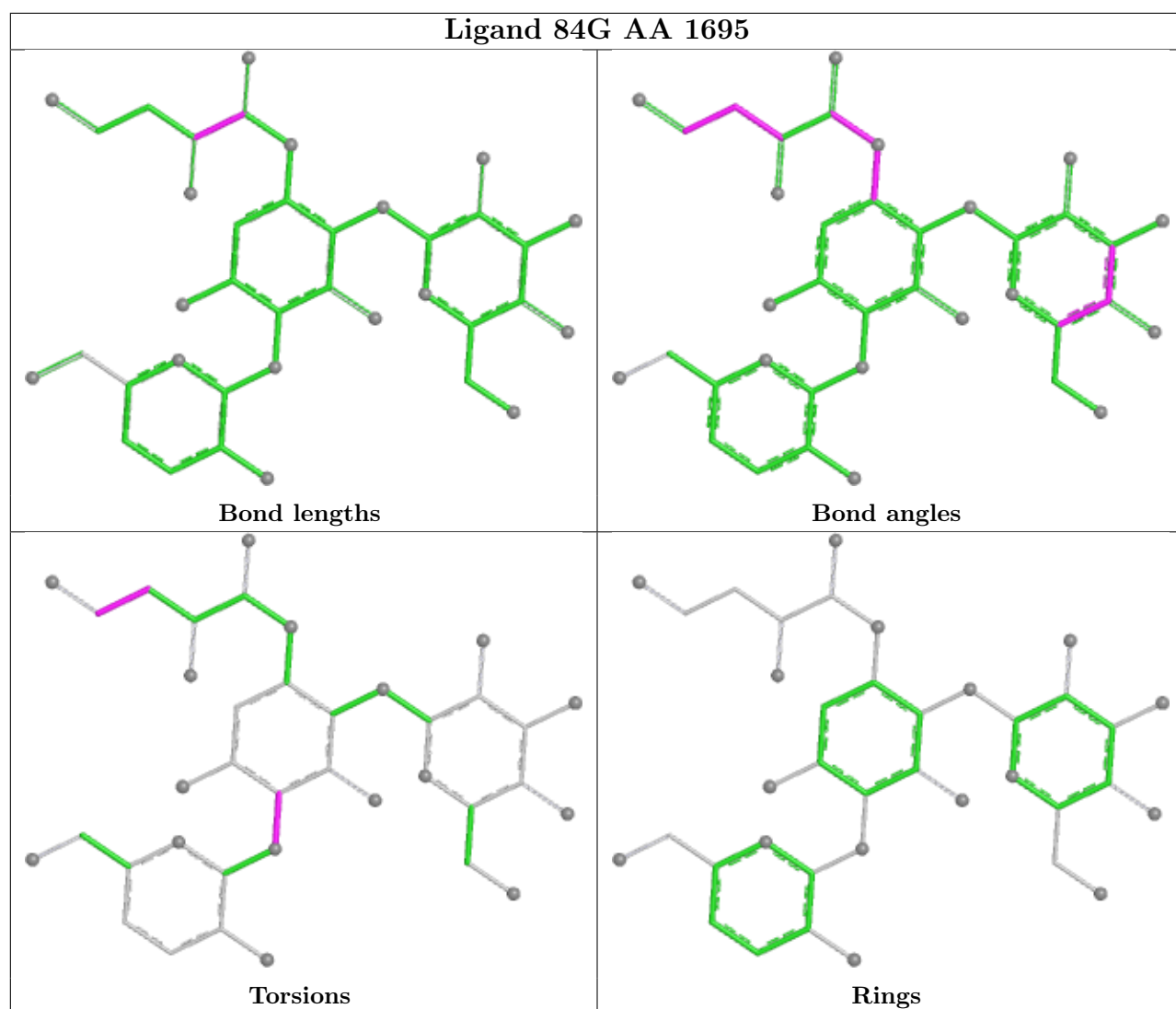
1 monomer is involved in 3 short contacts:

| Mol | Chain | Res  | Type | Clashes | Symm-Clashes |
|-----|-------|------|------|---------|--------------|
| 54  | AA    | 1694 | 84G  | 3       | 0            |

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.

## Ligand 84G AA 1694





## 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.

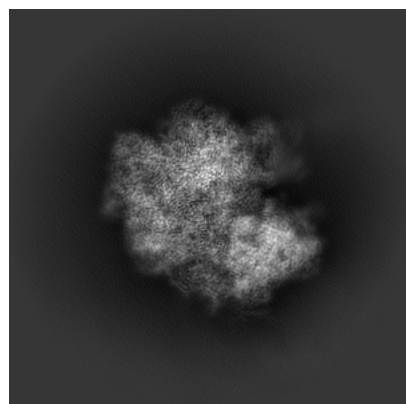
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-44193. These allow visual inspection of the internal detail of the map and identification of artifacts.

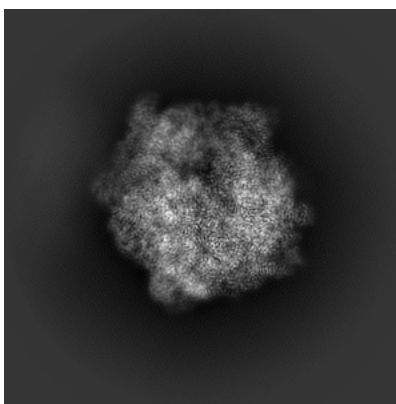
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

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

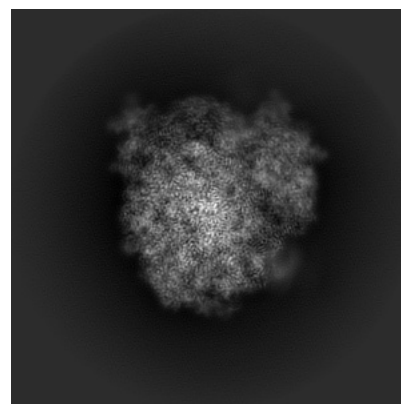
#### 6.1.1 Primary map



X

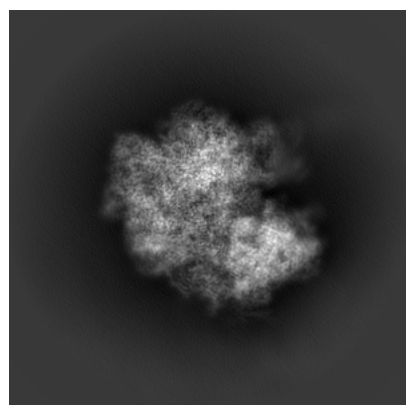


Y

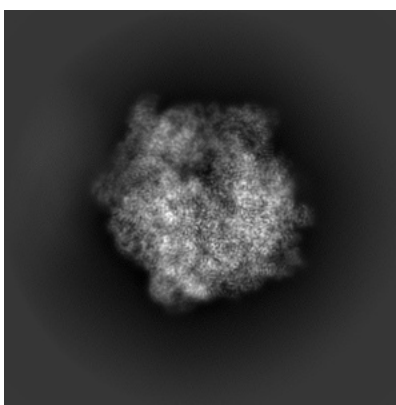


Z

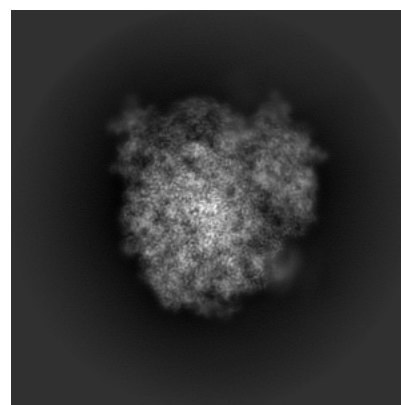
#### 6.1.2 Raw map



X



Y

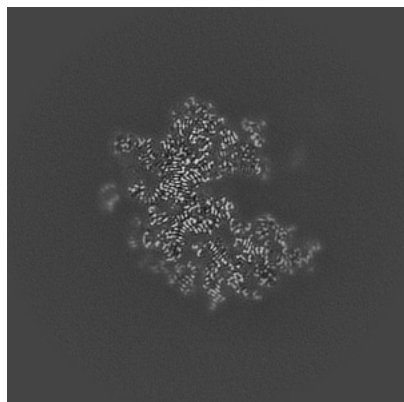


Z

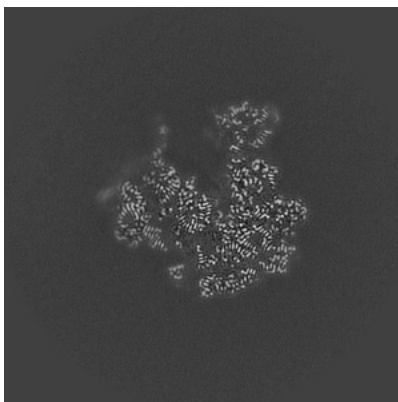
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices [i](#)

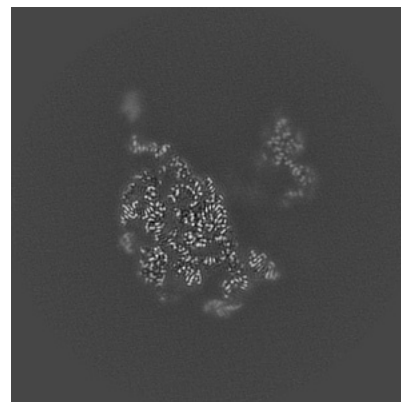
### 6.2.1 Primary map



X Index: 200

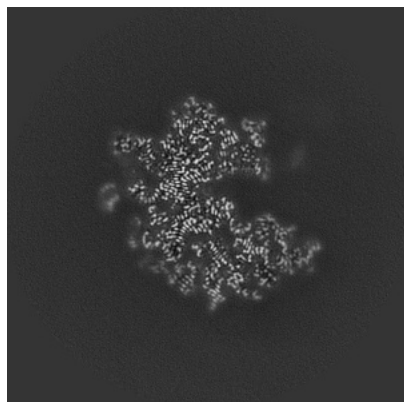


Y Index: 200

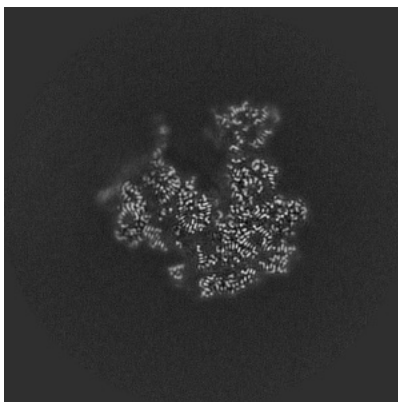


Z Index: 200

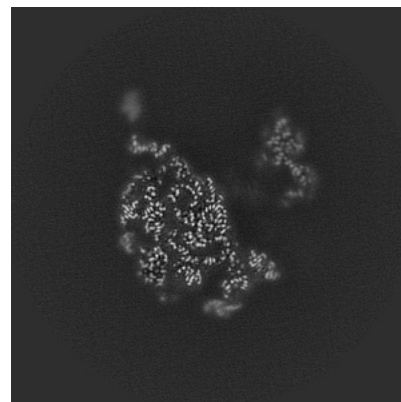
### 6.2.2 Raw map



X Index: 200



Y Index: 200

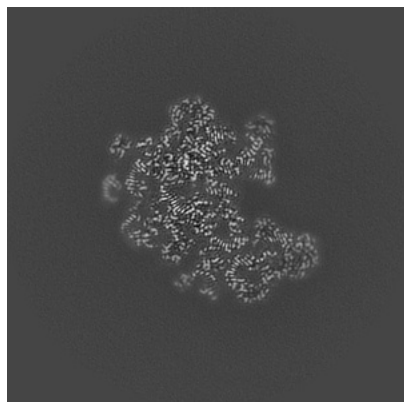


Z Index: 200

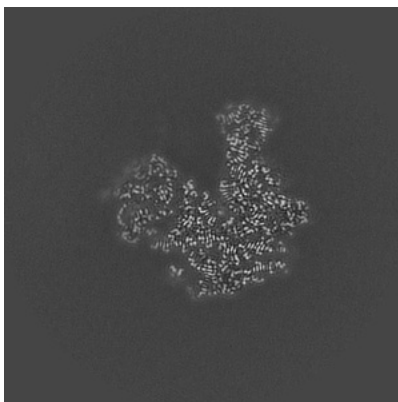
The images above show central slices of the map in three orthogonal directions.

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

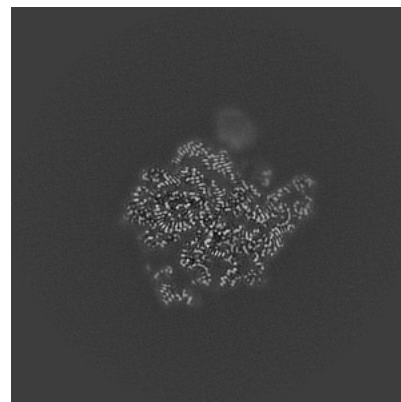
### 6.3.1 Primary map



X Index: 190

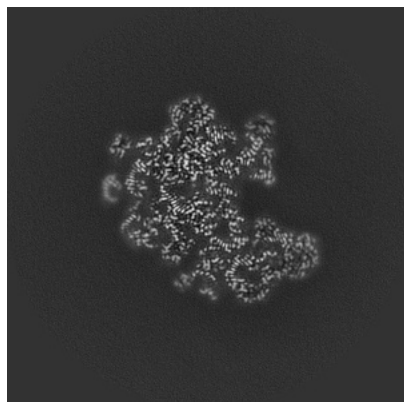


Y Index: 196

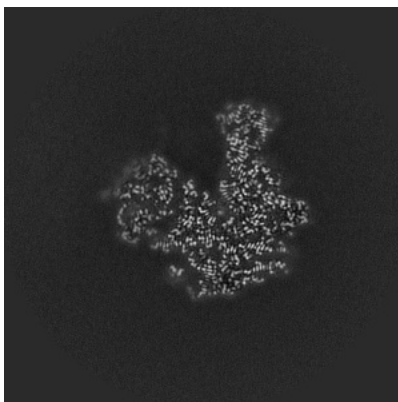


Z Index: 234

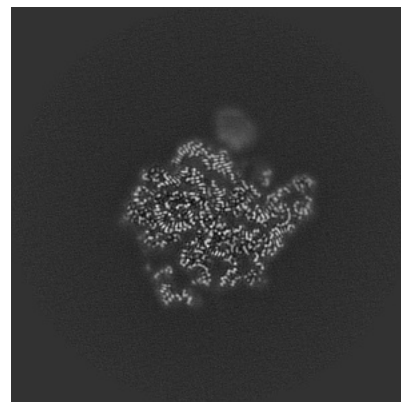
### 6.3.2 Raw map



X Index: 190



Y Index: 196

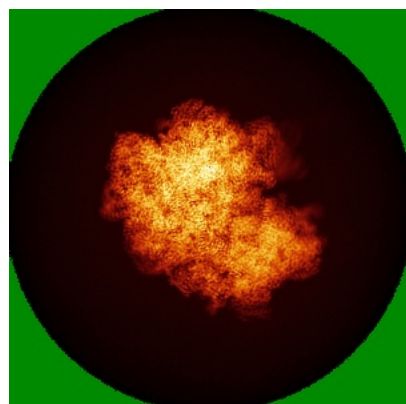


Z Index: 234

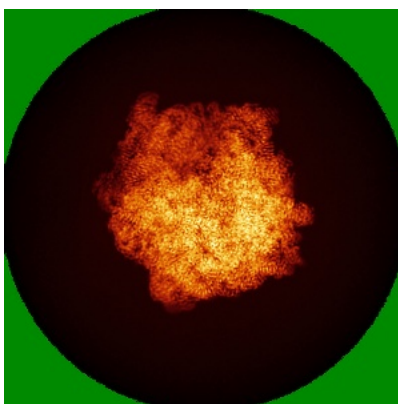
The images above show the largest variance slices of the map in three orthogonal directions.

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

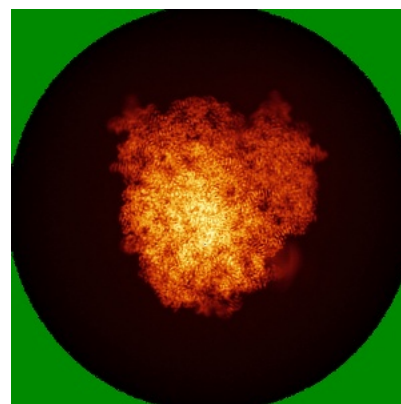
### 6.4.1 Primary map



X



Y

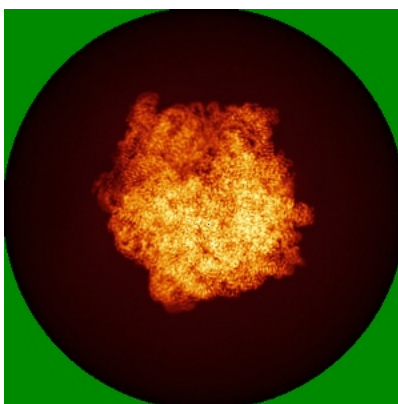


Z

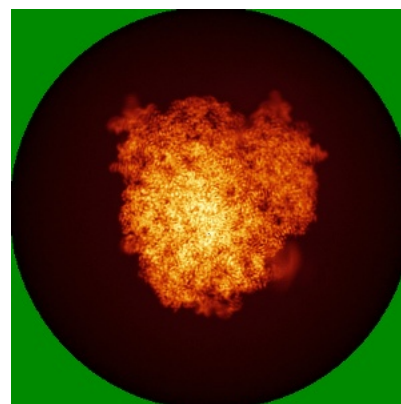
### 6.4.2 Raw map



X



Y

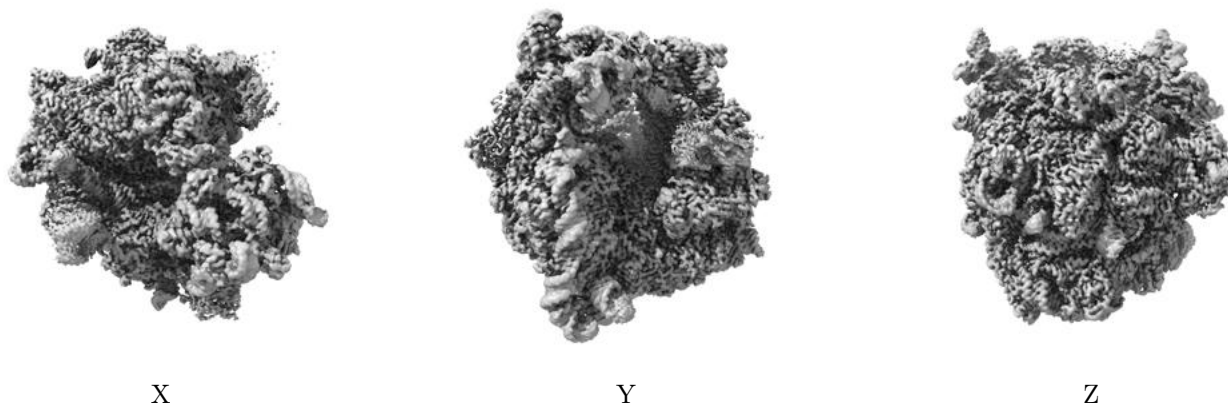


Z

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.

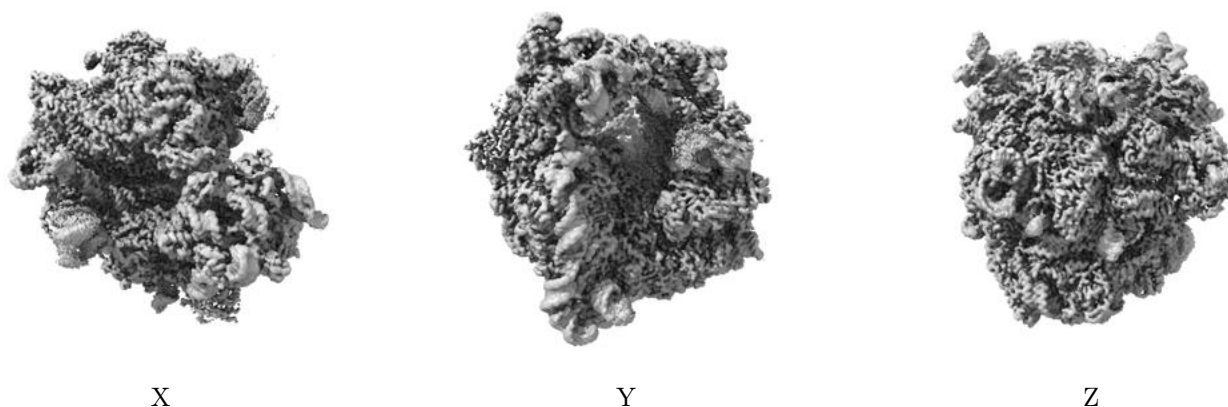
## 6.5 Orthogonal surface views [i](#)

### 6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 2.5. 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.

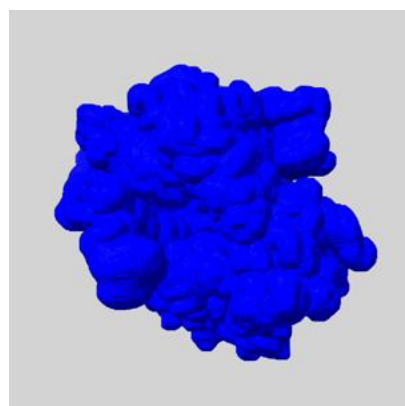
## 6.6 Mask visualisation [i](#)

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

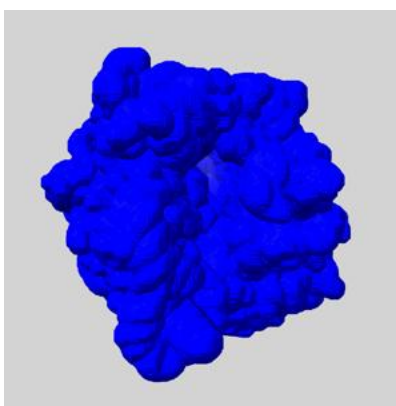
A mask typically either:

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

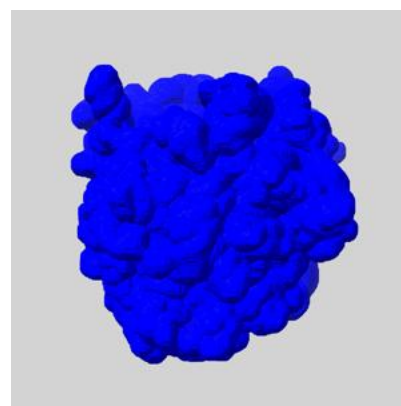
### 6.6.1 emd\_44193\_msk\_1.map [i](#)



X



Y

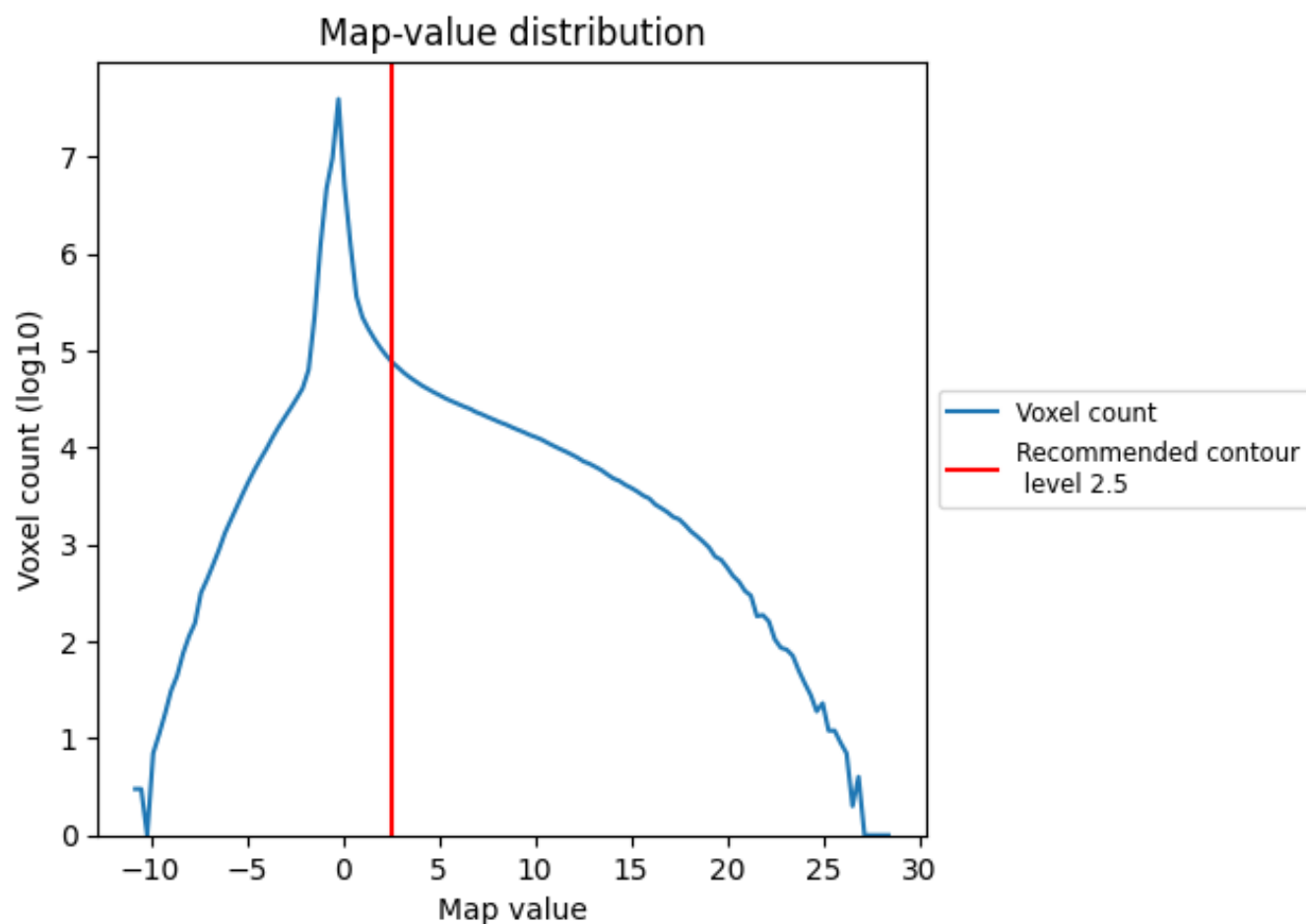


Z

## 7 Map analysis [i](#)

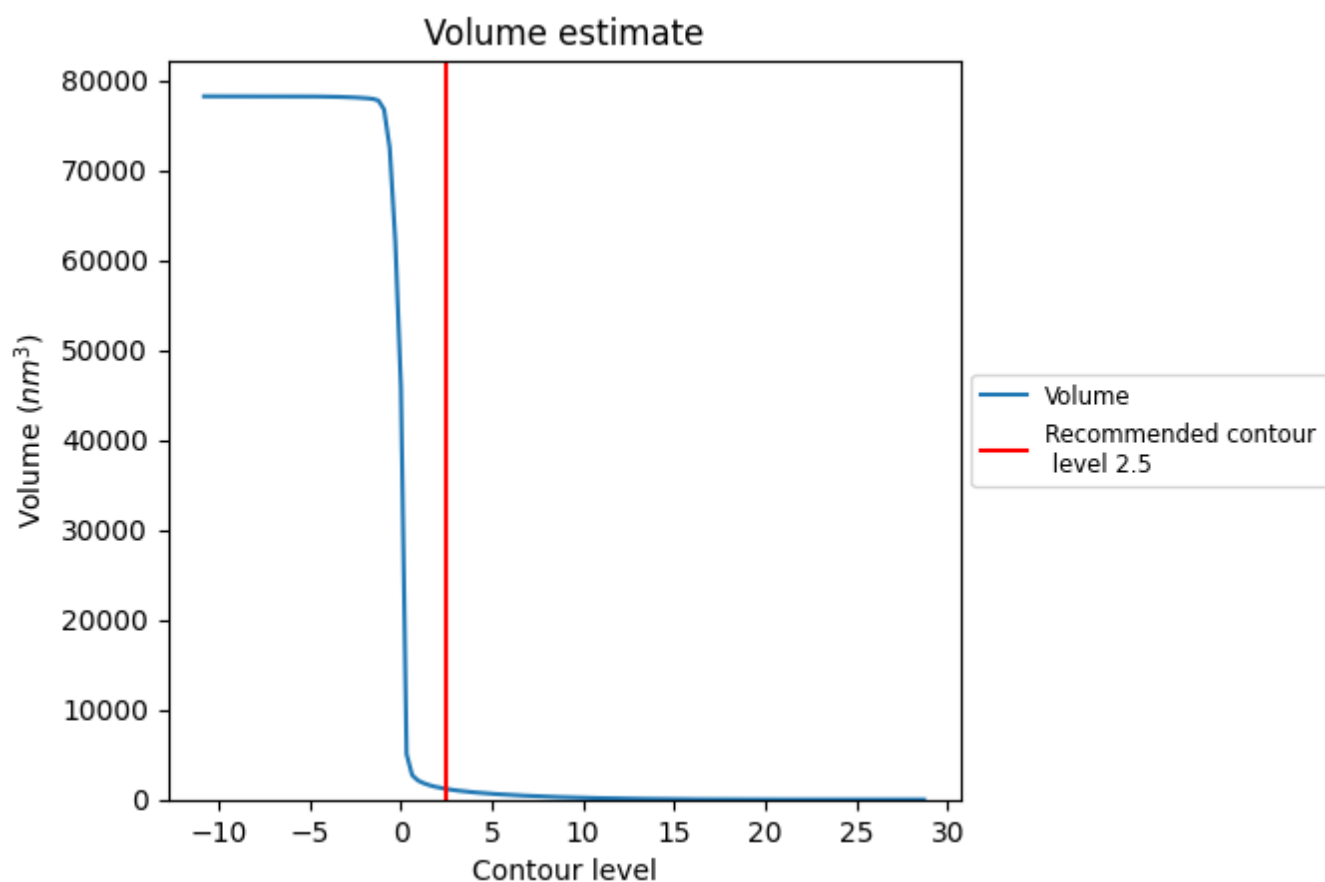
This section contains the results of statistical analysis of the map.

### 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.

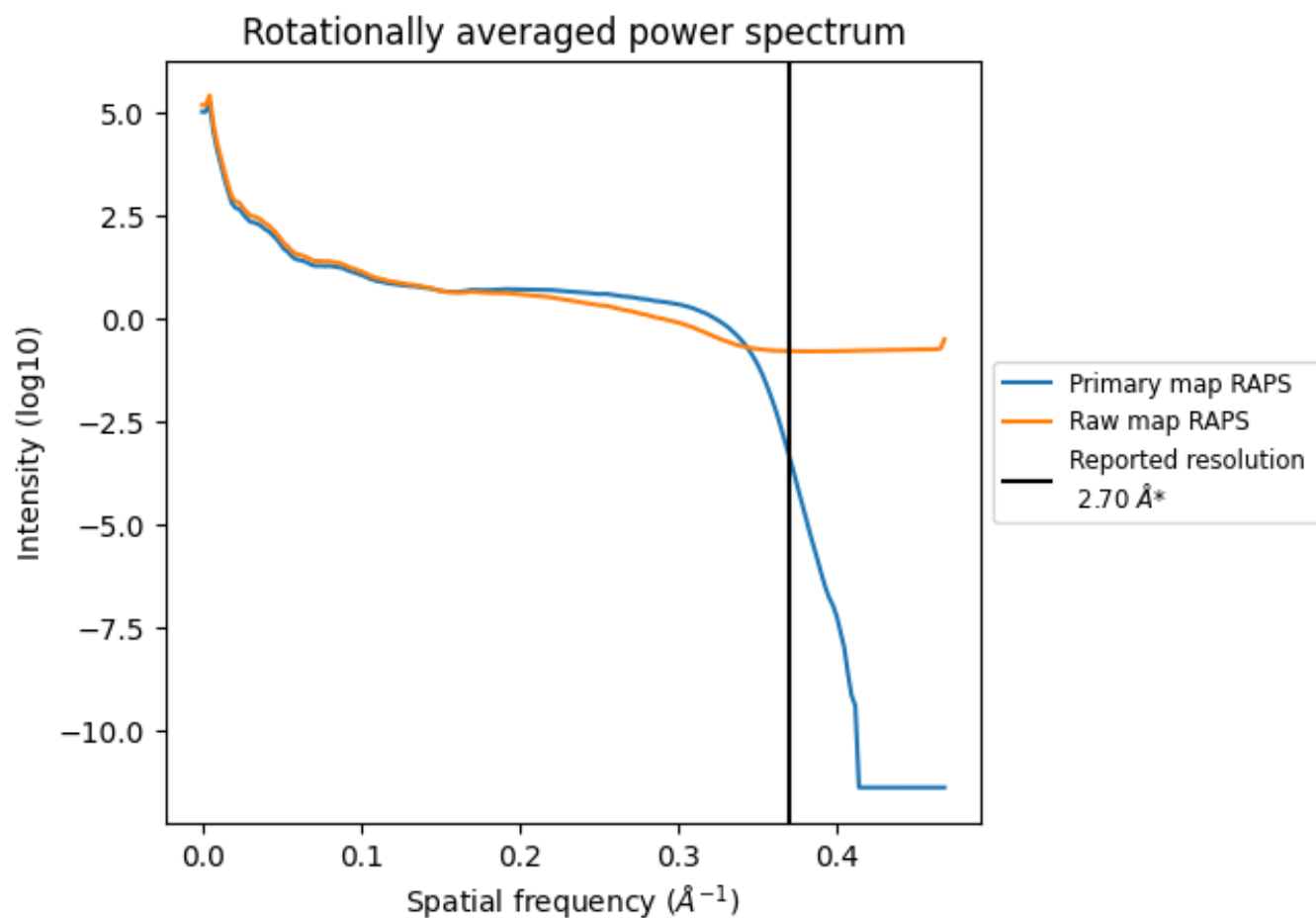
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 1174  $\text{nm}^3$ ; this corresponds to an approximate mass of 1060 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 ⓘ

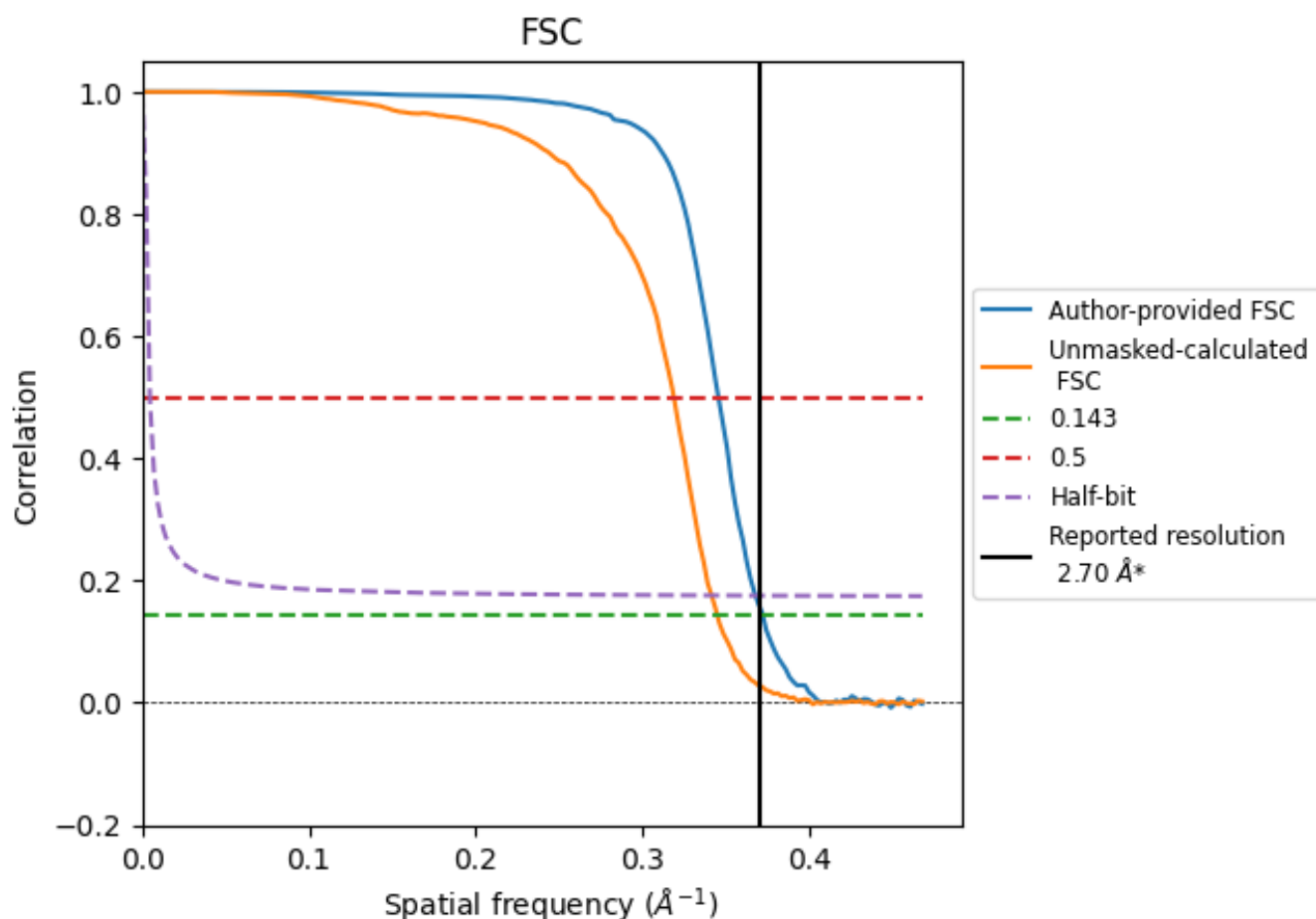


\*Reported resolution corresponds to spatial frequency of 0.370 Å<sup>-1</sup>

## 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 0.370  $\text{\AA}^{-1}$

## 8.2 Resolution estimates [i](#)

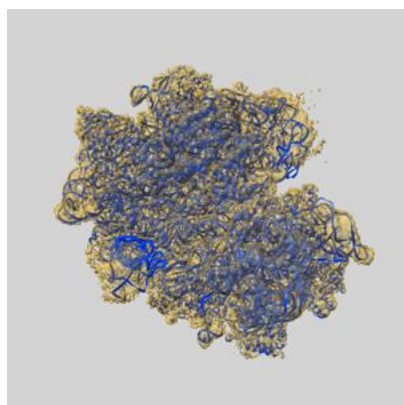
| Resolution estimate (Å)   | Estimation criterion (FSC cut-off) |      |          |
|---------------------------|------------------------------------|------|----------|
|                           | 0.143                              | 0.5  | Half-bit |
| Reported by author        | 2.70                               | -    | -        |
| Author-provided FSC curve | 2.69                               | 2.89 | 2.72     |
| Unmasked-calculated*      | 2.90                               | 3.14 | 2.93     |

\*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps.

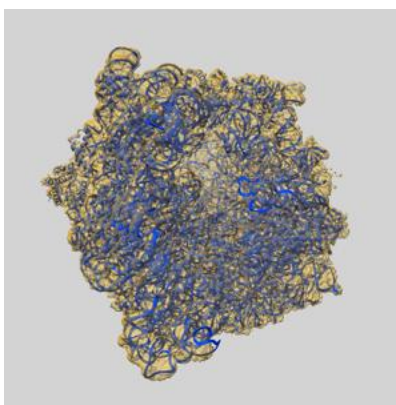
## 9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-44193 and PDB model 9B50. Per-residue inclusion information can be found in [section 3](#) on [page 14](#).

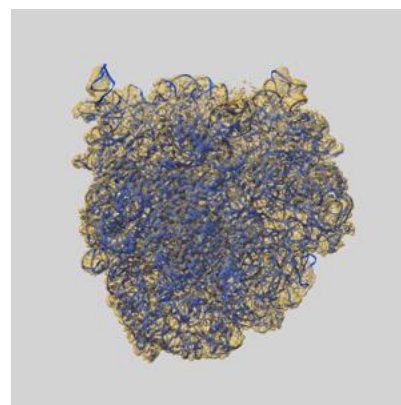
### 9.1 Map-model overlay [i](#)



X



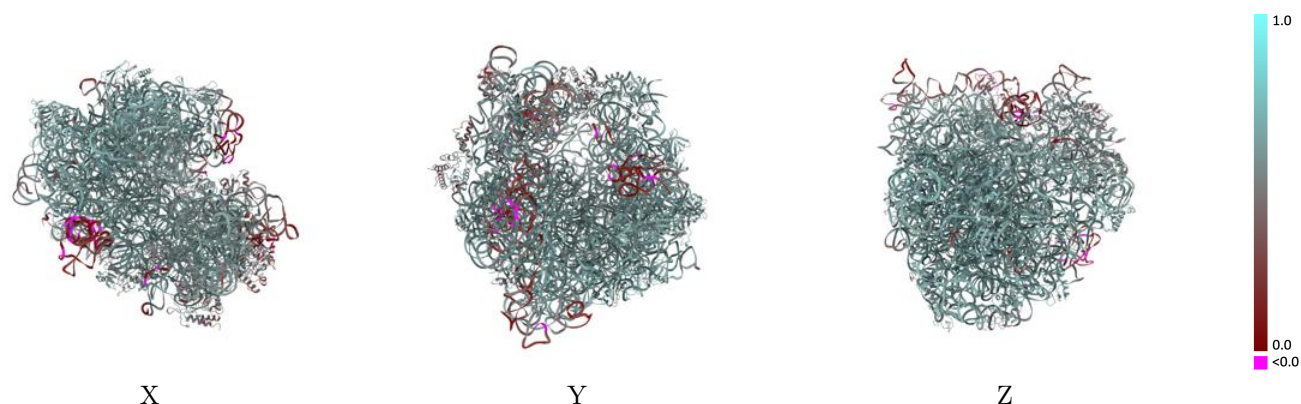
Y



Z

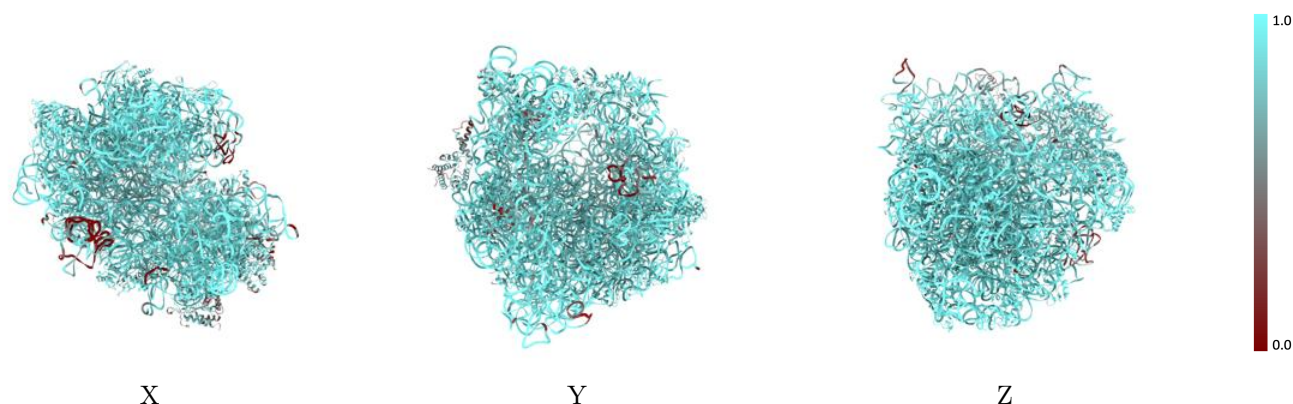
The images above show the 3D surface view of the map at the recommended contour level 2.5 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



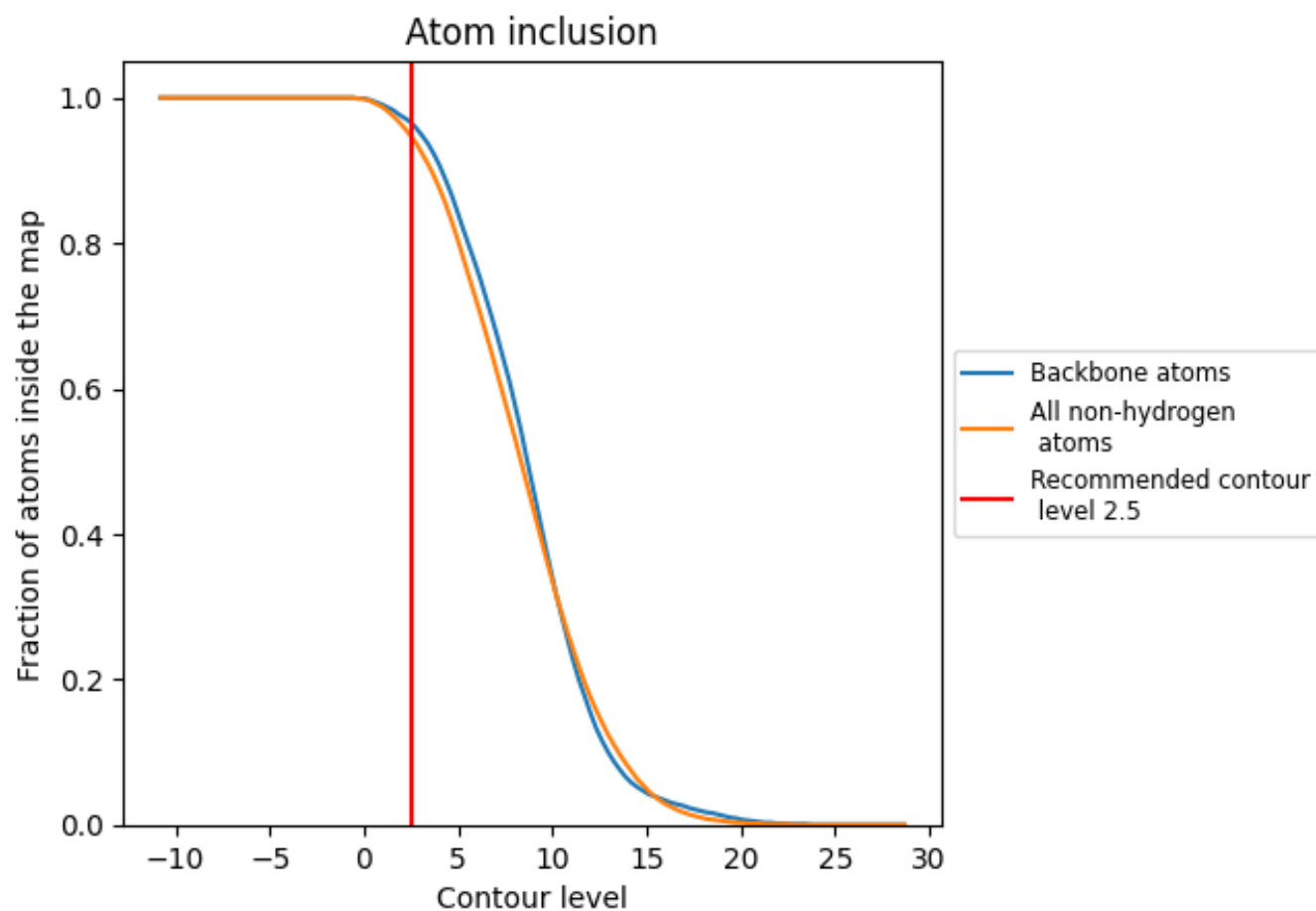
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (2.5).

## 9.4 Atom inclusion [i](#)



At the recommended contour level, 97% of all backbone atoms, 95% 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 (2.5) and Q-score for the entire model and for each chain.

| Chain | Atom inclusion                                                                             | Q-score                                                                                    |
|-------|--------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| All   |  0.9470   |  0.5750   |
| AA    |  0.9610   |  0.5530   |
| AB    |  0.6350   |  0.4760   |
| AC    |  0.8930   |  0.5430   |
| AD    |  0.7380   |  0.3620   |
| AE    |  0.9320   |  0.5740   |
| AF    |  0.9020   |  0.5330   |
| AG    |  0.8670   |  0.5060   |
| AH    |  0.9530   |  0.6000   |
| AI    |  0.8530   |  0.4860   |
| AJ    |  0.8090   |  0.4680   |
| AK    |  0.9340   |  0.5640   |
| AL    |  0.9070   |  0.5590   |
| AM    |  0.8850   |  0.5040   |
| AN    |  0.9030  |  0.5170  |
| AO    |  0.9530 |  0.5930 |
| AP    |  0.9140 |  0.5500 |
| AQ    |  0.9180 |  0.5550 |
| AR    |  0.9540 |  0.5690 |
| AS    |  0.8790 |  0.4950 |
| AT    |  0.9340 |  0.5710 |
| AU    |  0.6450 |  0.3900 |
| B0    |  0.9530 |  0.6180 |
| B1    |  0.9400 |  0.5950 |
| B2    |  0.9720 |  0.6390 |
| B3    |  0.9860 |  0.6410 |
| B4    |  0.9690 |  0.6200 |
| B5    |  0.8180 |  0.4930 |
| BA    |  0.9630 |  0.5930 |
| BB    |  0.9950 |  0.6040 |
| BC    |  0.9790 |  0.6320 |
| BD    |  0.9690 |  0.6280 |
| BE    |  0.9550 |  0.6050 |
| BF    |  0.8970 |  0.5420 |
| BG    |  0.9110 |  0.5600 |



*Continued on next page...*

*Continued from previous page...*

| Chain | Atom inclusion                                                                            | Q-score                                                                                   |
|-------|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| BH    |  0.7750  |  0.4790  |
| BJ    |  0.9700  |  0.6220  |
| BK    |  0.9660  |  0.6140  |
| BL    |  0.9670  |  0.6110  |
| BM    |  0.9650  |  0.6120  |
| BN    |  0.9780  |  0.6180  |
| BO    |  0.9560  |  0.5940  |
| BP    |  0.9480  |  0.6130  |
| BQ    |  0.9890  |  0.6370  |
| BR    |  0.9320  |  0.5960  |
| BS    |  0.9560  |  0.6160  |
| BT    |  0.9330  |  0.5900  |
| BU    |  0.9470  |  0.5790  |
| BV    |  0.9290  |  0.6020  |
| BW    |  0.9680  |  0.6260  |
| BX    |  0.9670  |  0.6240  |
| BY    |  0.9090  |  0.5640  |
| BZ    |  0.9520 |  0.6150 |