



## Full wwPDB EM Validation Report ⓘ

Dec 10, 2025 – 02:27 pm GMT

PDB ID : 9FS6 / pdb\_00009fs6  
EMDB ID : EMD-50724  
Title : Cryo-EM structure of *Saccharolobus solfataricus* 30S initiation complex bound to Ss-aIF2beta leaderless mRNA with h44 in up position  
Authors : Bourgeois, G.; Coureux, P.D.; Mechulam, Y.; Schmitt, E.  
Deposited on : 2024-06-20  
Resolution : 2.90 Å(reported)

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

We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

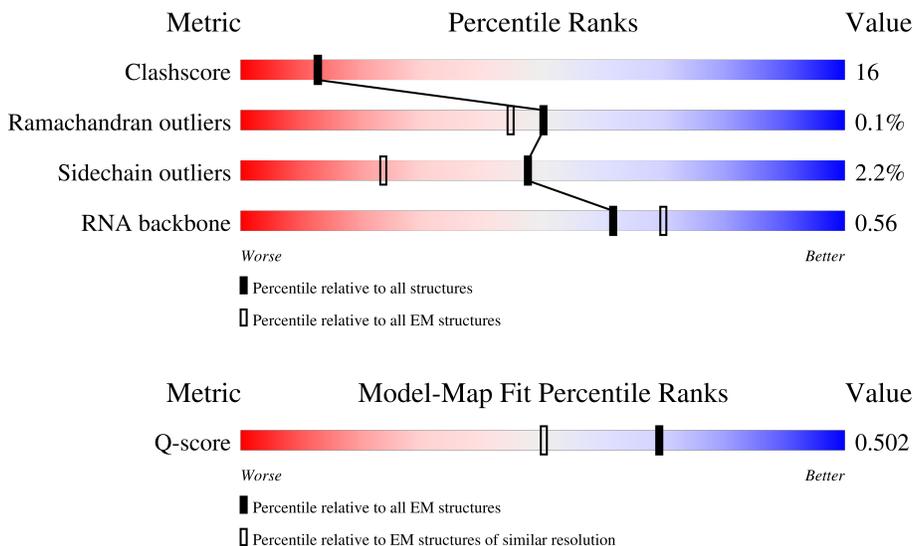
EMDB validation analysis : 0.0.1.dev129  
Mogul : 1.8.4, CSD as541be (2020)  
MolProbity : 4-5-2 with Phenix2.0  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)  
MapQ : 1.9.13  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.47

# 1 Overall quality at a glance

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

The reported resolution of this entry is 2.90 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.



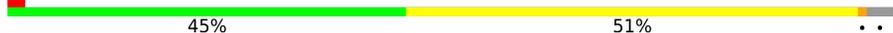
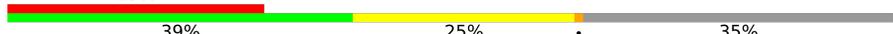
| Metric                | Whole archive<br>(#Entries) | EM structures<br>(#Entries) | Similar EM resolution<br>(#Entries, resolution range(Å)) |
|-----------------------|-----------------------------|-----------------------------|--|
| Clashscore            | 210492                      | 15764                       | -  |
| Ramachandran outliers | 207382                      | 16835                       | -  |
| Sidechain outliers    | 206894                      | 16415                       | -  |
| RNA backbone          | 6643                        | 2191                        | -  |
| Q-score               | -                           | 25397                       | 13054 ( 2.40 - 3.40 )                                    |

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   | 2     | 1497   | 51% 36% 10% .    |
| 2   | A     | 208    | 56% 33% 11%      |
| 3   | B     | 231    | 65% 27% . 7%     |

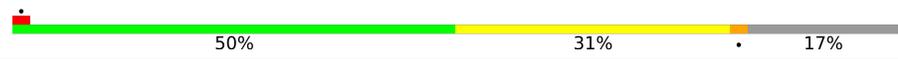
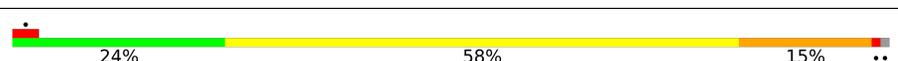
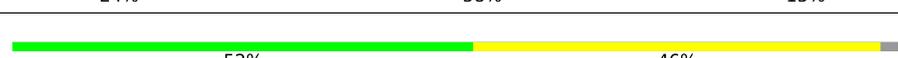
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| Mol | Chain | Length | Quality of chain   |
|-----|-------|--------|--|
| 4   | C     | 65     |  52% 35% 11%       |
| 5   | D     | 181    |  66% 26% 8%        |
| 6   | E     | 239    |  77% 22%           |
| 7   | F     | 214    |  75% 23%           |
| 8   | G     | 214    |  7% 58% 41%        |
| 9   | H     | 193    |  7% 47% 52%        |
| 10  | I     | 133    |  83% 15%           |
| 11  | J     | 133    |  69% 26% 5%        |
| 12  | K     | 137    |  45% 51%           |
| 13  | L     | 102    |  13% 47% 49%       |
| 14  | N     | 147    |  69% 29%           |
| 15  | O     | 165    |  50% 35% 15%      |
| 16  | Q     | 152    |  73% 22% 5%      |
| 17  | R     | 114    |  76% 23%         |
| 18  | S     | 79     |  47% 34% 16%     |
| 19  | T     | 140    |  58% 31% 9%      |
| 20  | U     | 158    |  62% 35%         |
| 21  | V     | 120    |  58% 30% 11%     |
| 22  | W     | 66     |  59% 38%         |
| 23  | X     | 83     |  10% 34% 46% 19% |
| 24  | Y     | 75     |  29% 39% 25% 35% |
| 25  | Z     | 229    |  54% 30% 14%     |
| 26  | 3     | 127    |  35% 60% 55% 8%  |
| 27  | c     | 110    |  53% 49% 47%     |
| 28  | d     | 72     |  14% 32% 58% 6%  |

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| Mol | Chain | Length | Quality of chain   |
|-----|-------|--------|--|
| 29  | e     | 52     |  |
| 30  | 4     | 77     |  |
| 31  | a     | 72     |  |
| 32  | P     | 54     |  |
| 33  | b     | 95     |  |
| 34  | 5     | 14     |  |
| 35  | M     | 132    |  |

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

| Mol | Type | Chain | Res  | Chirality | Geometry | Clashes | Electron density |
|-----|------|-------|------|-----------|----------|---------|------------------|
| 36  | SPM  | 2     | 1532 | -         | -        | X       | -                |

## 2 Entry composition i

There are 40 unique types of molecules in this entry. The entry contains 65629 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 rRNA 16S.

| Mol | Chain | Residues | Atoms |       |      |      |      | AltConf | Trace |
|-----|-------|----------|-------|-------|------|------|------|---------|-------|
|     |       |          | Total | C     | N    | O    | P    |         |       |
| 1   | 2     | 1440     | 30982 | 13818 | 5732 | 9992 | 1440 | 0       | 0     |

There are 7 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment          | Reference     |
|-------|---------|----------|--------|------------------|---------------|
| 2     | 843     | 4AC      | C      | modified residue | GB AE006641.1 |
| 2     | 930     | C4J      | U      | modified residue | GB AE006641.1 |
| 2     | 1466    | 4AC      | C      | modified residue | GB AE006641.1 |
| 2     | 1467    | 4AC      | C      | modified residue | GB AE006641.1 |
| 2     | 1477    | 4AC      | C      | modified residue | GB AE006641.1 |
| 2     | 1478    | 4AC      | C      | modified residue | GB AE006641.1 |
| 2     | 1496    | C        | A      | conflict         | GB AE006641.1 |

- Molecule 2 is a protein called Small ribosomal subunit protein eS1.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
|     |       |          | Total | C   | N   | O   | S |         |       |
| 2   | A     | 186      | 1515  | 974 | 261 | 278 | 2 | 0       | 0     |

- Molecule 3 is a protein called Small ribosomal subunit protein uS2.

| Mol | Chain | Residues | Atoms |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
|     |       |          | Total | C    | N   | O   | S |         |       |
| 3   | B     | 215      | 1698  | 1092 | 291 | 312 | 3 | 0       | 0     |

- Molecule 4 is a protein called Small zinc finger protein HVO-2753-like zinc-binding pocket domain-containing protein.

| Mol | Chain | Residues | Atoms |     |    |    |   | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
|     |       |          | Total | C   | N  | O  | S |         |       |
| 4   | C     | 58       | 455   | 282 | 84 | 81 | 8 | 0       | 0     |

- Molecule 5 is a protein called Small ribosomal subunit protein uS4.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
|     |       |          | Total | C   | N   | O   | S |         |       |
| 5   | D     | 166      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1354  | 864 | 249 | 240 | 1 |         |       |

- Molecule 6 is a protein called Small ribosomal subunit protein eS4.

| Mol | Chain | Residues | Atoms |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
|     |       |          | Total | C    | N   | O   | S |         |       |
| 6   | E     | 238      | Total | C    | N   | O   | S | 0       | 0     |
|     |       |          | 1930  | 1238 | 342 | 344 | 6 |         |       |

- Molecule 7 is a protein called Small ribosomal subunit protein uS5.

| Mol | Chain | Residues | Atoms |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
|     |       |          | Total | C    | N   | O   | S |         |       |
| 7   | F     | 210      | Total | C    | N   | O   | S | 0       | 0     |
|     |       |          | 1625  | 1041 | 275 | 303 | 6 |         |       |

- Molecule 8 is a protein called Small ribosomal subunit protein eS6.

| Mol | Chain | Residues | Atoms |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
|     |       |          | Total | C    | N   | O   | S |         |       |
| 8   | G     | 213      | Total | C    | N   | O   | S | 0       | 0     |
|     |       |          | 1661  | 1052 | 292 | 315 | 2 |         |       |

- Molecule 9 is a protein called Small ribosomal subunit protein uS7.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
|     |       |          | Total | C   | N   | O   | S |         |       |
| 9   | H     | 192      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1543  | 983 | 283 | 274 | 3 |         |       |

- Molecule 10 is a protein called Small ribosomal subunit protein uS8.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
|     |       |          | Total | C   | N   | O   | S |         |       |
| 10  | I     | 132      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1050  | 675 | 187 | 182 | 6 |         |       |

- Molecule 11 is a protein called Small ribosomal subunit protein eS8.

| Mol | Chain | Residues | Atoms |     |     |     | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---------|-------|
|     |       |          | Total | C   | N   | O   |         |       |
| 11  | J     | 127      | Total | C   | N   | O   | 0       | 0     |
|     |       |          | 982   | 617 | 186 | 179 |         |       |

- Molecule 12 is a protein called Small ribosomal subunit protein uS9.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
|     |       |          | Total | C   | N   | O   | S |         |       |
| 12  | K     | 133      | 1068  | 675 | 201 | 185 | 7 | 0       | 0     |

- Molecule 13 is a protein called Small ribosomal subunit protein uS10.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
|     |       |          | Total | C   | N   | O   | S |         |       |
| 13  | L     | 101      | 840   | 536 | 157 | 142 | 5 | 0       | 0     |

- Molecule 14 is a protein called Small ribosomal subunit protein uS12.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
|     |       |          | Total | C   | N   | O   | S |         |       |
| 14  | N     | 146      | 1140  | 723 | 220 | 193 | 4 | 0       | 0     |

- Molecule 15 is a protein called Small ribosomal subunit protein uS13.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
|     |       |          | Total | C   | N   | O   | S |         |       |
| 15  | O     | 140      | 1124  | 708 | 210 | 202 | 4 | 0       | 0     |

- Molecule 16 is a protein called Small ribosomal subunit protein uS15.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
|     |       |          | Total | C   | N   | O   | S |         |       |
| 16  | Q     | 145      | 1185  | 753 | 224 | 205 | 3 | 0       | 0     |

- Molecule 17 is a protein called Small ribosomal subunit protein uS17.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
|     |       |          | Total | C   | N   | O   | S |         |       |
| 17  | R     | 113      | 901   | 570 | 166 | 161 | 4 | 0       | 0     |

- Molecule 18 is a protein called Small ribosomal subunit protein eS17.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
|     |       |          | Total | C   | N   | O   | S |         |       |
| 18  | S     | 66       | 571   | 364 | 101 | 105 | 1 | 0       | 0     |

- Molecule 19 is a protein called Small ribosomal subunit protein uS19.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 19  | T     | 128      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1064  | 684 | 192 | 184 | 4 |         |       |

- Molecule 20 is a protein called Small ribosomal subunit protein eS19.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 20  | U     | 154      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1247  | 805 | 223 | 217 | 2 |         |       |

- Molecule 21 is a protein called Small ribosomal subunit protein eS24.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 21  | V     | 107      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 836   | 524 | 154 | 156 | 2 |         |       |

- Molecule 22 is a protein called Small ribosomal subunit protein eS27.

| Mol | Chain | Residues | Atoms |     |    |    |   | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 22  | W     | 65       | Total | C   | N  | O  | S | 0       | 0     |
|     |       |          | 503   | 319 | 93 | 84 | 7 |         |       |

- Molecule 23 is a protein called Small ribosomal subunit protein eS28.

| Mol | Chain | Residues | Atoms |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|----|---------|-------|
| 23  | X     | 67       | Total | C   | N   | O  | 0       | 0     |
|     |       |          | 535   | 335 | 103 | 97 |         |       |

- Molecule 24 is a protein called Small ribosomal subunit protein eS31.

| Mol | Chain | Residues | Atoms |     |    |    |   | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 24  | Y     | 49       | Total | C   | N  | O  | S | 0       | 0     |
|     |       |          | 395   | 252 | 73 | 65 | 5 |         |       |

- Molecule 25 is a protein called Small ribosomal subunit protein uS3.

| Mol | Chain | Residues | Atoms |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 25  | Z     | 196      | Total | C    | N   | O   | S | 0       | 0     |
|     |       |          | 1561  | 1009 | 274 | 272 | 6 |         |       |

- Molecule 26 is a protein called Large ribosomal subunit protein eL8.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
|     |       |          | Total | C   | N   | O   | S |         |       |
| 26  | 3     | 117      | 893   | 567 | 149 | 175 | 2 | 0       | 0     |

- Molecule 27 is a protein called Small ribosomal subunit protein eS25.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
|     |       |          | Total | C   | N   | O   | S |         |       |
| 27  | c     | 109      | 856   | 539 | 152 | 164 | 1 | 0       | 0     |

- Molecule 28 is a protein called VapB-type antitoxin.

| Mol | Chain | Residues | Atoms |     |    |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|----|-----|---|---------|-------|
|     |       |          | Total | C   | N  | O   | S |         |       |
| 28  | d     | 68       | 557   | 362 | 90 | 103 | 2 | 0       | 0     |

- Molecule 29 is a protein called LSU ribosomal protein S30E (Rps30E).

| Mol | Chain | Residues | Atoms |     |    |    | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---------|-------|
|     |       |          | Total | C   | N  | O  |         |       |
| 29  | e     | 43       | 354   | 220 | 74 | 60 | 0       | 0     |

- Molecule 30 is a RNA chain called tRNA met initiator.

| Mol | Chain | Residues | Atoms |     |     |     |    | AltConf | Trace |   |
|-----|-------|----------|-------|-----|-----|-----|----|---------|-------|---|
|     |       |          | Total | C   | N   | O   | P  | S       |       |   |
| 30  | 4     | 77       | 1645  | 734 | 296 | 537 | 77 | 1       | 0     | 0 |

There are 2 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment             | Reference     |
|-------|---------|----------|--------|---------------------|---------------|
| 4     | 1       | A        | C      | engineered mutation | GB 1334604293 |
| 4     | 72      | U        | A      | engineered mutation | GB 1334604293 |

- Molecule 31 is a protein called aS34.

| Mol | Chain | Residues | Atoms |     |    |    |   | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
|     |       |          | Total | C   | N  | O  | S |         |       |
| 31  | a     | 71       | 562   | 361 | 98 | 96 | 7 | 0       | 0     |

- Molecule 32 is a protein called Small ribosomal subunit protein uS14.

| Mol | Chain | Residues | Atoms |     |    |    |   | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 32  | P     | 53       | Total | C   | N  | O  | S | 0       | 0     |
|     |       |          | 440   | 282 | 80 | 74 | 4 |         |       |

- Molecule 33 is a protein called LSU ribosomal protein S26E (Rps26E).

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 33  | b     | 93       | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 723   | 449 | 139 | 128 | 7 |         |       |

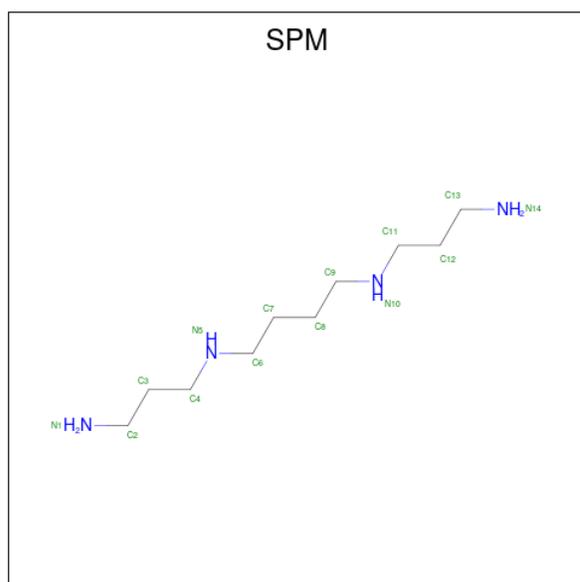
- Molecule 34 is a RNA chain called mRNA Ss-aIF2beta.

| Mol | Chain | Residues | Atoms |    |   |    |   | AltConf | Trace |
|-----|-------|----------|-------|----|---|----|---|---------|-------|
| 34  | 5     | 3        | Total | C  | N | O  | P | 0       | 0     |
|     |       |          | 47    | 19 | 7 | 18 | 3 |         |       |

- Molecule 35 is a protein called Small ribosomal subunit protein uS11.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 35  | M     | 127      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 944   | 587 | 184 | 170 | 3 |         |       |

- Molecule 36 is SPERMINE (CCD ID: SPM) (formula: C<sub>10</sub>H<sub>26</sub>N<sub>4</sub>).



| Mol | Chain | Residues | Atoms |    |   | AltConf |
|-----|-------|----------|-------|----|---|---------|
| 36  | 2     | 1        | Total | C  | N | 0       |
|     |       |          | 14    | 10 | 4 |         |

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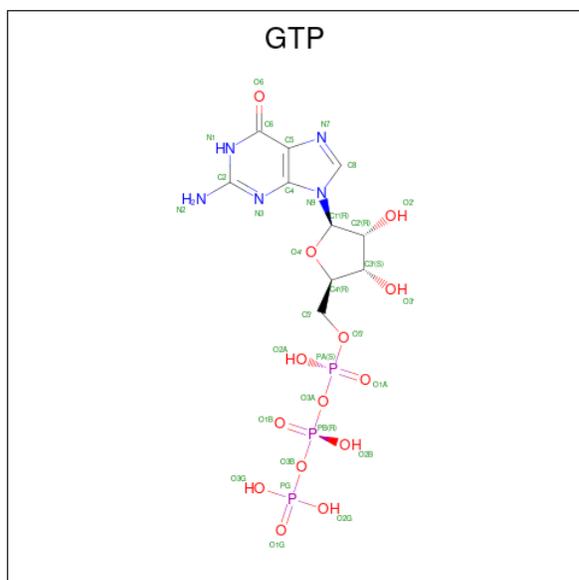
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| Mol | Chain | Residues | Atoms           | AltConf |
|-----|-------|----------|-----------------|---------|
| 37  | R     | 1        | Total Mg<br>1 1 | 0       |
| 37  | 5     | 1        | Total Mg<br>1 1 | 0       |

- Molecule 38 is ZINC ION (CCD ID: ZN) (formula: Zn).

| Mol | Chain | Residues | Atoms           | AltConf |
|-----|-------|----------|-----------------|---------|
| 38  | C     | 2        | Total Zn<br>2 2 | 0       |
| 38  | F     | 1        | Total Zn<br>1 1 | 0       |
| 38  | R     | 1        | Total Zn<br>1 1 | 0       |
| 38  | W     | 1        | Total Zn<br>1 1 | 0       |
| 38  | a     | 2        | Total Zn<br>2 2 | 0       |
| 38  | P     | 1        | Total Zn<br>1 1 | 0       |
| 38  | b     | 1        | Total Zn<br>1 1 | 0       |

- Molecule 39 is GUANOSINE-5'-TRIPHOSPHATE (CCD ID: GTP) (formula: C<sub>10</sub>H<sub>16</sub>N<sub>5</sub>O<sub>14</sub>P<sub>3</sub>).



| Mol | Chain | Residues | Atoms |    |   |    |   | AltConf |
|-----|-------|----------|-------|----|---|----|---|---------|
|     |       |          | Total | C  | N | O  | P |         |
| 39  | 5     | 1        | 32    | 10 | 5 | 14 | 3 | 0       |

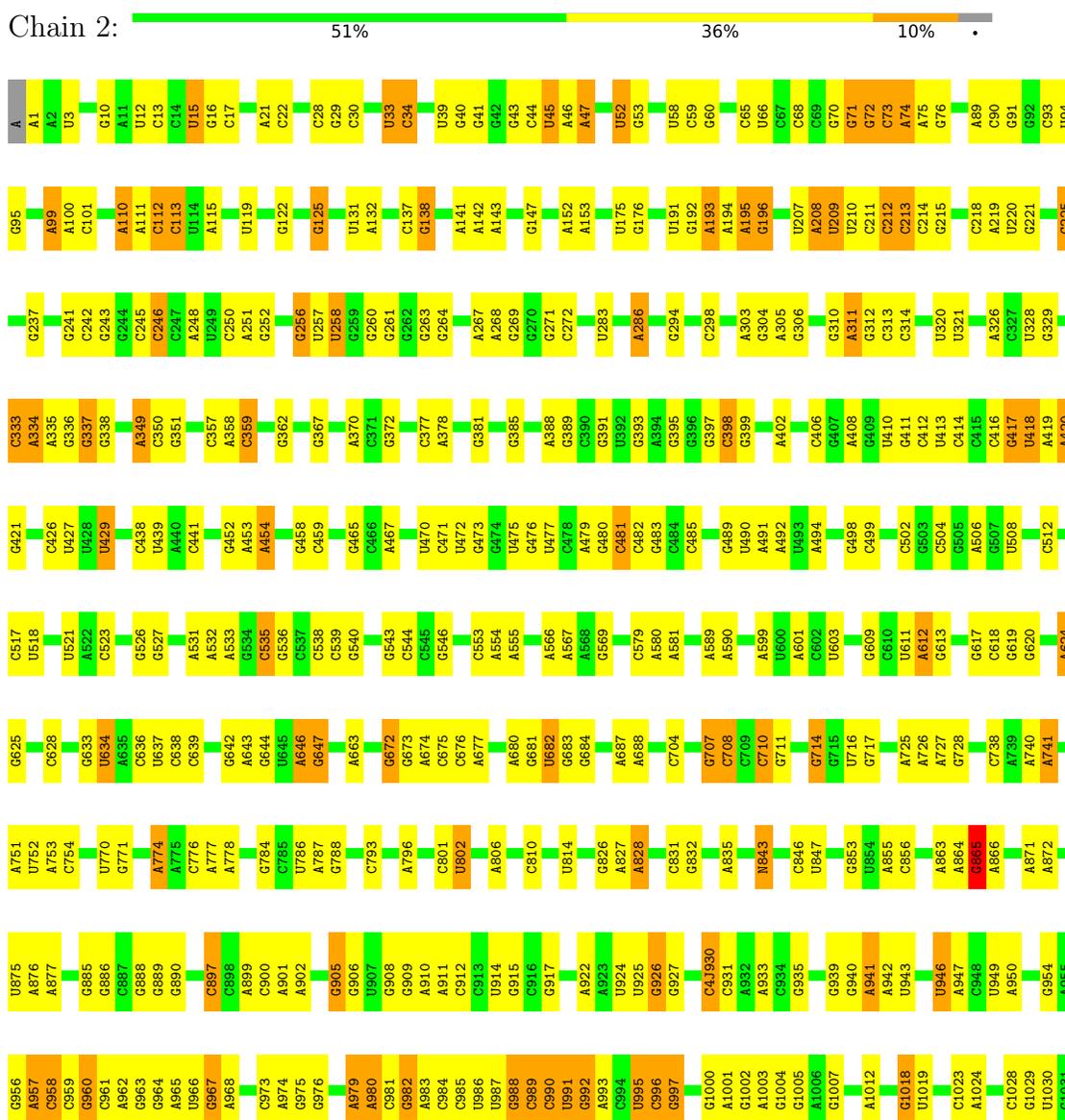
- Molecule 40 is water.

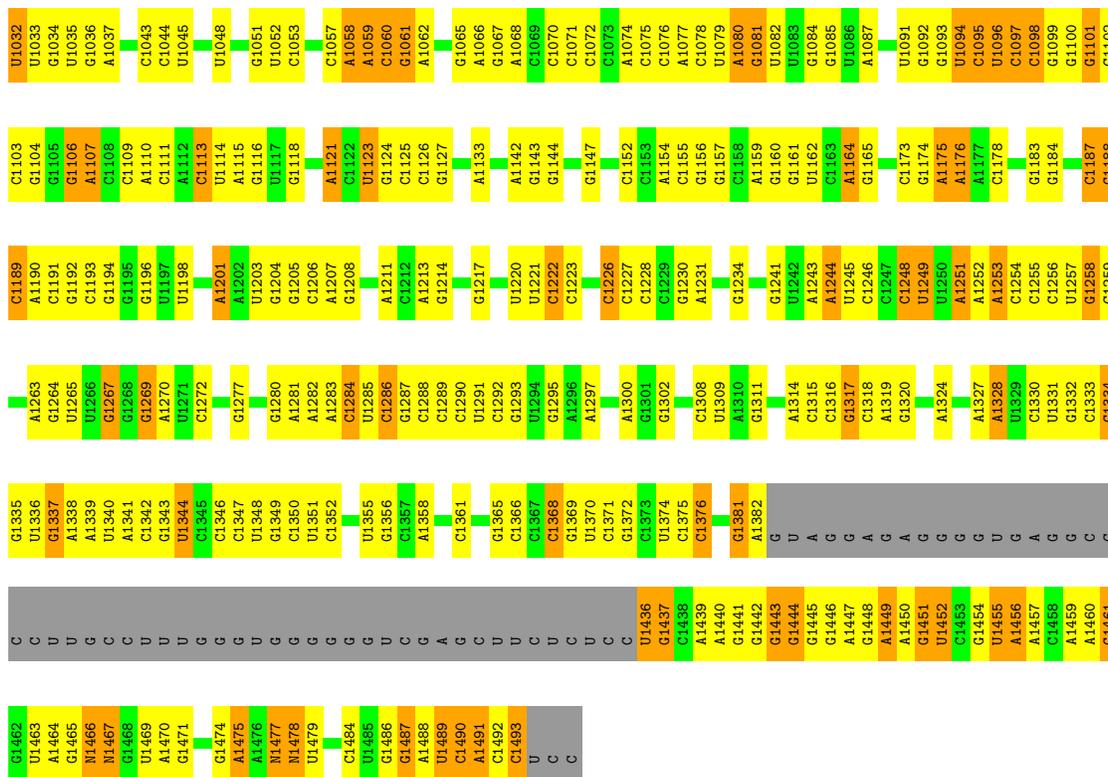
| Mol | Chain | Residues | Atoms        |          | AltConf |
|-----|-------|----------|--------------|----------|---------|
| 40  | 2     | 181      | Total<br>181 | O<br>181 | 0       |
| 40  | D     | 1        | Total<br>1   | O<br>1   | 0       |
| 40  | E     | 1        | Total<br>1   | O<br>1   | 0       |
| 40  | H     | 1        | Total<br>1   | O<br>1   | 0       |
| 40  | I     | 2        | Total<br>2   | O<br>2   | 0       |
| 40  | J     | 2        | Total<br>2   | O<br>2   | 0       |
| 40  | Q     | 1        | Total<br>1   | O<br>1   | 0       |
| 40  | R     | 3        | Total<br>3   | O<br>3   | 0       |
| 40  | U     | 1        | Total<br>1   | O<br>1   | 0       |
| 40  | 4     | 1        | Total<br>1   | O<br>1   | 0       |
| 40  | b     | 2        | Total<br>2   | O<br>2   | 0       |
| 40  | 5     | 3        | Total<br>3   | O<br>3   | 0       |

### 3 Residue-property plots [i](#)

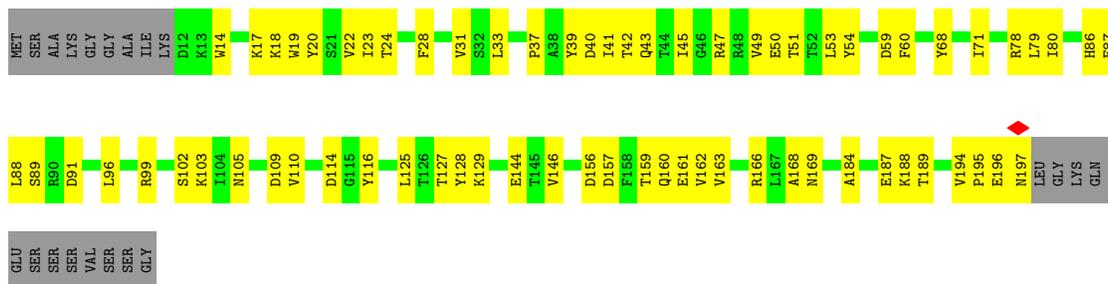
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion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

#### • Molecule 1: rRNA 16S

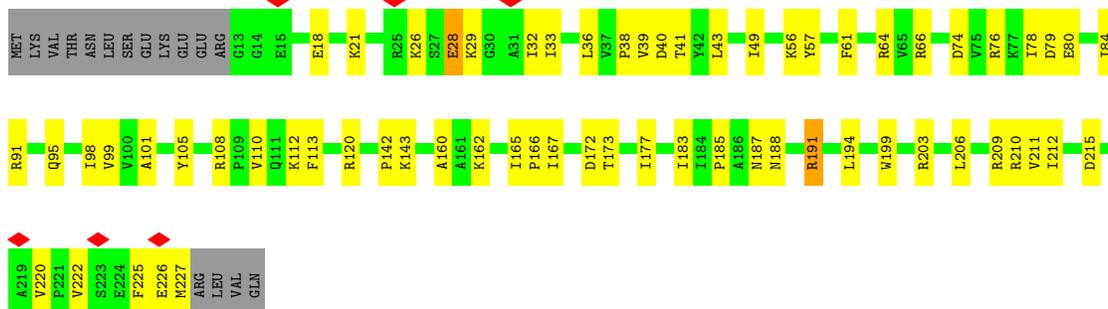




• Molecule 2: Small ribosomal subunit protein eS1



• Molecule 3: Small ribosomal subunit protein uS2



- Molecule 4: Small zinc finger protein HVO-2753-like zinc-binding pocket domain-containing protein

Chain C:  52% 35% 11%



- Molecule 5: Small ribosomal subunit protein uS4

Chain D:  66% 26% 8%



- Molecule 6: Small ribosomal subunit protein eS4

Chain E:  77% 22%



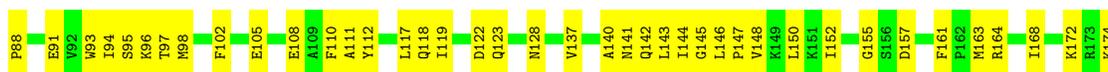
- Molecule 7: Small ribosomal subunit protein uS5

Chain F:  75% 23%



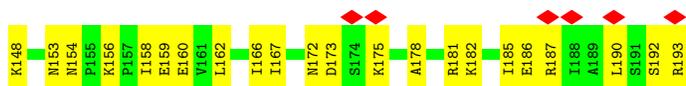
- Molecule 8: Small ribosomal subunit protein eS6

Chain G:  58% 41%

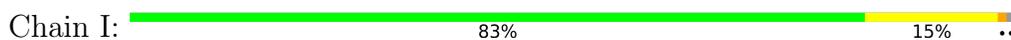




• Molecule 9: Small ribosomal subunit protein uS7



• Molecule 10: Small ribosomal subunit protein uS8



• Molecule 11: Small ribosomal subunit protein eS8

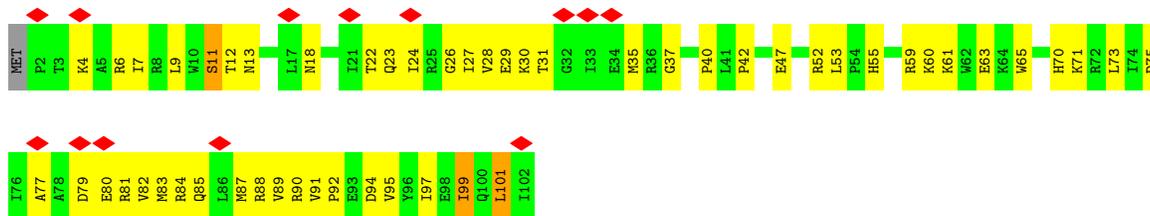


• Molecule 12: Small ribosomal subunit protein uS9

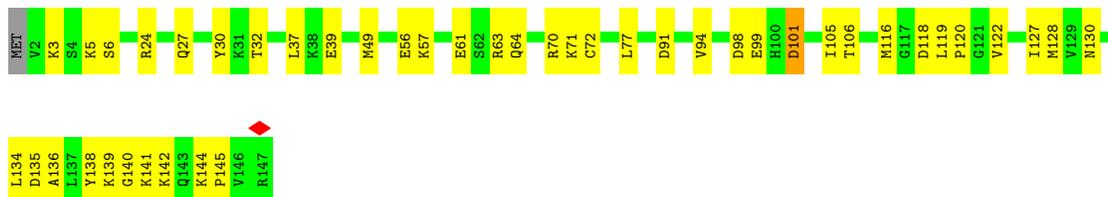


• Molecule 13: Small ribosomal subunit protein uS10

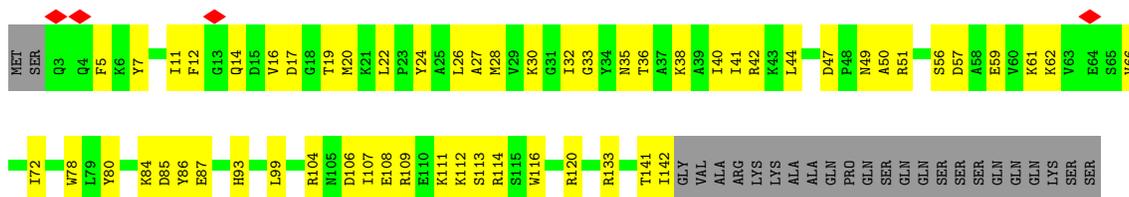




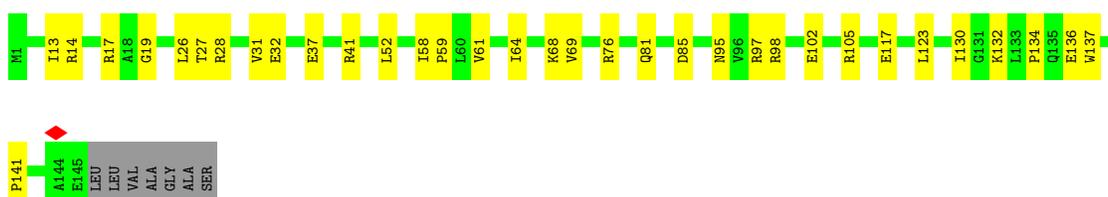
- Molecule 14: Small ribosomal subunit protein uS12



- Molecule 15: Small ribosomal subunit protein uS13



- Molecule 16: Small ribosomal subunit protein uS15



- Molecule 17: Small ribosomal subunit protein uS17

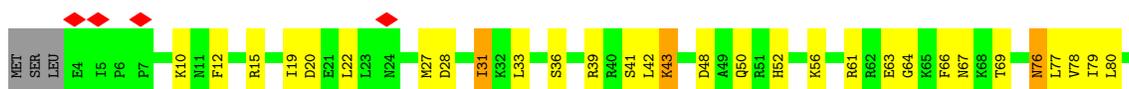


- Molecule 18: Small ribosomal subunit protein eS17





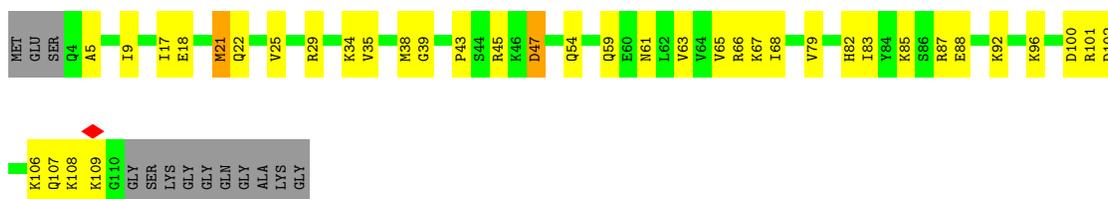
- Molecule 19: Small ribosomal subunit protein uS19



- Molecule 20: Small ribosomal subunit protein eS19



- Molecule 21: Small ribosomal subunit protein eS24

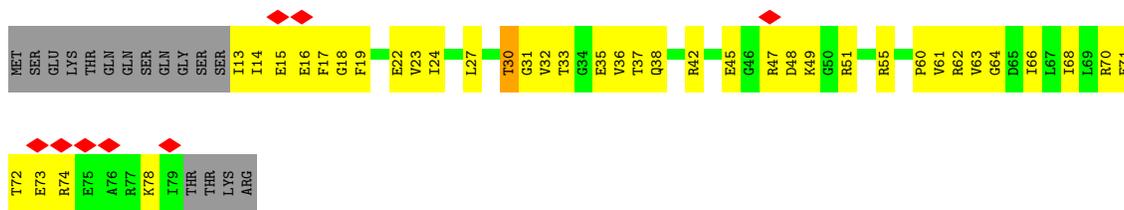


- Molecule 22: Small ribosomal subunit protein eS27



- Molecule 23: Small ribosomal subunit protein eS28

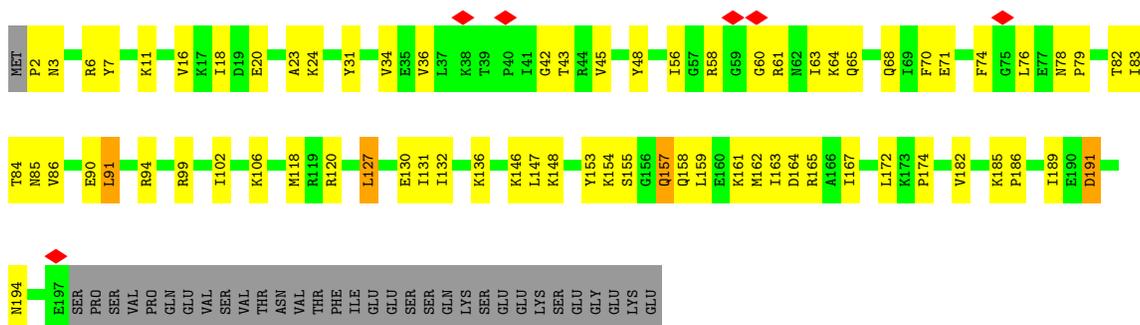




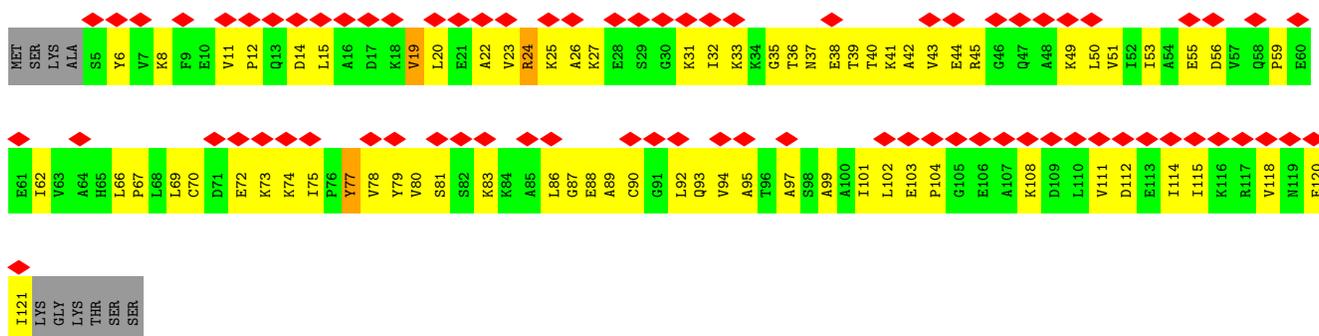
• Molecule 24: Small ribosomal subunit protein eS31



• Molecule 25: Small ribosomal subunit protein uS3

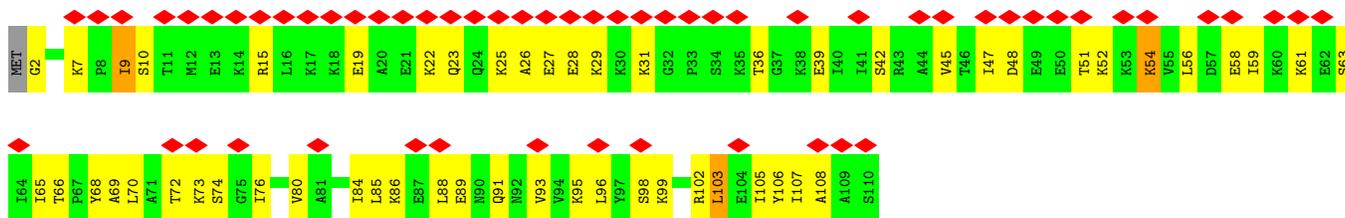


• Molecule 26: Large ribosomal subunit protein eL8



• Molecule 27: Small ribosomal subunit protein eS25





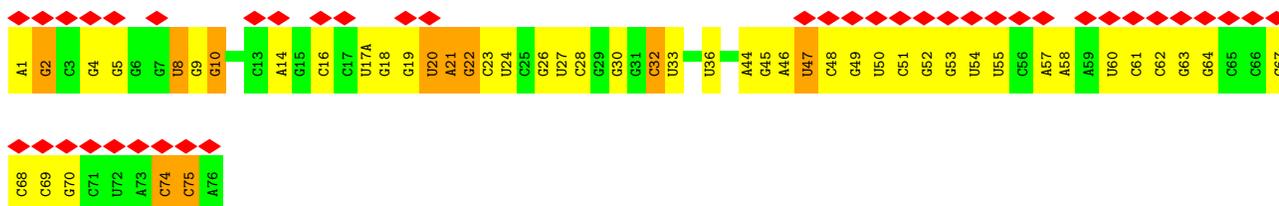
• Molecule 28: VapB-type antitoxin



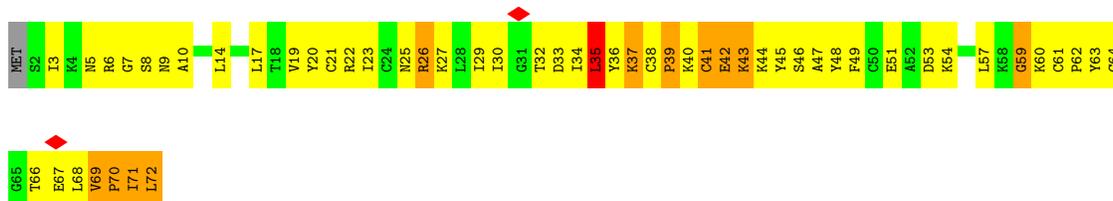
• Molecule 29: LSU ribosomal protein S30E (Rps30E)



• Molecule 30: tRNA met initiator



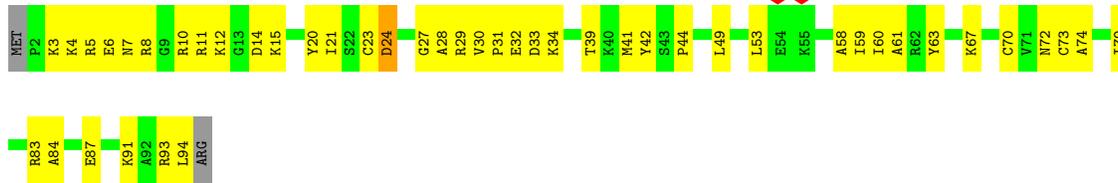
• Molecule 31: aS34



• Molecule 32: Small ribosomal subunit protein uS14



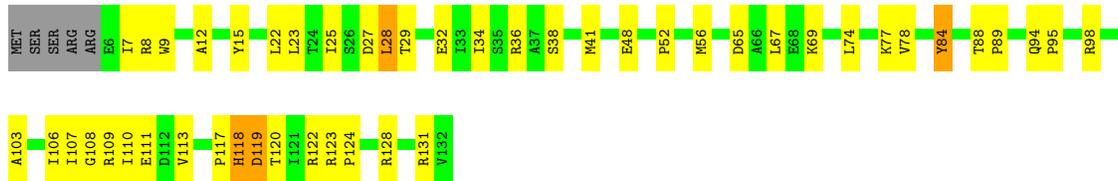
- Molecule 33: LSU ribosomal protein S26E (Rps26E)



- Molecule 34: mRNA Ss-aIF2beta



- Molecule 35: Small ribosomal subunit protein uS11



## 4 Experimental information

| Property                             | Value                                   | Source    |
|--------------------------------------|---|-----------|
| EM reconstruction method             | SINGLE PARTICLE                         | Depositor |
| Imposed symmetry                     | POINT, Not provided                     |           |
| Number of particles used             | 49401                                   | 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 ( $e^-/\text{\AA}^2$ ) | 40                                      | Depositor |
| Minimum defocus (nm)                 | 800                                     | Depositor |
| Maximum defocus (nm)                 | 2500                                    | Depositor |
| Magnification                        | Not provided                            |           |
| Image detector                       | GATAN K3 BIOQUANTUM (6k x 4k)           | Depositor |
| Maximum map value                    | 0.048                                   | Depositor |
| Minimum map value                    | -0.012                                  | Depositor |
| Average map value                    | 0.000                                   | Depositor |
| Map value standard deviation         | 0.002                                   | Depositor |
| Recommended contour level            | 0.0045                                  | Depositor |
| Map size (Å)                         | 361.19998, 361.19998, 361.19998         | wwPDB     |
| Map dimensions                       | 516, 516, 516                           | wwPDB     |
| Map angles (°)                       | 90.0, 90.0, 90.0                        | wwPDB     |
| Pixel spacing (Å)                    | 0.7, 0.7, 0.7                           | Depositor |

## 5 Model quality i

### 5.1 Standard geometry i

Bond lengths and bond angles in the following residue types are not validated in this section: A2M, C4J, H2U, MG, OMG, 5MC, OMC, 6MZ, SPM, 5MU, PSU, MA6, OMU, 4AC, ZN, 4SU, GTP

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   | 2     | 0.35         | 0/33843       | 0.31        | 0/52798       |
| 2   | A     | 0.28         | 0/1543        | 0.48        | 0/2077        |
| 3   | B     | 0.24         | 0/1731        | 0.45        | 1/2349 (0.0%) |
| 4   | C     | 0.28         | 0/466         | 0.43        | 0/625         |
| 5   | D     | 0.32         | 0/1380        | 0.34        | 0/1859        |
| 6   | E     | 0.32         | 0/1965        | 0.38        | 0/2644        |
| 7   | F     | 0.33         | 0/1654        | 0.41        | 0/2240        |
| 8   | G     | 0.27         | 1/1684 (0.1%) | 0.53        | 3/2265 (0.1%) |
| 9   | H     | 0.62         | 4/1571 (0.3%) | 0.72        | 4/2116 (0.2%) |
| 10  | I     | 0.35         | 0/1070        | 0.36        | 0/1444        |
| 11  | J     | 0.31         | 0/994         | 0.43        | 0/1337        |
| 12  | K     | 0.27         | 0/1084        | 0.62        | 0/1450        |
| 13  | L     | 0.26         | 0/856         | 0.58        | 0/1154        |
| 14  | N     | 0.33         | 0/1155        | 0.38        | 0/1540        |
| 15  | O     | 0.21         | 0/1142        | 0.48        | 0/1532        |
| 16  | Q     | 0.29         | 0/1206        | 0.39        | 0/1618        |
| 17  | R     | 0.35         | 0/918         | 0.38        | 0/1236        |
| 18  | S     | 0.25         | 0/578         | 0.51        | 0/770         |
| 19  | T     | 0.18         | 0/1087        | 0.41        | 0/1456        |
| 20  | U     | 0.22         | 0/1270        | 0.52        | 0/1710        |
| 21  | V     | 0.30         | 0/843         | 0.45        | 0/1124        |
| 22  | W     | 0.29         | 0/511         | 0.45        | 0/684         |
| 23  | X     | 0.21         | 0/538         | 0.52        | 0/722         |
| 24  | Y     | 0.20         | 0/404         | 0.50        | 0/540         |
| 25  | Z     | 0.27         | 0/1584        | 0.48        | 0/2124        |
| 26  | 3     | 0.72         | 2/902 (0.2%)  | 1.20        | 5/1216 (0.4%) |
| 27  | c     | 0.17         | 0/861         | 0.47        | 0/1143        |
| 28  | d     | 0.27         | 0/568         | 0.71        | 1/769 (0.1%)  |
| 29  | e     | 0.33         | 0/360         | 0.81        | 2/477 (0.4%)  |
| 30  | 4     | 0.18         | 1/1725 (0.1%) | 0.23        | 0/2687        |
| 31  | a     | 0.76         | 1/574 (0.2%)  | 1.36        | 9/770 (1.2%)  |

| Mol | Chain | Bond lengths |                | Bond angles |                 |
|-----|-------|--------------|----------------|-------------|-----------------|
|     |       | RMSZ         | # Z  >5        | RMSZ        | # Z  >5         |
| 32  | P     | 0.33         | 0/451          | 0.73        | 0/600           |
| 33  | b     | 0.32         | 0/732          | 0.76        | 1/976 (0.1%)    |
| 34  | 5     | 0.32         | 0/51           | 0.45        | 0/78            |
| 35  | M     | 0.29         | 0/960          | 0.67        | 2/1294 (0.2%)   |
| All | All   | 0.34         | 9/68261 (0.0%) | 0.44        | 28/99424 (0.0%) |

All (9) bond length outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z      | Observed(Å) | Ideal(Å) |
|-----|-------|-----|------|-------|--------|-------------|----------|
| 26  | 3     | 12  | PRO  | CB-CG | 17.20  | 2.35        | 1.49     |
| 9   | H     | 39  | PRO  | CB-CG | 14.77  | 2.23        | 1.49     |
| 9   | H     | 39  | PRO  | CG-CD | -14.68 | 1.00        | 1.50     |
| 26  | 3     | 12  | PRO  | CG-CD | -10.07 | 1.16        | 1.50     |
| 31  | a     | 70  | PRO  | CG-CD | -9.82  | 1.17        | 1.50     |
| 9   | H     | 39  | PRO  | N-CD  | 6.96   | 1.57        | 1.47     |
| 9   | H     | 39  | PRO  | CA-CB | -5.82  | 1.45        | 1.53     |
| 8   | G     | 88  | PRO  | CG-CD | -5.18  | 1.33        | 1.50     |
| 30  | 4     | 8   | 4SU  | O3'-P | 5.00   | 1.61        | 1.56     |

All (28) bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms    | Z      | Observed(°) | Ideal(°) |
|-----|-------|-----|------|----------|--------|-------------|----------|
| 26  | 3     | 12  | PRO  | CA-N-CD  | -23.86 | 78.60       | 112.00   |
| 26  | 3     | 12  | PRO  | CB-CG-CD | -23.66 | 30.37       | 106.10   |
| 9   | H     | 39  | PRO  | N-CD-CG  | -16.07 | 79.09       | 103.20   |
| 29  | e     | 2   | PRO  | CA-N-CD  | -13.05 | 93.72       | 112.00   |
| 26  | 3     | 12  | PRO  | N-CD-CG  | 12.98  | 122.67      | 103.20   |
| 31  | a     | 70  | PRO  | CA-N-CD  | -12.20 | 94.92       | 112.00   |
| 9   | H     | 39  | PRO  | CB-CG-CD | -10.50 | 72.50       | 106.10   |
| 8   | G     | 88  | PRO  | CA-N-CD  | -9.84  | 98.23       | 112.00   |
| 9   | H     | 39  | PRO  | CA-CB-CG | -8.67  | 88.02       | 104.50   |
| 8   | G     | 88  | PRO  | N-CD-CG  | -8.11  | 91.04       | 103.20   |
| 9   | H     | 39  | PRO  | N-CA-CB  | -8.04  | 94.81       | 103.25   |
| 26  | 3     | 12  | PRO  | N-CA-CB  | -6.95  | 94.18       | 103.15   |
| 31  | a     | 35  | LEU  | CA-CB-CG | 6.93   | 140.57      | 116.30   |
| 31  | a     | 39  | PRO  | CA-N-CD  | -6.62  | 102.73      | 112.00   |
| 35  | M     | 118 | HIS  | CA-C-N   | 6.61   | 134.16      | 121.54   |
| 35  | M     | 118 | HIS  | C-N-CA   | 6.61   | 134.16      | 121.54   |
| 29  | e     | 2   | PRO  | N-CD-CG  | -6.42  | 93.56       | 103.20   |
| 31  | a     | 70  | PRO  | N-CD-CG  | -6.39  | 93.61       | 103.20   |
| 8   | G     | 2   | PRO  | CA-N-CD  | -6.17  | 103.36      | 112.00   |
| 28  | d     | 51  | GLU  | CA-CB-CG | 6.00   | 126.09      | 114.10   |

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| Mol | Chain | Res | Type | Atoms    | Z     | Observed(°) | Ideal(°) |
|-----|-------|-----|------|----------|-------|-------------|----------|
| 31  | a     | 42  | GLU  | N-CA-C   | 5.53  | 117.31      | 111.28   |
| 33  | b     | 14  | ASP  | N-CA-C   | 5.43  | 117.20      | 111.28   |
| 31  | a     | 41  | CYS  | N-CA-C   | 5.37  | 119.44      | 111.87   |
| 31  | a     | 69  | VAL  | C-N-CD   | 5.23  | 146.44      | 125.00   |
| 26  | 3     | 24  | ARG  | CA-CB-CG | 5.23  | 124.56      | 114.10   |
| 31  | a     | 7   | GLY  | N-CA-C   | -5.22 | 108.42      | 115.36   |
| 3   | B     | 28  | GLU  | CB-CG-CD | 5.08  | 121.23      | 112.60   |
| 31  | a     | 59  | GLY  | N-CA-C   | 5.06  | 122.33      | 115.30   |

There are no chirality outliers.

There are no planarity outliers.

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

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

| Mol | Chain | Non-H | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|-------|----------|----------|---------|--------------|
| 1   | 2     | 30982 | 0        | 15677    | 628     | 0            |
| 2   | A     | 1515  | 0        | 1565     | 67      | 0            |
| 3   | B     | 1698  | 0        | 1753     | 50      | 0            |
| 4   | C     | 455   | 0        | 437      | 22      | 0            |
| 5   | D     | 1354  | 0        | 1419     | 37      | 0            |
| 6   | E     | 1930  | 0        | 2013     | 38      | 0            |
| 7   | F     | 1625  | 0        | 1689     | 35      | 0            |
| 8   | G     | 1661  | 0        | 1737     | 67      | 0            |
| 9   | H     | 1543  | 0        | 1611     | 115     | 0            |
| 10  | I     | 1050  | 0        | 1100     | 14      | 0            |
| 11  | J     | 982   | 0        | 1046     | 30      | 0            |
| 12  | K     | 1068  | 0        | 1125     | 82      | 0            |
| 13  | L     | 840   | 0        | 893      | 52      | 0            |
| 14  | N     | 1140  | 0        | 1244     | 35      | 0            |
| 15  | O     | 1124  | 0        | 1162     | 58      | 0            |
| 16  | Q     | 1185  | 0        | 1260     | 28      | 0            |
| 17  | R     | 901   | 0        | 935      | 19      | 0            |
| 18  | S     | 571   | 0        | 598      | 25      | 0            |
| 19  | T     | 1064  | 0        | 1107     | 41      | 0            |
| 20  | U     | 1247  | 0        | 1329     | 65      | 0            |
| 21  | V     | 836   | 0        | 894      | 29      | 0            |

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| Mol | Chain | Non-H | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|-------|----------|----------|---------|--------------|
| 22  | W     | 503   | 0        | 532      | 20      | 0            |
| 23  | X     | 535   | 0        | 572      | 44      | 0            |
| 24  | Y     | 395   | 0        | 405      | 21      | 0            |
| 25  | Z     | 1561  | 0        | 1667     | 62      | 0            |
| 26  | 3     | 893   | 0        | 940      | 70      | 0            |
| 27  | c     | 856   | 0        | 941      | 53      | 0            |
| 28  | d     | 557   | 0        | 576      | 73      | 0            |
| 29  | e     | 354   | 0        | 386      | 19      | 0            |
| 30  | 4     | 1645  | 0        | 840      | 33      | 0            |
| 31  | a     | 562   | 0        | 574      | 78      | 0            |
| 32  | P     | 440   | 0        | 435      | 38      | 0            |
| 33  | b     | 723   | 0        | 756      | 120     | 0            |
| 34  | 5     | 47    | 0        | 21       | 2       | 0            |
| 35  | M     | 944   | 0        | 978      | 71      | 0            |
| 36  | 2     | 546   | 0        | 1014     | 81      | 0            |
| 37  | 2     | 54    | 0        | 0        | 0       | 0            |
| 37  | 5     | 1     | 0        | 0        | 0       | 0            |
| 37  | F     | 1     | 0        | 0        | 0       | 0            |
| 37  | R     | 1     | 0        | 0        | 0       | 0            |
| 38  | C     | 2     | 0        | 0        | 0       | 0            |
| 38  | F     | 1     | 0        | 0        | 0       | 0            |
| 38  | P     | 1     | 0        | 0        | 0       | 0            |
| 38  | R     | 1     | 0        | 0        | 0       | 0            |
| 38  | W     | 1     | 0        | 0        | 0       | 0            |
| 38  | a     | 2     | 0        | 0        | 0       | 0            |
| 38  | b     | 1     | 0        | 0        | 0       | 0            |
| 39  | 5     | 32    | 0        | 11       | 1       | 0            |
| 40  | 2     | 181   | 0        | 0        | 16      | 0            |
| 40  | 4     | 1     | 0        | 0        | 0       | 0            |
| 40  | 5     | 3     | 0        | 0        | 0       | 0            |
| 40  | D     | 1     | 0        | 0        | 0       | 0            |
| 40  | E     | 1     | 0        | 0        | 0       | 0            |
| 40  | H     | 1     | 0        | 0        | 0       | 0            |
| 40  | I     | 2     | 0        | 0        | 0       | 0            |
| 40  | J     | 2     | 0        | 0        | 0       | 0            |
| 40  | Q     | 1     | 0        | 0        | 0       | 0            |
| 40  | R     | 3     | 0        | 0        | 0       | 0            |
| 40  | U     | 1     | 0        | 0        | 0       | 0            |
| 40  | b     | 2     | 0        | 0        | 0       | 0            |
| All | All   | 65629 | 0        | 51242    | 1900    | 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 16.

All (1900) 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) |
|------------------|--------------------|--------------------------|-------------------|
| 28:d:5:LYS:HG3   | 28:d:16:ILE:CG2    | 1.35                     | 1.52              |
| 28:d:5:LYS:CG    | 28:d:16:ILE:CG2    | 1.89                     | 1.49              |
| 33:b:59:ILE:CD1  | 35:M:109:ARG:HG2   | 1.48                     | 1.41              |
| 28:d:5:LYS:HG2   | 28:d:16:ILE:CB     | 1.54                     | 1.36              |
| 1:2:810:C:OP1    | 36:2:1535:SPM:H132 | 1.31                     | 1.28              |
| 1:2:125:G:OP2    | 36:2:1521:SPM:H71  | 1.28                     | 1.25              |
| 33:b:67:LYS:HE2  | 35:M:88:THR:CG2    | 1.65                     | 1.25              |
| 33:b:21:ILE:CD1  | 33:b:32:GLU:HG2    | 1.66                     | 1.24              |
| 33:b:20:TYR:CE2  | 33:b:29:ARG:HD2    | 1.73                     | 1.22              |
| 1:2:125:G:OP2    | 36:2:1521:SPM:C7   | 1.89                     | 1.20              |
| 28:d:5:LYS:CG    | 28:d:16:ILE:HG21   | 1.62                     | 1.16              |
| 28:d:5:LYS:HD3   | 28:d:16:ILE:HG22   | 1.28                     | 1.16              |
| 28:d:5:LYS:CD    | 28:d:16:ILE:HG22   | 1.75                     | 1.15              |
| 33:b:59:ILE:HD13 | 35:M:109:ARG:HG2   | 1.26                     | 1.14              |
| 33:b:53:LEU:HD11 | 35:M:107:ILE:HG21  | 1.25                     | 1.13              |
| 28:d:5:LYS:CG    | 28:d:16:ILE:HB     | 1.78                     | 1.11              |
| 1:2:810:C:OP1    | 36:2:1535:SPM:C13  | 1.98                     | 1.11              |
| 1:2:683:G:O6     | 33:b:15:LYS:HE2    | 1.50                     | 1.10              |
| 9:H:39:PRO:CB    | 9:H:39:PRO:CG      | 2.23                     | 1.10              |
| 33:b:21:ILE:HD11 | 33:b:32:GLU:CG     | 1.83                     | 1.08              |
| 28:d:5:LYS:CG    | 28:d:16:ILE:CB     | 2.20                     | 1.07              |
| 33:b:67:LYS:CE   | 35:M:88:THR:HG23   | 1.84                     | 1.07              |
| 33:b:21:ILE:HD11 | 33:b:32:GLU:HG2    | 1.32                     | 1.06              |
| 33:b:59:ILE:CD1  | 35:M:109:ARG:CG    | 2.32                     | 1.06              |
| 33:b:67:LYS:CE   | 35:M:88:THR:CG2    | 2.33                     | 1.06              |
| 33:b:59:ILE:HD11 | 35:M:109:ARG:HG2   | 1.37                     | 1.01              |
| 33:b:59:ILE:HD11 | 35:M:109:ARG:CG    | 1.87                     | 1.01              |
| 33:b:67:LYS:HE2  | 35:M:88:THR:HG23   | 1.04                     | 1.00              |
| 33:b:20:TYR:CE2  | 33:b:29:ARG:CD     | 2.44                     | 0.99              |
| 28:d:5:LYS:CG    | 28:d:16:ILE:HG22   | 1.87                     | 0.99              |
| 1:2:683:G:O6     | 33:b:15:LYS:CE     | 2.12                     | 0.98              |
| 1:2:683:G:C6     | 33:b:15:LYS:CE     | 2.47                     | 0.98              |
| 1:2:793:C:OP2    | 36:2:1535:SPM:H82  | 1.64                     | 0.98              |
| 1:2:683:G:N7     | 33:b:15:LYS:NZ     | 2.13                     | 0.97              |
| 1:2:393:G:OP1    | 36:2:1532:SPM:C4   | 2.12                     | 0.96              |
| 33:b:21:ILE:CD1  | 33:b:32:GLU:CG     | 2.43                     | 0.95              |
| 1:2:1091:U:H3    | 1:2:1104:G:H1      | 1.01                     | 0.95              |
| 1:2:949:U:H3     | 1:2:1183:G:H1      | 0.98                     | 0.94              |
| 12:K:39:LEU:HD22 | 20:U:12:PRO:HD3    | 1.49                     | 0.93              |
| 33:b:29:ARG:NH1  | 35:M:122:ARG:HD2   | 1.84                     | 0.92              |

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| Atom-1            | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|--------------------|--------------------------|-------------------|
| 33:b:53:LEU:CD1   | 35:M:107:ILE:HG21  | 2.00                     | 0.92              |
| 33:b:20:TYR:CD2   | 33:b:29:ARG:HD2    | 2.03                     | 0.92              |
| 1:2:1201:A:OP2    | 40:2:1601:HOH:O    | 1.88                     | 0.91              |
| 1:2:125:G:P       | 36:2:1521:SPM:H71  | 2.10                     | 0.91              |
| 28:d:5:LYS:HD2    | 28:d:5:LYS:H       | 1.34                     | 0.91              |
| 1:2:683:G:C6      | 33:b:15:LYS:HE3    | 2.05                     | 0.90              |
| 1:2:21:A:OP1      | 36:2:1529:SPM:H112 | 1.72                     | 0.90              |
| 1:2:683:G:C6      | 33:b:15:LYS:HE2    | 2.05                     | 0.90              |
| 4:C:57:CYS:SG     | 4:C:60:CYS:HB3     | 2.08                     | 0.90              |
| 31:a:49:PHE:CD2   | 31:a:53:ASP:HB3    | 2.07                     | 0.90              |
| 31:a:49:PHE:HB3   | 31:a:53:ASP:HB2    | 1.54                     | 0.89              |
| 25:Z:16:VAL:HG21  | 32:P:48:LEU:HD23   | 1.52                     | 0.88              |
| 1:2:310:G:HO2'    | 5:D:2:GLY:N        | 1.71                     | 0.88              |
| 1:2:684:G:O6      | 33:b:15:LYS:HG2    | 1.74                     | 0.88              |
| 31:a:51:GLU:HA    | 31:a:54:LYS:HE2    | 1.57                     | 0.87              |
| 9:H:111:ARG:HG2   | 9:H:135:ARG:HH12   | 1.40                     | 0.87              |
| 2:A:14:TRP:HH2    | 35:M:69:LYS:O      | 1.57                     | 0.86              |
| 33:b:21:ILE:HD11  | 33:b:32:GLU:CD     | 1.99                     | 0.86              |
| 31:a:41:CYS:HB2   | 31:a:44:LYS:HD3    | 1.56                     | 0.86              |
| 2:A:17:LYS:HE3    | 35:M:32:GLU:OE2    | 1.75                     | 0.86              |
| 31:a:57:LEU:HD21  | 32:P:4:TYR:CE2     | 2.11                     | 0.86              |
| 15:O:104:ARG:HH21 | 27:c:10:SER:HB3    | 1.40                     | 0.85              |
| 31:a:49:PHE:HD2   | 31:a:53:ASP:HB3    | 1.39                     | 0.85              |
| 32:P:45:ALA:O     | 32:P:50:PHE:HB2    | 1.75                     | 0.85              |
| 28:d:5:LYS:HG2    | 28:d:16:ILE:HB     | 0.85                     | 0.85              |
| 31:a:5:ASN:ND2    | 32:P:42:ARG:HG2    | 1.90                     | 0.84              |
| 35:M:117:PRO:HG3  | 35:M:120:THR:HB    | 1.58                     | 0.83              |
| 1:2:943:U:H4'     | 36:2:1514:SPM:H112 | 1.58                     | 0.83              |
| 2:A:19:TRP:CD1    | 35:M:8:ARG:HH21    | 1.97                     | 0.83              |
| 1:2:683:G:C5      | 33:b:15:LYS:CE     | 2.62                     | 0.83              |
| 1:2:941:A:N6      | 1:2:1187:C:OP1     | 2.12                     | 0.83              |
| 31:a:36:TYR:CE2   | 31:a:70:PRO:HB3    | 2.13                     | 0.83              |
| 31:a:5:ASN:HD21   | 32:P:42:ARG:HG2    | 1.42                     | 0.83              |
| 1:2:1371:C:O2     | 1:2:1451:G:N2      | 2.12                     | 0.82              |
| 28:d:5:LYS:CD     | 28:d:16:ILE:CG2    | 2.44                     | 0.82              |
| 33:b:60:ILE:HG13  | 35:M:110:ILE:HB    | 1.58                     | 0.82              |
| 3:B:172:ASP:OD1   | 3:B:173:THR:N      | 2.12                     | 0.82              |
| 31:a:49:PHE:HB3   | 31:a:53:ASP:CB     | 2.10                     | 0.81              |
| 1:2:681:G:OP1     | 2:A:99:ARG:HD3     | 1.79                     | 0.81              |
| 8:G:17:LYS:HA     | 8:G:17:LYS:HE3     | 1.62                     | 0.81              |
| 9:H:25:PRO:HA     | 9:H:28:LYS:HE2     | 1.62                     | 0.81              |

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| Atom-1           | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|--------------------|--------------------------|-------------------|
| 8:G:141:ASN:OD1  | 8:G:147:PRO:HA     | 1.80                     | 0.80              |
| 31:a:57:LEU:HD21 | 32:P:4:TYR:HE2     | 1.44                     | 0.80              |
| 9:H:90:TYR:HB2   | 9:H:97:PRO:HG3     | 1.63                     | 0.80              |
| 1:2:786:U:OP2    | 22:W:6:ARG:NH2     | 2.15                     | 0.80              |
| 30:4:9:G:O2'     | 30:4:10:G:N7       | 2.15                     | 0.80              |
| 22:W:30:ILE:HD11 | 22:W:38:VAL:HG21   | 1.64                     | 0.80              |
| 33:b:23:CYS:O    | 33:b:27:GLY:N      | 2.15                     | 0.80              |
| 1:2:71:G:N2      | 1:2:213:C:O2       | 2.11                     | 0.80              |
| 31:a:45:TYR:CE2  | 32:P:6:PRO:HB2     | 2.17                     | 0.79              |
| 21:V:63:VAL:HG22 | 21:V:83:ILE:HG12   | 1.63                     | 0.79              |
| 9:H:6:LEU:HB3    | 28:d:70:LYS:HD2    | 1.64                     | 0.79              |
| 33:b:28:ALA:HB2  | 35:M:128:ARG:O     | 1.83                     | 0.78              |
| 12:K:32:VAL:HA   | 12:K:68:ILE:HB     | 1.66                     | 0.78              |
| 33:b:21:ILE:HD13 | 33:b:32:GLU:HG2    | 1.64                     | 0.78              |
| 2:A:33:LEU:HD22  | 2:A:51:THR:HG21    | 1.65                     | 0.78              |
| 33:b:67:LYS:CE   | 35:M:88:THR:HG21   | 2.12                     | 0.78              |
| 5:D:116:SER:HB2  | 5:D:121:GLN:HG2    | 1.66                     | 0.77              |
| 9:H:101:LEU:HA   | 9:H:166:ILE:HD11   | 1.65                     | 0.77              |
| 1:2:579:C:H5''   | 36:2:1534:SPM:H132 | 1.66                     | 0.77              |
| 33:b:42:TYR:OH   | 35:M:89:PRO:HG2    | 1.85                     | 0.77              |
| 33:b:59:ILE:HD11 | 35:M:109:ARG:HG3   | 1.67                     | 0.77              |
| 28:d:5:LYS:NZ    | 28:d:5:LYS:HB3     | 2.00                     | 0.77              |
| 33:b:24:ASP:HA   | 35:M:123:ARG:NH2   | 1.99                     | 0.77              |
| 33:b:70:CYS:SG   | 33:b:72:ASN:N      | 2.58                     | 0.77              |
| 3:B:191:ARG:HH21 | 3:B:226:GLU:HB3    | 1.50                     | 0.76              |
| 12:K:23:ILE:HD11 | 12:K:64:ILE:HG13   | 1.65                     | 0.76              |
| 1:2:393:G:P      | 36:2:1532:SPM:H41  | 2.26                     | 0.76              |
| 14:N:70:ARG:HG3  | 14:N:119:LEU:HD13  | 1.66                     | 0.76              |
| 14:N:61:GLU:OE2  | 14:N:61:GLU:N      | 2.15                     | 0.76              |
| 15:O:42:ARG:NH2  | 20:U:54:GLU:OE2    | 2.18                     | 0.76              |
| 1:2:711:G:OP1    | 16:Q:132:LYS:NZ    | 2.18                     | 0.76              |
| 1:2:1336:U:H3'   | 12:K:76:MET:HE2    | 1.66                     | 0.76              |
| 28:d:48:GLU:HA   | 28:d:51:GLU:HB3    | 1.66                     | 0.75              |
| 2:A:14:TRP:CH2   | 35:M:69:LYS:O      | 2.39                     | 0.75              |
| 1:2:1456:A:OP1   | 40:2:1602:HOH:O    | 2.04                     | 0.75              |
| 1:2:967:G:N1     | 26:3:38:GLU:OE2    | 2.20                     | 0.74              |
| 12:K:29:ARG:N    | 12:K:65:ASP:OD2    | 2.20                     | 0.74              |
| 28:d:5:LYS:HD2   | 28:d:5:LYS:N       | 2.01                     | 0.74              |
| 28:d:21:ILE:HA   | 28:d:24:LEU:HB2    | 1.69                     | 0.74              |
| 5:D:98:GLU:OE1   | 5:D:98:GLU:N       | 2.19                     | 0.74              |
| 9:H:29:LYS:NZ    | 28:d:27:TYR:O      | 2.20                     | 0.74              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 9:H:156:LYS:HZ2  | 9:H:160:GLU:HB3   | 1.52                     | 0.74              |
| 1:2:1034:G:N2    | 1:2:1037:A:OP2    | 2.20                     | 0.74              |
| 1:2:71:G:N1      | 1:2:213:C:N3      | 2.29                     | 0.74              |
| 9:H:187:ARG:HA   | 9:H:190:LEU:HG    | 1.67                     | 0.74              |
| 11:J:34:PHE:HB3  | 11:J:95:ILE:HG12  | 1.68                     | 0.74              |
| 16:Q:136:GLU:N   | 16:Q:136:GLU:OE2  | 2.20                     | 0.74              |
| 33:b:21:ILE:HD13 | 33:b:32:GLU:CA    | 2.18                     | 0.74              |
| 20:U:47:GLU:N    | 20:U:47:GLU:OE1   | 2.21                     | 0.73              |
| 31:a:34:ILE:HD12 | 31:a:34:ILE:O     | 1.87                     | 0.73              |
| 1:2:1095:C:O2'   | 1:2:1096:U:O5'    | 2.07                     | 0.73              |
| 1:2:1292:C:OP1   | 15:O:35:ASN:ND2   | 2.21                     | 0.73              |
| 35:M:117:PRO:CG  | 35:M:120:THR:HB   | 2.19                     | 0.73              |
| 3:B:18:GLU:OE1   | 3:B:18:GLU:N      | 2.20                     | 0.73              |
| 9:H:132:PRO:HA   | 9:H:135:ARG:HD3   | 1.71                     | 0.73              |
| 15:O:84:LYS:O    | 19:T:15:ARG:NH1   | 2.22                     | 0.73              |
| 26:3:92:LEU:HD21 | 26:3:94:VAL:HG12  | 1.70                     | 0.73              |
| 23:X:45:GLU:HA   | 23:X:49:LYS:HD2   | 1.71                     | 0.72              |
| 23:X:35:GLU:N    | 23:X:35:GLU:OE1   | 2.22                     | 0.72              |
| 3:B:49:ILE:O     | 3:B:187:ASN:ND2   | 2.22                     | 0.72              |
| 30:4:50:U:H3     | 30:4:64:G:H1      | 0.78                     | 0.72              |
| 33:b:7:ASN:C     | 33:b:8:ARG:HG2    | 2.14                     | 0.72              |
| 1:2:796:A:OP1    | 40:2:1603:HOH:O   | 2.08                     | 0.72              |
| 1:2:1097:C:H42   | 20:U:6:ILE:HB     | 1.54                     | 0.72              |
| 28:d:5:LYS:HB3   | 28:d:5:LYS:HZ2    | 1.54                     | 0.72              |
| 31:a:44:LYS:HG2  | 31:a:45:TYR:CD1   | 2.24                     | 0.72              |
| 26:3:40:THR:HG22 | 26:3:66:LEU:HD11  | 1.70                     | 0.72              |
| 1:2:125:G:OP2    | 36:2:1521:SPM:H72 | 1.90                     | 0.71              |
| 3:B:101:ALA:HB2  | 3:B:110:VAL:HG21  | 1.72                     | 0.71              |
| 4:C:16:CYS:HB3   | 4:C:19:CYS:SG     | 2.29                     | 0.71              |
| 1:2:191:U:O3'    | 11:J:45:LYS:NZ    | 2.24                     | 0.71              |
| 1:2:965:A:H2'    | 26:3:94:VAL:HG11  | 1.72                     | 0.71              |
| 9:H:111:ARG:NH2  | 23:X:68:ILE:O     | 2.17                     | 0.71              |
| 1:2:483:G:H5''   | 14:N:116:MET:HG3  | 1.73                     | 0.71              |
| 1:2:683:G:N7     | 33:b:15:LYS:CE    | 2.53                     | 0.71              |
| 1:2:967:G:N7     | 26:3:37:ASN:ND2   | 2.39                     | 0.71              |
| 22:W:38:VAL:HG22 | 22:W:48:VAL:HG12  | 1.72                     | 0.71              |
| 26:3:11:VAL:HG12 | 26:3:79:TYR:HD2   | 1.56                     | 0.71              |
| 1:2:684:G:O6     | 33:b:15:LYS:CG    | 2.39                     | 0.70              |
| 1:2:1074:A:OP1   | 12:K:13:ARG:NH2   | 2.24                     | 0.70              |
| 1:2:393:G:OP1    | 36:2:1532:SPM:H42 | 1.88                     | 0.70              |
| 1:2:1035:U:O3'   | 7:F:192:ARG:NH2   | 2.24                     | 0.70              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 16:Q:134:PRO:HG2 | 16:Q:137:TRP:HB2  | 1.72                     | 0.70              |
| 33:b:23:CYS:O    | 33:b:27:GLY:HA2   | 1.91                     | 0.70              |
| 14:N:49:MET:HB3  | 14:N:106:THR:HG22 | 1.73                     | 0.70              |
| 33:b:7:ASN:O     | 33:b:8:ARG:HG2    | 1.92                     | 0.70              |
| 15:O:106:ASP:OD1 | 15:O:109:ARG:NH2  | 2.22                     | 0.70              |
| 20:U:158:GLU:OE1 | 20:U:158:GLU:N    | 2.25                     | 0.70              |
| 19:T:108:HIS:HD1 | 19:T:113:TYR:HH   | 1.38                     | 0.70              |
| 1:2:1217:G:OP1   | 32:P:32:TYR:OH    | 2.05                     | 0.70              |
| 7:F:121:CYS:SG   | 7:F:126:CYS:HB3   | 2.31                     | 0.70              |
| 27:c:58:GLU:HG2  | 27:c:65:ILE:HG22  | 1.72                     | 0.70              |
| 1:2:393:G:OP1    | 36:2:1532:SPM:H41 | 1.92                     | 0.70              |
| 1:2:517:C:N3     | 40:2:1629:HOH:O   | 2.25                     | 0.70              |
| 24:Y:26:TYR:OH   | 24:Y:38:ASN:OD1   | 2.08                     | 0.70              |
| 1:2:192:G:P      | 11:J:45:LYS:HZ1   | 2.15                     | 0.70              |
| 9:H:111:ARG:NH2  | 23:X:70:ARG:HB3   | 2.06                     | 0.70              |
| 32:P:47:GLU:OE1  | 32:P:47:GLU:N     | 2.24                     | 0.70              |
| 24:Y:41:CYS:HB3  | 24:Y:46:SER:H     | 1.57                     | 0.69              |
| 1:2:644:G:OP1    | 2:A:39:TYR:OH     | 2.09                     | 0.69              |
| 5:D:143:TYR:OH   | 5:D:149:GLU:OE2   | 2.08                     | 0.69              |
| 33:b:67:LYS:HE2  | 35:M:88:THR:HG21  | 1.65                     | 0.69              |
| 1:2:1446:G:H2'   | 1:2:1447:A:H8     | 1.57                     | 0.69              |
| 23:X:22:GLU:OE2  | 28:d:33:THR:OG1   | 2.10                     | 0.69              |
| 28:d:27:TYR:HB2  | 28:d:37:LEU:HD13  | 1.73                     | 0.69              |
| 20:U:45:PHE:HB2  | 20:U:87:LYS:HB2   | 1.74                     | 0.69              |
| 33:b:21:ILE:HD13 | 33:b:32:GLU:HA    | 1.74                     | 0.69              |
| 1:2:1451:G:O2'   | 1:2:1452:U:H5'    | 1.93                     | 0.69              |
| 9:H:111:ARG:HH22 | 23:X:18:GLY:HA3   | 1.56                     | 0.69              |
| 10:I:101:GLU:N   | 10:I:101:GLU:OE2  | 2.26                     | 0.69              |
| 25:Z:90:GLU:OE2  | 25:Z:120:ARG:NH2  | 2.26                     | 0.69              |
| 1:2:962:A:H2'    | 1:2:963:G:H8      | 1.57                     | 0.69              |
| 25:Z:16:VAL:CG2  | 32:P:48:LEU:HD23  | 2.23                     | 0.69              |
| 33:b:23:CYS:O    | 33:b:27:GLY:CA    | 2.41                     | 0.69              |
| 3:B:188:ASN:HA   | 3:B:194:LEU:HD13  | 1.75                     | 0.68              |
| 16:Q:97:ARG:NH2  | 16:Q:117:GLU:OE2  | 2.21                     | 0.68              |
| 1:2:1162:U:O4    | 36:2:1515:SPM:N1  | 2.25                     | 0.68              |
| 13:L:101:LEU:N   | 13:L:101:LEU:HD22 | 2.07                     | 0.68              |
| 1:2:962:A:H2'    | 1:2:963:G:C8      | 2.28                     | 0.68              |
| 1:2:644:G:N3     | 35:M:36:ARG:NH2   | 2.39                     | 0.68              |
| 1:2:910:A:H2'    | 1:2:911:A:C8      | 2.28                     | 0.68              |
| 1:2:1198:U:OP1   | 40:2:1604:HOH:O   | 2.12                     | 0.68              |
| 15:O:51:ARG:NH1  | 27:c:42:SER:OG    | 2.26                     | 0.68              |

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| Atom-1                    | Atom-2                    | Interatomic distance (Å) | Clash overlap (Å) |
|---------------------------|---------------------------|--------------------------|-------------------|
| 20:U:76:ILE:O             | 20:U:79:THR:OG1           | 2.08                     | 0.68              |
| 12:K:28:GLY:O             | 12:K:61:ARG:NH2           | 2.27                     | 0.68              |
| 28:d:5:LYS:HG3            | 28:d:16:ILE:HG21          | 0.70                     | 0.68              |
| 8:G:26:SER:C              | 8:G:96:LYS:HZ1            | 2.02                     | 0.68              |
| 1:2:1057:C:N4             | 1:2:1060:OMC:OP2          | 2.27                     | 0.68              |
| 1:2:349:A:H5 <sup>?</sup> | 1:2:350:C:H5              | 1.59                     | 0.67              |
| 1:2:964:G:N2              | 1:2:965:A:N1              | 2.42                     | 0.67              |
| 10:I:114:MET:HE1          | 10:I:122:LEU:HD12         | 1.75                     | 0.67              |
| 16:Q:98:ARG:NH1           | 16:Q:102:GLU:OE2          | 2.27                     | 0.67              |
| 26:3:120:GLU:OE1          | 26:3:120:GLU:N            | 2.27                     | 0.67              |
| 40:2:1601:HOH:O           | 9:H:153:ASN:OD1           | 2.12                     | 0.67              |
| 11:J:89:GLU:OE2           | 11:J:89:GLU:N             | 2.25                     | 0.67              |
| 1:2:777:A:H5 <sup>?</sup> | 33:b:8:ARG:NH2            | 2.09                     | 0.67              |
| 26:3:112:ASP:HA           | 26:3:115:ILE:HD12         | 1.75                     | 0.67              |
| 1:2:417:G:H21             | 1:2:419:A:H1 <sup>?</sup> | 1.59                     | 0.67              |
| 7:F:160:VAL:HG12          | 7:F:178:SER:HB3           | 1.76                     | 0.67              |
| 27:c:65:ILE:HD11          | 27:c:106:TYR:HB2          | 1.77                     | 0.67              |
| 21:V:88:GLU:N             | 21:V:88:GLU:OE2           | 2.25                     | 0.67              |
| 25:Z:70:PHE:HB3           | 25:Z:76:LEU:HD12          | 1.76                     | 0.67              |
| 31:a:64:CYS:SG            | 31:a:66:THR:OG1           | 2.48                     | 0.67              |
| 1:2:502:C:OP1             | 29:e:41:ARG:NH1           | 2.27                     | 0.67              |
| 5:D:86:GLU:OE1            | 5:D:86:GLU:N              | 2.20                     | 0.67              |
| 1:2:634:U:OP1             | 2:A:188:LYS:NZ            | 2.27                     | 0.67              |
| 1:2:754:C:O2 <sup>?</sup> | 35:M:131:ARG:O            | 2.06                     | 0.67              |
| 15:O:112:LYS:NZ           | 19:T:104:GLU:OE2          | 2.28                     | 0.67              |
| 28:d:64:PRO:HG2           | 28:d:67:ILE:HG12          | 1.77                     | 0.67              |
| 1:2:418:U:H1 <sup>?</sup> | 1:2:419:A:C5              | 2.30                     | 0.66              |
| 1:2:619:G:H2 <sup>?</sup> | 1:2:620:G:C8              | 2.31                     | 0.66              |
| 19:T:27:MET:HE2           | 19:T:27:MET:HA            | 1.75                     | 0.66              |
| 26:3:93:GLN:NE2           | 26:3:93:GLN:O             | 2.27                     | 0.66              |
| 1:2:613:G:OP2             | 40:2:1605:HOH:O           | 2.13                     | 0.66              |
| 7:F:141:LYS:HG3           | 7:F:146:GLU:HG3           | 1.78                     | 0.66              |
| 25:Z:36:VAL:HG12          | 25:Z:45:VAL:HG22          | 1.76                     | 0.66              |
| 31:a:6:ARG:NE             | 32:P:46:TYR:CE2           | 2.64                     | 0.66              |
| 1:2:337:OMG:HM22          | 1:2:338:G:H5 <sup>?</sup> | 1.77                     | 0.66              |
| 1:2:680:A:OP1             | 2:A:129:LYS:HE3           | 1.95                     | 0.66              |
| 1:2:1491:A:H2             | 33:b:94:LEU:HD21          | 1.58                     | 0.66              |
| 19:T:15:ARG:HB2           | 19:T:33:LEU:HD23          | 1.75                     | 0.66              |
| 21:V:107:GLN:HE21         | 21:V:109:LYS:HB2          | 1.60                     | 0.66              |
| 9:H:10:ILE:HA             | 9:H:37:TYR:CE1            | 2.30                     | 0.66              |
| 1:2:256:G:H4 <sup>?</sup> | 1:2:257:U:H5 <sup>?</sup> | 1.77                     | 0.66              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 7:F:7:SER:HB2     | 7:F:53:LYS:HE3    | 1.78                     | 0.66              |
| 5:D:30:LEU:HD23   | 5:D:35:LEU:HB2    | 1.77                     | 0.66              |
| 12:K:98:GLU:OE1   | 12:K:98:GLU:N     | 2.28                     | 0.66              |
| 1:2:714:G:H21     | 10:I:3:PHE:HZ     | 1.42                     | 0.66              |
| 1:2:1114:U:H4'    | 13:L:42:PRO:HG3   | 1.77                     | 0.66              |
| 1:2:1203:U:O2'    | 9:H:71:ASN:ND2    | 2.29                     | 0.66              |
| 1:2:681:G:N7      | 2:A:129:LYS:NZ    | 2.44                     | 0.66              |
| 1:2:393:G:OP1     | 36:2:1532:SPM:C3  | 2.44                     | 0.65              |
| 5:D:21:GLU:OE1    | 5:D:21:GLU:N      | 2.22                     | 0.65              |
| 15:O:104:ARG:O    | 15:O:108:GLU:HG2  | 1.96                     | 0.65              |
| 1:2:917:G:OP1     | 36:2:1525:SPM:N10 | 2.27                     | 0.65              |
| 9:H:18:THR:HG21   | 9:H:35:PRO:HA     | 1.78                     | 0.65              |
| 13:L:99:ILE:HD12  | 13:L:99:ILE:O     | 1.95                     | 0.65              |
| 25:Z:6:ARG:HB3    | 25:Z:6:ARG:NH1    | 2.11                     | 0.65              |
| 31:a:43:LYS:HE3   | 31:a:43:LYS:HA    | 1.78                     | 0.65              |
| 22:W:51:MET:HA    | 22:W:51:MET:HE3   | 1.79                     | 0.65              |
| 26:3:27:LYS:HZ1   | 26:3:89:ALA:HB3   | 1.62                     | 0.65              |
| 1:2:1443:G:H3'    | 1:2:1444:G:H8     | 1.59                     | 0.65              |
| 3:B:112:LYS:HA    | 3:B:112:LYS:HE3   | 1.78                     | 0.65              |
| 26:3:83:LYS:HZ2   | 26:3:95:ALA:HB1   | 1.61                     | 0.65              |
| 1:2:1374:U:C2     | 1:2:1448:G:C2     | 2.84                     | 0.65              |
| 14:N:119:LEU:HD12 | 14:N:120:PRO:HD2  | 1.79                     | 0.65              |
| 16:Q:32:GLU:OE2   | 16:Q:76:ARG:NH1   | 2.26                     | 0.65              |
| 33:b:67:LYS:HE3   | 35:M:88:THR:CG2   | 2.25                     | 0.65              |
| 1:2:1161:G:O6     | 36:2:1515:SPM:N1  | 2.29                     | 0.65              |
| 1:2:1443:G:H3'    | 1:2:1444:G:C8     | 2.32                     | 0.65              |
| 3:B:98:ILE:HG12   | 3:B:142:PRO:HB3   | 1.77                     | 0.65              |
| 33:b:70:CYS:SG    | 33:b:72:ASN:HB2   | 2.37                     | 0.65              |
| 35:M:48:GLU:N     | 35:M:48:GLU:OE1   | 2.30                     | 0.65              |
| 1:2:362:G:OP2     | 40:2:1606:HOH:O   | 2.14                     | 0.64              |
| 1:2:628:C:OP1     | 16:Q:105:ARG:NH1  | 2.27                     | 0.64              |
| 1:2:1318:C:H2'    | 1:2:1319:A:H8     | 1.62                     | 0.64              |
| 20:U:35:GLU:OE1   | 20:U:35:GLU:N     | 2.22                     | 0.64              |
| 31:a:41:CYS:CB    | 31:a:44:LYS:HD3   | 2.25                     | 0.64              |
| 35:M:25:ILE:HG22  | 35:M:34:ILE:HB    | 1.80                     | 0.64              |
| 1:2:1374:U:C2     | 1:2:1448:G:N2     | 2.64                     | 0.64              |
| 21:V:38:MET:HA    | 21:V:38:MET:HE3   | 1.79                     | 0.64              |
| 27:c:22:LYS:HA    | 27:c:25:LYS:HB3   | 1.79                     | 0.64              |
| 31:a:38:CYS:HB2   | 31:a:61:CYS:HB2   | 1.77                     | 0.64              |
| 1:2:672:OMG:H2'   | 1:2:673:G:C8      | 2.32                     | 0.64              |
| 33:b:53:LEU:CD1   | 35:M:107:ILE:CG2  | 2.73                     | 0.64              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 1:2:599:A:HO2'    | 10:I:110:SER:HG   | 1.46                     | 0.64              |
| 1:2:1465:G:OP1    | 36:2:1523:SPM:N14 | 2.30                     | 0.64              |
| 36:2:1516:SPM:N14 | 12:K:122:LYS:O    | 2.30                     | 0.64              |
| 9:H:113:GLU:OE1   | 9:H:115:THR:HG23  | 1.98                     | 0.64              |
| 1:2:141:A:OP1     | 40:2:1607:HOH:O   | 2.14                     | 0.64              |
| 11:J:40:GLU:N     | 11:J:40:GLU:OE2   | 2.30                     | 0.64              |
| 25:Z:65:GLN:OE1   | 25:Z:68:GLN:NE2   | 2.29                     | 0.64              |
| 26:3:24:ARG:HG3   | 26:3:89:ALA:HB1   | 1.80                     | 0.64              |
| 26:3:26:ALA:HB1   | 26:3:101:ILE:HD13 | 1.79                     | 0.64              |
| 28:d:41:LEU:HD22  | 28:d:43:LEU:HB2   | 1.79                     | 0.64              |
| 28:d:7:LYS:HB2    | 28:d:14:VAL:HB    | 1.78                     | 0.64              |
| 9:H:26:SER:HA     | 23:X:66:ILE:HB    | 1.78                     | 0.64              |
| 33:b:4:LYS:HB3    | 33:b:5:ARG:HD2    | 1.77                     | 0.64              |
| 12:K:32:VAL:HG13  | 12:K:37:ILE:HD11  | 1.78                     | 0.63              |
| 13:L:12:THR:OG1   | 13:L:13:ASN:OD1   | 2.15                     | 0.63              |
| 12:K:10:SER:HB3   | 12:K:21:CYS:HB3   | 1.78                     | 0.63              |
| 14:N:91:ASP:N     | 14:N:138:TYR:OH   | 2.31                     | 0.63              |
| 20:U:20:LEU:HD21  | 20:U:65:LEU:HD23  | 1.79                     | 0.63              |
| 1:2:481:OMC:HM22  | 1:2:482:C:H5'     | 1.79                     | 0.63              |
| 9:H:91:LEU:O      | 27:c:63:SER:OG    | 2.14                     | 0.63              |
| 11:J:33:THR:HG21  | 11:J:56:ARG:HD3   | 1.79                     | 0.63              |
| 1:2:1251:A:H2'    | 1:2:1252:A:C8     | 2.34                     | 0.63              |
| 8:G:128:ASN:HD21  | 8:G:143:LEU:HD21  | 1.63                     | 0.63              |
| 25:Z:130:GLU:HB3  | 25:Z:182:VAL:HB   | 1.80                     | 0.63              |
| 31:a:34:ILE:HD12  | 31:a:34:ILE:C     | 2.23                     | 0.63              |
| 1:2:926:OMG:N7    | 36:2:1525:SPM:H82 | 2.13                     | 0.63              |
| 27:c:80:VAL:O     | 27:c:84:ILE:HD12  | 1.98                     | 0.63              |
| 5:D:19:ILE:HG22   | 5:D:22:ARG:H      | 1.64                     | 0.63              |
| 12:K:30:VAL:HG23  | 12:K:37:ILE:HD13  | 1.81                     | 0.63              |
| 20:U:77:GLU:OE2   | 20:U:77:GLU:N     | 2.30                     | 0.63              |
| 11:J:63:ALA:HB2   | 11:J:78:ILE:HG13  | 1.81                     | 0.63              |
| 12:K:37:ILE:HG21  | 12:K:50:MET:HE3   | 1.79                     | 0.63              |
| 14:N:98:ASP:OD1   | 14:N:144:LYS:NZ   | 2.31                     | 0.63              |
| 20:U:94:GLU:OE1   | 20:U:94:GLU:N     | 2.24                     | 0.63              |
| 25:Z:118:MET:HE3  | 25:Z:147:LEU:HG   | 1.81                     | 0.63              |
| 26:3:51:VAL:HG13  | 26:3:77:TYR:HB2   | 1.79                     | 0.63              |
| 26:3:55:GLU:HB2   | 26:3:80:VAL:HG21  | 1.80                     | 0.63              |
| 27:c:68:TYR:O     | 27:c:72:THR:HG23  | 1.98                     | 0.63              |
| 36:2:1524:SPM:N14 | 36:2:1535:SPM:N1  | 2.46                     | 0.63              |
| 13:L:81:ARG:HD2   | 13:L:84:ARG:HH12  | 1.63                     | 0.63              |
| 22:W:40:CYS:CB    | 22:W:43:CYS:SG    | 2.86                     | 0.63              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 11:J:81:ILE:HD11 | 11:J:96:ILE:HB    | 1.81                     | 0.62              |
| 15:O:14:GLN:HE22 | 15:O:30:LYS:H     | 1.46                     | 0.62              |
| 17:R:91:ASP:OD1  | 17:R:91:ASP:N     | 2.32                     | 0.62              |
| 1:2:1324:A:C8    | 32:P:12:TYR:HB3   | 2.34                     | 0.62              |
| 1:2:74:A:N1      | 1:2:213:C:O2'     | 2.33                     | 0.62              |
| 1:2:636:C:H2'    | 1:2:637:U:C6      | 2.35                     | 0.62              |
| 23:X:48:ASP:OD2  | 23:X:51:ARG:NE    | 2.30                     | 0.62              |
| 33:b:53:LEU:HD11 | 35:M:107:ILE:CG2  | 2.14                     | 0.62              |
| 1:2:683:G:C5     | 33:b:15:LYS:HE3   | 2.30                     | 0.62              |
| 2:A:116:TYR:CD1  | 2:A:195:PRO:HD2   | 2.35                     | 0.62              |
| 8:G:26:SER:HG    | 8:G:93:TRP:CG     | 2.18                     | 0.62              |
| 25:Z:58:ARG:O    | 25:Z:58:ARG:NH1   | 2.28                     | 0.62              |
| 33:b:7:ASN:O     | 33:b:8:ARG:CG     | 2.47                     | 0.62              |
| 31:a:45:TYR:HE1  | 32:P:9:GLU:HB2    | 1.64                     | 0.62              |
| 2:A:19:TRP:CG    | 35:M:8:ARG:HH21   | 2.16                     | 0.62              |
| 26:3:19:VAL:HB   | 26:3:114:ILE:HG21 | 1.82                     | 0.62              |
| 1:2:1076:C:H2'   | 1:2:1077:A:H8     | 1.64                     | 0.62              |
| 9:H:89:ILE:HA    | 9:H:92:LYS:HB2    | 1.82                     | 0.62              |
| 31:a:37:LYS:HE3  | 31:a:71:ILE:HB    | 1.81                     | 0.62              |
| 1:2:1369:G:O2'   | 1:2:1475:MA6:O2'  | 2.17                     | 0.61              |
| 30:4:36:U:H3     | 39:5:102:GTP:HN1  | 1.47                     | 0.61              |
| 8:G:32:ILE:N     | 8:G:35:GLU:OE2    | 2.34                     | 0.61              |
| 1:2:947:A:O2'    | 1:2:1007:G:OP2    | 2.15                     | 0.61              |
| 16:Q:58:ILE:HG23 | 16:Q:64:ILE:HD12  | 1.83                     | 0.61              |
| 1:2:1188:G:O2'   | 1:2:1189:C:OP1    | 2.18                     | 0.61              |
| 1:2:1479:U:P     | 35:M:128:ARG:HH12 | 2.24                     | 0.61              |
| 9:H:41:THR:O     | 9:H:44:ARG:NH1    | 2.33                     | 0.61              |
| 1:2:119:U:O2     | 6:E:141:ASN:ND2   | 2.30                     | 0.61              |
| 2:A:86:HIS:CE1   | 2:A:189:THR:HG23  | 2.36                     | 0.61              |
| 8:G:202:SER:OG   | 8:G:203:GLN:N     | 2.31                     | 0.61              |
| 15:O:7:TYR:OH    | 27:c:39:GLU:OE2   | 2.18                     | 0.61              |
| 26:3:31:LYS:HB2  | 26:3:102:LEU:HB2  | 1.81                     | 0.61              |
| 31:a:34:ILE:HD11 | 31:a:51:GLU:HB2   | 1.82                     | 0.61              |
| 6:E:34:GLU:OE1   | 6:E:34:GLU:N      | 2.33                     | 0.61              |
| 8:G:42:PRO:HB2   | 8:G:79:PHE:HD1    | 1.65                     | 0.61              |
| 12:K:80:ASP:OD1  | 12:K:83:ARG:NH1   | 2.28                     | 0.61              |
| 31:a:37:LYS:HA   | 31:a:47:ALA:O     | 1.99                     | 0.61              |
| 1:2:438:C:N3     | 36:2:1518:SPM:N14 | 2.49                     | 0.61              |
| 20:U:130:LYS:H   | 20:U:130:LYS:HD2  | 1.65                     | 0.61              |
| 1:2:1189:C:HO2'  | 27:c:2:GLY:N      | 1.98                     | 0.61              |
| 1:2:1436:U:H2'   | 1:2:1437:G:C8     | 2.36                     | 0.61              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 1:2:987:U:H2'    | 1:2:988:G:C8      | 2.36                     | 0.61              |
| 1:2:351:G:O2'    | 8:G:172:LYS:NZ    | 2.33                     | 0.60              |
| 1:2:1272:C:O2'   | 27:c:7:LYS:NZ     | 2.33                     | 0.60              |
| 7:F:90:SER:HB2   | 7:F:114:ILE:HA    | 1.83                     | 0.60              |
| 12:K:29:ARG:NH2  | 20:U:158:GLU:OE1  | 2.34                     | 0.60              |
| 21:V:22:GLN:HE22 | 21:V:85:LYS:NZ    | 1.99                     | 0.60              |
| 2:A:19:TRP:CD1   | 35:M:8:ARG:NH2    | 2.69                     | 0.60              |
| 2:A:47:ARG:HB3   | 35:M:29:THR:HG21  | 1.83                     | 0.60              |
| 5:D:106:LEU:O    | 5:D:110:VAL:HG12  | 2.01                     | 0.60              |
| 16:Q:97:ARG:CZ   | 16:Q:141:PRO:HB3  | 2.31                     | 0.60              |
| 17:R:2:VAL:O     | 17:R:6:LYS:NZ     | 2.21                     | 0.60              |
| 23:X:55:ARG:NH1  | 23:X:74:ARG:HB2   | 2.15                     | 0.60              |
| 31:a:49:PHE:HD2  | 31:a:53:ASP:CB    | 2.11                     | 0.60              |
| 1:2:1253:A:N1    | 1:2:1335:G:O2'    | 2.26                     | 0.60              |
| 11:J:38:SER:O    | 11:J:61:THR:OG1   | 2.17                     | 0.60              |
| 1:2:1343:G:H2'   | 1:2:1344:OMU:H6   | 1.83                     | 0.60              |
| 5:D:99:GLN:O     | 5:D:103:GLU:HG2   | 2.01                     | 0.60              |
| 1:2:1048:U:HO2'  | 18:S:2:GLY:N      | 1.99                     | 0.60              |
| 1:2:1267:G:OP1   | 20:U:48:ARG:NH2   | 2.35                     | 0.60              |
| 1:2:1449:A:H8    | 1:2:1449:A:OP2    | 1.84                     | 0.60              |
| 4:C:34:CYS:HB3   | 4:C:38:GLY:H      | 1.65                     | 0.60              |
| 8:G:30:LYS:H     | 8:G:30:LYS:HD3    | 1.67                     | 0.60              |
| 9:H:18:THR:HA    | 9:H:98:ILE:HD11   | 1.83                     | 0.60              |
| 10:I:55:ASP:OD2  | 10:I:60:LYS:NZ    | 2.34                     | 0.60              |
| 16:Q:61:VAL:HG11 | 16:Q:69:VAL:HG23  | 1.84                     | 0.60              |
| 28:d:22:ALA:HB2  | 28:d:65:LEU:HD23  | 1.82                     | 0.60              |
| 33:b:33:ASP:OD1  | 33:b:33:ASP:N     | 2.34                     | 0.60              |
| 5:D:31:GLY:HA3   | 29:e:38:TYR:CG    | 2.37                     | 0.60              |
| 27:c:96:LEU:HB2  | 27:c:106:TYR:CE1  | 2.37                     | 0.60              |
| 3:B:108:ARG:NH1  | 3:B:227:MET:O     | 2.35                     | 0.60              |
| 22:W:24:CYS:HB2  | 22:W:43:CYS:HB3   | 1.82                     | 0.60              |
| 26:3:44:GLU:HA   | 26:3:73:LYS:HE3   | 1.84                     | 0.60              |
| 1:2:1469:U:H5''  | 36:2:1538:SPM:H22 | 1.84                     | 0.60              |
| 15:O:85:ASP:OD1  | 15:O:86:TYR:N     | 2.34                     | 0.60              |
| 1:2:1337:G:H5'   | 9:H:75:LYS:HB2    | 1.84                     | 0.60              |
| 27:c:74:SER:HB2  | 27:c:76:ILE:HG12  | 1.83                     | 0.59              |
| 1:2:617:G:H2'    | 1:2:618:C:C6      | 2.37                     | 0.59              |
| 1:2:1066:A:OP2   | 25:Z:155:SER:OG   | 2.20                     | 0.59              |
| 1:2:1070:C:H2'   | 1:2:1071:C:C6     | 2.37                     | 0.59              |
| 1:2:1203:U:H5'   | 27:c:102:ARG:HD3  | 1.83                     | 0.59              |
| 5:D:158:THR:HG21 | 21:V:39:GLY:HA3   | 1.82                     | 0.59              |

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| Atom-1           | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|--------------------|--------------------------|-------------------|
| 10:I:100:LYS:HG3 | 10:I:101:GLU:OE2   | 2.02                     | 0.59              |
| 12:K:28:GLY:N    | 12:K:64:ILE:O      | 2.33                     | 0.59              |
| 25:Z:18:ILE:HG22 | 25:Z:34:VAL:HG11   | 1.82                     | 0.59              |
| 1:2:1282:A:HO2'  | 19:T:76:ASN:HD22   | 1.45                     | 0.59              |
| 9:H:111:ARG:HG2  | 9:H:135:ARG:NH1    | 2.15                     | 0.59              |
| 1:2:885:G:H2'    | 1:2:886:G:C8       | 2.37                     | 0.59              |
| 25:Z:154:LYS:HA  | 31:a:3:ILE:HD11    | 1.84                     | 0.59              |
| 1:2:788:G:H5'    | 3:B:56:LYS:HG3     | 1.84                     | 0.59              |
| 6:E:113:GLU:OE2  | 6:E:237:ARG:NH2    | 2.34                     | 0.59              |
| 7:F:79:LEU:HD11  | 7:F:188:GLU:HA     | 1.84                     | 0.59              |
| 9:H:19:LYS:HD2   | 28:d:59:TRP:CZ2    | 2.38                     | 0.59              |
| 12:K:23:ILE:HD13 | 12:K:66:ALA:HB2    | 1.83                     | 0.59              |
| 30:4:50:U:O2     | 30:4:64:G:N2       | 2.20                     | 0.59              |
| 1:2:483:G:O4'    | 36:2:1502:SPM:H131 | 2.03                     | 0.59              |
| 1:2:988:G:O2'    | 1:2:989:C:O5'      | 2.19                     | 0.59              |
| 24:Y:24:ARG:HD3  | 26:3:37:ASN:HB3    | 1.82                     | 0.59              |
| 26:3:6:TYR:OH    | 26:3:77:TYR:OH     | 2.19                     | 0.59              |
| 12:K:101:LYS:HZ3 | 28:d:65:LEU:HD12   | 1.67                     | 0.59              |
| 1:2:475:U:H4'    | 29:e:16:GLN:HE21   | 1.67                     | 0.59              |
| 1:2:1444:G:N2    | 1:2:1445:G:O6      | 2.35                     | 0.59              |
| 28:d:4:LEU:N     | 28:d:4:LEU:HD23    | 2.18                     | 0.59              |
| 30:4:58:A:O2'    | 30:4:60:U:OP2      | 2.13                     | 0.59              |
| 1:2:922:A:N3     | 1:2:949:U:O2'      | 2.34                     | 0.59              |
| 1:2:1097:C:N4    | 20:U:140:LEU:HB2   | 2.17                     | 0.59              |
| 1:2:1451:G:C2'   | 1:2:1452:U:H5'     | 2.32                     | 0.59              |
| 12:K:119:GLU:HG2 | 12:K:128:ALA:HB1   | 1.84                     | 0.59              |
| 13:L:7:ILE:HG13  | 13:L:99:ILE:HG23   | 1.85                     | 0.59              |
| 25:Z:42:GLY:HA3  | 25:Z:78:ASN:HB3    | 1.85                     | 0.59              |
| 27:c:39:GLU:HB2  | 27:c:76:ILE:HA     | 1.84                     | 0.59              |
| 25:Z:158:GLN:NE2 | 25:Z:191:ASP:OD2   | 2.35                     | 0.59              |
| 5:D:110:VAL:HG13 | 5:D:122:ALA:HB1    | 1.85                     | 0.58              |
| 12:K:99:LEU:HA   | 12:K:102:ILE:HG12  | 1.84                     | 0.58              |
| 1:2:243:G:OP1    | 17:R:73:ARG:NH1    | 2.36                     | 0.58              |
| 6:E:122:ILE:O    | 6:E:204:ARG:NH2    | 2.29                     | 0.58              |
| 9:H:16:TRP:CZ3   | 9:H:86:PHE:HB3     | 2.39                     | 0.58              |
| 23:X:30:THR:OG1  | 23:X:31:GLY:N      | 2.34                     | 0.58              |
| 33:b:29:ARG:HH12 | 35:M:122:ARG:HD2   | 1.64                     | 0.58              |
| 1:2:1318:C:H2'   | 1:2:1319:A:C8      | 2.38                     | 0.58              |
| 17:R:20:GLU:OE2  | 17:R:20:GLU:N      | 2.25                     | 0.58              |
| 1:2:465:G:O6     | 36:2:1502:SPM:N1   | 2.32                     | 0.58              |
| 3:B:99:VAL:HG23  | 3:B:110:VAL:HG13   | 1.86                     | 0.58              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 22:W:47:LEU:HA     | 22:W:58:VAL:HG22   | 1.84                     | 0.58              |
| 36:2:1524:SPM:HN41 | 36:2:1535:SPM:HN12 | 1.50                     | 0.58              |
| 9:H:39:PRO:HB3     | 9:H:58:VAL:HG23    | 1.83                     | 0.58              |
| 33:b:67:LYS:HE3    | 35:M:88:THR:HG21   | 1.83                     | 0.58              |
| 13:L:11:SER:OG     | 13:L:95:VAL:HG12   | 2.03                     | 0.58              |
| 15:O:7:TYR:CZ      | 27:c:29:LYS:HD2    | 2.38                     | 0.58              |
| 1:2:1282:A:O2'     | 19:T:76:ASN:ND2    | 2.24                     | 0.58              |
| 2:A:156:ASP:O      | 2:A:160:GLN:HG2    | 2.03                     | 0.58              |
| 19:T:83:LEU:HD23   | 19:T:88:MET:HE3    | 1.86                     | 0.58              |
| 1:2:991:U:H2'      | 1:2:992:G:C4       | 2.39                     | 0.58              |
| 1:2:1024:A:OP1     | 36:2:1537:SPM:N14  | 2.37                     | 0.58              |
| 1:2:1152:C:OP1     | 32:P:52:LYS:NZ     | 2.36                     | 0.58              |
| 8:G:80:LYS:NZ      | 8:G:145:GLY:O      | 2.35                     | 0.58              |
| 9:H:158:ILE:HG23   | 9:H:159:GLU:OE1    | 2.03                     | 0.58              |
| 14:N:127:ILE:HG13  | 14:N:128:MET:HG2   | 1.84                     | 0.58              |
| 16:Q:26:LEU:HD12   | 16:Q:58:ILE:HD11   | 1.84                     | 0.58              |
| 5:D:31:GLY:HA3     | 29:e:38:TYR:CD1    | 2.38                     | 0.58              |
| 6:E:40:ALA:HB2     | 6:E:75:TYR:HB2     | 1.86                     | 0.58              |
| 8:G:174:LYS:HG2    | 8:G:193:ARG:HG2    | 1.86                     | 0.58              |
| 9:H:156:LYS:NZ     | 9:H:160:GLU:HB3    | 2.19                     | 0.58              |
| 15:O:22:LEU:HD23   | 15:O:26:LEU:HD23   | 1.86                     | 0.58              |
| 1:2:218:C:H2'      | 1:2:219:A:H8       | 1.67                     | 0.57              |
| 7:F:141:LYS:NZ     | 7:F:143:GLY:O      | 2.37                     | 0.57              |
| 9:H:111:ARG:NH2    | 23:X:18:GLY:HA3    | 2.19                     | 0.57              |
| 12:K:97:LYS:O      | 12:K:97:LYS:NZ     | 2.29                     | 0.57              |
| 31:a:59:GLY:O      | 31:a:68:LEU:HG     | 2.04                     | 0.57              |
| 12:K:23:ILE:HD11   | 12:K:64:ILE:CG1    | 2.32                     | 0.57              |
| 4:C:34:CYS:CB      | 4:C:37:CYS:SG      | 2.92                     | 0.57              |
| 5:D:89:THR:OG1     | 5:D:90:VAL:N       | 2.36                     | 0.57              |
| 7:F:69:ASP:N       | 7:F:69:ASP:OD1     | 2.36                     | 0.57              |
| 18:S:64:LYS:O      | 18:S:67:SER:OG     | 2.22                     | 0.57              |
| 20:U:51:ASP:OD1    | 20:U:52:ASN:N      | 2.36                     | 0.57              |
| 26:3:35:GLY:O      | 26:3:39:THR:OG1    | 2.22                     | 0.57              |
| 9:H:111:ARG:NH1    | 23:X:17:PHE:O      | 2.38                     | 0.57              |
| 1:2:1004:G:HO2'    | 1:2:1178:C:HO2'    | 1.50                     | 0.57              |
| 8:G:64:ILE:HG12    | 8:G:102:PHE:HD2    | 1.69                     | 0.57              |
| 8:G:148:VAL:HB     | 8:G:212:ILE:HG23   | 1.86                     | 0.57              |
| 13:L:4:LYS:HG3     | 13:L:77:ALA:HA     | 1.86                     | 0.57              |
| 1:2:429:U:H1'      | 5:D:127:THR:HG22   | 1.87                     | 0.57              |
| 1:2:1341:A:OP2     | 9:H:52:LYS:NZ      | 2.30                     | 0.57              |
| 7:F:32:LYS:NZ      | 7:F:36:ASP:OD1     | 2.36                     | 0.57              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 4:C:34:CYS:HB3    | 4:C:37:CYS:SG     | 2.45                     | 0.57              |
| 35:M:15:TYR:HB3   | 35:M:22:LEU:HB2   | 1.86                     | 0.57              |
| 1:2:39:U:O4       | 6:E:18:LYS:NZ     | 2.38                     | 0.57              |
| 6:E:109:ILE:HB    | 6:E:113:GLU:HG3   | 1.86                     | 0.57              |
| 18:S:32:LYS:O     | 18:S:35:VAL:HG12  | 2.03                     | 0.57              |
| 3:B:57:TYR:OH     | 4:C:65:PRO:O      | 2.21                     | 0.57              |
| 15:O:78:TRP:HH2   | 20:U:40:ALA:HB2   | 1.70                     | 0.57              |
| 18:S:19:ARG:NH1   | 18:S:20:TYR:OH    | 2.38                     | 0.57              |
| 18:S:30:THR:O     | 18:S:34:ILE:HD12  | 2.04                     | 0.57              |
| 1:2:682:U:O2      | 1:2:682:U:H2'     | 2.05                     | 0.56              |
| 1:2:1311:G:O6     | 12:K:14:ARG:NH2   | 2.34                     | 0.56              |
| 7:F:12:GLU:OE1    | 7:F:12:GLU:N      | 2.35                     | 0.56              |
| 1:2:1019:U:OP1    | 13:L:59:ARG:HD3   | 2.04                     | 0.56              |
| 4:C:59:ASN:OD1    | 4:C:60:CYS:N      | 2.38                     | 0.56              |
| 11:J:96:ILE:HD13  | 11:J:121:ILE:HD13 | 1.88                     | 0.56              |
| 12:K:84:MET:SD    | 12:K:113:GLY:HA2  | 2.45                     | 0.56              |
| 1:2:93:C:H1'      | 1:2:359:C:H5'     | 1.88                     | 0.56              |
| 1:2:518:U:OP2     | 36:2:1501:SPM:N5  | 2.38                     | 0.56              |
| 1:2:1470:A:OP1    | 36:2:1538:SPM:N1  | 2.38                     | 0.56              |
| 1:2:1492:C:H5     | 33:b:39:THR:HG1   | 1.53                     | 0.56              |
| 3:B:199:TRP:NE1   | 3:B:220:VAL:O     | 2.30                     | 0.56              |
| 12:K:120:SER:O    | 12:K:122:LYS:NZ   | 2.37                     | 0.56              |
| 15:O:107:ILE:HG22 | 15:O:111:LYS:NZ   | 2.20                     | 0.56              |
| 21:V:59:GLN:OE1   | 21:V:59:GLN:N     | 2.38                     | 0.56              |
| 26:3:73:LYS:HB2   | 26:3:75:ILE:HG13  | 1.88                     | 0.56              |
| 33:b:20:TYR:CD2   | 33:b:29:ARG:HB3   | 2.40                     | 0.56              |
| 1:2:12:U:H2'      | 1:2:13:C:C6       | 2.40                     | 0.56              |
| 1:2:458:G:H2'     | 1:2:459:C:C6      | 2.41                     | 0.56              |
| 1:2:1032:OMU:HM22 | 1:2:1033:U:H5'    | 1.86                     | 0.56              |
| 13:L:80:GLU:HA    | 13:L:83:MET:HE2   | 1.88                     | 0.56              |
| 25:Z:11:LYS:HZ2   | 25:Z:11:LYS:HB3   | 1.69                     | 0.56              |
| 23:X:19:PHE:HD1   | 23:X:70:ARG:HA    | 1.71                     | 0.56              |
| 35:M:84:TYR:HD1   | 35:M:84:TYR:C     | 2.14                     | 0.56              |
| 1:2:926:OMG:HM22  | 1:2:927:G:H5'     | 1.86                     | 0.56              |
| 1:2:1070:C:H2'    | 1:2:1071:C:H6     | 1.71                     | 0.56              |
| 1:2:1191:C:OP2    | 27:c:2:GLY:N      | 2.38                     | 0.56              |
| 1:2:1213:A:H2'    | 1:2:1214:G:C8     | 2.41                     | 0.56              |
| 1:2:1339:A:OP2    | 9:H:45:HIS:NE2    | 2.30                     | 0.56              |
| 1:2:1368:5MC:H2'  | 1:2:1369:G:C8     | 2.41                     | 0.56              |
| 8:G:35:GLU:OE1    | 8:G:97:THR:OG1    | 2.24                     | 0.56              |
| 1:2:1253:A:H5'    | 20:U:86:ARG:HH12  | 1.71                     | 0.56              |

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| Atom-1           | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|--------------------|--------------------------|-------------------|
| 12:K:101:LYS:NZ  | 28:d:65:LEU:HD12   | 2.20                     | 0.56              |
| 23:X:38:GLN:NE2  | 23:X:78:LYS:HD3    | 2.21                     | 0.56              |
| 26:3:114:ILE:O   | 26:3:118:VAL:HG13  | 2.06                     | 0.56              |
| 1:2:237:G:OP2    | 36:2:1531:SPM:N1   | 2.37                     | 0.56              |
| 1:2:1206:C:H5''  | 20:U:47:GLU:OE2    | 2.06                     | 0.56              |
| 1:2:1335:G:O3'   | 12:K:74:GLY:HA3    | 2.05                     | 0.56              |
| 21:V:96:LYS:NZ   | 21:V:100:ASP:OD1   | 2.33                     | 0.56              |
| 8:G:60:LEU:HD11  | 8:G:111:ALA:HB1    | 1.87                     | 0.56              |
| 20:U:12:PRO:HB2  | 20:U:15:LEU:HD23   | 1.87                     | 0.56              |
| 1:2:989:C:O4'    | 24:Y:49:ALA:HB2    | 2.06                     | 0.56              |
| 8:G:29:VAL:HA    | 8:G:45:LYS:HZ3     | 1.71                     | 0.56              |
| 1:2:22:C:OP1     | 36:2:1529:SPM:H132 | 2.06                     | 0.55              |
| 1:2:535:C:OP2    | 40:2:1609:HOH:O    | 2.18                     | 0.55              |
| 6:E:26:PRO:HG2   | 6:E:33:ILE:HG12    | 1.87                     | 0.55              |
| 8:G:140:ALA:HB1  | 8:G:144:ILE:HD12   | 1.88                     | 0.55              |
| 9:H:21:GLU:OE1   | 28:d:58:ALA:N      | 2.37                     | 0.55              |
| 25:Z:58:ARG:HH11 | 25:Z:58:ARG:C      | 2.14                     | 0.55              |
| 1:2:1349:G:H2'   | 1:2:1350:C:H6      | 1.71                     | 0.55              |
| 1:2:902:A:N3     | 1:2:1340:U:O2'     | 2.27                     | 0.55              |
| 1:2:927:G:N7     | 36:2:1525:SPM:H91  | 2.21                     | 0.55              |
| 28:d:29:ARG:HH21 | 28:d:62:TRP:HE3    | 1.54                     | 0.55              |
| 28:d:43:LEU:HD21 | 28:d:48:GLU:HG2    | 1.89                     | 0.55              |
| 31:a:17:LEU:HB3  | 31:a:30:ILE:HB     | 1.87                     | 0.55              |
| 31:a:34:ILE:HD13 | 31:a:54:LYS:HE2    | 1.88                     | 0.55              |
| 33:b:70:CYS:SG   | 33:b:73:CYS:N      | 2.77                     | 0.55              |
| 1:2:334:A:OP2    | 36:2:1509:SPM:N5   | 2.35                     | 0.55              |
| 1:2:1032:OMU:H5' | 3:B:162:LYS:HE2    | 1.88                     | 0.55              |
| 1:2:1241:G:H1'   | 1:2:1246:C:O2      | 2.06                     | 0.55              |
| 1:2:1252:A:H2'   | 1:2:1253:A:C8      | 2.41                     | 0.55              |
| 6:E:173:ILE:HG12 | 6:E:228:SER:HB2    | 1.88                     | 0.55              |
| 22:W:40:CYS:HB3  | 22:W:44:GLY:H      | 1.71                     | 0.55              |
| 6:E:10:PRO:HG3   | 6:E:34:GLU:HA      | 1.88                     | 0.55              |
| 6:E:127:ILE:HG13 | 6:E:128:LYS:H      | 1.72                     | 0.55              |
| 9:H:12:VAL:N     | 9:H:16:TRP:O       | 2.40                     | 0.55              |
| 15:O:47:ASP:OD1  | 15:O:49:ASN:N      | 2.40                     | 0.55              |
| 32:P:3:LYS:HD3   | 32:P:4:TYR:H       | 1.72                     | 0.55              |
| 1:2:95:G:OP2     | 36:2:1507:SPM:N5   | 2.38                     | 0.55              |
| 3:B:108:ARG:HH21 | 3:B:112:LYS:NZ     | 2.04                     | 0.55              |
| 8:G:105:GLU:N    | 8:G:105:GLU:OE1    | 2.38                     | 0.55              |
| 13:L:91:VAL:HG11 | 13:L:97:ILE:HG13   | 1.88                     | 0.55              |
| 1:2:1097:C:C4    | 20:U:140:LEU:HB2   | 2.42                     | 0.55              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 9:H:23:ARG:HH22  | 9:H:99:GLN:HE22  | 1.55                     | 0.55              |
| 9:H:78:ALA:O     | 9:H:82:VAL:HG13  | 2.06                     | 0.55              |
| 27:c:47:ILE:HG22 | 27:c:84:ILE:HG23 | 1.89                     | 0.55              |
| 33:b:70:CYS:SG   | 33:b:72:ASN:CB   | 2.94                     | 0.55              |
| 1:2:385:G:N2     | 1:2:388:A:OP2    | 2.35                     | 0.55              |
| 1:2:475:U:H4'    | 29:e:16:GLN:NE2  | 2.21                     | 0.55              |
| 1:2:1191:C:H4'   | 15:O:141:THR:HA  | 1.89                     | 0.55              |
| 6:E:127:ILE:HG13 | 6:E:128:LYS:N    | 2.21                     | 0.55              |
| 9:H:142:HIS:CG   | 9:H:181:ARG:HD3  | 2.41                     | 0.55              |
| 28:d:39:LYS:HE2  | 28:d:39:LYS:N    | 2.22                     | 0.55              |
| 1:2:900:C:H2'    | 1:2:901:A:H8     | 1.71                     | 0.55              |
| 4:C:54:GLU:OE1   | 4:C:63:LYS:HD2   | 2.07                     | 0.55              |
| 23:X:22:GLU:HG3  | 23:X:66:ILE:HD13 | 1.89                     | 0.55              |
| 1:2:636:C:H2'    | 1:2:637:U:H6     | 1.72                     | 0.54              |
| 9:H:24:ASP:OD1   | 9:H:26:SER:N     | 2.37                     | 0.54              |
| 9:H:30:TYR:HE1   | 23:X:62:ARG:HH12 | 1.54                     | 0.54              |
| 9:H:172:ASN:HD22 | 9:H:172:ASN:N    | 2.04                     | 0.54              |
| 12:K:10:SER:OG   | 12:K:85:ALA:O    | 2.20                     | 0.54              |
| 13:L:9:LEU:O     | 13:L:71:LYS:HA   | 2.07                     | 0.54              |
| 13:L:90:ARG:NH2  | 13:L:91:VAL:O    | 2.40                     | 0.54              |
| 18:S:36:ILE:HG22 | 18:S:47:ARG:HD2  | 1.88                     | 0.54              |
| 1:2:975:G:H2'    | 1:2:976:G:H8     | 1.72                     | 0.54              |
| 1:2:1043:C:H2'   | 1:2:1044:C:H6    | 1.73                     | 0.54              |
| 2:A:22:VAL:O     | 2:A:33:LEU:N     | 2.37                     | 0.54              |
| 21:V:5:ALA:HB3   | 21:V:17:ILE:HB   | 1.89                     | 0.54              |
| 29:e:29:VAL:HB   | 29:e:32:VAL:HB   | 1.89                     | 0.54              |
| 1:2:1277:G:OP2   | 19:T:36:SER:OG   | 2.20                     | 0.54              |
| 2:A:39:TYR:N     | 2:A:43:GLN:OE1   | 2.40                     | 0.54              |
| 8:G:94:ILE:HD12  | 8:G:98:MET:HB2   | 1.90                     | 0.54              |
| 31:a:37:LYS:CE   | 31:a:71:ILE:HB   | 2.38                     | 0.54              |
| 1:2:682:U:C6     | 33:b:11:ARG:HD2  | 2.43                     | 0.54              |
| 12:K:66:ALA:C    | 12:K:67:LYS:HD2  | 2.32                     | 0.54              |
| 13:L:23:GLN:NE2  | 13:L:89:VAL:O    | 2.39                     | 0.54              |
| 25:Z:6:ARG:HB3   | 25:Z:6:ARG:HH11  | 1.70                     | 0.54              |
| 1:2:412:C:OP1    | 29:e:31:ARG:NH2  | 2.40                     | 0.54              |
| 5:D:145:VAL:HG11 | 5:D:153:ILE:HD11 | 1.89                     | 0.54              |
| 14:N:130:ASN:HB3 | 14:N:145:PRO:HG2 | 1.89                     | 0.54              |
| 31:a:49:PHE:HB3  | 31:a:53:ASP:HB3  | 1.88                     | 0.54              |
| 34:5:2:U:O2'     | 34:5:3:G:H5'     | 2.08                     | 0.54              |
| 2:A:59:ASP:N     | 2:A:59:ASP:OD1   | 2.39                     | 0.54              |
| 1:2:479:A:OP1    | 14:N:71:LYS:NZ   | 2.40                     | 0.54              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 1:2:1352:C:H4'   | 36:2:1537:SPM:H42 | 1.89                     | 0.54              |
| 15:O:44:LEU:HD11 | 15:O:66:VAL:HG21  | 1.89                     | 0.54              |
| 31:a:21:CYS:HB3  | 31:a:26:ARG:H     | 1.72                     | 0.54              |
| 1:2:682:U:H1'    | 33:b:11:ARG:HH11  | 1.71                     | 0.54              |
| 1:2:683:G:C5     | 33:b:15:LYS:HE2   | 2.36                     | 0.54              |
| 1:2:1071:C:H2'   | 1:2:1072:C:H6     | 1.73                     | 0.54              |
| 2:A:20:TYR:CE2   | 2:A:41:ILE:HD12   | 2.43                     | 0.54              |
| 12:K:31:PHE:HE1  | 20:U:156:TYR:HE1  | 1.56                     | 0.54              |
| 12:K:83:ARG:HB3  | 12:K:83:ARG:HH11  | 1.72                     | 0.54              |
| 13:L:4:LYS:H     | 13:L:4:LYS:HE2    | 1.72                     | 0.54              |
| 1:2:110:A:H1'    | 17:R:35:ARG:HG2   | 1.90                     | 0.54              |
| 1:2:426:C:H2'    | 1:2:427:U:C6      | 2.42                     | 0.54              |
| 1:2:1081:G:N2    | 1:2:1082:U:O4     | 2.36                     | 0.54              |
| 2:A:110:VAL:HG11 | 2:A:146:VAL:HG12  | 1.89                     | 0.54              |
| 8:G:8:ILE:HB     | 8:G:117:LEU:HD23  | 1.88                     | 0.54              |
| 9:H:193:ARG:OXT  | 23:X:74:ARG:NH2   | 2.41                     | 0.54              |
| 28:d:33:THR:HG23 | 28:d:35:GLU:H     | 1.73                     | 0.54              |
| 2:A:19:TRP:CH2   | 2:A:37:PRO:HG3    | 2.43                     | 0.53              |
| 3:B:61:PHE:CD1   | 3:B:185:PRO:HG3   | 2.43                     | 0.53              |
| 14:N:91:ASP:OD2  | 29:e:11:GLY:HA2   | 2.08                     | 0.53              |
| 33:b:20:TYR:CE2  | 33:b:29:ARG:HD3   | 2.38                     | 0.53              |
| 1:2:981:C:H5'    | 19:T:52:HIS:HE1   | 1.73                     | 0.53              |
| 15:O:57:ASP:O    | 15:O:61:LYS:HG2   | 2.09                     | 0.53              |
| 26:3:79:TYR:HE1  | 26:3:118:VAL:HG12 | 1.74                     | 0.53              |
| 1:2:45:U:O2'     | 1:2:46:A:H2'      | 2.07                     | 0.53              |
| 2:A:23:ILE:HD11  | 2:A:80:ILE:HG22   | 1.91                     | 0.53              |
| 21:V:9:ILE:H     | 21:V:9:ILE:HD12   | 1.73                     | 0.53              |
| 32:P:45:ALA:C    | 32:P:50:PHE:HB2   | 2.33                     | 0.53              |
| 1:2:708:C:OP1    | 16:Q:14:ARG:NH2   | 2.38                     | 0.53              |
| 2:A:50:GLU:HG3   | 2:A:68:TYR:HE2    | 1.74                     | 0.53              |
| 13:L:18:ASN:O    | 13:L:22:THR:HG23  | 2.09                     | 0.53              |
| 19:T:50:GLN:HG2  | 19:T:77:LEU:HB2   | 1.90                     | 0.53              |
| 19:T:124:GLU:OE2 | 19:T:125:PRO:HD2  | 2.08                     | 0.53              |
| 22:W:17:LEU:H    | 22:W:17:LEU:HD12  | 1.74                     | 0.53              |
| 33:b:30:VAL:HG23 | 33:b:31:PRO:HD2   | 1.89                     | 0.53              |
| 1:2:625:G:OP1    | 36:2:1511:SPM:N5  | 2.42                     | 0.53              |
| 1:2:1077:A:H2'   | 1:2:1078:C:C6     | 2.44                     | 0.53              |
| 16:Q:37:GLU:OE2  | 16:Q:41:ARG:NH2   | 2.42                     | 0.53              |
| 19:T:67:ASN:OD1  | 19:T:67:ASN:N     | 2.41                     | 0.53              |
| 25:Z:56:ILE:HG13 | 25:Z:83:ILE:HD12  | 1.90                     | 0.53              |
| 30:4:69:C:H2'    | 30:4:70:G:C8      | 2.44                     | 0.53              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 1:2:218:C:OP1    | 36:2:1521:SPM:N14 | 2.39                     | 0.53              |
| 24:Y:56:GLU:HB3  | 24:Y:69:ILE:HB    | 1.91                     | 0.53              |
| 30:4:50:U:O4     | 30:4:64:G:O6      | 2.26                     | 0.53              |
| 30:4:67:C:H2'    | 30:4:68:C:C6      | 2.44                     | 0.53              |
| 31:a:34:ILE:HD13 | 31:a:54:LYS:CE    | 2.39                     | 0.53              |
| 35:M:84:TYR:C    | 35:M:84:TYR:CD1   | 2.86                     | 0.53              |
| 1:2:681:G:H3'    | 1:2:681:G:N3      | 2.24                     | 0.53              |
| 1:2:1487:G:O2'   | 33:b:5:ARG:NH1    | 2.32                     | 0.53              |
| 20:U:143:PHE:HZ  | 20:U:156:TYR:HB3  | 1.73                     | 0.53              |
| 35:M:12:ALA:HB2  | 35:M:74:LEU:HD13  | 1.90                     | 0.53              |
| 1:2:673:G:H2'    | 1:2:674:A:C8      | 2.43                     | 0.53              |
| 5:D:107:GLN:HE21 | 5:D:119:ILE:HG13  | 1.74                     | 0.53              |
| 8:G:43:GLN:HE22  | 8:G:82:ASP:HB2    | 1.73                     | 0.53              |
| 28:d:34:LEU:H    | 28:d:34:LEU:HD12  | 1.74                     | 0.53              |
| 28:d:64:PRO:HB2  | 28:d:66:PRO:HD2   | 1.89                     | 0.53              |
| 35:M:94:GLN:O    | 35:M:98:ARG:HG2   | 2.09                     | 0.53              |
| 1:2:72:G:N1      | 1:2:209:U:O2'     | 2.40                     | 0.53              |
| 1:2:257:U:H2'    | 1:2:258:U:C6      | 2.43                     | 0.53              |
| 6:E:169:ASP:OD1  | 6:E:231:ARG:NH2   | 2.42                     | 0.53              |
| 16:Q:27:THR:O    | 16:Q:31:VAL:HG12  | 2.09                     | 0.53              |
| 26:3:66:LEU:O    | 26:3:70:CYS:N     | 2.41                     | 0.53              |
| 30:4:74:C:H4'    | 30:4:75:C:O5'     | 2.08                     | 0.53              |
| 12:K:36:PRO:HB3  | 20:U:156:TYR:CZ   | 2.43                     | 0.52              |
| 15:O:22:LEU:HD22 | 15:O:41:ILE:HD11  | 1.90                     | 0.52              |
| 25:Z:64:LYS:HD2  | 25:Z:64:LYS:C     | 2.34                     | 0.52              |
| 1:2:958:C:H2'    | 1:2:959:C:H6      | 1.74                     | 0.52              |
| 14:N:71:LYS:HG3  | 29:e:7:LEU:HD22   | 1.91                     | 0.52              |
| 25:Z:130:GLU:OE1 | 25:Z:148:LYS:HB2  | 2.09                     | 0.52              |
| 27:c:96:LEU:HD11 | 27:c:99:LYS:HB2   | 1.91                     | 0.52              |
| 33:b:20:TYR:CD2  | 33:b:29:ARG:CD    | 2.83                     | 0.52              |
| 33:b:58:ALA:HB2  | 35:M:107:ILE:O    | 2.09                     | 0.52              |
| 1:2:611:U:O4     | 1:2:711:G:O2'     | 2.22                     | 0.52              |
| 1:2:728:G:H4'    | 1:2:1470:A:H4'    | 1.91                     | 0.52              |
| 5:D:104:ARG:NH2  | 5:D:145:VAL:O     | 2.38                     | 0.52              |
| 6:E:120:ARG:NH2  | 6:E:137:GLU:OE2   | 2.37                     | 0.52              |
| 14:N:57:LYS:HD2  | 14:N:94:VAL:HG22  | 1.90                     | 0.52              |
| 18:S:34:ILE:HD12 | 18:S:34:ILE:H     | 1.75                     | 0.52              |
| 1:2:900:C:C2     | 1:2:901:A:C8      | 2.97                     | 0.52              |
| 1:2:1293:G:H5''  | 15:O:33:GLY:N     | 2.25                     | 0.52              |
| 6:E:234:SER:OG   | 6:E:236:LEU:O     | 2.26                     | 0.52              |
| 18:S:27:ASP:O    | 18:S:30:THR:OG1   | 2.26                     | 0.52              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 33:b:21:ILE:N    | 33:b:21:ILE:HD12  | 2.24                     | 0.52              |
| 1:2:827:A:H2'    | 1:2:828:A:C8      | 2.45                     | 0.52              |
| 1:2:1077:A:H2'   | 1:2:1078:C:H6     | 1.73                     | 0.52              |
| 31:a:45:TYR:CE1  | 32:P:9:GLU:HB2    | 2.45                     | 0.52              |
| 31:a:62:PRO:HG2  | 31:a:63:TYR:CZ    | 2.43                     | 0.52              |
| 1:2:338:G:O2'    | 8:G:191:ARG:O     | 2.26                     | 0.52              |
| 1:2:612:A:N6     | 22:W:10:PRO:HG3   | 2.24                     | 0.52              |
| 1:2:1243:A:H4'   | 1:2:1245:U:C5     | 2.45                     | 0.52              |
| 7:F:11:GLU:OE1   | 7:F:11:GLU:N      | 2.31                     | 0.52              |
| 8:G:180:PRO:O    | 8:G:182:GLY:N     | 2.43                     | 0.52              |
| 26:3:49:LYS:NZ   | 26:3:103:GLU:H    | 2.08                     | 0.52              |
| 1:2:264:G:O2'    | 11:J:32:PRO:HB3   | 2.10                     | 0.52              |
| 1:2:1243:A:O2'   | 1:2:1245:U:OP2    | 2.23                     | 0.52              |
| 9:H:19:LYS:HG2   | 28:d:59:TRP:CD2   | 2.45                     | 0.52              |
| 11:J:82:LEU:HD12 | 11:J:108:LEU:HD11 | 1.92                     | 0.52              |
| 1:2:979:A:H2'    | 1:2:980:A:H8      | 1.75                     | 0.52              |
| 13:L:101:LEU:N   | 13:L:101:LEU:CD2  | 2.73                     | 0.52              |
| 19:T:28:ASP:O    | 19:T:31:ILE:HG22  | 2.10                     | 0.52              |
| 20:U:109:GLN:O   | 20:U:113:LYS:HD3  | 2.10                     | 0.52              |
| 31:a:59:GLY:C    | 31:a:68:LEU:HG    | 2.34                     | 0.52              |
| 1:2:687:A:H2'    | 1:2:688:A:C8      | 2.45                     | 0.52              |
| 1:2:704:C:OP1    | 1:2:814:U:O2'     | 2.26                     | 0.52              |
| 1:2:1208:G:OP2   | 20:U:46:LYS:NZ    | 2.35                     | 0.52              |
| 1:2:1280:G:N1    | 1:2:1283:A:OP2    | 2.42                     | 0.52              |
| 9:H:182:LYS:O    | 9:H:186:GLU:HG2   | 2.10                     | 0.52              |
| 12:K:107:ASP:OD2 | 12:K:109:THR:OG1  | 2.21                     | 0.52              |
| 13:L:27:ILE:HG12 | 13:L:85:GLN:NE2   | 2.24                     | 0.52              |
| 26:3:78:VAL:HG11 | 26:3:114:ILE:HD12 | 1.92                     | 0.52              |
| 27:c:80:VAL:HG12 | 27:c:84:ILE:HD11  | 1.91                     | 0.52              |
| 30:4:62:C:H2'    | 30:4:63:G:H8      | 1.74                     | 0.52              |
| 31:a:45:TYR:HE2  | 32:P:6:PRO:HB2    | 1.67                     | 0.52              |
| 1:2:406:C:O2'    | 1:2:580:A:N3      | 2.39                     | 0.52              |
| 5:D:86:GLU:H     | 5:D:86:GLU:CD     | 2.16                     | 0.52              |
| 6:E:117:LYS:HB2  | 6:E:162:LEU:HD11  | 1.91                     | 0.52              |
| 12:K:130:ARG:NH1 | 12:K:131:TRP:O    | 2.43                     | 0.52              |
| 23:X:62:ARG:HB2  | 28:d:31:GLN:HE22  | 1.75                     | 0.52              |
| 26:3:66:LEU:HD22 | 26:3:66:LEU:H     | 1.74                     | 0.52              |
| 27:c:95:LYS:HG2  | 27:c:107:ILE:HG22 | 1.92                     | 0.52              |
| 35:M:65:ASP:O    | 35:M:69:LYS:HG2   | 2.10                     | 0.52              |
| 1:2:793:C:OP2    | 36:2:1535:SPM:C8  | 2.46                     | 0.51              |
| 1:2:914:U:H2'    | 1:2:915:G:H8      | 1.75                     | 0.51              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 1:2:974:A:N3     | 24:Y:57:ARG:NH2   | 2.58                     | 0.51              |
| 1:2:1095:C:H2'   | 1:2:1095:C:OP2    | 2.10                     | 0.51              |
| 1:2:1196:G:OP1   | 12:K:126:TYR:OH   | 2.27                     | 0.51              |
| 1:2:1484:C:P     | 33:b:10:ARG:HH12  | 2.33                     | 0.51              |
| 7:F:17:THR:OG1   | 7:F:43:GLU:OE2    | 2.20                     | 0.51              |
| 25:Z:23:ALA:HA   | 25:Z:31:TYR:HD1   | 1.75                     | 0.51              |
| 28:d:5:LYS:HD3   | 28:d:16:ILE:O     | 2.11                     | 0.51              |
| 31:a:39:PRO:HB3  | 31:a:69:VAL:HG11  | 1.92                     | 0.51              |
| 9:H:22:ILE:HD13  | 9:H:102:VAL:CG1   | 2.41                     | 0.51              |
| 9:H:22:ILE:HD11  | 9:H:106:GLU:HB3   | 1.92                     | 0.51              |
| 9:H:193:ARG:NH2  | 23:X:71:GLU:OE1   | 2.42                     | 0.51              |
| 12:K:59:ASP:HB2  | 12:K:63:LYS:NZ    | 2.25                     | 0.51              |
| 15:O:24:TYR:O    | 15:O:28:MET:HG2   | 2.11                     | 0.51              |
| 28:d:21:ILE:O    | 28:d:25:ASN:N     | 2.42                     | 0.51              |
| 6:E:30:PRO:HD2   | 6:E:78:PRO:HG2    | 1.91                     | 0.51              |
| 8:G:79:PHE:HE1   | 8:G:98:MET:HG3    | 1.75                     | 0.51              |
| 19:T:31:ILE:HG13 | 19:T:39:ARG:HG2   | 1.92                     | 0.51              |
| 22:W:43:CYS:SG   | 22:W:45:THR:HG23  | 2.51                     | 0.51              |
| 31:a:67:GLU:OE1  | 31:a:68:LEU:N     | 2.41                     | 0.51              |
| 35:M:22:LEU:HD13 | 35:M:38:SER:HB3   | 1.93                     | 0.51              |
| 1:2:979:A:H2'    | 1:2:980:A:C8      | 2.44                     | 0.51              |
| 1:2:1243:A:H1'   | 1:2:1246:C:N4     | 2.24                     | 0.51              |
| 1:2:1253:A:H5'   | 20:U:86:ARG:HH22  | 1.74                     | 0.51              |
| 8:G:95:SER:OG    | 8:G:97:THR:OG1    | 2.26                     | 0.51              |
| 13:L:81:ARG:HA   | 13:L:84:ARG:HH11  | 1.75                     | 0.51              |
| 30:4:4:G:H2'     | 30:4:5:G:H8       | 1.76                     | 0.51              |
| 1:2:946:U:H4'    | 1:2:947:A:O4'     | 2.11                     | 0.51              |
| 9:H:27:LEU:HD21  | 9:H:135:ARG:HE    | 1.74                     | 0.51              |
| 13:L:81:ARG:HA   | 13:L:84:ARG:NH1   | 2.26                     | 0.51              |
| 15:O:116:TRP:CD1 | 15:O:120:ARG:HG2  | 2.45                     | 0.51              |
| 23:X:62:ARG:HB2  | 28:d:31:GLN:NE2   | 2.26                     | 0.51              |
| 1:2:418:U:O2     | 1:2:419:A:N6      | 2.43                     | 0.51              |
| 1:2:958:C:H2'    | 1:2:959:C:C6      | 2.46                     | 0.51              |
| 3:B:211:VAL:HG23 | 3:B:212:ILE:HG12  | 1.92                     | 0.51              |
| 9:H:91:LEU:HD13  | 27:c:107:ILE:HD13 | 1.93                     | 0.51              |
| 12:K:52:PRO:HG2  | 12:K:86:LEU:HD12  | 1.92                     | 0.51              |
| 26:3:108:LYS:HA  | 26:3:108:LYS:HE3  | 1.92                     | 0.51              |
| 31:a:37:LYS:HG2  | 31:a:69:VAL:HG13  | 1.91                     | 0.51              |
| 1:2:467:A:OP2    | 40:2:1611:HOH:O   | 2.19                     | 0.51              |
| 1:2:476:G:H2'    | 1:2:490:U:C5      | 2.46                     | 0.51              |
| 1:2:581:A:OP1    | 36:2:1534:SPM:H22 | 2.10                     | 0.51              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 1:2:843:4AC:HM72 | 14:N:3:LYS:HZ2    | 1.76                     | 0.51              |
| 1:2:1272:C:H4'   | 27:c:7:LYS:HZ3    | 1.76                     | 0.51              |
| 2:A:196:GLU:OE1  | 2:A:196:GLU:N     | 2.44                     | 0.51              |
| 5:D:123:ARG:HD3  | 29:e:31:ARG:HD2   | 1.93                     | 0.51              |
| 25:Z:61:ARG:O    | 25:Z:64:LYS:HE3   | 2.11                     | 0.51              |
| 31:a:51:GLU:HG3  | 31:a:54:LYS:HE3   | 1.93                     | 0.51              |
| 33:b:41:MET:HA   | 33:b:41:MET:HE3   | 1.91                     | 0.51              |
| 2:A:116:TYR:CE1  | 2:A:194:VAL:HG12  | 2.46                     | 0.51              |
| 8:G:197:ARG:HG2  | 8:G:205:ILE:HD11  | 1.91                     | 0.51              |
| 15:O:11:ILE:HG22 | 15:O:12:PHE:CD1   | 2.47                     | 0.51              |
| 19:T:15:ARG:HG3  | 19:T:33:LEU:HB3   | 1.92                     | 0.51              |
| 27:c:22:LYS:O    | 27:c:26:ALA:N     | 2.39                     | 0.51              |
| 1:2:349:A:H5''   | 1:2:350:C:C5      | 2.45                     | 0.50              |
| 1:2:611:U:O2'    | 1:2:612:A:OP2     | 2.25                     | 0.50              |
| 15:O:78:TRP:CH2  | 20:U:40:ALA:HB2   | 2.47                     | 0.50              |
| 15:O:116:TRP:O   | 15:O:116:TRP:HD1  | 1.94                     | 0.50              |
| 22:W:21:CYS:CB   | 22:W:40:CYS:SG    | 2.99                     | 0.50              |
| 22:W:39:ARG:HD2  | 22:W:44:GLY:O     | 2.10                     | 0.50              |
| 30:4:62:C:H2'    | 30:4:63:G:C8      | 2.46                     | 0.50              |
| 1:2:100:A:H5''   | 11:J:11:LYS:HD3   | 1.93                     | 0.50              |
| 1:2:1243:A:H4'   | 1:2:1245:U:H5     | 1.76                     | 0.50              |
| 3:B:79:ASP:OD1   | 3:B:80:GLU:N      | 2.45                     | 0.50              |
| 5:D:44:ALA:HA    | 5:D:101:LEU:HD23  | 1.93                     | 0.50              |
| 8:G:3:ASP:OD1    | 8:G:3:ASP:N       | 2.44                     | 0.50              |
| 8:G:164:ARG:NH1  | 8:G:181:PRO:O     | 2.44                     | 0.50              |
| 8:G:168:ILE:H    | 8:G:168:ILE:HD12  | 1.76                     | 0.50              |
| 26:3:15:LEU:HD21 | 26:3:114:ILE:HG22 | 1.93                     | 0.50              |
| 1:2:1126:C:H2'   | 1:2:1127:G:H8     | 1.75                     | 0.50              |
| 2:A:102:SER:HB2  | 2:A:129:LYS:HA    | 1.93                     | 0.50              |
| 12:K:83:ARG:NH1  | 12:K:83:ARG:HB3   | 2.26                     | 0.50              |
| 13:L:65:TRP:HB3  | 32:P:50:PHE:HB3   | 1.92                     | 0.50              |
| 17:R:36:VAL:HG21 | 17:R:110:LEU:HD21 | 1.93                     | 0.50              |
| 18:S:9:ILE:HD11  | 18:S:46:VAL:HG23  | 1.92                     | 0.50              |
| 1:2:16:G:N7      | 36:2:1501:SPM:N14 | 2.60                     | 0.50              |
| 1:2:220:U:H2'    | 1:2:221:G:H8      | 1.77                     | 0.50              |
| 1:2:1184:G:OP2   | 36:2:1514:SPM:N14 | 2.38                     | 0.50              |
| 26:3:11:VAL:HG12 | 26:3:79:TYR:CD2   | 2.42                     | 0.50              |
| 1:2:826:G:O6     | 36:2:1513:SPM:H81 | 2.12                     | 0.50              |
| 1:2:1204:G:H2'   | 1:2:1205:G:H8     | 1.75                     | 0.50              |
| 9:H:111:ARG:HH22 | 23:X:70:ARG:HB3   | 1.77                     | 0.50              |
| 9:H:192:SER:O    | 9:H:192:SER:OG    | 2.27                     | 0.50              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 19:T:61:ARG:NH1   | 19:T:61:ARG:O     | 2.44                     | 0.50              |
| 19:T:64:GLY:HA2   | 19:T:66:PHE:CE1   | 2.47                     | 0.50              |
| 19:T:77:LEU:HD23  | 19:T:110:LEU:HD21 | 1.94                     | 0.50              |
| 25:Z:161:LYS:O    | 25:Z:185:LYS:HG3  | 2.12                     | 0.50              |
| 33:b:44:PRO:HG2   | 35:M:110:ILE:HG22 | 1.92                     | 0.50              |
| 1:2:207:U:H2'     | 1:2:208:A:C8      | 2.46                     | 0.50              |
| 1:2:539:C:H2'     | 1:2:540:G:O4'     | 2.11                     | 0.50              |
| 1:2:968:A:H62     | 1:2:992:G:H21     | 1.60                     | 0.50              |
| 1:2:673:G:H2'     | 1:2:674:A:H8      | 1.76                     | 0.50              |
| 9:H:159:GLU:HB2   | 27:c:103:LEU:HD21 | 1.94                     | 0.50              |
| 14:N:140:GLY:O    | 14:N:141:LYS:HG2  | 2.11                     | 0.50              |
| 23:X:23:VAL:HG23  | 23:X:63:VAL:HA    | 1.94                     | 0.50              |
| 32:P:5:LYS:HD2    | 32:P:5:LYS:N      | 2.27                     | 0.50              |
| 32:P:48:LEU:HB2   | 32:P:50:PHE:CD1   | 2.46                     | 0.50              |
| 1:2:603:U:OP1     | 36:2:1533:SPM:H61 | 2.12                     | 0.50              |
| 1:2:1070:C:C2     | 1:2:1071:C:C5     | 3.00                     | 0.50              |
| 6:E:161:GLU:HB2   | 6:E:168:LEU:HD21  | 1.93                     | 0.50              |
| 12:K:43:GLU:HG3   | 12:K:44:MET:N     | 2.27                     | 0.50              |
| 12:K:46:ARG:NH1   | 12:K:46:ARG:HB3   | 2.27                     | 0.50              |
| 19:T:48:ASP:O     | 19:T:52:HIS:HD2   | 1.94                     | 0.50              |
| 26:3:27:LYS:HZ2   | 26:3:90:CYS:H     | 1.58                     | 0.50              |
| 31:a:34:ILE:CD1   | 31:a:54:LYS:HE2   | 2.41                     | 0.50              |
| 1:2:1071:C:H4'    | 32:P:53:TYR:CD2   | 2.47                     | 0.50              |
| 1:2:1084:G:H5'    | 1:2:1244:A:O2'    | 2.12                     | 0.50              |
| 1:2:1336:U:H3'    | 12:K:76:MET:CE    | 2.39                     | 0.50              |
| 2:A:24:THR:OG1    | 2:A:31:VAL:N      | 2.45                     | 0.50              |
| 8:G:142:GLN:HG2   | 8:G:143:LEU:HD22  | 1.94                     | 0.50              |
| 12:K:102:ILE:HD12 | 28:d:66:PRO:HB2   | 1.92                     | 0.50              |
| 12:K:123:TRP:HE3  | 12:K:124:MET:HG3  | 1.77                     | 0.50              |
| 13:L:83:MET:O     | 13:L:87:MET:HG3   | 2.12                     | 0.50              |
| 15:O:56:SER:N     | 15:O:59:GLU:OE2   | 2.44                     | 0.50              |
| 24:Y:57:ARG:HA    | 24:Y:68:PHE:HA    | 1.93                     | 0.50              |
| 25:Z:60:GLY:O     | 25:Z:63:ILE:HG22  | 2.12                     | 0.50              |
| 28:d:46:TRP:HA    | 28:d:49:ALA:HB3   | 1.93                     | 0.50              |
| 33:b:30:VAL:CG2   | 33:b:31:PRO:HD2   | 2.42                     | 0.50              |
| 6:E:169:ASP:CG    | 6:E:231:ARG:HH22  | 2.20                     | 0.49              |
| 18:S:43:SER:HB3   | 18:S:46:VAL:HG12  | 1.93                     | 0.49              |
| 27:c:19:GLU:O     | 27:c:23:GLN:N     | 2.41                     | 0.49              |
| 1:2:908:G:N1      | 1:2:1302:G:OP2    | 2.45                     | 0.49              |
| 1:2:1085:G:H21    | 1:2:1110:A:H62    | 1.60                     | 0.49              |
| 1:2:1252:A:O2'    | 20:U:86:ARG:NH2   | 2.44                     | 0.49              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 2:A:116:TYR:HD1   | 2:A:195:PRO:HD2   | 1.76                     | 0.49              |
| 3:B:29:LYS:HA     | 3:B:29:LYS:HE2    | 1.92                     | 0.49              |
| 13:L:53:LEU:HD11  | 13:L:60:LYS:HA    | 1.94                     | 0.49              |
| 13:L:79:ASP:OD1   | 13:L:82:VAL:HG22  | 2.12                     | 0.49              |
| 19:T:39:ARG:O     | 19:T:43:LYS:HB3   | 2.12                     | 0.49              |
| 33:b:44:PRO:HD2   | 33:b:61:ALA:O     | 2.12                     | 0.49              |
| 1:2:965:A:O4'     | 1:2:993:A:N6      | 2.46                     | 0.49              |
| 1:2:1053:C:O2'    | 18:S:10:LYS:NZ    | 2.31                     | 0.49              |
| 9:H:20:VAL:HB     | 9:H:99:GLN:OE1    | 2.11                     | 0.49              |
| 13:L:24:ILE:HA    | 13:L:27:ILE:HD12  | 1.93                     | 0.49              |
| 15:O:107:ILE:HG22 | 15:O:111:LYS:HZ3  | 1.77                     | 0.49              |
| 31:a:39:PRO:HD2   | 31:a:40:LYS:N     | 2.27                     | 0.49              |
| 1:2:914:U:H2'     | 1:2:915:G:C8      | 2.48                     | 0.49              |
| 1:2:1004:G:H5''   | 31:a:27:LYS:HG2   | 1.93                     | 0.49              |
| 1:2:1192:G:O2'    | 30:4:30:G:OP1     | 2.29                     | 0.49              |
| 16:Q:17:ARG:NH1   | 16:Q:19:GLY:O     | 2.45                     | 0.49              |
| 28:d:5:LYS:NZ     | 28:d:5:LYS:CB     | 2.73                     | 0.49              |
| 32:P:28:VAL:HA    | 32:P:37:CYS:HA    | 1.93                     | 0.49              |
| 35:M:77:LYS:HD3   | 35:M:111:GLU:OE1  | 2.12                     | 0.49              |
| 1:2:707:G:N7      | 16:Q:17:ARG:NH2   | 2.61                     | 0.49              |
| 1:2:1043:C:H2'    | 1:2:1044:C:C6     | 2.48                     | 0.49              |
| 1:2:1081:G:H1'    | 1:2:1082:U:H5     | 1.78                     | 0.49              |
| 15:O:30:LYS:NZ    | 27:c:9:ILE:O      | 2.35                     | 0.49              |
| 25:Z:16:VAL:HG21  | 32:P:48:LEU:CD2   | 2.35                     | 0.49              |
| 1:2:716:U:H2'     | 1:2:717:G:O4'     | 2.13                     | 0.49              |
| 1:2:1081:G:N7     | 1:2:1109:C:O2'    | 2.45                     | 0.49              |
| 1:2:1193:C:C5     | 36:2:1526:SPM:H22 | 2.47                     | 0.49              |
| 1:2:1314:A:H1'    | 9:H:72:LYS:HG2    | 1.95                     | 0.49              |
| 9:H:109:ALA:HB1   | 9:H:135:ARG:HB3   | 1.94                     | 0.49              |
| 12:K:87:ALA:HA    | 12:K:90:LEU:HD12  | 1.94                     | 0.49              |
| 30:4:69:C:H2'     | 30:4:70:G:H8      | 1.78                     | 0.49              |
| 32:P:4:TYR:N      | 32:P:4:TYR:CD1    | 2.80                     | 0.49              |
| 33:b:59:ILE:HD12  | 35:M:109:ARG:HA   | 1.93                     | 0.49              |
| 1:2:1343:G:H2'    | 1:2:1344:OMU:C6   | 2.42                     | 0.49              |
| 3:B:142:PRO:HG2   | 3:B:165:ILE:HD13  | 1.95                     | 0.49              |
| 5:D:16:HIS:HB3    | 5:D:19:ILE:HD13   | 1.94                     | 0.49              |
| 5:D:157:VAL:HG13  | 5:D:158:THR:HG23  | 1.95                     | 0.49              |
| 13:L:65:TRP:HA    | 32:P:51:ARG:O     | 2.12                     | 0.49              |
| 26:3:20:LEU:O     | 26:3:24:ARG:HD2   | 2.12                     | 0.49              |
| 27:c:59:ILE:HG13  | 27:c:65:ILE:HG23  | 1.94                     | 0.49              |
| 28:d:17:ASN:N     | 28:d:17:ASN:OD1   | 2.45                     | 0.49              |

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| Atom-1            | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|--------------------|--------------------------|-------------------|
| 33:b:21:ILE:HD13  | 33:b:32:GLU:CB     | 2.43                     | 0.49              |
| 1:2:29:G:H2'      | 1:2:30:C:C6        | 2.48                     | 0.49              |
| 1:2:71:G:H2'      | 1:2:72:G:C8        | 2.48                     | 0.49              |
| 1:2:1355:U:H5'    | 33:b:84:ALA:HA     | 1.93                     | 0.49              |
| 11:J:66:LEU:HA    | 11:J:73:ALA:HA     | 1.93                     | 0.49              |
| 26:3:70:CYS:SG    | 26:3:77:TYR:HB3    | 2.53                     | 0.49              |
| 29:e:28:GLU:HB3   | 29:e:32:VAL:HG12   | 1.94                     | 0.49              |
| 35:M:52:PRO:HB3   | 35:M:95:PRO:HG2    | 1.94                     | 0.49              |
| 1:2:855:A:H2'     | 1:2:856:C:C6       | 2.47                     | 0.49              |
| 1:2:1048:U:O3'    | 18:S:2:GLY:N       | 2.46                     | 0.49              |
| 1:2:1096:U:O2     | 1:2:1100:G:C6      | 2.66                     | 0.49              |
| 1:2:1337:G:OP2    | 12:K:76:MET:SD     | 2.71                     | 0.49              |
| 12:K:67:LYS:C     | 12:K:68:ILE:HD13   | 2.37                     | 0.49              |
| 1:2:207:U:H2'     | 1:2:208:A:H8       | 1.78                     | 0.49              |
| 1:2:684:G:O6      | 33:b:15:LYS:CD     | 2.61                     | 0.49              |
| 1:2:909:G:C2      | 1:2:910:A:C8       | 3.00                     | 0.49              |
| 1:2:949:U:H2'     | 1:2:950:A:C8       | 2.48                     | 0.49              |
| 2:A:116:TYR:CE1   | 2:A:195:PRO:HD2    | 2.47                     | 0.49              |
| 5:D:36:ARG:HA     | 29:e:31:ARG:HG3    | 1.94                     | 0.49              |
| 10:I:81:LEU:HB2   | 10:I:86:MET:HE2    | 1.95                     | 0.49              |
| 22:W:18:ARG:HG3   | 22:W:27:GLU:OE2    | 2.13                     | 0.49              |
| 28:d:49:ALA:O     | 28:d:52:LEU:HG     | 2.12                     | 0.49              |
| 1:2:897:C:O2'     | 1:2:1308:C:OP2     | 2.27                     | 0.48              |
| 1:2:1003:A:O2'    | 31:a:26:ARG:NH2    | 2.46                     | 0.48              |
| 1:2:1058:A:H4'    | 1:2:1059:A:H5'     | 1.95                     | 0.48              |
| 1:2:1204:G:H2'    | 1:2:1205:G:C8      | 2.48                     | 0.48              |
| 1:2:1254:C:H2'    | 1:2:1255:C:H6      | 1.78                     | 0.48              |
| 13:L:91:VAL:HG22  | 13:L:95:VAL:CG2    | 2.43                     | 0.48              |
| 31:a:14:LEU:C     | 31:a:14:LEU:HD12   | 2.38                     | 0.48              |
| 31:a:60:LYS:HA    | 31:a:66:THR:O      | 2.13                     | 0.48              |
| 1:2:810:C:P       | 36:2:1535:SPM:H132 | 2.46                     | 0.48              |
| 4:C:9:GLU:OE1     | 4:C:9:GLU:HA       | 2.13                     | 0.48              |
| 5:D:164:ARG:HG3   | 5:D:164:ARG:O      | 2.13                     | 0.48              |
| 9:H:121:GLY:C     | 9:H:122:ILE:HD13   | 2.39                     | 0.48              |
| 11:J:93:ARG:HB2   | 11:J:95:ILE:HD12   | 1.95                     | 0.48              |
| 16:Q:85:ASP:OD1   | 16:Q:85:ASP:N      | 2.47                     | 0.48              |
| 23:X:27:LEU:HD12  | 23:X:38:GLN:HG2    | 1.95                     | 0.48              |
| 24:Y:65:TYR:O     | 24:Y:65:TYR:CD2    | 2.66                     | 0.48              |
| 25:Z:127:LEU:HD13 | 25:Z:186:PRO:HA    | 1.95                     | 0.48              |
| 1:2:642:G:H2'     | 1:2:643:A:C8       | 2.48                     | 0.48              |
| 1:2:1094:U:O3'    | 20:U:129:PRO:HB3   | 2.13                     | 0.48              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 1:2:1328:A:P      | 20:U:89:ARG:HH22  | 2.37                     | 0.48              |
| 1:2:1493:C:OP1    | 33:b:93:ARG:HG2   | 2.13                     | 0.48              |
| 2:A:103:LYS:HE3   | 2:A:105:ASN:ND2   | 2.28                     | 0.48              |
| 4:C:40:VAL:HG11   | 4:C:58:PRO:HD2    | 1.95                     | 0.48              |
| 9:H:33:LEU:HD12   | 28:d:62:TRP:CD1   | 2.48                     | 0.48              |
| 13:L:101:LEU:HD22 | 13:L:101:LEU:H    | 1.75                     | 0.48              |
| 15:O:38:LYS:HD3   | 20:U:49:VAL:HG23  | 1.94                     | 0.48              |
| 15:O:44:LEU:HD22  | 15:O:62:LYS:HD2   | 1.96                     | 0.48              |
| 20:U:13:PRO:HG3   | 20:U:66:ARG:NH2   | 2.29                     | 0.48              |
| 1:2:828:A:OP2     | 1:2:828:A:H8      | 1.96                     | 0.48              |
| 1:2:843:4AC:H5    | 14:N:6:SER:OG     | 2.13                     | 0.48              |
| 3:B:26:LYS:HE2    | 3:B:39:VAL:HG21   | 1.94                     | 0.48              |
| 7:F:121:CYS:SG    | 7:F:126:CYS:CB    | 2.92                     | 0.48              |
| 9:H:63:ASN:O      | 9:H:66:MET:HB2    | 2.14                     | 0.48              |
| 17:R:14:PRO:HB2   | 17:R:15:ASN:OD1   | 2.13                     | 0.48              |
| 21:V:29:ARG:HG3   | 21:V:85:LYS:HE3   | 1.95                     | 0.48              |
| 32:P:45:ALA:O     | 32:P:50:PHE:CB    | 2.57                     | 0.48              |
| 1:2:580:A:OP1     | 36:2:1534:SPM:H91 | 2.13                     | 0.48              |
| 1:2:1174:G:H5'    | 1:2:1176:A:H1'    | 1.95                     | 0.48              |
| 13:L:26:GLY:HA2   | 13:L:29:GLU:CD    | 2.38                     | 0.48              |
| 28:d:21:ILE:HD12  | 28:d:22:ALA:N     | 2.28                     | 0.48              |
| 33:b:24:ASP:CA    | 35:M:123:ARG:NH2  | 2.75                     | 0.48              |
| 1:2:476:G:H2'     | 1:2:490:U:C6      | 2.49                     | 0.48              |
| 1:2:963:G:H2'     | 1:2:964:G:C8      | 2.49                     | 0.48              |
| 1:2:964:G:O2'     | 1:2:993:A:N1      | 2.43                     | 0.48              |
| 9:H:18:THR:HA     | 9:H:98:ILE:CD1    | 2.43                     | 0.48              |
| 12:K:31:PHE:HE1   | 20:U:156:TYR:CE1  | 2.31                     | 0.48              |
| 12:K:102:ILE:CD1  | 28:d:66:PRO:HB2   | 2.43                     | 0.48              |
| 14:N:24:ARG:HD3   | 14:N:30:TYR:CZ    | 2.48                     | 0.48              |
| 20:U:15:LEU:HD22  | 20:U:15:LEU:H     | 1.79                     | 0.48              |
| 25:Z:106:LYS:HB2  | 25:Z:106:LYS:HE3  | 1.56                     | 0.48              |
| 27:c:28:GLU:HA    | 27:c:31:LYS:HD2   | 1.95                     | 0.48              |
| 1:2:141:A:H2'     | 1:2:142:A:O4'     | 2.14                     | 0.48              |
| 1:2:1285:U:H4'    | 15:O:116:TRP:CZ3  | 2.49                     | 0.48              |
| 18:S:57:TYR:O     | 18:S:60:ILE:HD12  | 2.14                     | 0.48              |
| 25:Z:24:LYS:HG2   | 31:a:14:LEU:HB3   | 1.96                     | 0.48              |
| 25:Z:165:ARG:HD2  | 31:a:3:ILE:HG23   | 1.96                     | 0.48              |
| 27:c:48:ASP:OD1   | 27:c:51:THR:HG23  | 2.14                     | 0.48              |
| 27:c:86:LYS:O     | 27:c:89:GLU:HG3   | 2.14                     | 0.48              |
| 1:2:391:G:OP2     | 36:2:1517:SPM:H42 | 2.13                     | 0.48              |
| 1:2:498:G:H2'     | 1:2:499:C:C6      | 2.49                     | 0.48              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 1:2:589:A:H2'    | 1:2:590:A:C8      | 2.49                     | 0.48              |
| 7:F:3:GLU:OE1    | 7:F:3:GLU:N       | 2.46                     | 0.48              |
| 8:G:18:ARG:NH1   | 8:G:63:GLU:OE1    | 2.41                     | 0.48              |
| 28:d:50:TYR:HD1  | 28:d:53:ILE:HG22  | 1.79                     | 0.48              |
| 31:a:19:VAL:HG21 | 31:a:48:TYR:CD1   | 2.49                     | 0.48              |
| 35:M:38:SER:H    | 35:M:41:MET:HG3   | 1.78                     | 0.48              |
| 1:2:498:G:H5''   | 29:e:22:PRO:HB3   | 1.96                     | 0.48              |
| 1:2:527:G:O2'    | 1:2:533:A:N1      | 2.38                     | 0.48              |
| 1:2:680:A:OP1    | 2:A:129:LYS:CE    | 2.61                     | 0.48              |
| 1:2:865:OMG:HM22 | 1:2:866:A:O4'     | 2.11                     | 0.48              |
| 1:2:949:U:H2'    | 1:2:950:A:H8      | 1.79                     | 0.48              |
| 1:2:1012:A:O2'   | 25:Z:136:LYS:HD3  | 2.13                     | 0.48              |
| 30:4:1:A:H3'     | 30:4:2:G:H8       | 1.79                     | 0.48              |
| 30:4:47:U:H5''   | 30:4:48:C:H5'     | 1.96                     | 0.48              |
| 33:b:44:PRO:HB3  | 35:M:78:VAL:HG21  | 1.95                     | 0.48              |
| 1:2:131:U:H2'    | 1:2:132:A:C8      | 2.48                     | 0.48              |
| 1:2:417:G:N2     | 1:2:419:A:H1'     | 2.26                     | 0.48              |
| 1:2:633:G:H2'    | 1:2:634:U:C6      | 2.49                     | 0.48              |
| 1:2:777:A:H5''   | 33:b:8:ARG:HH21   | 1.78                     | 0.48              |
| 1:2:1070:C:H1'   | 25:Z:157:GLN:OE1  | 2.14                     | 0.48              |
| 2:A:159:THR:HA   | 2:A:162:VAL:HG22  | 1.95                     | 0.48              |
| 19:T:79:ILE:HD11 | 19:T:110:LEU:HD13 | 1.95                     | 0.48              |
| 26:3:49:LYS:HZ3  | 26:3:103:GLU:H    | 1.61                     | 0.48              |
| 28:d:55:GLN:CD   | 28:d:55:GLN:H     | 2.22                     | 0.48              |
| 1:2:419:A:H2'    | 1:2:420:A:C8      | 2.49                     | 0.47              |
| 1:2:777:A:H3'    | 33:b:8:ARG:NH2    | 2.29                     | 0.47              |
| 11:J:58:LYS:HA   | 11:J:58:LYS:HD2   | 1.65                     | 0.47              |
| 13:L:24:ILE:O    | 13:L:28:VAL:HG12  | 2.14                     | 0.47              |
| 14:N:39:GLU:CD   | 14:N:39:GLU:H     | 2.22                     | 0.47              |
| 1:2:439:U:OP1    | 21:V:67:LYS:NZ    | 2.48                     | 0.47              |
| 1:2:589:A:H2'    | 1:2:590:A:H8      | 1.79                     | 0.47              |
| 2:A:24:THR:HB    | 2:A:28:PHE:HB2    | 1.97                     | 0.47              |
| 3:B:38:PRO:HB2   | 3:B:40:ASP:OD1    | 2.13                     | 0.47              |
| 4:C:54:GLU:CD    | 4:C:63:LYS:HD2    | 2.39                     | 0.47              |
| 5:D:110:VAL:HG23 | 5:D:115:LEU:HB2   | 1.96                     | 0.47              |
| 8:G:16:PRO:HB2   | 8:G:112:TYR:HB2   | 1.96                     | 0.47              |
| 9:H:38:LEU:O     | 9:H:40:HIS:N      | 2.48                     | 0.47              |
| 21:V:18:GLU:OE2  | 21:V:34:LYS:HB2   | 2.14                     | 0.47              |
| 21:V:61:ASN:O    | 21:V:87:ARG:NH1   | 2.43                     | 0.47              |
| 30:4:32:OMC:HM22 | 30:4:33:U:H5'     | 1.96                     | 0.47              |
| 1:2:52:OMU:HM22  | 1:2:53:G:O4'      | 2.14                     | 0.47              |

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| Atom-1            | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|--------------------|--------------------------|-------------------|
| 1:2:778:A:OP1     | 33:b:3:LYS:NZ      | 2.34                     | 0.47              |
| 1:2:810:C:OP1     | 36:2:1535:SPM:C12  | 2.58                     | 0.47              |
| 1:2:910:A:H2'     | 1:2:911:A:H8       | 1.76                     | 0.47              |
| 8:G:60:LEU:HD13   | 8:G:61:THR:N       | 2.30                     | 0.47              |
| 9:H:132:PRO:HA    | 9:H:135:ARG:HB2    | 1.95                     | 0.47              |
| 1:2:410:U:C2      | 29:e:29:VAL:HG22   | 2.50                     | 0.47              |
| 1:2:1226:C:OP2    | 20:U:75:GLY:HA3    | 2.15                     | 0.47              |
| 1:2:1477:4AC:HM73 | 1:2:1478:4AC:HM72  | 1.97                     | 0.47              |
| 1:2:1489:U:OP2    | 33:b:5:ARG:NH2     | 2.47                     | 0.47              |
| 2:A:23:ILE:HD13   | 2:A:78:ARG:CZ      | 2.44                     | 0.47              |
| 13:L:30:LYS:NZ    | 13:L:31:THR:HG22   | 2.29                     | 0.47              |
| 15:O:30:LYS:HG2   | 15:O:99:LEU:HD23   | 1.95                     | 0.47              |
| 1:2:974:A:N6      | 1:2:975:G:O6       | 2.48                     | 0.47              |
| 1:2:1466:4AC:HM73 | 1:2:1467:4AC:HM72  | 1.97                     | 0.47              |
| 2:A:18:LYS:HB2    | 2:A:20:TYR:CE1     | 2.49                     | 0.47              |
| 6:E:222:ASN:OD1   | 6:E:225:ASN:ND2    | 2.47                     | 0.47              |
| 7:F:128:CYS:SG    | 7:F:154:LYS:HD2    | 2.55                     | 0.47              |
| 15:O:62:LYS:O     | 15:O:66:VAL:HG23   | 2.14                     | 0.47              |
| 15:O:116:TRP:HD1  | 15:O:120:ARG:HG2   | 1.80                     | 0.47              |
| 20:U:72:SER:O     | 20:U:73:ILE:HG12   | 2.15                     | 0.47              |
| 25:Z:58:ARG:CZ    | 25:Z:61:ARG:HE     | 2.28                     | 0.47              |
| 26:3:6:TYR:HB2    | 26:3:55:GLU:OE2    | 2.15                     | 0.47              |
| 33:b:7:ASN:C      | 33:b:8:ARG:CG      | 2.85                     | 0.47              |
| 33:b:79:ILE:HG22  | 33:b:94:LEU:HD13   | 1.97                     | 0.47              |
| 1:2:942:A:C2      | 1:2:1283:A:C4      | 3.03                     | 0.47              |
| 1:2:1490:C:H5'    | 1:2:1491:A:C8      | 2.50                     | 0.47              |
| 2:A:157:ASP:OD1   | 2:A:157:ASP:N      | 2.46                     | 0.47              |
| 9:H:36:VAL:HG23   | 12:K:106:TYR:OH    | 2.14                     | 0.47              |
| 9:H:40:HIS:HD2    | 12:K:48:LYS:NZ     | 2.12                     | 0.47              |
| 9:H:79:TYR:CD1    | 9:H:79:TYR:C       | 2.93                     | 0.47              |
| 13:L:94:ASP:OD1   | 13:L:94:ASP:N      | 2.41                     | 0.47              |
| 15:O:116:TRP:HE1  | 15:O:120:ARG:HD3   | 1.79                     | 0.47              |
| 17:R:48:TYR:N     | 17:R:89:GLU:OE2    | 2.47                     | 0.47              |
| 25:Z:48:TYR:HB3   | 25:Z:86:VAL:HG12   | 1.96                     | 0.47              |
| 29:e:28:GLU:HB2   | 29:e:33:ARG:HB2    | 1.95                     | 0.47              |
| 1:2:99:A:OP1      | 11:J:18:GLY:N      | 2.41                     | 0.47              |
| 1:2:131:U:H2'     | 1:2:132:A:H8       | 1.80                     | 0.47              |
| 1:2:147:G:N7      | 36:2:1522:SPM:H131 | 2.29                     | 0.47              |
| 1:2:1024:A:N1     | 1:2:1065:G:O2'     | 2.36                     | 0.47              |
| 1:2:1113:C:OP1    | 12:K:13:ARG:NH1    | 2.48                     | 0.47              |
| 1:2:1143:G:P      | 12:K:108:ARG:HH21  | 2.37                     | 0.47              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 1:2:1382:A:P     | 1:2:1382:A:H8     | 2.36                     | 0.47              |
| 1:2:1477:4AC:O7  | 1:2:1477:4AC:H5   | 2.14                     | 0.47              |
| 2:A:60:PHE:HE1   | 33:b:59:ILE:CG2   | 2.28                     | 0.47              |
| 2:A:109:ASP:N    | 2:A:109:ASP:OD1   | 2.48                     | 0.47              |
| 7:F:138:VAL:HG11 | 7:F:201:THR:HG22  | 1.96                     | 0.47              |
| 8:G:18:ARG:HB3   | 8:G:110:PHE:CD1   | 2.49                     | 0.47              |
| 8:G:157:ASP:HA   | 8:G:205:ILE:HA    | 1.97                     | 0.47              |
| 9:H:131:SER:HB2  | 23:X:61:VAL:HG22  | 1.96                     | 0.47              |
| 9:H:162:LEU:O    | 9:H:166:ILE:HG22  | 2.14                     | 0.47              |
| 12:K:30:VAL:O    | 20:U:156:TYR:OH   | 2.33                     | 0.47              |
| 23:X:22:GLU:OE2  | 23:X:64:GLY:HA2   | 2.15                     | 0.47              |
| 27:c:52:LYS:HE3  | 27:c:91:GLN:NE2   | 2.29                     | 0.47              |
| 31:a:51:GLU:HA   | 31:a:54:LYS:CE    | 2.37                     | 0.47              |
| 32:P:34:ILE:CG2  | 32:P:36:LEU:HD12  | 2.45                     | 0.47              |
| 35:M:52:PRO:O    | 35:M:56:MET:HG3   | 2.15                     | 0.47              |
| 1:2:242:C:OP1    | 17:R:75:SER:HB2   | 2.14                     | 0.47              |
| 1:2:981:C:H5'    | 19:T:52:HIS:CE1   | 2.50                     | 0.47              |
| 1:2:1188:G:H2'   | 1:2:1188:G:N3     | 2.30                     | 0.47              |
| 8:G:155:GLY:H    | 8:G:163:MET:HG2   | 1.79                     | 0.47              |
| 16:Q:136:GLU:H   | 16:Q:136:GLU:CD   | 2.21                     | 0.47              |
| 19:T:97:VAL:HG11 | 19:T:114:SER:HA   | 1.95                     | 0.47              |
| 23:X:30:THR:HG23 | 23:X:36:VAL:HG13  | 1.97                     | 0.47              |
| 33:b:6:GLU:OE1   | 33:b:6:GLU:HA     | 2.15                     | 0.47              |
| 1:2:112:C:H2'    | 1:2:113:OMC:C6    | 2.50                     | 0.47              |
| 1:2:1071:C:H2'   | 1:2:1072:C:C6     | 2.48                     | 0.47              |
| 1:2:1075:C:H1'   | 1:2:1142:A:C4     | 2.50                     | 0.47              |
| 1:2:1253:A:C5'   | 20:U:86:ARG:HH22  | 2.28                     | 0.47              |
| 3:B:105:TYR:HB2  | 3:B:191:ARG:HD2   | 1.96                     | 0.47              |
| 12:K:121:GLU:HA  | 12:K:128:ALA:HA   | 1.97                     | 0.47              |
| 23:X:45:GLU:HA   | 23:X:49:LYS:HA    | 1.96                     | 0.47              |
| 25:Z:7:TYR:C     | 25:Z:7:TYR:CD1    | 2.92                     | 0.47              |
| 27:c:58:GLU:HG2  | 27:c:65:ILE:CG2   | 2.42                     | 0.47              |
| 28:d:61:MET:SD   | 28:d:61:MET:N     | 2.86                     | 0.47              |
| 1:2:28:C:O4'     | 14:N:49:MET:HE1   | 2.14                     | 0.47              |
| 1:2:263:G:H5''   | 11:J:98:ARG:HD2   | 1.97                     | 0.47              |
| 1:2:393:G:OP1    | 36:2:1532:SPM:H32 | 2.15                     | 0.47              |
| 1:2:801:C:H2'    | 1:2:802:U:O4'     | 2.15                     | 0.47              |
| 5:D:154:ASP:OD1  | 5:D:155:TYR:N     | 2.42                     | 0.47              |
| 6:E:102:ARG:HD3  | 6:E:102:ARG:HA    | 1.74                     | 0.47              |
| 10:I:108:SER:HB2 | 10:I:129:LEU:HD11 | 1.97                     | 0.47              |
| 20:U:108:PHE:CD2 | 20:U:125:ARG:HD3  | 2.50                     | 0.47              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 24:Y:57:ARG:HB3    | 24:Y:68:PHE:HD1    | 1.79                     | 0.47              |
| 28:d:4:LEU:N       | 28:d:4:LEU:CD2     | 2.78                     | 0.47              |
| 31:a:37:LYS:HD3    | 31:a:42:GLU:OE2    | 2.15                     | 0.47              |
| 1:2:137:C:O2'      | 8:G:118:GLN:HB2    | 2.15                     | 0.46              |
| 1:2:452:G:O2'      | 1:2:454:A:H1'      | 2.15                     | 0.46              |
| 1:2:973:C:O2       | 24:Y:57:ARG:NH1    | 2.48                     | 0.46              |
| 1:2:974:A:H1'      | 24:Y:57:ARG:CZ     | 2.45                     | 0.46              |
| 1:2:1349:G:H2'     | 1:2:1350:C:C6      | 2.49                     | 0.46              |
| 36:2:1532:SPM:HN41 | 36:2:1532:SPM:H111 | 1.55                     | 0.46              |
| 11:J:41:ASP:OD1    | 11:J:61:THR:N      | 2.39                     | 0.46              |
| 12:K:37:ILE:HG12   | 12:K:50:MET:HE3    | 1.97                     | 0.46              |
| 14:N:136:ALA:HB1   | 14:N:142:LYS:HB2   | 1.97                     | 0.46              |
| 17:R:20:GLU:H      | 17:R:20:GLU:CD     | 2.20                     | 0.46              |
| 19:T:12:PHE:HB3    | 19:T:19:ILE:HD11   | 1.97                     | 0.46              |
| 25:Z:20:GLU:OE2    | 31:a:9:ASN:ND2     | 2.48                     | 0.46              |
| 26:3:50:LEU:HD12   | 26:3:50:LEU:O      | 2.15                     | 0.46              |
| 1:2:393:G:P        | 36:2:1532:SPM:C4   | 2.95                     | 0.46              |
| 1:2:408:A:O5'      | 5:D:141:PRO:HD2    | 2.15                     | 0.46              |
| 1:2:543:G:H2'      | 1:2:544:C:C6       | 2.50                     | 0.46              |
| 1:2:784:G:O2'      | 10:I:9:ASN:OD1     | 2.33                     | 0.46              |
| 1:2:1285:U:H3'     | 1:2:1286:C:H2'     | 1.97                     | 0.46              |
| 14:N:56:GLU:HA     | 14:N:99:GLU:OE2    | 2.16                     | 0.46              |
| 16:Q:130:ILE:HD11  | 16:Q:132:LYS:HD2   | 1.97                     | 0.46              |
| 18:S:9:ILE:HD11    | 18:S:46:VAL:CG2    | 2.45                     | 0.46              |
| 19:T:80:LEU:H      | 19:T:83:LEU:HD13   | 1.79                     | 0.46              |
| 22:W:21:CYS:HB2    | 22:W:40:CYS:SG     | 2.55                     | 0.46              |
| 25:Z:159:LEU:HD22  | 25:Z:163:ILE:HG12  | 1.98                     | 0.46              |
| 26:3:36:THR:HB     | 26:3:97:ALA:HB3    | 1.96                     | 0.46              |
| 1:2:152:A:H2'      | 1:2:153:A:C8       | 2.51                     | 0.46              |
| 1:2:617:G:H2'      | 1:2:618:C:H6       | 1.79                     | 0.46              |
| 1:2:1116:G:OP1     | 13:L:70:HIS:ND1    | 2.48                     | 0.46              |
| 1:2:1123:U:OP1     | 18:S:49:ARG:NH1    | 2.47                     | 0.46              |
| 11:J:109:ALA:HB1   | 11:J:123:ALA:HB1   | 1.96                     | 0.46              |
| 23:X:24:ILE:HD11   | 23:X:42:ARG:HB3    | 1.97                     | 0.46              |
| 26:3:41:LYS:HE3    | 26:3:45:ARG:HH22   | 1.80                     | 0.46              |
| 30:4:20:H2U:O2'    | 30:4:22:G:OP1      | 2.30                     | 0.46              |
| 1:2:418:U:H4'      | 1:2:419:A:H5'      | 1.96                     | 0.46              |
| 1:2:521:U:C4       | 14:N:27:GLN:HG2    | 2.50                     | 0.46              |
| 1:2:964:G:O2'      | 1:2:967:G:O2'      | 2.34                     | 0.46              |
| 1:2:1028:C:H2'     | 1:2:1029:G:H8      | 1.80                     | 0.46              |
| 1:2:1110:A:H5'     | 1:2:1111:C:OP2     | 2.15                     | 0.46              |

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| Atom-1            | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|--------------------|--------------------------|-------------------|
| 1:2:1125:C:H2'    | 1:2:1126:C:H6      | 1.80                     | 0.46              |
| 1:2:1315:C:OP1    | 36:2:1527:SPM:H61  | 2.15                     | 0.46              |
| 36:2:1526:SPM:H31 | 36:2:1526:SPM:H61  | 1.80                     | 0.46              |
| 2:A:88:LEU:HG     | 2:A:187:GLU:HA     | 1.97                     | 0.46              |
| 9:H:30:TYR:CE2    | 9:H:132:PRO:HG2    | 2.50                     | 0.46              |
| 23:X:47:ARG:NH1   | 23:X:48:ASP:OD1    | 2.46                     | 0.46              |
| 26:3:59:PRO:HG2   | 26:3:62:ILE:HB     | 1.97                     | 0.46              |
| 1:2:826:G:N7      | 36:2:1513:SPM:H111 | 2.30                     | 0.46              |
| 1:2:990:C:H1'     | 24:Y:62:LYS:HD3    | 1.97                     | 0.46              |
| 1:2:1100:G:N2     | 1:2:1101:G:C8      | 2.83                     | 0.46              |
| 1:2:1446:G:H2'    | 1:2:1447:A:C8      | 2.45                     | 0.46              |
| 5:D:80:MET:HE3    | 5:D:80:MET:HB2     | 1.78                     | 0.46              |
| 7:F:188:GLU:OE2   | 7:F:192:ARG:NH1    | 2.48                     | 0.46              |
| 11:J:96:ILE:HD11  | 11:J:111:VAL:HG21  | 1.97                     | 0.46              |
| 18:S:18:ASP:OD2   | 18:S:19:ARG:N      | 2.48                     | 0.46              |
| 20:U:22:ILE:O     | 20:U:26:GLU:HG3    | 2.16                     | 0.46              |
| 25:Z:84:THR:OG1   | 25:Z:85:ASN:N      | 2.47                     | 0.46              |
| 27:c:45:VAL:HG21  | 27:c:84:ILE:HG13   | 1.96                     | 0.46              |
| 1:2:1018:OMG:H5'' | 13:L:61:LYS:HE3    | 1.98                     | 0.46              |
| 3:B:36:LEU:O      | 3:B:203:ARG:NH2    | 2.43                     | 0.46              |
| 8:G:2:PRO:O       | 8:G:123:GLN:HB2    | 2.16                     | 0.46              |
| 8:G:7:VAL:C       | 8:G:8:ILE:HD13     | 2.40                     | 0.46              |
| 12:K:18:ARG:HB2   | 12:K:71:TYR:CZ     | 2.50                     | 0.46              |
| 14:N:32:THR:HG22  | 14:N:37:LEU:HD12   | 1.98                     | 0.46              |
| 19:T:31:ILE:HD11  | 19:T:42:LEU:HB2    | 1.97                     | 0.46              |
| 19:T:101:VAL:HA   | 19:T:105:MET:HE2   | 1.96                     | 0.46              |
| 26:3:80:VAL:HG22  | 26:3:81:SER:O      | 2.16                     | 0.46              |
| 1:2:675:C:H2'     | 1:2:676:C:C6       | 2.50                     | 0.46              |
| 1:2:875:U:OP1     | 14:N:63:ARG:NH2    | 2.35                     | 0.46              |
| 3:B:91:ARG:NH2    | 4:C:35:PRO:O       | 2.48                     | 0.46              |
| 3:B:95:GLN:OE1    | 3:B:120:ARG:NH1    | 2.49                     | 0.46              |
| 15:O:22:LEU:HB2   | 15:O:50:ALA:O      | 2.15                     | 0.46              |
| 23:X:24:ILE:N     | 23:X:24:ILE:HD12   | 2.31                     | 0.46              |
| 27:c:65:ILE:C     | 27:c:65:ILE:HD12   | 2.40                     | 0.46              |
| 33:b:91:LYS:HD3   | 33:b:91:LYS:HA     | 1.68                     | 0.46              |
| 1:2:305:A:O2'     | 17:R:68:LYS:NZ     | 2.49                     | 0.46              |
| 1:2:1087:A:N6     | 1:2:1107:A:H61     | 2.14                     | 0.46              |
| 1:2:1173:C:H2'    | 1:2:1174:G:O4'     | 2.16                     | 0.46              |
| 3:B:199:TRP:HD1   | 3:B:225:PHE:CD1    | 2.34                     | 0.46              |
| 5:D:146:ASN:HB2   | 5:D:148:ASP:OD1    | 2.16                     | 0.46              |
| 8:G:36:LYS:HD3    | 8:G:36:LYS:H       | 1.80                     | 0.46              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 26:3:56:ASP:HB3  | 26:3:83:LYS:HD2   | 1.97                     | 0.46              |
| 27:c:39:GLU:HA   | 27:c:76:ILE:HG22  | 1.97                     | 0.46              |
| 33:b:83:ARG:HB3  | 33:b:87:GLU:HG3   | 1.98                     | 0.46              |
| 35:M:41:MET:HE3  | 35:M:41:MET:HB3   | 1.83                     | 0.46              |
| 1:2:391:G:OP2    | 36:2:1517:SPM:H61 | 2.15                     | 0.46              |
| 1:2:871:A:H2'    | 1:2:872:A:C8      | 2.51                     | 0.46              |
| 1:2:1078:C:H2'   | 1:2:1079:U:H6     | 1.80                     | 0.46              |
| 1:2:1284:C:OP2   | 40:2:1614:HOH:O   | 2.20                     | 0.46              |
| 1:2:1350:C:H2'   | 1:2:1351:U:H6     | 1.80                     | 0.46              |
| 1:2:1465:G:H2'   | 1:2:1466:4AC:H6   | 1.98                     | 0.46              |
| 4:C:55:TYR:C     | 4:C:56:ILE:HD13   | 2.40                     | 0.46              |
| 7:F:108:ARG:O    | 7:F:112:MET:HG2   | 2.16                     | 0.46              |
| 26:3:32:ILE:HD12 | 26:3:32:ILE:HA    | 1.82                     | 0.46              |
| 31:a:29:ILE:HG22 | 31:a:32:THR:HG22  | 1.97                     | 0.46              |
| 35:M:67:LEU:HD11 | 35:M:103:ALA:O    | 2.15                     | 0.46              |
| 1:2:741:A:H4'    | 1:2:1471:G:O2'    | 2.16                     | 0.46              |
| 2:A:40:ASP:C     | 2:A:40:ASP:OD1    | 2.59                     | 0.46              |
| 2:A:96:LEU:HB3   | 2:A:125:LEU:HD11  | 1.98                     | 0.46              |
| 2:A:197:ASN:OD1  | 2:A:197:ASN:N     | 2.48                     | 0.46              |
| 10:I:43:LYS:HB2  | 10:I:43:LYS:NZ    | 2.31                     | 0.46              |
| 13:L:6:ARG:NH1   | 13:L:73:LEU:HD21  | 2.31                     | 0.46              |
| 28:d:5:LYS:CD    | 28:d:5:LYS:N      | 2.73                     | 0.46              |
| 1:2:33:U:H2'     | 1:2:34:C:O4'      | 2.16                     | 0.45              |
| 1:2:73:C:OP2     | 1:2:209:U:N3      | 2.45                     | 0.45              |
| 1:2:1287:G:OP2   | 40:2:1613:HOH:O   | 2.20                     | 0.45              |
| 3:B:177:ILE:O    | 3:B:177:ILE:HG22  | 2.16                     | 0.45              |
| 7:F:13:TRP:O     | 7:F:24:LYS:HE3    | 2.16                     | 0.45              |
| 15:O:72:ILE:O    | 15:O:80:TYR:OH    | 2.32                     | 0.45              |
| 35:M:9:TRP:HB2   | 35:M:28:LEU:HD21  | 1.98                     | 0.45              |
| 1:2:93:C:H2'     | 1:2:94:U:C6       | 2.51                     | 0.45              |
| 1:2:175:U:H2'    | 1:2:176:G:O4'     | 2.16                     | 0.45              |
| 1:2:303:A:H2'    | 1:2:304:G:O4'     | 2.16                     | 0.45              |
| 1:2:985:C:C2     | 1:2:986:U:H5      | 2.35                     | 0.45              |
| 1:2:1207:A:H2'   | 1:2:1208:G:C8     | 2.51                     | 0.45              |
| 1:2:1248:C:H3'   | 1:2:1249:U:H6     | 1.81                     | 0.45              |
| 1:2:1328:A:OP2   | 20:U:89:ARG:NH2   | 2.47                     | 0.45              |
| 9:H:13:PHE:CE1   | 9:H:83:LYS:HB2    | 2.51                     | 0.45              |
| 13:L:101:LEU:CD2 | 13:L:101:LEU:H    | 2.28                     | 0.45              |
| 30:4:27:U:H2'    | 30:4:28:C:C6      | 2.52                     | 0.45              |
| 33:b:49:LEU:HD11 | 35:M:98:ARG:CG    | 2.37                     | 0.45              |
| 1:2:142:A:H2'    | 1:2:143:A:C8      | 2.52                     | 0.45              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 1:2:393:G:OP2    | 36:2:1532:SPM:H41 | 2.16                     | 0.45              |
| 1:2:553:C:H2'    | 1:2:554:A:O4'     | 2.17                     | 0.45              |
| 1:2:956:G:H22    | 1:2:1175:A:P      | 2.39                     | 0.45              |
| 1:2:1164:A:H4'   | 1:2:1165:G:H5''   | 1.97                     | 0.45              |
| 1:2:1258:G:H2'   | 1:2:1259:C:C6     | 2.51                     | 0.45              |
| 6:E:208:VAL:C    | 6:E:209:ILE:HD12  | 2.40                     | 0.45              |
| 8:G:12:GLN:HG3   | 8:G:214:ARG:HD2   | 1.98                     | 0.45              |
| 17:R:15:ASN:O    | 17:R:16:ILE:HD13  | 2.16                     | 0.45              |
| 20:U:142:ILE:HA  | 20:U:145:GLU:OE1  | 2.15                     | 0.45              |
| 26:3:101:ILE:C   | 26:3:102:LEU:HD23 | 2.41                     | 0.45              |
| 27:c:15:ARG:O    | 27:c:19:GLU:HB2   | 2.17                     | 0.45              |
| 1:2:218:C:H2'    | 1:2:219:A:C8      | 2.50                     | 0.45              |
| 1:2:646:A:C2     | 1:2:663:A:C5      | 3.05                     | 0.45              |
| 3:B:206:LEU:HD22 | 3:B:211:VAL:HG21  | 1.98                     | 0.45              |
| 5:D:29:LEU:HD21  | 5:D:99:GLN:NE2    | 2.32                     | 0.45              |
| 9:H:107:ASN:ND2  | 9:H:172:ASN:HD21  | 2.15                     | 0.45              |
| 27:c:54:LYS:HE2  | 27:c:70:LEU:HD12  | 1.98                     | 0.45              |
| 28:d:20:THR:O    | 28:d:23:VAL:HG12  | 2.17                     | 0.45              |
| 31:a:63:TYR:CD1  | 32:P:6:PRO:HB3    | 2.51                     | 0.45              |
| 32:P:19:CYS:CB   | 32:P:22:CYS:SG    | 3.03                     | 0.45              |
| 1:2:1096:U:O2    | 1:2:1100:G:O6     | 2.35                     | 0.45              |
| 1:2:1369:G:H2'   | 1:2:1370:U:H6     | 1.81                     | 0.45              |
| 2:A:14:TRP:HE1   | 2:A:17:LYS:HD2    | 1.82                     | 0.45              |
| 3:B:21:LYS:HD2   | 3:B:21:LYS:O      | 2.16                     | 0.45              |
| 20:U:77:GLU:HA   | 20:U:80:ARG:HG3   | 1.98                     | 0.45              |
| 25:Z:68:GLN:HE22 | 31:a:72:LEU:CD1   | 2.30                     | 0.45              |
| 26:3:27:LYS:NZ   | 26:3:89:ALA:HB3   | 2.31                     | 0.45              |
| 31:a:51:GLU:HA   | 31:a:54:LYS:HG2   | 1.99                     | 0.45              |
| 33:b:30:VAL:HG22 | 33:b:34:LYS:HB3   | 1.98                     | 0.45              |
| 1:2:899:A:H2'    | 1:2:900:C:C6      | 2.51                     | 0.45              |
| 4:C:31:GLU:OE1   | 4:C:43:ARG:NE     | 2.49                     | 0.45              |
| 6:E:49:LEU:HD13  | 21:V:25:VAL:HG21  | 1.97                     | 0.45              |
| 9:H:10:ILE:HA    | 9:H:37:TYR:CZ     | 2.51                     | 0.45              |
| 13:L:85:GLN:O    | 13:L:88:ARG:NE    | 2.47                     | 0.45              |
| 22:W:64:ILE:O    | 22:W:65:MET:HG3   | 2.17                     | 0.45              |
| 26:3:42:ALA:HA   | 26:3:45:ARG:HG2   | 1.99                     | 0.45              |
| 28:d:51:GLU:OE2  | 28:d:51:GLU:O     | 2.35                     | 0.45              |
| 30:4:4:G:H2'     | 30:4:5:G:C8       | 2.51                     | 0.45              |
| 30:4:68:C:H2'    | 30:4:69:C:C6      | 2.51                     | 0.45              |
| 32:P:3:LYS:HG3   | 32:P:4:TYR:CE1    | 2.50                     | 0.45              |
| 33:b:42:TYR:CE1  | 35:M:89:PRO:HD2   | 2.52                     | 0.45              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 1:2:634:U:H1'     | 35:M:118:HIS:ND1  | 2.31                     | 0.45              |
| 1:2:707:G:O2'     | 16:Q:59:PRO:O     | 2.32                     | 0.45              |
| 1:2:1061:OMG:HM22 | 1:2:1062:A:H5'    | 1.98                     | 0.45              |
| 1:2:1124:G:C2     | 1:2:1125:C:C6     | 3.05                     | 0.45              |
| 6:E:16:SER:HB2    | 6:E:19:GLN:HB2    | 1.98                     | 0.45              |
| 8:G:20:LYS:HE3    | 8:G:108:GLU:OE1   | 2.17                     | 0.45              |
| 8:G:128:ASN:OD1   | 8:G:128:ASN:N     | 2.50                     | 0.45              |
| 9:H:25:PRO:O      | 9:H:28:LYS:HG2    | 2.16                     | 0.45              |
| 9:H:193:ARG:HD2   | 23:X:74:ARG:NH2   | 2.32                     | 0.45              |
| 22:W:49:TYR:HB2   | 22:W:56:LYS:HG2   | 1.98                     | 0.45              |
| 25:Z:71:GLU:HG3   | 25:Z:79:PRO:HD3   | 1.99                     | 0.45              |
| 26:3:104:PRO:O    | 26:3:108:LYS:NZ   | 2.50                     | 0.45              |
| 31:a:59:GLY:O     | 31:a:68:LEU:N     | 2.47                     | 0.45              |
| 33:b:24:ASP:HA    | 35:M:123:ARG:HH21 | 1.79                     | 0.45              |
| 1:2:193:A:H2'     | 1:2:194:A:C8      | 2.52                     | 0.45              |
| 1:2:257:U:H4'     | 11:J:10:ARG:HD3   | 1.98                     | 0.45              |
| 1:2:975:G:H2'     | 1:2:976:G:C8      | 2.52                     | 0.45              |
| 1:2:1029:G:H2'    | 1:2:1030:U:C6     | 2.52                     | 0.45              |
| 1:2:1355:U:H2'    | 1:2:1356:G:C8     | 2.52                     | 0.45              |
| 3:B:199:TRP:CZ3   | 3:B:203:ARG:HD3   | 2.52                     | 0.45              |
| 10:I:118:GLU:OE1  | 10:I:121:ARG:NE   | 2.35                     | 0.45              |
| 14:N:134:LEU:HD23 | 14:N:134:LEU:HA   | 1.85                     | 0.45              |
| 22:W:40:CYS:C     | 22:W:42:SER:H     | 2.23                     | 0.45              |
| 30:4:67:C:H2'     | 30:4:68:C:H6      | 1.80                     | 0.45              |
| 31:a:21:CYS:SG    | 31:a:49:PHE:HA    | 2.57                     | 0.45              |
| 1:2:770:U:O2'     | 1:2:864:A:N1      | 2.47                     | 0.45              |
| 1:2:1155:C:H2'    | 1:2:1156:G:O4'    | 2.17                     | 0.45              |
| 36:2:1510:SPM:H61 | 6:E:11:TRP:CH2    | 2.51                     | 0.45              |
| 6:E:182:VAL:HG11  | 6:E:227:MET:HE3   | 1.99                     | 0.45              |
| 15:O:109:ARG:O    | 15:O:113:SER:OG   | 2.28                     | 0.45              |
| 26:3:101:ILE:HD11 | 26:3:104:PRO:HG3  | 1.99                     | 0.45              |
| 30:4:21:A:O4'     | 30:4:48:C:N4      | 2.50                     | 0.45              |
| 33:b:21:ILE:CD1   | 33:b:32:GLU:CB    | 2.95                     | 0.45              |
| 1:2:980:A:H2'     | 1:2:981:C:C6      | 2.51                     | 0.45              |
| 4:C:57:CYS:HB3    | 4:C:62:PHE:H      | 1.82                     | 0.45              |
| 6:E:209:ILE:HD11  | 6:E:223:ILE:HD13  | 1.98                     | 0.45              |
| 8:G:41:VAL:HG11   | 8:G:146:LEU:HD21  | 1.99                     | 0.45              |
| 10:I:83:TYR:CZ    | 10:I:123:ARG:HG3  | 2.52                     | 0.45              |
| 12:K:59:ASP:HB2   | 12:K:63:LYS:HZ3   | 1.82                     | 0.45              |
| 14:N:77:LEU:HD21  | 14:N:105:ILE:HD11 | 1.99                     | 0.45              |
| 25:Z:99:ARG:O     | 25:Z:102:ILE:HG13 | 2.17                     | 0.45              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 27:c:88:LEU:HB3   | 27:c:93:VAL:HB    | 1.99                     | 0.45              |
| 1:2:397:G:OP1     | 36:2:1520:SPM:H92 | 2.16                     | 0.44              |
| 1:2:567:A:OP2     | 40:2:1616:HOH:O   | 2.21                     | 0.44              |
| 1:2:637:U:H2'     | 1:2:638:C:C6      | 2.52                     | 0.44              |
| 1:2:1376:C:H42    | 1:2:1444:G:N2     | 2.15                     | 0.44              |
| 6:E:209:ILE:HD12  | 6:E:209:ILE:N     | 2.32                     | 0.44              |
| 8:G:168:ILE:HD12  | 8:G:168:ILE:N     | 2.33                     | 0.44              |
| 9:H:39:PRO:HB3    | 9:H:39:PRO:HD3    | 1.74                     | 0.44              |
| 9:H:108:SER:OG    | 9:H:178:ALA:HB1   | 2.17                     | 0.44              |
| 11:J:101:LYS:HE2  | 11:J:101:LYS:HB3  | 1.90                     | 0.44              |
| 14:N:91:ASP:HB3   | 29:e:14:ARG:HD3   | 1.99                     | 0.44              |
| 27:c:98:SER:HB2   | 27:c:105:ILE:HD11 | 1.99                     | 0.44              |
| 33:b:20:TYR:CD2   | 33:b:20:TYR:O     | 2.70                     | 0.44              |
| 1:2:47:A:OP2      | 40:2:1612:HOH:O   | 2.20                     | 0.44              |
| 1:2:441:C:P       | 21:V:101:ARG:HH21 | 2.40                     | 0.44              |
| 1:2:1125:C:H2'    | 1:2:1126:C:C6     | 2.52                     | 0.44              |
| 3:B:40:ASP:OD1    | 3:B:41:THR:N      | 2.50                     | 0.44              |
| 14:N:98:ASP:O     | 14:N:101:ASP:HB2  | 2.18                     | 0.44              |
| 19:T:63:GLU:N     | 19:T:63:GLU:OE1   | 2.50                     | 0.44              |
| 20:U:27:ASN:OD1   | 20:U:27:ASN:C     | 2.60                     | 0.44              |
| 20:U:64:LEU:HD22  | 20:U:108:PHE:CZ   | 2.53                     | 0.44              |
| 33:b:11:ARG:HA    | 33:b:11:ARG:HD3   | 1.84                     | 0.44              |
| 1:2:195:A:N1      | 1:2:225:G:O2'     | 2.45                     | 0.44              |
| 1:2:381:G:O6      | 36:2:1517:SPM:N14 | 2.51                     | 0.44              |
| 1:2:638:C:H2'     | 1:2:639:C:H6      | 1.81                     | 0.44              |
| 1:2:682:U:O4'     | 33:b:11:ARG:HD2   | 2.17                     | 0.44              |
| 3:B:160:ALA:HB3   | 3:B:167:ILE:HD11  | 1.99                     | 0.44              |
| 3:B:177:ILE:CG2   | 3:B:183:ILE:HD11  | 2.47                     | 0.44              |
| 5:D:134:ASN:OD1   | 5:D:152:LEU:HD13  | 2.17                     | 0.44              |
| 9:H:37:TYR:HB2    | 12:K:51:GLU:OE2   | 2.18                     | 0.44              |
| 9:H:95:GLN:NE2    | 9:H:99:GLN:HG3    | 2.31                     | 0.44              |
| 9:H:134:ARG:O     | 9:H:138:LEU:HD12  | 2.17                     | 0.44              |
| 13:L:97:ILE:O     | 13:L:97:ILE:HD12  | 2.16                     | 0.44              |
| 15:O:85:ASP:OD1   | 15:O:87:GLU:HG3   | 2.18                     | 0.44              |
| 16:Q:123:LEU:HD23 | 16:Q:123:LEU:HA   | 1.81                     | 0.44              |
| 18:S:18:ASP:OD2   | 18:S:18:ASP:C     | 2.60                     | 0.44              |
| 27:c:56:LEU:O     | 27:c:59:ILE:HG22  | 2.18                     | 0.44              |
| 1:2:682:U:C2      | 33:b:11:ARG:NH1   | 2.85                     | 0.44              |
| 1:2:871:A:H2'     | 1:2:872:A:H8      | 1.82                     | 0.44              |
| 1:2:1075:C:H2'    | 1:2:1076:C:H6     | 1.82                     | 0.44              |
| 2:A:91:ASP:HA     | 33:b:63:TYR:HB3   | 1.98                     | 0.44              |

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| Atom-1            | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|------------------|--------------------------|-------------------|
| 12:K:37:ILE:N     | 12:K:37:ILE:HD12 | 2.32                     | 0.44              |
| 13:L:52:ARG:NE    | 13:L:63:GLU:OE2  | 2.51                     | 0.44              |
| 28:d:15:GLU:OE1   | 28:d:17:ASN:ND2  | 2.50                     | 0.44              |
| 30:4:10:G:N2      | 30:4:26:G:H1'    | 2.32                     | 0.44              |
| 31:a:57:LEU:HD21  | 32:P:4:TYR:CD2   | 2.51                     | 0.44              |
| 32:P:44:VAL:O     | 32:P:47:GLU:HB2  | 2.18                     | 0.44              |
| 1:2:326:A:O2'     | 8:G:191:ARG:NH2  | 2.51                     | 0.44              |
| 1:2:942:A:C8      | 1:2:943:U:C5     | 3.06                     | 0.44              |
| 1:2:1287:G:H2'    | 1:2:1288:C:C6    | 2.52                     | 0.44              |
| 36:2:1537:SPM:N10 | 40:2:1641:HOH:O  | 2.35                     | 0.44              |
| 2:A:50:GLU:HG3    | 2:A:68:TYR:CE2   | 2.53                     | 0.44              |
| 2:A:114:ASP:OD1   | 2:A:114:ASP:N    | 2.40                     | 0.44              |
| 9:H:38:LEU:HA     | 9:H:39:PRO:HG2   | 1.98                     | 0.44              |
| 12:K:81:ALA:HA    | 12:K:84:MET:HE3  | 2.00                     | 0.44              |
| 14:N:128:MET:HE3  | 14:N:128:MET:HB3 | 1.84                     | 0.44              |
| 20:U:23:TYR:HA    | 20:U:26:GLU:OE1  | 2.17                     | 0.44              |
| 1:2:1226:C:H2'    | 1:2:1227:C:C6    | 2.53                     | 0.44              |
| 1:2:1269:G:N2     | 1:2:1295:G:H1'   | 2.33                     | 0.44              |
| 1:2:1319:A:H2'    | 1:2:1320:G:C8    | 2.52                     | 0.44              |
| 3:B:64:ARG:HG2    | 3:B:66:ARG:NH1   | 2.33                     | 0.44              |
| 13:L:11:SER:HG    | 13:L:95:VAL:HG12 | 1.80                     | 0.44              |
| 14:N:135:ASP:O    | 14:N:139:LYS:HG2 | 2.18                     | 0.44              |
| 19:T:20:ASP:OD1   | 19:T:20:ASP:N    | 2.49                     | 0.44              |
| 20:U:143:PHE:CZ   | 20:U:156:TYR:HB3 | 2.52                     | 0.44              |
| 28:d:41:LEU:CD2   | 28:d:43:LEU:HB2  | 2.48                     | 0.44              |
| 1:2:314:C:O2'     | 1:2:566:A:N1     | 2.47                     | 0.44              |
| 1:2:863:A:H2'     | 1:2:864:A:C8     | 2.52                     | 0.44              |
| 1:2:1372:G:H22    | 1:2:1449:A:H2    | 1.64                     | 0.44              |
| 2:A:22:VAL:HG12   | 2:A:79:LEU:HB2   | 1.99                     | 0.44              |
| 6:E:118:TYR:OH    | 6:E:235:ASP:OD2  | 2.28                     | 0.44              |
| 7:F:126:CYS:HB2   | 7:F:153:PRO:HA   | 1.99                     | 0.44              |
| 8:G:152:ILE:HA    | 8:G:210:THR:HG22 | 1.99                     | 0.44              |
| 12:K:23:ILE:HD12  | 12:K:24:TYR:H    | 1.83                     | 0.44              |
| 12:K:45:VAL:O     | 12:K:49:ILE:HG12 | 2.17                     | 0.44              |
| 22:W:26:ASN:OD1   | 22:W:27:GLU:N    | 2.51                     | 0.44              |
| 26:3:14:ASP:OD1   | 26:3:15:LEU:N    | 2.51                     | 0.44              |
| 26:3:33:LYS:HZ3   | 26:3:42:ALA:HB3  | 1.82                     | 0.44              |
| 31:a:23:ILE:HD12  | 31:a:49:PHE:HE2  | 1.82                     | 0.44              |
| 1:2:472:U:H2'     | 1:2:473:G:H8     | 1.81                     | 0.44              |
| 1:2:885:G:H4'     | 7:F:68:THR:HA    | 1.99                     | 0.44              |
| 1:2:996:C:H2'     | 1:2:996:C:OP2    | 2.18                     | 0.44              |

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| Atom-1            | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|--------------------|--------------------------|-------------------|
| 1:2:1226:C:OP2    | 20:U:78:LYS:HD3    | 2.18                     | 0.44              |
| 9:H:39:PRO:HB2    | 9:H:62:ILE:HD12    | 2.00                     | 0.44              |
| 20:U:45:PHE:CE1   | 20:U:46:LYS:HE2    | 2.53                     | 0.44              |
| 25:Z:7:TYR:CZ     | 25:Z:11:LYS:HE3    | 2.52                     | 0.44              |
| 26:3:39:THR:O     | 26:3:43:VAL:HG23   | 2.18                     | 0.44              |
| 31:a:51:GLU:HG3   | 31:a:54:LYS:CE     | 2.47                     | 0.44              |
| 1:2:311:A:O2'     | 1:2:312:G:H5'      | 2.18                     | 0.44              |
| 1:2:419:A:H2'     | 1:2:420:A:N9       | 2.33                     | 0.44              |
| 1:2:1283:A:OP1    | 19:T:41:SER:OG     | 2.27                     | 0.44              |
| 4:C:16:CYS:CB     | 4:C:19:CYS:SG      | 2.99                     | 0.44              |
| 16:Q:95:ASN:OD1   | 16:Q:98:ARG:NH2    | 2.38                     | 0.44              |
| 21:V:21:MET:HE3   | 21:V:21:MET:HB2    | 1.84                     | 0.44              |
| 26:3:6:TYR:CZ     | 26:3:8:LYS:HD2     | 2.53                     | 0.44              |
| 26:3:55:GLU:N     | 26:3:80:VAL:HG21   | 2.33                     | 0.44              |
| 26:3:79:TYR:CE1   | 26:3:118:VAL:HG12  | 2.53                     | 0.44              |
| 31:a:49:PHE:CD2   | 31:a:53:ASP:CB     | 2.89                     | 0.44              |
| 1:2:310:G:H5''    | 1:2:311:A:OP1      | 2.18                     | 0.43              |
| 1:2:710:OMC:OP1   | 16:Q:68:LYS:HB3    | 2.17                     | 0.43              |
| 1:2:1293:G:H5''   | 15:O:33:GLY:H      | 1.83                     | 0.43              |
| 36:2:1534:SPM:H91 | 36:2:1534:SPM:H122 | 1.67                     | 0.43              |
| 8:G:28:GLN:OE1    | 8:G:45:LYS:HE2     | 2.18                     | 0.43              |
| 9:H:193:ARG:HA    | 23:X:74:ARG:HH22   | 1.82                     | 0.43              |
| 15:O:5:PHE:C      | 15:O:5:PHE:CD2     | 2.96                     | 0.43              |
| 23:X:32:VAL:HG13  | 23:X:33:THR:HG23   | 1.99                     | 0.43              |
| 28:d:65:LEU:HB3   | 28:d:66:PRO:HD3    | 1.99                     | 0.43              |
| 30:4:14:A:C4      | 30:4:22:G:C2       | 3.06                     | 0.43              |
| 35:M:111:GLU:OE2  | 35:M:113:VAL:HG13  | 2.18                     | 0.43              |
| 1:2:777:A:H3'     | 33:b:8:ARG:HH22    | 1.82                     | 0.43              |
| 1:2:831:C:H2'     | 1:2:832:G:O4'      | 2.18                     | 0.43              |
| 1:2:855:A:H2'     | 1:2:856:C:H6       | 1.83                     | 0.43              |
| 1:2:1003:A:H61    | 1:2:1174:G:H1'     | 1.83                     | 0.43              |
| 1:2:1125:C:C2     | 1:2:1126:C:C5      | 3.06                     | 0.43              |
| 1:2:1479:U:H5''   | 35:M:131:ARG:NH2   | 2.33                     | 0.43              |
| 7:F:14:LYS:HD3    | 7:F:14:LYS:HA      | 1.81                     | 0.43              |
| 13:L:27:ILE:HG12  | 13:L:85:GLN:CD     | 2.43                     | 0.43              |
| 23:X:73:GLU:OE1   | 23:X:73:GLU:N      | 2.51                     | 0.43              |
| 25:Z:167:ILE:HD12 | 31:a:8:SER:HA      | 2.00                     | 0.43              |
| 30:4:23:C:H2'     | 30:4:24:U:C6       | 2.52                     | 0.43              |
| 1:2:286:A:H8      | 1:2:286:A:OP2      | 2.00                     | 0.43              |
| 1:2:381:G:P       | 6:E:44:ARG:HH22    | 2.41                     | 0.43              |
| 1:2:504:C:O2'     | 1:2:508:U:OP1      | 2.36                     | 0.43              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 1:2:1000:G:H2'   | 1:2:1001:A:O4'    | 2.18                     | 0.43              |
| 1:2:1133:A:O3'   | 18:S:10:LYS:NZ    | 2.44                     | 0.43              |
| 1:2:1155:C:OP1   | 25:Z:146:LYS:NZ   | 2.51                     | 0.43              |
| 1:2:1201:A:H2    | 1:2:1204:G:N3     | 2.16                     | 0.43              |
| 1:2:1461:G:OP1   | 1:2:1464:A:H4'    | 2.18                     | 0.43              |
| 5:D:158:THR:O    | 5:D:158:THR:OG1   | 2.34                     | 0.43              |
| 7:F:11:GLU:HA    | 7:F:24:LYS:NZ     | 2.33                     | 0.43              |
| 9:H:30:TYR:HE2   | 9:H:132:PRO:HG2   | 1.81                     | 0.43              |
| 9:H:127:ALA:HB3  | 23:X:74:ARG:NH2   | 2.33                     | 0.43              |
| 14:N:98:ASP:OD1  | 14:N:98:ASP:N     | 2.51                     | 0.43              |
| 16:Q:13:ILE:O    | 22:W:12:PRO:HB3   | 2.18                     | 0.43              |
| 16:Q:52:LEU:HB3  | 16:Q:58:ILE:HB    | 2.00                     | 0.43              |
| 1:2:991:U:H2'    | 1:2:992:G:C8      | 2.53                     | 0.43              |
| 1:2:1314:A:H2'   | 1:2:1315:C:C6     | 2.53                     | 0.43              |
| 2:A:54:TYR:CD1   | 2:A:54:TYR:C      | 2.97                     | 0.43              |
| 3:B:199:TRP:CD1  | 3:B:222:VAL:HA    | 2.53                     | 0.43              |
| 7:F:118:ARG:NH2  | 7:F:204:PHE:O     | 2.51                     | 0.43              |
| 8:G:48:GLU:OE1   | 8:G:83:VAL:HG21   | 2.18                     | 0.43              |
| 9:H:41:THR:HG23  | 9:H:59:GLU:CD     | 2.44                     | 0.43              |
| 20:U:45:PHE:HB3  | 20:U:97:VAL:HB    | 1.99                     | 0.43              |
| 20:U:113:LYS:HD3 | 20:U:113:LYS:H    | 1.83                     | 0.43              |
| 20:U:133:SER:HA  | 20:U:136:ASP:OD1  | 2.18                     | 0.43              |
| 21:V:22:GLN:HE22 | 21:V:85:LYS:HZ1   | 1.66                     | 0.43              |
| 23:X:47:ARG:CZ   | 23:X:47:ARG:HB3   | 2.48                     | 0.43              |
| 26:3:41:LYS:HE3  | 26:3:41:LYS:HB3   | 1.80                     | 0.43              |
| 26:3:75:ILE:HG13 | 26:3:75:ILE:H     | 1.66                     | 0.43              |
| 26:3:87:GLY:O    | 26:3:92:LEU:HD22  | 2.19                     | 0.43              |
| 1:2:416:C:H2'    | 1:2:417:G:O4'     | 2.18                     | 0.43              |
| 1:2:526:G:OP2    | 14:N:5:LYS:NZ     | 2.47                     | 0.43              |
| 1:2:726:A:H2'    | 1:2:727:A:H8      | 1.84                     | 0.43              |
| 1:2:1228:C:OP1   | 20:U:125:ARG:NH2  | 2.35                     | 0.43              |
| 1:2:1332:G:O6    | 36:2:1516:SPM:H92 | 2.18                     | 0.43              |
| 1:2:1337:G:C8    | 12:K:76:MET:HE1   | 2.53                     | 0.43              |
| 3:B:18:GLU:OE2   | 3:B:43:LEU:HD22   | 2.17                     | 0.43              |
| 6:E:14:MET:SD    | 6:E:102:ARG:NH1   | 2.91                     | 0.43              |
| 6:E:50:ALA:HB1   | 6:E:55:GLU:HB2    | 1.99                     | 0.43              |
| 6:E:58:HIS:CE1   | 21:V:92:LYS:HZ3   | 2.36                     | 0.43              |
| 18:S:57:TYR:HA   | 18:S:60:ILE:HD11  | 2.01                     | 0.43              |
| 20:U:12:PRO:HA   | 20:U:13:PRO:HD3   | 1.90                     | 0.43              |
| 21:V:66:ARG:HD3  | 21:V:82:HIS:CE1   | 2.53                     | 0.43              |
| 23:X:13:ILE:O    | 23:X:16:GLU:HG3   | 2.19                     | 0.43              |

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| Atom-1            | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|------------------|--------------------------|-------------------|
| 23:X:14:ILE:HD12  | 23:X:15:GLU:N    | 2.34                     | 0.43              |
| 25:Z:164:ASP:OD2  | 25:Z:164:ASP:C   | 2.62                     | 0.43              |
| 1:2:65:C:H2'      | 1:2:66:U:C6      | 2.54                     | 0.43              |
| 1:2:1466:4AC:O7   | 1:2:1466:4AC:H5  | 2.18                     | 0.43              |
| 4:C:39:GLU:OE1    | 4:C:39:GLU:N     | 2.52                     | 0.43              |
| 12:K:31:PHE:CE1   | 12:K:36:PRO:HG3  | 2.54                     | 0.43              |
| 17:R:51:THR:HG22  | 17:R:52:LYS:HG3  | 2.01                     | 0.43              |
| 19:T:56:LYS:HE2   | 19:T:56:LYS:HB2  | 1.74                     | 0.43              |
| 20:U:108:PHE:HD1  | 20:U:108:PHE:HA  | 1.72                     | 0.43              |
| 1:2:482:C:O2'     | 1:2:485:C:N4     | 2.47                     | 0.43              |
| 1:2:988:G:H4'     | 24:Y:50:HIS:CD2  | 2.54                     | 0.43              |
| 1:2:1106:G:H2'    | 1:2:1107:A:O4'   | 2.18                     | 0.43              |
| 7:F:77:LYS:NZ     | 7:F:188:GLU:OE1  | 2.40                     | 0.43              |
| 9:H:111:ARG:NH2   | 23:X:68:ILE:HG22 | 2.33                     | 0.43              |
| 9:H:138:LEU:HB3   | 9:H:142:HIS:NE2  | 2.32                     | 0.43              |
| 15:O:104:ARG:HH11 | 15:O:104:ARG:HG2 | 1.83                     | 0.43              |
| 16:Q:27:THR:OG1   | 16:Q:28:ARG:N    | 2.52                     | 0.43              |
| 17:R:3:SER:OG     | 17:R:4:LYS:N     | 2.50                     | 0.43              |
| 19:T:105:MET:HB3  | 19:T:113:TYR:CZ  | 2.54                     | 0.43              |
| 21:V:45:ARG:NH1   | 21:V:65:VAL:O    | 2.41                     | 0.43              |
| 28:d:55:GLN:CD    | 28:d:55:GLN:N    | 2.75                     | 0.43              |
| 28:d:68:TYR:C     | 28:d:68:TYR:CD1  | 2.97                     | 0.43              |
| 1:2:967:G:O6      | 26:3:37:ASN:HB2  | 2.19                     | 0.43              |
| 1:2:992:G:N7      | 26:3:38:GLU:HG2  | 2.34                     | 0.43              |
| 1:2:1067:G:H2'    | 1:2:1068:A:O4'   | 2.19                     | 0.43              |
| 1:2:1316:C:H2'    | 1:2:1317:G:C8    | 2.54                     | 0.43              |
| 1:2:1342:C:OP2    | 23:X:60:PRO:HB3  | 2.19                     | 0.43              |
| 2:A:47:ARG:HD3    | 35:M:29:THR:HG21 | 2.00                     | 0.43              |
| 3:B:209:ARG:O     | 3:B:210:ARG:HG2  | 2.19                     | 0.43              |
| 8:G:51:LYS:HB3    | 8:G:51:LYS:HE2   | 1.76                     | 0.43              |
| 9:H:116:ARG:HB3   | 9:H:123:VAL:CG2  | 2.49                     | 0.43              |
| 9:H:142:HIS:CE1   | 9:H:181:ARG:HD3  | 2.54                     | 0.43              |
| 9:H:173:ASP:OD2   | 9:H:175:LYS:HG2  | 2.18                     | 0.43              |
| 12:K:24:TYR:OH    | 12:K:67:LYS:HD3  | 2.18                     | 0.43              |
| 12:K:26:GLY:HA3   | 12:K:65:ASP:OD1  | 2.18                     | 0.43              |
| 13:L:84:ARG:HA    | 13:L:87:MET:SD   | 2.59                     | 0.43              |
| 24:Y:58:TRP:HB2   | 24:Y:67:GLU:HG2  | 2.01                     | 0.43              |
| 27:c:36:THR:O     | 27:c:36:THR:OG1  | 2.36                     | 0.43              |
| 33:b:70:CYS:SG    | 33:b:72:ASN:CA   | 3.06                     | 0.43              |
| 1:2:682:U:C6      | 33:b:11:ARG:CZ   | 3.01                     | 0.43              |
| 1:2:1096:U:C2     | 1:2:1098:C:N3    | 2.86                     | 0.43              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 1:2:1272:C:H4'   | 27:c:7:LYS:NZ     | 2.33                     | 0.43              |
| 11:J:41:ASP:O    | 11:J:42:ILE:HD13  | 2.19                     | 0.43              |
| 15:O:14:GLN:NE2  | 15:O:30:LYS:H     | 2.13                     | 0.43              |
| 19:T:22:LEU:HD13 | 19:T:106:ILE:HD13 | 2.00                     | 0.43              |
| 25:Z:56:ILE:CG1  | 25:Z:83:ILE:HD12  | 2.49                     | 0.43              |
| 1:2:219:A:H2'    | 1:2:220:U:C6      | 2.54                     | 0.43              |
| 1:2:961:C:H2'    | 1:2:962:A:H8      | 1.84                     | 0.43              |
| 1:2:1226:C:H2'   | 1:2:1227:C:H6     | 1.83                     | 0.43              |
| 1:2:1346:C:H2'   | 1:2:1347:C:H6     | 1.83                     | 0.43              |
| 3:B:39:VAL:O     | 3:B:43:LEU:HG     | 2.19                     | 0.43              |
| 12:K:37:ILE:HG12 | 12:K:50:MET:CE    | 2.49                     | 0.43              |
| 21:V:107:GLN:HG3 | 21:V:109:LYS:HD3  | 2.01                     | 0.43              |
| 27:c:27:GLU:O    | 27:c:31:LYS:N     | 2.51                     | 0.43              |
| 30:4:50:U:H2'    | 30:4:51:C:C6      | 2.54                     | 0.43              |
| 1:2:40:G:H2'     | 1:2:41:G:C8       | 2.54                     | 0.42              |
| 1:2:910:A:O2'    | 1:2:1297:A:N3     | 2.41                     | 0.42              |
| 1:2:965:A:H5'    | 26:3:94:VAL:HG21  | 2.00                     | 0.42              |
| 1:2:1028:C:H2'   | 1:2:1029:G:C8     | 2.54                     | 0.42              |
| 1:2:1319:A:H2'   | 1:2:1320:G:H8     | 1.83                     | 0.42              |
| 1:2:1330:C:OP2   | 36:2:1527:SPM:N14 | 2.52                     | 0.42              |
| 2:A:144:GLU:OE1  | 2:A:144:GLU:HA    | 2.18                     | 0.42              |
| 9:H:142:HIS:CD2  | 9:H:181:ARG:HD3   | 2.54                     | 0.42              |
| 9:H:182:LYS:O    | 9:H:185:ILE:HG22  | 2.18                     | 0.42              |
| 13:L:28:VAL:HG21 | 13:L:35:MET:HB2   | 2.01                     | 0.42              |
| 13:L:53:LEU:HD21 | 13:L:59:ARG:O     | 2.19                     | 0.42              |
| 1:2:58:U:H2'     | 1:2:59:C:C6       | 2.54                     | 0.42              |
| 1:2:682:U:C1'    | 33:b:11:ARG:HD2   | 2.48                     | 0.42              |
| 2:A:86:HIS:HE1   | 2:A:189:THR:HG23  | 1.84                     | 0.42              |
| 8:G:72:LYS:HA    | 8:G:72:LYS:HD2    | 1.78                     | 0.42              |
| 8:G:157:ASP:OD1  | 8:G:161:PHE:N     | 2.51                     | 0.42              |
| 9:H:160:GLU:OE1  | 9:H:160:GLU:HA    | 2.19                     | 0.42              |
| 15:O:72:ILE:HD11 | 15:O:93:HIS:CD2   | 2.55                     | 0.42              |
| 19:T:94:LYS:HB2  | 19:T:94:LYS:HE3   | 1.79                     | 0.42              |
| 1:2:251:A:N1     | 1:2:283:U:O2'     | 2.43                     | 0.42              |
| 1:2:268:A:H2'    | 1:2:269:G:C8      | 2.53                     | 0.42              |
| 1:2:305:A:C5     | 1:2:306:G:H1'     | 2.54                     | 0.42              |
| 1:2:917:G:N7     | 15:O:133:ARG:NH2  | 2.53                     | 0.42              |
| 1:2:988:G:H4'    | 24:Y:50:HIS:HD2   | 1.85                     | 0.42              |
| 1:2:990:C:C4     | 1:2:991:U:C5      | 3.07                     | 0.42              |
| 1:2:1369:G:H2'   | 1:2:1370:U:C6     | 2.54                     | 0.42              |
| 7:F:51:LEU:HB3   | 7:F:54:LEU:HD13   | 2.02                     | 0.42              |

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| Atom-1             | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|-------------------|--------------------------|-------------------|
| 8:G:26:SER:HB2     | 8:G:29:VAL:HG23   | 2.01                     | 0.42              |
| 12:K:53:LEU:HD13   | 12:K:86:LEU:HD11  | 2.01                     | 0.42              |
| 15:O:11:ILE:HB     | 15:O:16:VAL:HG21  | 2.01                     | 0.42              |
| 20:U:121:LYS:HD3   | 20:U:122:ASN:N    | 2.34                     | 0.42              |
| 25:Z:43:THR:O      | 25:Z:79:PRO:HA    | 2.20                     | 0.42              |
| 25:Z:64:LYS:HD2    | 25:Z:65:GLN:N     | 2.35                     | 0.42              |
| 25:Z:74:PHE:N      | 25:Z:74:PHE:CD2   | 2.85                     | 0.42              |
| 27:c:59:ILE:HG21   | 27:c:108:ALA:HB2  | 2.01                     | 0.42              |
| 30:4:22:G:H2'      | 30:4:23:C:C6      | 2.54                     | 0.42              |
| 1:2:333:C:H4'      | 1:2:334:A:H5''    | 2.01                     | 0.42              |
| 1:2:942:A:C8       | 1:2:943:U:H5      | 2.37                     | 0.42              |
| 1:2:957:A:O5'      | 1:2:958:C:H5      | 2.02                     | 0.42              |
| 1:2:991:U:H2'      | 1:2:992:G:C5      | 2.54                     | 0.42              |
| 1:2:996:C:O2'      | 1:2:997:G:H8      | 2.02                     | 0.42              |
| 1:2:1005:G:P       | 31:a:27:LYS:HZ1   | 2.42                     | 0.42              |
| 1:2:1091:U:O4      | 1:2:1104:G:O6     | 2.37                     | 0.42              |
| 1:2:1092:G:H2'     | 1:2:1093:G:H8     | 1.84                     | 0.42              |
| 1:2:1207:A:H2'     | 1:2:1208:G:H8     | 1.84                     | 0.42              |
| 1:2:1333:C:H2'     | 1:2:1334:G:C8     | 2.54                     | 0.42              |
| 36:2:1516:SPM:H91  | 12:K:121:GLU:OE1  | 2.19                     | 0.42              |
| 2:A:40:ASP:OD1     | 2:A:42:THR:N      | 2.49                     | 0.42              |
| 8:G:155:GLY:N      | 8:G:163:MET:HG2   | 2.34                     | 0.42              |
| 9:H:70:ARG:HG3     | 9:H:71:ASN:N      | 2.35                     | 0.42              |
| 11:J:126:LEU:HD23  | 11:J:126:LEU:HA   | 1.88                     | 0.42              |
| 12:K:36:PRO:O      | 12:K:39:LEU:HD12  | 2.19                     | 0.42              |
| 20:U:14:ASP:OD1    | 20:U:14:ASP:N     | 2.50                     | 0.42              |
| 21:V:54:GLN:OE1    | 21:V:54:GLN:C     | 2.63                     | 0.42              |
| 27:c:61:LYS:HD2    | 27:c:61:LYS:C     | 2.44                     | 0.42              |
| 27:c:66:THR:HG23   | 27:c:69:ALA:H     | 1.83                     | 0.42              |
| 27:c:69:ALA:O      | 27:c:73:LYS:HG2   | 2.20                     | 0.42              |
| 31:a:57:LEU:CD1    | 31:a:62:PRO:HD3   | 2.50                     | 0.42              |
| 33:b:21:ILE:HD13   | 33:b:32:GLU:CG    | 2.33                     | 0.42              |
| 33:b:24:ASP:CA     | 35:M:123:ARG:HH22 | 2.31                     | 0.42              |
| 35:M:27:ASP:OD1    | 35:M:27:ASP:N     | 2.41                     | 0.42              |
| 1:2:1085:G:N2      | 1:2:1110:A:H62    | 2.17                     | 0.42              |
| 36:2:1516:SPM:H122 | 12:K:121:GLU:OE1  | 2.20                     | 0.42              |
| 36:2:1520:SPM:H121 | 36:2:1520:SPM:H91 | 1.64                     | 0.42              |
| 7:F:139:VAL:HG22   | 7:F:148:ASP:OD2   | 2.20                     | 0.42              |
| 12:K:64:ILE:HD12   | 12:K:64:ILE:HA    | 1.80                     | 0.42              |
| 26:3:50:LEU:HD11   | 26:3:101:ILE:HG13 | 2.01                     | 0.42              |
| 31:a:5:ASN:ND2     | 32:P:42:ARG:NH1   | 2.66                     | 0.42              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 1:2:72:G:C2       | 1:2:209:U:H1'     | 2.55                     | 0.42              |
| 1:2:885:G:H2'     | 1:2:886:G:H8      | 1.84                     | 0.42              |
| 1:2:1371:C:C2     | 1:2:1451:G:N2     | 2.64                     | 0.42              |
| 1:2:1442:G:N3     | 1:2:1443:G:C8     | 2.88                     | 0.42              |
| 36:2:1528:SPM:H62 | 36:2:1528:SPM:H32 | 1.73                     | 0.42              |
| 8:G:28:GLN:OE1    | 8:G:28:GLN:C      | 2.62                     | 0.42              |
| 9:H:36:VAL:HG11   | 9:H:56:PRO:HG3    | 2.00                     | 0.42              |
| 11:J:89:GLU:H     | 11:J:89:GLU:CD    | 2.24                     | 0.42              |
| 12:K:56:ALA:HB2   | 12:K:90:LEU:HD22  | 2.01                     | 0.42              |
| 13:L:47:GLU:OE1   | 13:L:47:GLU:HA    | 2.20                     | 0.42              |
| 19:T:69:THR:HA    | 19:T:87:LYS:HB2   | 2.01                     | 0.42              |
| 25:Z:154:LYS:HD2  | 31:a:3:ILE:CD1    | 2.49                     | 0.42              |
| 30:4:27:U:H2'     | 30:4:28:C:H6      | 1.84                     | 0.42              |
| 32:P:13:GLY:O     | 32:P:16:VAL:HG22  | 2.20                     | 0.42              |
| 1:2:17:C:O2'      | 1:2:876:A:N1      | 2.50                     | 0.42              |
| 1:2:209:U:H2'     | 1:2:210:U:C2      | 2.54                     | 0.42              |
| 1:2:646:A:O2'     | 1:2:647:G:OP2     | 2.37                     | 0.42              |
| 1:2:1101:G:C6     | 1:2:1102:C:C4     | 3.07                     | 0.42              |
| 36:2:1518:SPM:H72 | 36:2:1518:SPM:H41 | 1.73                     | 0.42              |
| 36:2:1520:SPM:HN0 | 36:2:1530:SPM:H31 | 1.85                     | 0.42              |
| 3:B:113:PHE:CD1   | 3:B:113:PHE:C     | 2.96                     | 0.42              |
| 11:J:33:THR:O     | 11:J:33:THR:OG1   | 2.29                     | 0.42              |
| 16:Q:81:GLN:C     | 16:Q:81:GLN:OE1   | 2.62                     | 0.42              |
| 18:S:28:TYR:CD1   | 18:S:28:TYR:C     | 2.98                     | 0.42              |
| 1:2:138:G:N7      | 36:2:1522:SPM:H32 | 2.35                     | 0.42              |
| 1:2:413:U:H2'     | 1:2:414:C:C6      | 2.55                     | 0.42              |
| 1:2:579:C:H1'     | 5:D:143:TYR:HD1   | 1.83                     | 0.42              |
| 1:2:613:G:O4'     | 10:I:2:VAL:HG12   | 2.19                     | 0.42              |
| 1:2:963:G:H2'     | 1:2:964:G:H8      | 1.85                     | 0.42              |
| 1:2:1213:A:N3     | 1:2:1334:G:O2'    | 2.38                     | 0.42              |
| 3:B:74:ASP:O      | 3:B:78:ILE:HG13   | 2.20                     | 0.42              |
| 8:G:122:ASP:OD1   | 8:G:123:GLN:N     | 2.50                     | 0.42              |
| 9:H:21:GLU:O      | 9:H:23:ARG:NH1    | 2.51                     | 0.42              |
| 9:H:182:LYS:HA    | 9:H:185:ILE:HG22  | 2.02                     | 0.42              |
| 11:J:80:GLU:OE1   | 11:J:81:ILE:N     | 2.43                     | 0.42              |
| 18:S:39:VAL:HG23  | 25:Z:194:ASN:O    | 2.19                     | 0.42              |
| 26:3:74:LYS:HA    | 26:3:74:LYS:HD2   | 1.73                     | 0.42              |
| 28:d:53:ILE:HD12  | 28:d:53:ILE:HA    | 1.80                     | 0.42              |
| 1:2:940:G:H21     | 1:2:1327:A:H5'    | 1.85                     | 0.42              |
| 1:2:1478:4AC:O7   | 1:2:1478:4AC:H5   | 2.19                     | 0.42              |
| 2:A:14:TRP:NE1    | 2:A:17:LYS:HD2    | 2.35                     | 0.42              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 2:A:127:THR:HG23 | 2:A:128:TYR:CD2   | 2.55                     | 0.42              |
| 8:G:119:ILE:HD12 | 8:G:119:ILE:HA    | 1.86                     | 0.42              |
| 9:H:63:ASN:OD1   | 9:H:75:LYS:HE3    | 2.19                     | 0.42              |
| 9:H:181:ARG:HB2  | 9:H:181:ARG:CZ    | 2.50                     | 0.42              |
| 12:K:53:LEU:HD12 | 12:K:90:LEU:HD21  | 2.02                     | 0.42              |
| 15:O:114:ARG:CZ  | 15:O:114:ARG:HB2  | 2.50                     | 0.42              |
| 25:Z:153:TYR:OH  | 25:Z:189:ILE:HG12 | 2.20                     | 0.42              |
| 27:c:47:ILE:CG2  | 27:c:84:ILE:HG23  | 2.50                     | 0.42              |
| 28:d:34:LEU:HD23 | 28:d:50:TYR:HB2   | 2.02                     | 0.42              |
| 35:M:7:ILE:HD12  | 35:M:106:ILE:HD12 | 2.01                     | 0.42              |
| 1:2:778:A:OP2    | 33:b:8:ARG:NH2    | 2.53                     | 0.42              |
| 1:2:1252:A:N1    | 1:2:1335:G:H1'    | 2.35                     | 0.42              |
| 9:H:34:MET:HA    | 9:H:35:PRO:HD3    | 1.93                     | 0.42              |
| 9:H:41:THR:HG23  | 9:H:59:GLU:OE1    | 2.20                     | 0.42              |
| 9:H:193:ARG:HD2  | 23:X:74:ARG:HH22  | 1.84                     | 0.42              |
| 12:K:124:MET:CE  | 13:L:60:LYS:H     | 2.33                     | 0.42              |
| 25:Z:91:LEU:O    | 25:Z:91:LEU:HD13  | 2.20                     | 0.42              |
| 28:d:15:GLU:OE1  | 28:d:17:ASN:CG    | 2.63                     | 0.42              |
| 30:4:44:A:H2'    | 30:4:45:G:O4'     | 2.20                     | 0.42              |
| 1:2:959:C:C4     | 1:2:960:G:N7      | 2.88                     | 0.41              |
| 1:2:1071:C:H4'   | 32:P:53:TYR:HD2   | 1.83                     | 0.41              |
| 1:2:1228:C:P     | 20:U:125:ARG:HH22 | 2.41                     | 0.41              |
| 2:A:20:TYR:CD2   | 2:A:41:ILE:HD12   | 2.55                     | 0.41              |
| 9:H:111:ARG:CZ   | 23:X:68:ILE:HG22  | 2.50                     | 0.41              |
| 14:N:63:ARG:HG3  | 14:N:118:ASP:O    | 2.20                     | 0.41              |
| 25:Z:172:LEU:HB3 | 25:Z:174:PRO:HD2  | 2.01                     | 0.41              |
| 28:d:18:ASP:HA   | 28:d:65:LEU:HD21  | 2.01                     | 0.41              |
| 29:e:28:GLU:OE1  | 29:e:33:ARG:HD3   | 2.20                     | 0.41              |
| 2:A:47:ARG:HB3   | 35:M:29:THR:CG2   | 2.48                     | 0.41              |
| 7:F:43:GLU:H     | 7:F:46:ILE:HD12   | 1.85                     | 0.41              |
| 9:H:88:ILE:HD13  | 9:H:160:GLU:OE1   | 2.20                     | 0.41              |
| 12:K:12:ALA:HB2  | 12:K:88:ARG:HH12  | 1.85                     | 0.41              |
| 12:K:27:LYS:HA   | 12:K:62:SER:O     | 2.20                     | 0.41              |
| 15:O:17:ASP:OD1  | 15:O:17:ASP:C     | 2.63                     | 0.41              |
| 15:O:36:THR:O    | 15:O:40:ILE:HG23  | 2.19                     | 0.41              |
| 15:O:47:ASP:OD1  | 15:O:47:ASP:C     | 2.63                     | 0.41              |
| 15:O:116:TRP:CD1 | 15:O:116:TRP:O    | 2.72                     | 0.41              |
| 18:S:57:TYR:CZ   | 18:S:61:MET:HE2   | 2.55                     | 0.41              |
| 21:V:47:ASP:OD2  | 21:V:47:ASP:N     | 2.51                     | 0.41              |
| 21:V:102:ASP:OD2 | 21:V:102:ASP:N    | 2.53                     | 0.41              |
| 21:V:106:LYS:O   | 21:V:108:LYS:HG2  | 2.20                     | 0.41              |

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| Atom-1            | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|--------------------|--------------------------|-------------------|
| 25:Z:165:ARG:HB2  | 25:Z:182:VAL:HG22  | 2.03                     | 0.41              |
| 31:a:29:ILE:HG22  | 31:a:30:ILE:O      | 2.20                     | 0.41              |
| 1:2:1:A:H1'       | 7:F:159:VAL:HG13   | 2.02                     | 0.41              |
| 1:2:212:C:H2'     | 1:2:213:C:C6       | 2.55                     | 0.41              |
| 1:2:682:U:N1      | 33:b:11:ARG:NH1    | 2.68                     | 0.41              |
| 1:2:707:G:C8      | 16:Q:59:PRO:HB2    | 2.55                     | 0.41              |
| 1:2:1115:A:O4'    | 13:L:40:PRO:HB2    | 2.20                     | 0.41              |
| 1:2:1161:G:H2'    | 1:2:1162:U:C6      | 2.55                     | 0.41              |
| 1:2:1256:C:H2'    | 1:2:1257:U:C6      | 2.55                     | 0.41              |
| 1:2:1331:U:OP2    | 36:2:1516:SPM:H132 | 2.20                     | 0.41              |
| 1:2:1436:U:O2'    | 1:2:1437:G:OP1     | 2.37                     | 0.41              |
| 3:B:108:ARG:HH21  | 3:B:112:LYS:HZ1    | 1.68                     | 0.41              |
| 3:B:172:ASP:OD1   | 3:B:173:THR:HG22   | 2.21                     | 0.41              |
| 3:B:199:TRP:CD2   | 3:B:222:VAL:HG22   | 2.55                     | 0.41              |
| 8:G:142:GLN:OE1   | 8:G:142:GLN:N      | 2.33                     | 0.41              |
| 11:J:82:LEU:CD1   | 11:J:108:LEU:HD11  | 2.50                     | 0.41              |
| 24:Y:38:ASN:ND2   | 24:Y:58:TRP:HZ3    | 2.18                     | 0.41              |
| 26:3:22:ALA:HB1   | 26:3:111:VAL:HG23  | 2.01                     | 0.41              |
| 31:a:22:ARG:HD2   | 31:a:46:SER:O      | 2.20                     | 0.41              |
| 1:2:196:G:H3'     | 36:2:1521:SPM:H92  | 2.02                     | 0.41              |
| 1:2:637:U:H2'     | 1:2:638:C:H6       | 1.86                     | 0.41              |
| 1:2:905:OMG:H2'   | 1:2:906:G:O4'      | 2.20                     | 0.41              |
| 1:2:980:A:O3'     | 19:T:52:HIS:ND1    | 2.52                     | 0.41              |
| 1:2:986:U:H2'     | 1:2:987:U:C6       | 2.55                     | 0.41              |
| 1:2:1057:C:C4     | 1:2:1059:A:H5''    | 2.55                     | 0.41              |
| 1:2:1317:G:OP1    | 20:U:94:GLU:HB2    | 2.20                     | 0.41              |
| 2:A:45:ILE:HA     | 2:A:71:ILE:HG22    | 2.02                     | 0.41              |
| 4:C:37:CYS:SG     | 4:C:60:CYS:HB2     | 2.60                     | 0.41              |
| 6:E:145:ASP:N     | 6:E:145:ASP:OD1    | 2.45                     | 0.41              |
| 7:F:187:THR:O     | 7:F:191:VAL:HG23   | 2.20                     | 0.41              |
| 8:G:26:SER:O      | 8:G:96:LYS:NZ      | 2.39                     | 0.41              |
| 13:L:90:ARG:HH21  | 13:L:92:PRO:HA     | 1.85                     | 0.41              |
| 15:O:104:ARG:HD3  | 15:O:108:GLU:OE2   | 2.19                     | 0.41              |
| 32:P:48:LEU:HB2   | 32:P:50:PHE:HD1    | 1.85                     | 0.41              |
| 33:b:74:ALA:HA    | 33:b:79:ILE:HD12   | 2.02                     | 0.41              |
| 33:b:83:ARG:HD2   | 33:b:87:GLU:HG3    | 2.03                     | 0.41              |
| 1:2:328:U:H2'     | 1:2:329:G:O4'      | 2.21                     | 0.41              |
| 1:2:624:A:N6      | 33:b:15:LYS:HD3    | 2.36                     | 0.41              |
| 36:2:1514:SPM:H61 | 36:2:1514:SPM:H32  | 1.79                     | 0.41              |
| 7:F:100:ARG:O     | 7:F:104:GLN:HG2    | 2.20                     | 0.41              |
| 8:G:87:VAL:HA     | 8:G:93:TRP:CZ2     | 2.56                     | 0.41              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 19:T:78:VAL:HA   | 19:T:108:HIS:O    | 2.21                     | 0.41              |
| 26:3:86:LEU:HD11 | 26:3:99:ALA:CB    | 2.51                     | 0.41              |
| 1:2:726:A:H2'    | 1:2:727:A:C8      | 2.56                     | 0.41              |
| 1:2:843:4AC:H5   | 1:2:843:4AC:O7    | 2.20                     | 0.41              |
| 1:2:1005:G:P     | 31:a:27:LYS:NZ    | 2.93                     | 0.41              |
| 1:2:1036:G:P     | 7:F:192:ARG:HH22  | 2.43                     | 0.41              |
| 1:2:1080:A:H4'   | 13:L:37:GLY:HA3   | 2.01                     | 0.41              |
| 1:2:1096:U:H2'   | 1:2:1098:C:C4     | 2.56                     | 0.41              |
| 1:2:1348:U:H2'   | 1:2:1349:G:C8     | 2.56                     | 0.41              |
| 3:B:26:LYS:O     | 3:B:76:ARG:HD3    | 2.20                     | 0.41              |
| 8:G:148:VAL:HB   | 8:G:212:ILE:CG2   | 2.51                     | 0.41              |
| 8:G:177:LEU:HD23 | 8:G:177:LEU:HA    | 1.91                     | 0.41              |
| 14:N:105:ILE:O   | 14:N:105:ILE:HG13 | 2.21                     | 0.41              |
| 15:O:56:SER:OG   | 15:O:59:GLU:OE1   | 2.36                     | 0.41              |
| 17:R:23:CYS:HB2  | 17:R:83:PRO:HG2   | 2.02                     | 0.41              |
| 24:Y:35:LYS:HA   | 24:Y:35:LYS:HE3   | 2.02                     | 0.41              |
| 24:Y:39:LYS:H    | 24:Y:39:LYS:HG3   | 1.72                     | 0.41              |
| 26:3:101:ILE:O   | 26:3:102:LEU:HD23 | 2.20                     | 0.41              |
| 31:a:20:TYR:HD2  | 31:a:25:ASN:ND2   | 2.18                     | 0.41              |
| 31:a:30:ILE:CD1  | 31:a:35:LEU:HD11  | 2.51                     | 0.41              |
| 1:2:125:G:OP2    | 36:2:1521:SPM:C6  | 2.61                     | 0.41              |
| 1:2:218:C:P      | 36:2:1521:SPM:N14 | 2.93                     | 0.41              |
| 1:2:725:A:OP2    | 1:2:771:G:N2      | 2.53                     | 0.41              |
| 1:2:741:A:OP1    | 36:2:1512:SPM:H21 | 2.21                     | 0.41              |
| 1:2:787:A:H2'    | 1:2:788:G:O4'     | 2.21                     | 0.41              |
| 1:2:1093:G:C6    | 1:2:1094:U:C4     | 3.09                     | 0.41              |
| 1:2:1154:A:H4'   | 25:Z:154:LYS:HG3  | 2.03                     | 0.41              |
| 1:2:1230:G:C2    | 1:2:1234:G:C6     | 3.09                     | 0.41              |
| 2:A:168:ALA:HB1  | 2:A:184:ALA:O     | 2.21                     | 0.41              |
| 3:B:21:LYS:HD2   | 3:B:21:LYS:C      | 2.45                     | 0.41              |
| 3:B:33:ILE:O     | 3:B:33:ILE:HD12   | 2.21                     | 0.41              |
| 9:H:84:LEU:CB    | 9:H:159:GLU:HG2   | 2.51                     | 0.41              |
| 9:H:145:THR:O    | 9:H:148:LYS:N     | 2.53                     | 0.41              |
| 9:H:167:ILE:HD13 | 9:H:167:ILE:HA    | 1.91                     | 0.41              |
| 13:L:7:ILE:HG13  | 13:L:99:ILE:CG2   | 2.50                     | 0.41              |
| 20:U:130:LYS:HD2 | 20:U:130:LYS:N    | 2.33                     | 0.41              |
| 28:d:5:LYS:N     | 28:d:5:LYS:HZ3    | 2.19                     | 0.41              |
| 30:4:52:G:H2'    | 30:4:53:G:H8      | 1.85                     | 0.41              |
| 1:2:398:C:OP1    | 36:2:1530:SPM:H32 | 2.21                     | 0.41              |
| 1:2:771:G:OP1    | 1:2:865:OMG:N2    | 2.53                     | 0.41              |
| 1:2:846:C:O2'    | 1:2:847:U:H5'     | 2.20                     | 0.41              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 1:2:982:G:H4'    | 1:2:984:C:H41     | 1.86                     | 0.41              |
| 1:2:1044:C:H2'   | 1:2:1045:U:C6     | 2.55                     | 0.41              |
| 1:2:1203:U:OP2   | 9:H:158:ILE:HG22  | 2.21                     | 0.41              |
| 1:2:1257:U:H5''  | 27:c:99:LYS:NZ    | 2.36                     | 0.41              |
| 3:B:143:LYS:O    | 3:B:166:PRO:HD2   | 2.20                     | 0.41              |
| 9:H:10:ILE:HG22  | 9:H:35:PRO:O      | 2.20                     | 0.41              |
| 15:O:44:LEU:HD13 | 15:O:62:LYS:NZ    | 2.35                     | 0.41              |
| 32:P:47:GLU:N    | 32:P:47:GLU:CD    | 2.78                     | 0.41              |
| 33:b:30:VAL:CG2  | 33:b:31:PRO:CD    | 2.99                     | 0.41              |
| 1:2:90:C:H2'     | 1:2:91:G:O4'      | 2.21                     | 0.41              |
| 1:2:220:U:H2'    | 1:2:221:G:C8      | 2.55                     | 0.41              |
| 1:2:241:G:H2'    | 1:2:242:C:O4'     | 2.21                     | 0.41              |
| 1:2:298:C:O2'    | 5:D:3:ASP:O       | 2.36                     | 0.41              |
| 1:2:381:G:OP1    | 6:E:44:ARG:NH2    | 2.43                     | 0.41              |
| 1:2:476:G:N1     | 1:2:492:A:OP2     | 2.53                     | 0.41              |
| 1:2:684:G:O6     | 33:b:15:LYS:HD3   | 2.21                     | 0.41              |
| 1:2:925:U:OP1    | 36:2:1525:SPM:H41 | 2.21                     | 0.41              |
| 1:2:1078:C:H2'   | 1:2:1079:U:C6     | 2.55                     | 0.41              |
| 1:2:1288:C:H2'   | 1:2:1289:C:H6     | 1.85                     | 0.41              |
| 1:2:1455:U:C4    | 34:5:2:U:H5''     | 2.56                     | 0.41              |
| 2:A:161:GLU:OE1  | 2:A:166:ARG:HD2   | 2.21                     | 0.41              |
| 5:D:161:PHE:HD2  | 5:D:166:PRO:HD3   | 1.86                     | 0.41              |
| 8:G:137:VAL:HA   | 8:G:150:LEU:O     | 2.21                     | 0.41              |
| 9:H:61:LEU:O     | 9:H:65:ILE:HG12   | 2.21                     | 0.41              |
| 12:K:61:ARG:O    | 12:K:64:ILE:HG22  | 2.21                     | 0.41              |
| 14:N:72:CYS:SG   | 14:N:122:VAL:HG21 | 2.60                     | 0.41              |
| 15:O:28:MET:HE3  | 15:O:28:MET:HB3   | 1.79                     | 0.41              |
| 17:R:82:PRO:HG2  | 17:R:85:ILE:HG12  | 2.02                     | 0.41              |
| 18:S:5:TYR:O     | 18:S:10:LYS:HE3   | 2.20                     | 0.41              |
| 23:X:55:ARG:CZ   | 23:X:74:ARG:HB2   | 2.51                     | 0.41              |
| 24:Y:56:GLU:OE1  | 24:Y:56:GLU:HA    | 2.20                     | 0.41              |
| 28:d:23:VAL:HG13 | 28:d:37:LEU:HD11  | 2.02                     | 0.41              |
| 28:d:39:LYS:HE2  | 28:d:39:LYS:H     | 1.84                     | 0.41              |
| 29:e:5:GLY:HA2   | 29:e:9:LYS:HD2    | 2.03                     | 0.41              |
| 30:4:9:G:H1'     | 30:4:45:G:H2'     | 2.02                     | 0.41              |
| 30:4:19:G:C2     | 30:4:57:A:H1'     | 2.56                     | 0.41              |
| 1:2:367:G:N1     | 1:2:370:A:OP2     | 2.47                     | 0.41              |
| 1:2:738:C:H5''   | 35:M:124:PRO:HB3  | 2.03                     | 0.41              |
| 1:2:1036:G:H2'   | 1:2:1037:A:C8     | 2.56                     | 0.41              |
| 1:2:1222:C:H2'   | 1:2:1223:C:C6     | 2.56                     | 0.41              |
| 1:2:1336:U:OP1   | 12:K:76:MET:HG2   | 2.21                     | 0.41              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:2:1382:A:N7    | 1:2:1439:A:H2    | 2.19                     | 0.41              |
| 2:A:159:THR:O    | 2:A:163:VAL:HG22 | 2.21                     | 0.41              |
| 3:B:84:ILE:CD1   | 4:C:36:ASN:HB2   | 2.51                     | 0.41              |
| 4:C:45:ASP:OD1   | 4:C:48:CYS:HB2   | 2.21                     | 0.41              |
| 6:E:175:GLU:HA   | 6:E:175:GLU:OE1  | 2.20                     | 0.41              |
| 9:H:84:LEU:HB3   | 9:H:159:GLU:HG2  | 2.03                     | 0.41              |
| 11:J:64:ASN:ND2  | 11:J:122:ASN:OD1 | 2.53                     | 0.41              |
| 17:R:88:ARG:CZ   | 17:R:88:ARG:HB2  | 2.50                     | 0.41              |
| 19:T:12:PHE:HD2  | 19:T:19:ILE:HD11 | 1.86                     | 0.41              |
| 20:U:65:LEU:HD12 | 20:U:65:LEU:HA   | 1.84                     | 0.41              |
| 25:Z:165:ARG:NH1 | 31:a:6:ARG:O     | 2.52                     | 0.41              |
| 26:3:25:LYS:HB2  | 26:3:25:LYS:HE2  | 1.76                     | 0.41              |
| 27:c:84:ILE:O    | 27:c:88:LEU:HG   | 2.21                     | 0.41              |
| 1:2:638:C:H2'    | 1:2:639:C:C6     | 2.56                     | 0.40              |
| 1:2:1280:G:N2    | 1:2:1282:A:H3'   | 2.36                     | 0.40              |
| 2:A:60:PHE:HE1   | 33:b:59:ILE:HG21 | 1.85                     | 0.40              |
| 2:A:166:ARG:HA   | 2:A:169:ASN:OD1  | 2.21                     | 0.40              |
| 6:E:120:ARG:HG3  | 6:E:227:MET:HE2  | 2.02                     | 0.40              |
| 7:F:59:VAL:HG11  | 7:F:81:ILE:HD12  | 2.02                     | 0.40              |
| 8:G:119:ILE:HG12 | 8:G:144:ILE:HG23 | 2.02                     | 0.40              |
| 12:K:110:MET:H   | 12:K:110:MET:HG3 | 1.64                     | 0.40              |
| 13:L:90:ARG:HD2  | 13:L:90:ARG:HA   | 1.75                     | 0.40              |
| 15:O:7:TYR:OH    | 27:c:29:LYS:HD2  | 2.21                     | 0.40              |
| 18:S:30:THR:O    | 18:S:33:GLN:N    | 2.54                     | 0.40              |
| 23:X:68:ILE:O    | 23:X:68:ILE:HG22 | 2.21                     | 0.40              |
| 26:3:23:VAL:HG11 | 26:3:86:LEU:HD22 | 2.04                     | 0.40              |
| 28:d:5:LYS:HE3   | 28:d:68:TYR:CE1  | 2.56                     | 0.40              |
| 33:b:58:ALA:HB1  | 35:M:108:GLY:O   | 2.21                     | 0.40              |
| 1:2:774:A:N7     | 1:2:1466:4AC:O2' | 2.54                     | 0.40              |
| 1:2:911:A:H2'    | 1:2:912:C:C6     | 2.56                     | 0.40              |
| 1:2:1222:C:H2'   | 1:2:1223:C:H6    | 1.86                     | 0.40              |
| 1:2:1231:A:H4'   | 20:U:36:TRP:CE3  | 2.55                     | 0.40              |
| 1:2:1290:C:H2'   | 1:2:1291:U:H6    | 1.86                     | 0.40              |
| 1:2:1365:G:H2'   | 1:2:1366:OMC:O4' | 2.22                     | 0.40              |
| 1:2:1451:G:N2    | 1:2:1452:U:C2    | 2.89                     | 0.40              |
| 2:A:53:LEU:HA    | 2:A:53:LEU:HD12  | 1.87                     | 0.40              |
| 2:A:80:ILE:HD12  | 2:A:80:ILE:O     | 2.21                     | 0.40              |
| 3:B:76:ARG:HA    | 3:B:79:ASP:OD2   | 2.21                     | 0.40              |
| 4:C:63:LYS:HA    | 4:C:63:LYS:HD3   | 1.93                     | 0.40              |
| 8:G:22:LYS:HB3   | 8:G:91:GLU:HG2   | 2.04                     | 0.40              |
| 12:K:29:ARG:HA   | 20:U:156:TYR:CE1 | 2.56                     | 0.40              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 20:U:86:ARG:HA    | 20:U:95:LYS:O     | 2.22                     | 0.40              |
| 25:Z:2:PRO:HB2    | 25:Z:3:ASN:H      | 1.60                     | 0.40              |
| 27:c:85:LEU:HA    | 27:c:85:LEU:HD23  | 1.81                     | 0.40              |
| 29:e:2:PRO:HB2    | 29:e:3:SER:H      | 1.63                     | 0.40              |
| 31:a:34:ILE:HD13  | 31:a:54:LYS:NZ    | 2.37                     | 0.40              |
| 33:b:10:ARG:NH2   | 33:b:12:LYS:HD3   | 2.35                     | 0.40              |
| 1:2:10:G:O2'      | 7:F:72:GLU:HG2    | 2.21                     | 0.40              |
| 1:2:15:OMU:HM22   | 1:2:16:G:H5'      | 2.02                     | 0.40              |
| 1:2:260:G:H2'     | 1:2:261:G:H8      | 1.86                     | 0.40              |
| 1:2:1082:U:C2     | 1:2:1084:G:C8     | 3.09                     | 0.40              |
| 1:2:1443:G:H2'    | 1:2:1443:G:N3     | 2.36                     | 0.40              |
| 36:2:1524:SPM:H31 | 36:2:1524:SPM:H61 | 1.67                     | 0.40              |
| 9:H:20:VAL:HG11   | 9:H:99:GLN:HB2    | 2.04                     | 0.40              |
| 9:H:32:SER:HA     | 28:d:62:TRP:CE2   | 2.56                     | 0.40              |
| 9:H:79:TYR:CE1    | 9:H:83:LYS:HE2    | 2.56                     | 0.40              |
| 9:H:79:TYR:O      | 9:H:82:VAL:HG22   | 2.21                     | 0.40              |
| 12:K:98:GLU:O     | 12:K:102:ILE:HG12 | 2.21                     | 0.40              |
| 17:R:92:LYS:NZ    | 17:R:92:LYS:HB3   | 2.36                     | 0.40              |
| 19:T:10:LYS:HD3   | 19:T:10:LYS:HA    | 1.78                     | 0.40              |
| 21:V:68:ILE:HG12  | 21:V:79:VAL:HG22  | 2.02                     | 0.40              |
| 24:Y:43:ARG:NH2   | 24:Y:63:CYS:SG    | 2.95                     | 0.40              |
| 25:Z:94:ARG:NE    | 31:a:10:ALA:HB1   | 2.37                     | 0.40              |
| 25:Z:131:ILE:C    | 25:Z:132:ILE:HD12 | 2.47                     | 0.40              |
| 26:3:66:LEU:HA    | 26:3:69:LEU:HG    | 2.03                     | 0.40              |
| 26:3:79:TYR:OH    | 26:3:121:ILE:HG12 | 2.21                     | 0.40              |
| 28:d:38:SER:HB2   | 28:d:43:LEU:CD2   | 2.51                     | 0.40              |
| 1:2:413:U:H2'     | 1:2:414:C:H6      | 1.87                     | 0.40              |
| 1:2:979:A:O2'     | 1:2:980:A:OP1     | 2.32                     | 0.40              |
| 1:2:1121:A:N3     | 1:2:1144:G:C2     | 2.89                     | 0.40              |
| 1:2:1165:G:OP2    | 13:L:55:HIS:ND1   | 2.50                     | 0.40              |
| 1:2:1201:A:N3     | 1:2:1201:A:H2'    | 2.37                     | 0.40              |
| 4:C:37:CYS:SG     | 4:C:38:GLY:N      | 2.95                     | 0.40              |
| 6:E:152:PHE:HA    | 6:E:156:MET:HE1   | 2.03                     | 0.40              |
| 8:G:24:LYS:HB2    | 8:G:93:TRP:CD1    | 2.56                     | 0.40              |
| 15:O:27:ALA:HA    | 15:O:32:ILE:HG22  | 2.03                     | 0.40              |
| 17:R:23:CYS:HB3   | 17:R:84:CYS:HB3   | 2.03                     | 0.40              |
| 18:S:24:ILE:H     | 18:S:24:ILE:HG12  | 1.71                     | 0.40              |
| 25:Z:158:GLN:O    | 25:Z:162:MET:HB2  | 2.21                     | 0.40              |
| 31:a:59:GLY:O     | 31:a:67:GLU:OE1   | 2.39                     | 0.40              |
| 1:2:634:U:H1'     | 35:M:118:HIS:CG   | 2.57                     | 0.40              |
| 1:2:683:G:N7      | 33:b:15:LYS:HE2   | 2.34                     | 0.40              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:2:888:G:C2     | 1:2:890:G:C8     | 3.10                     | 0.40              |
| 1:2:995:U:H6     | 1:2:995:U:H5''   | 1.86                     | 0.40              |
| 1:2:1121:A:C2    | 1:2:1144:G:C4    | 3.10                     | 0.40              |
| 1:2:1381:G:C2    | 1:2:1439:A:C4    | 3.10                     | 0.40              |
| 2:A:80:ILE:HD12  | 2:A:80:ILE:C     | 2.47                     | 0.40              |
| 2:A:89:SER:OG    | 2:A:91:ASP:OD2   | 2.27                     | 0.40              |
| 9:H:29:LYS:HD2   | 9:H:29:LYS:HA    | 1.74                     | 0.40              |
| 10:I:10:ALA:HA   | 10:I:27:ILE:HG12 | 2.02                     | 0.40              |
| 19:T:89:ALA:HA   | 19:T:97:VAL:O    | 2.22                     | 0.40              |
| 21:V:9:ILE:HD12  | 21:V:9:ILE:N     | 2.36                     | 0.40              |
| 21:V:35:VAL:HG11 | 21:V:43:PRO:HG2  | 2.03                     | 0.40              |
| 24:Y:55:ASN:ND2  | 24:Y:57:ARG:HG2  | 2.36                     | 0.40              |
| 25:Z:165:ARG:CD  | 31:a:3:ILE:HG23  | 2.51                     | 0.40              |
| 26:3:53:ILE:HD13 | 26:3:67:PRO:HD3  | 2.04                     | 0.40              |
| 28:d:17:ASN:HB2  | 28:d:18:ASP:H    | 1.62                     | 0.40              |

There are no symmetry-related clashes.

## 5.3 Torsion angles [i](#)

### 5.3.1 Protein backbone [i](#)

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

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

| Mol | Chain | Analysed      | Favoured  | Allowed | Outliers | Percentiles |     |
|-----|-------|---------------|-----------|---------|----------|-------------|-----|
| 2   | A     | 184/208 (88%) | 179 (97%) | 5 (3%)  | 0        | 100         | 100 |
| 3   | B     | 213/231 (92%) | 205 (96%) | 8 (4%)  | 0        | 100         | 100 |
| 4   | C     | 56/65 (86%)   | 55 (98%)  | 1 (2%)  | 0        | 100         | 100 |
| 5   | D     | 164/181 (91%) | 161 (98%) | 3 (2%)  | 0        | 100         | 100 |
| 6   | E     | 236/239 (99%) | 230 (98%) | 6 (2%)  | 0        | 100         | 100 |
| 7   | F     | 208/214 (97%) | 202 (97%) | 6 (3%)  | 0        | 100         | 100 |
| 8   | G     | 211/214 (99%) | 200 (95%) | 11 (5%) | 0        | 100         | 100 |
| 9   | H     | 190/193 (98%) | 182 (96%) | 8 (4%)  | 0        | 100         | 100 |

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| Mol | Chain | Analysed        | Favoured   | Allowed  | Outliers | Percentiles |     |
|-----|-------|-----------------|------------|----------|----------|-------------|-----|
| 10  | I     | 130/133 (98%)   | 126 (97%)  | 4 (3%)   | 0        | 100         | 100 |
| 11  | J     | 125/133 (94%)   | 123 (98%)  | 2 (2%)   | 0        | 100         | 100 |
| 12  | K     | 131/137 (96%)   | 123 (94%)  | 8 (6%)   | 0        | 100         | 100 |
| 13  | L     | 99/102 (97%)    | 92 (93%)   | 7 (7%)   | 0        | 100         | 100 |
| 14  | N     | 144/147 (98%)   | 138 (96%)  | 6 (4%)   | 0        | 100         | 100 |
| 15  | O     | 138/165 (84%)   | 130 (94%)  | 8 (6%)   | 0        | 100         | 100 |
| 16  | Q     | 143/152 (94%)   | 142 (99%)  | 1 (1%)   | 0        | 100         | 100 |
| 17  | R     | 111/114 (97%)   | 108 (97%)  | 3 (3%)   | 0        | 100         | 100 |
| 18  | S     | 64/79 (81%)     | 63 (98%)   | 1 (2%)   | 0        | 100         | 100 |
| 19  | T     | 126/140 (90%)   | 123 (98%)  | 3 (2%)   | 0        | 100         | 100 |
| 20  | U     | 152/158 (96%)   | 146 (96%)  | 6 (4%)   | 0        | 100         | 100 |
| 21  | V     | 105/120 (88%)   | 102 (97%)  | 3 (3%)   | 0        | 100         | 100 |
| 22  | W     | 63/66 (96%)     | 58 (92%)   | 5 (8%)   | 0        | 100         | 100 |
| 23  | X     | 65/83 (78%)     | 57 (88%)   | 8 (12%)  | 0        | 100         | 100 |
| 24  | Y     | 47/75 (63%)     | 36 (77%)   | 11 (23%) | 0        | 100         | 100 |
| 25  | Z     | 194/229 (85%)   | 191 (98%)  | 3 (2%)   | 0        | 100         | 100 |
| 26  | 3     | 115/127 (91%)   | 103 (90%)  | 12 (10%) | 0        | 100         | 100 |
| 27  | c     | 107/110 (97%)   | 99 (92%)   | 8 (8%)   | 0        | 100         | 100 |
| 28  | d     | 66/72 (92%)     | 60 (91%)   | 5 (8%)   | 1 (2%)   | 8           | 29  |
| 29  | e     | 41/52 (79%)     | 41 (100%)  | 0        | 0        | 100         | 100 |
| 31  | a     | 69/72 (96%)     | 64 (93%)   | 5 (7%)   | 0        | 100         | 100 |
| 32  | P     | 51/54 (94%)     | 47 (92%)   | 4 (8%)   | 0        | 100         | 100 |
| 33  | b     | 91/95 (96%)     | 90 (99%)   | 1 (1%)   | 0        | 100         | 100 |
| 35  | M     | 125/132 (95%)   | 118 (94%)  | 6 (5%)   | 1 (1%)   | 16          | 45  |
| All | All   | 3964/4292 (92%) | 3794 (96%) | 168 (4%) | 2 (0%)   | 50          | 77  |

All (2) Ramachandran outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 35  | M     | 119 | ASP  |
| 28  | d     | 17  | ASN  |

### 5.3.2 Protein sidechains [i](#)

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

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

| Mol | Chain | Analysed       | Rotameric  | Outliers | Percentiles |     |
|-----|-------|----------------|------------|----------|-------------|-----|
| 2   | A     | 168/184 (91%)  | 166 (99%)  | 2 (1%)   | 67          | 89  |
| 3   | B     | 182/198 (92%)  | 178 (98%)  | 4 (2%)   | 47          | 78  |
| 4   | C     | 51/58 (88%)    | 50 (98%)   | 1 (2%)   | 50          | 79  |
| 5   | D     | 147/158 (93%)  | 147 (100%) | 0        | 100         | 100 |
| 6   | E     | 214/215 (100%) | 213 (100%) | 1 (0%)   | 86          | 96  |
| 7   | F     | 180/184 (98%)  | 180 (100%) | 0        | 100         | 100 |
| 8   | G     | 186/187 (100%) | 183 (98%)  | 3 (2%)   | 58          | 84  |
| 9   | H     | 166/167 (99%)  | 164 (99%)  | 2 (1%)   | 67          | 89  |
| 10  | I     | 113/114 (99%)  | 112 (99%)  | 1 (1%)   | 75          | 92  |
| 11  | J     | 104/110 (94%)  | 104 (100%) | 0        | 100         | 100 |
| 12  | K     | 109/113 (96%)  | 106 (97%)  | 3 (3%)   | 38          | 73  |
| 13  | L     | 93/94 (99%)    | 89 (96%)   | 4 (4%)   | 25          | 57  |
| 14  | N     | 122/123 (99%)  | 120 (98%)  | 2 (2%)   | 58          | 84  |
| 15  | O     | 121/142 (85%)  | 118 (98%)  | 3 (2%)   | 42          | 75  |
| 16  | Q     | 125/129 (97%)  | 125 (100%) | 0        | 100         | 100 |
| 17  | R     | 101/102 (99%)  | 101 (100%) | 0        | 100         | 100 |
| 18  | S     | 63/75 (84%)    | 58 (92%)   | 5 (8%)   | 10          | 30  |
| 19  | T     | 116/126 (92%)  | 112 (97%)  | 4 (3%)   | 32          | 67  |
| 20  | U     | 134/138 (97%)  | 131 (98%)  | 3 (2%)   | 47          | 78  |
| 21  | V     | 92/99 (93%)    | 90 (98%)   | 2 (2%)   | 47          | 78  |
| 22  | W     | 57/58 (98%)    | 55 (96%)   | 2 (4%)   | 31          | 66  |
| 23  | X     | 58/73 (80%)    | 55 (95%)   | 3 (5%)   | 19          | 50  |
| 24  | Y     | 43/65 (66%)    | 42 (98%)   | 1 (2%)   | 45          | 77  |
| 25  | Z     | 163/195 (84%)  | 158 (97%)  | 5 (3%)   | 35          | 70  |
| 26  | 3     | 97/105 (92%)   | 93 (96%)   | 4 (4%)   | 26          | 60  |
| 27  | c     | 95/96 (99%)    | 92 (97%)   | 3 (3%)   | 34          | 69  |

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| Mol | Chain | Analysed        | Rotameric  | Outliers | Percentiles |     |
|-----|-------|-----------------|------------|----------|-------------|-----|
| 28  | d     | 62/65 (95%)     | 58 (94%)   | 4 (6%)   | 14          | 40  |
| 29  | e     | 40/46 (87%)     | 39 (98%)   | 1 (2%)   | 42          | 75  |
| 31  | a     | 61/62 (98%)     | 54 (88%)   | 7 (12%)  | 4           | 15  |
| 32  | P     | 45/46 (98%)     | 45 (100%)  | 0        | 100         | 100 |
| 33  | b     | 77/79 (98%)     | 76 (99%)   | 1 (1%)   | 65          | 88  |
| 35  | M     | 93/98 (95%)     | 89 (96%)   | 4 (4%)   | 25          | 57  |
| All | All   | 3478/3704 (94%) | 3403 (98%) | 75 (2%)  | 47          | 78  |

All (75) residues with a non-rotameric sidechain are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 2   | A     | 49  | VAL  |
| 2   | A     | 87  | GLU  |
| 3   | B     | 28  | GLU  |
| 3   | B     | 32  | ILE  |
| 3   | B     | 191 | ARG  |
| 3   | B     | 215 | ASP  |
| 4   | C     | 31  | GLU  |
| 6   | E     | 187 | VAL  |
| 8   | G     | 41  | VAL  |
| 8   | G     | 56  | VAL  |
| 8   | G     | 71  | LYS  |
| 9   | H     | 119 | TYR  |
| 9   | H     | 154 | ASN  |
| 10  | I     | 110 | SER  |
| 12  | K     | 90  | LEU  |
| 12  | K     | 99  | LEU  |
| 12  | K     | 111 | LEU  |
| 13  | L     | 11  | SER  |
| 13  | L     | 75  | ASP  |
| 13  | L     | 99  | ILE  |
| 13  | L     | 101 | LEU  |
| 14  | N     | 64  | GLN  |
| 14  | N     | 101 | ASP  |
| 15  | O     | 19  | THR  |
| 15  | O     | 20  | MET  |
| 15  | O     | 142 | ILE  |
| 18  | S     | 3   | ASN  |
| 18  | S     | 8   | ASP  |
| 18  | S     | 35  | VAL  |

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| <b>Mol</b> | <b>Chain</b> | <b>Res</b> | <b>Type</b> |
|------------|--------------|------------|-------------|
| 18         | S            | 61         | MET         |
| 18         | S            | 63         | GLU         |
| 19         | T            | 31         | ILE         |
| 19         | T            | 43         | LYS         |
| 19         | T            | 76         | ASN         |
| 19         | T            | 102        | THR         |
| 20         | U            | 11         | VAL         |
| 20         | U            | 14         | ASP         |
| 20         | U            | 103        | VAL         |
| 21         | V            | 21         | MET         |
| 21         | V            | 47         | ASP         |
| 22         | W            | 38         | VAL         |
| 22         | W            | 62         | VAL         |
| 23         | X            | 30         | THR         |
| 23         | X            | 37         | THR         |
| 23         | X            | 72         | THR         |
| 24         | Y            | 39         | LYS         |
| 25         | Z            | 82         | THR         |
| 25         | Z            | 91         | LEU         |
| 25         | Z            | 127        | LEU         |
| 25         | Z            | 157        | GLN         |
| 25         | Z            | 191        | ASP         |
| 26         | 3            | 19         | VAL         |
| 26         | 3            | 72         | GLU         |
| 26         | 3            | 77         | TYR         |
| 26         | 3            | 88         | GLU         |
| 27         | c            | 9          | ILE         |
| 27         | c            | 54         | LYS         |
| 27         | c            | 103        | LEU         |
| 28         | d            | 5          | LYS         |
| 28         | d            | 17         | ASN         |
| 28         | d            | 26         | GLU         |
| 28         | d            | 44         | SER         |
| 29         | e            | 13         | VAL         |
| 31         | a            | 26         | ARG         |
| 31         | a            | 33         | ASP         |
| 31         | a            | 35         | LEU         |
| 31         | a            | 37         | LYS         |
| 31         | a            | 43         | LYS         |
| 31         | a            | 71         | ILE         |
| 31         | a            | 72         | LEU         |
| 33         | b            | 24         | ASP         |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 35  | M     | 23  | LEU  |
| 35  | M     | 28  | LEU  |
| 35  | M     | 84  | TYR  |
| 35  | M     | 119 | ASP  |

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (34) such sidechains are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 2   | A     | 86  | HIS  |
| 2   | A     | 105 | ASN  |
| 3   | B     | 187 | ASN  |
| 5   | D     | 99  | GLN  |
| 5   | D     | 121 | GLN  |
| 6   | E     | 19  | GLN  |
| 6   | E     | 58  | HIS  |
| 8   | G     | 188 | ASN  |
| 9   | H     | 5   | ASN  |
| 9   | H     | 47  | HIS  |
| 9   | H     | 71  | ASN  |
| 9   | H     | 95  | GLN  |
| 9   | H     | 172 | ASN  |
| 11  | J     | 52  | ASN  |
| 12  | K     | 78  | GLN  |
| 13  | L     | 100 | GLN  |
| 14  | N     | 130 | ASN  |
| 15  | O     | 14  | GLN  |
| 15  | O     | 121 | HIS  |
| 16  | Q     | 2   | ASN  |
| 16  | Q     | 55  | GLN  |
| 18  | S     | 31  | ASN  |
| 21  | V     | 22  | GLN  |
| 22  | W     | 23  | ASN  |
| 24  | Y     | 50  | HIS  |
| 24  | Y     | 51  | HIS  |
| 25  | Z     | 3   | ASN  |
| 27  | c     | 91  | GLN  |
| 27  | c     | 100 | ASN  |
| 31  | a     | 5   | ASN  |
| 31  | a     | 25  | ASN  |
| 35  | M     | 13  | HIS  |
| 35  | M     | 18  | GLN  |
| 35  | M     | 60  | ASN  |

## 5.3.3 RNA ⓘ

| Mol | Chain | Analysed        | Backbone Outliers | Pucker Outliers |
|-----|-------|-----------------|-------------------|-----------------|
| 1   | 2     | 1439/1497 (96%) | 233 (16%)         | 4 (0%)          |
| 30  | 4     | 76/77 (98%)     | 15 (19%)          | 1 (1%)          |
| 34  | 5     | 1/14 (7%)       | 1 (100%)          | 0               |
| All | All   | 1516/1588 (95%) | 249 (16%)         | 5 (0%)          |

All (249) RNA backbone outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | 2     | 3   | U    |
| 1   | 2     | 33  | U    |
| 1   | 2     | 34  | C    |
| 1   | 2     | 43  | G    |
| 1   | 2     | 44  | C    |
| 1   | 2     | 45  | U    |
| 1   | 2     | 47  | A    |
| 1   | 2     | 60  | G    |
| 1   | 2     | 68  | C    |
| 1   | 2     | 70  | G    |
| 1   | 2     | 71  | G    |
| 1   | 2     | 72  | G    |
| 1   | 2     | 73  | C    |
| 1   | 2     | 74  | A    |
| 1   | 2     | 75  | A    |
| 1   | 2     | 76  | G    |
| 1   | 2     | 89  | A    |
| 1   | 2     | 99  | A    |
| 1   | 2     | 101 | C    |
| 1   | 2     | 110 | A    |
| 1   | 2     | 111 | A    |
| 1   | 2     | 112 | C    |
| 1   | 2     | 115 | A    |
| 1   | 2     | 122 | G    |
| 1   | 2     | 125 | G    |
| 1   | 2     | 138 | G    |
| 1   | 2     | 193 | A    |
| 1   | 2     | 195 | A    |
| 1   | 2     | 196 | G    |
| 1   | 2     | 208 | A    |
| 1   | 2     | 209 | U    |
| 1   | 2     | 211 | C    |
| 1   | 2     | 212 | C    |

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| <b>Mol</b> | <b>Chain</b> | <b>Res</b> | <b>Type</b> |
|------------|--------------|------------|-------------|
| 1          | 2            | 213        | C           |
| 1          | 2            | 214        | C           |
| 1          | 2            | 215        | G           |
| 1          | 2            | 225        | G           |
| 1          | 2            | 245        | C           |
| 1          | 2            | 246        | OMC         |
| 1          | 2            | 248        | A           |
| 1          | 2            | 250        | C           |
| 1          | 2            | 252        | G           |
| 1          | 2            | 256        | G           |
| 1          | 2            | 258        | U           |
| 1          | 2            | 267        | A           |
| 1          | 2            | 271        | G           |
| 1          | 2            | 272        | C           |
| 1          | 2            | 286        | A           |
| 1          | 2            | 294        | G           |
| 1          | 2            | 311        | A           |
| 1          | 2            | 320        | U           |
| 1          | 2            | 321        | U           |
| 1          | 2            | 333        | C           |
| 1          | 2            | 334        | A           |
| 1          | 2            | 335        | A           |
| 1          | 2            | 336        | G           |
| 1          | 2            | 349        | A           |
| 1          | 2            | 357        | C           |
| 1          | 2            | 358        | A           |
| 1          | 2            | 359        | C           |
| 1          | 2            | 372        | G           |
| 1          | 2            | 377        | C           |
| 1          | 2            | 378        | A           |
| 1          | 2            | 389        | G           |
| 1          | 2            | 395        | G           |
| 1          | 2            | 398        | C           |
| 1          | 2            | 402        | A           |
| 1          | 2            | 411        | G           |
| 1          | 2            | 417        | G           |
| 1          | 2            | 418        | U           |
| 1          | 2            | 420        | A           |
| 1          | 2            | 421        | G           |
| 1          | 2            | 429        | U           |
| 1          | 2            | 453        | A           |
| 1          | 2            | 454        | A           |

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| <b>Mol</b> | <b>Chain</b> | <b>Res</b> | <b>Type</b> |
|------------|--------------|------------|-------------|
| 1          | 2            | 470        | U           |
| 1          | 2            | 471        | C           |
| 1          | 2            | 477        | U           |
| 1          | 2            | 480        | G           |
| 1          | 2            | 489        | G           |
| 1          | 2            | 491        | A           |
| 1          | 2            | 506        | A           |
| 1          | 2            | 523        | C           |
| 1          | 2            | 531        | A           |
| 1          | 2            | 532        | A           |
| 1          | 2            | 535        | C           |
| 1          | 2            | 536        | G           |
| 1          | 2            | 555        | A           |
| 1          | 2            | 569        | G           |
| 1          | 2            | 601        | A           |
| 1          | 2            | 609        | G           |
| 1          | 2            | 612        | A           |
| 1          | 2            | 624        | A           |
| 1          | 2            | 634        | U           |
| 1          | 2            | 646        | A           |
| 1          | 2            | 647        | G           |
| 1          | 2            | 677        | A           |
| 1          | 2            | 682        | U           |
| 1          | 2            | 707        | G           |
| 1          | 2            | 708        | C           |
| 1          | 2            | 714        | G           |
| 1          | 2            | 740        | A           |
| 1          | 2            | 741        | A           |
| 1          | 2            | 751        | A           |
| 1          | 2            | 752        | U           |
| 1          | 2            | 753        | A           |
| 1          | 2            | 774        | A           |
| 1          | 2            | 776        | C           |
| 1          | 2            | 802        | U           |
| 1          | 2            | 806        | A           |
| 1          | 2            | 828        | A           |
| 1          | 2            | 835        | A           |
| 1          | 2            | 853        | G           |
| 1          | 2            | 865        | OMG         |
| 1          | 2            | 877        | A           |
| 1          | 2            | 889        | G           |
| 1          | 2            | 897        | C           |

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| <b>Mol</b> | <b>Chain</b> | <b>Res</b> | <b>Type</b> |
|------------|--------------|------------|-------------|
| 1          | 2            | 924        | U           |
| 1          | 2            | 930        | C4J         |
| 1          | 2            | 931        | C           |
| 1          | 2            | 933        | A           |
| 1          | 2            | 935        | G           |
| 1          | 2            | 939        | G           |
| 1          | 2            | 941        | A           |
| 1          | 2            | 946        | U           |
| 1          | 2            | 954        | G           |
| 1          | 2            | 957        | A           |
| 1          | 2            | 958        | C           |
| 1          | 2            | 960        | G           |
| 1          | 2            | 966        | U           |
| 1          | 2            | 967        | G           |
| 1          | 2            | 979        | A           |
| 1          | 2            | 980        | A           |
| 1          | 2            | 982        | G           |
| 1          | 2            | 983        | A           |
| 1          | 2            | 988        | G           |
| 1          | 2            | 989        | C           |
| 1          | 2            | 990        | C           |
| 1          | 2            | 991        | U           |
| 1          | 2            | 992        | G           |
| 1          | 2            | 995        | U           |
| 1          | 2            | 996        | C           |
| 1          | 2            | 997        | G           |
| 1          | 2            | 1002       | G           |
| 1          | 2            | 1023       | C           |
| 1          | 2            | 1051       | G           |
| 1          | 2            | 1052       | U           |
| 1          | 2            | 1058       | A           |
| 1          | 2            | 1059       | A           |
| 1          | 2            | 1080       | A           |
| 1          | 2            | 1081       | G           |
| 1          | 2            | 1094       | U           |
| 1          | 2            | 1095       | C           |
| 1          | 2            | 1096       | U           |
| 1          | 2            | 1097       | C           |
| 1          | 2            | 1098       | C           |
| 1          | 2            | 1099       | G           |
| 1          | 2            | 1101       | G           |
| 1          | 2            | 1103       | C           |

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| <b>Mol</b> | <b>Chain</b> | <b>Res</b> | <b>Type</b> |
|------------|--------------|------------|-------------|
| 1          | 2            | 1106       | G           |
| 1          | 2            | 1107       | A           |
| 1          | 2            | 1113       | C           |
| 1          | 2            | 1118       | G           |
| 1          | 2            | 1121       | A           |
| 1          | 2            | 1123       | U           |
| 1          | 2            | 1147       | G           |
| 1          | 2            | 1157       | G           |
| 1          | 2            | 1159       | A           |
| 1          | 2            | 1160       | G           |
| 1          | 2            | 1164       | A           |
| 1          | 2            | 1175       | A           |
| 1          | 2            | 1176       | A           |
| 1          | 2            | 1187       | C           |
| 1          | 2            | 1188       | G           |
| 1          | 2            | 1189       | C           |
| 1          | 2            | 1190       | A           |
| 1          | 2            | 1201       | A           |
| 1          | 2            | 1211       | A           |
| 1          | 2            | 1220       | U           |
| 1          | 2            | 1221       | U           |
| 1          | 2            | 1222       | C           |
| 1          | 2            | 1226       | C           |
| 1          | 2            | 1244       | A           |
| 1          | 2            | 1248       | C           |
| 1          | 2            | 1249       | U           |
| 1          | 2            | 1251       | A           |
| 1          | 2            | 1253       | A           |
| 1          | 2            | 1258       | G           |
| 1          | 2            | 1263       | A           |
| 1          | 2            | 1264       | G           |
| 1          | 2            | 1265       | U           |
| 1          | 2            | 1267       | G           |
| 1          | 2            | 1269       | G           |
| 1          | 2            | 1270       | A           |
| 1          | 2            | 1281       | A           |
| 1          | 2            | 1284       | C           |
| 1          | 2            | 1286       | C           |
| 1          | 2            | 1300       | A           |
| 1          | 2            | 1309       | U           |
| 1          | 2            | 1317       | G           |
| 1          | 2            | 1328       | A           |

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| <b>Mol</b> | <b>Chain</b> | <b>Res</b> | <b>Type</b> |
|------------|--------------|------------|-------------|
| 1          | 2            | 1334       | G           |
| 1          | 2            | 1337       | G           |
| 1          | 2            | 1338       | A           |
| 1          | 2            | 1358       | A           |
| 1          | 2            | 1361       | C           |
| 1          | 2            | 1375       | C           |
| 1          | 2            | 1376       | C           |
| 1          | 2            | 1381       | G           |
| 1          | 2            | 1437       | G           |
| 1          | 2            | 1440       | A           |
| 1          | 2            | 1441       | G           |
| 1          | 2            | 1443       | G           |
| 1          | 2            | 1444       | G           |
| 1          | 2            | 1449       | A           |
| 1          | 2            | 1450       | A           |
| 1          | 2            | 1451       | G           |
| 1          | 2            | 1452       | U           |
| 1          | 2            | 1454       | G           |
| 1          | 2            | 1455       | U           |
| 1          | 2            | 1456       | A           |
| 1          | 2            | 1459       | A           |
| 1          | 2            | 1460       | A           |
| 1          | 2            | 1461       | G           |
| 1          | 2            | 1463       | U           |
| 1          | 2            | 1474       | G           |
| 1          | 2            | 1486       | G           |
| 1          | 2            | 1487       | G           |
| 1          | 2            | 1488       | A           |
| 1          | 2            | 1489       | U           |
| 1          | 2            | 1490       | C           |
| 1          | 2            | 1491       | A           |
| 1          | 2            | 1493       | C           |
| 30         | 4            | 2          | G           |
| 30         | 4            | 8          | 4SU         |
| 30         | 4            | 10         | G           |
| 30         | 4            | 16         | C           |
| 30         | 4            | 17(A)      | U           |
| 30         | 4            | 18         | G           |
| 30         | 4            | 20         | H2U         |
| 30         | 4            | 21         | A           |
| 30         | 4            | 22         | G           |
| 30         | 4            | 46         | A           |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 30  | 4     | 47  | U    |
| 30  | 4     | 49  | G    |
| 30  | 4     | 61  | C    |
| 30  | 4     | 74  | C    |
| 30  | 4     | 75  | C    |
| 34  | 5     | 3   | G    |

All (5) RNA pucker outliers are listed below:

| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 1   | 2     | 44   | C    |
| 1   | 2     | 979  | A    |
| 1   | 2     | 1188 | G    |
| 1   | 2     | 1436 | U    |
| 30  | 4     | 74   | C    |

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

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

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

| Mol | Type | Chain | Res  | Link | Bond lengths |      |             | Bond angles |      |             |
|-----|------|-------|------|------|--------------|------|-------------|-------------|------|-------------|
|     |      |       |      |      | Counts       | RMSZ | # $ Z  > 2$ | Counts      | RMSZ | # $ Z  > 2$ |
| 30  | H2U  | 4     | 20   | 30   | 18,21,22     | 0.30 | 0           | 21,30,33    | 0.44 | 0           |
| 1   | OMG  | 2     | 337  | 1    | 18,26,27     | 0.97 | 1 (5%)      | 19,38,41    | 1.17 | 2 (10%)     |
| 1   | OMU  | 2     | 1344 | 1    | 19,22,23     | 1.22 | 3 (15%)     | 26,31,34    | 1.67 | 6 (23%)     |
| 1   | OMG  | 2     | 1018 | 1    | 18,26,27     | 0.98 | 1 (5%)      | 19,38,41    | 1.08 | 2 (10%)     |
| 1   | 4AC  | 2     | 1477 | 1    | 21,24,25     | 1.03 | 2 (9%)      | 29,34,37    | 1.60 | 7 (24%)     |
| 1   | OMC  | 2     | 113  | 1    | 19,22,23     | 0.86 | 1 (5%)      | 26,31,34    | 0.86 | 0           |
| 30  | 4SU  | 4     | 8    | 30   | 18,21,22     | 0.28 | 0           | 26,30,33    | 0.35 | 0           |
| 1   | OMU  | 2     | 15   | 1    | 19,22,23     | 1.35 | 4 (21%)     | 26,31,34    | 1.82 | 5 (19%)     |
| 1   | OMC  | 2     | 246  | 1    | 19,22,23     | 0.88 | 1 (5%)      | 26,31,34    | 1.03 | 1 (3%)      |
| 1   | OMC  | 2     | 481  | 1    | 19,22,23     | 0.94 | 1 (5%)      | 26,31,34    | 1.05 | 3 (11%)     |
| 1   | OMG  | 2     | 865  | 1    | 18,26,27     | 0.96 | 1 (5%)      | 19,38,41    | 1.10 | 2 (10%)     |

| Mol | Type | Chain | Res  | Link | Bond lengths |      |          | Bond angles |      |          |
|-----|------|-------|------|------|--------------|------|----------|-------------|------|----------|
|     |      |       |      |      | Counts       | RMSZ | # Z  > 2 | Counts      | RMSZ | # Z  > 2 |
| 1   | MA6  | 2     | 1475 | 1    | 18,26,27     | 0.94 | 1 (5%)   | 19,38,41    | 1.26 | 3 (15%)  |
| 30  | PSU  | 4     | 55   | 30   | 18,21,22     | 1.31 | 2 (11%)  | 22,30,33    | 1.89 | 3 (13%)  |
| 1   | OMC  | 2     | 710  | 1    | 19,22,23     | 0.88 | 2 (10%)  | 26,31,34    | 0.79 | 0        |
| 1   | OMC  | 2     | 1060 | 1    | 19,22,23     | 0.85 | 1 (5%)   | 26,31,34    | 0.73 | 0        |
| 1   | OMU  | 2     | 1032 | 1    | 19,22,23     | 1.29 | 3 (15%)  | 26,31,34    | 1.74 | 4 (15%)  |
| 30  | OMC  | 4     | 32   | 30   | 19,22,23     | 0.84 | 0        | 26,31,34    | 1.04 | 2 (7%)   |
| 30  | 5MU  | 4     | 54   | 30   | 19,22,23     | 1.39 | 5 (26%)  | 28,32,35    | 2.10 | 8 (28%)  |
| 1   | OMC  | 2     | 512  | 1    | 19,22,23     | 0.86 | 2 (10%)  | 26,31,34    | 0.86 | 0        |
| 1   | C4J  | 2     | 930  | 1    | 24,29,30     | 0.65 | 1 (4%)   | 29,42,45    | 0.55 | 0        |
| 1   | OMG  | 2     | 905  | 1    | 18,26,27     | 0.97 | 1 (5%)   | 19,38,41    | 1.10 | 2 (10%)  |
| 1   | 4AC  | 2     | 1467 | 1    | 21,24,25     | 1.04 | 2 (9%)   | 29,34,37    | 1.27 | 4 (13%)  |
| 1   | OMU  | 2     | 52   | 1    | 19,22,23     | 1.28 | 3 (15%)  | 26,31,34    | 1.75 | 5 (19%)  |
| 1   | 4AC  | 2     | 843  | 1    | 21,24,25     | 1.11 | 3 (14%)  | 29,34,37    | 1.39 | 4 (13%)  |
| 1   | OMG  | 2     | 926  | 1    | 18,26,27     | 0.96 | 1 (5%)   | 19,38,41    | 1.12 | 2 (10%)  |
| 1   | OMG  | 2     | 546  | 1    | 18,26,27     | 0.98 | 1 (5%)   | 19,38,41    | 1.14 | 2 (10%)  |
| 1   | OMG  | 2     | 1061 | 1    | 18,26,27     | 0.98 | 1 (5%)   | 19,38,41    | 1.13 | 2 (10%)  |
| 1   | OMG  | 2     | 672  | 1    | 18,26,27     | 0.98 | 1 (5%)   | 19,38,41    | 1.07 | 2 (10%)  |
| 1   | 6MZ  | 2     | 1457 | 1,37 | 18,25,26     | 0.82 | 1 (5%)   | 16,36,39    | 2.10 | 3 (18%)  |
| 1   | OMG  | 2     | 1194 | 1    | 18,26,27     | 0.94 | 1 (5%)   | 19,38,41    | 1.11 | 2 (10%)  |
| 1   | 5MC  | 2     | 1368 | 1    | 18,22,23     | 0.92 | 2 (11%)  | 26,32,35    | 1.05 | 2 (7%)   |
| 1   | OMC  | 2     | 538  | 1    | 19,22,23     | 0.88 | 2 (10%)  | 26,31,34    | 0.87 | 1 (3%)   |
| 1   | OMC  | 2     | 313  | 1    | 19,22,23     | 0.89 | 2 (10%)  | 26,31,34    | 0.95 | 1 (3%)   |
| 1   | OMG  | 2     | 399  | 1    | 18,26,27     | 1.00 | 1 (5%)   | 19,38,41    | 1.15 | 3 (15%)  |
| 1   | 4AC  | 2     | 1466 | 1    | 21,24,25     | 1.03 | 2 (9%)   | 29,34,37    | 1.30 | 4 (13%)  |
| 1   | A2M  | 2     | 494  | 1    | 18,25,26     | 0.93 | 1 (5%)   | 18,36,39    | 1.32 | 2 (11%)  |
| 1   | OMC  | 2     | 1366 | 1    | 19,22,23     | 0.81 | 0        | 26,31,34    | 0.74 | 0        |
| 1   | 4AC  | 2     | 1478 | 1    | 21,24,25     | 1.03 | 2 (9%)   | 29,34,37    | 1.35 | 4 (13%)  |

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   |
|-----|------|-------|-----|------|---------|-----------|---------|
| 30  | H2U  | 4     | 20  | 30   | -       | 3/7/38/39 | 0/2/2/2 |
| 1   | OMG  | 2     | 337 | 1    | -       | 1/5/27/28 | 0/3/3/3 |

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| Mol | Type | Chain | Res  | Link | Chirals | Torsions   | Rings   |
|-----|------|-------|------|------|---------|------------|---------|
| 1   | OMU  | 2     | 1344 | 1    | -       | 0/9/27/28  | 0/2/2/2 |
| 1   | OMG  | 2     | 1018 | 1    | -       | 0/5/27/28  | 0/3/3/3 |
| 1   | 4AC  | 2     | 1477 | 1    | -       | 2/11/29/30 | 0/2/2/2 |
| 1   | OMC  | 2     | 113  | 1    | -       | 0/9/27/28  | 0/2/2/2 |
| 30  | 4SU  | 4     | 8    | 30   | -       | 0/7/25/26  | 0/2/2/2 |
| 1   | OMU  | 2     | 15   | 1    | -       | 0/9/27/28  | 0/2/2/2 |
| 1   | OMC  | 2     | 246  | 1    | -       | 3/9/27/28  | 0/2/2/2 |
| 1   | OMC  | 2     | 481  | 1    | -       | 0/9/27/28  | 0/2/2/2 |
| 1   | OMG  | 2     | 865  | 1    | -       | 3/5/27/28  | 0/3/3/3 |
| 1   | MA6  | 2     | 1475 | 1    | -       | 0/7/29/30  | 0/3/3/3 |
| 30  | PSU  | 4     | 55   | 30   | -       | 1/7/25/26  | 0/2/2/2 |
| 1   | OMC  | 2     | 710  | 1    | -       | 0/9/27/28  | 0/2/2/2 |
| 1   | OMC  | 2     | 1060 | 1    | -       | 0/9/27/28  | 0/2/2/2 |
| 1   | OMU  | 2     | 1032 | 1    | -       | 0/9/27/28  | 0/2/2/2 |
| 30  | OMC  | 4     | 32   | 30   | -       | 4/9/27/28  | 0/2/2/2 |
| 30  | 5MU  | 4     | 54   | 30   | -       | 0/7/25/26  | 0/2/2/2 |
| 1   | OMC  | 2     | 512  | 1    | -       | 0/9/27/28  | 0/2/2/2 |
| 1   | C4J  | 2     | 930  | 1    | -       | 3/16/34/35 | 0/2/2/2 |
| 1   | OMG  | 2     | 905  | 1    | -       | 0/5/27/28  | 0/3/3/3 |
| 1   | 4AC  | 2     | 1467 | 1    | -       | 0/11/29/30 | 0/2/2/2 |
| 1   | OMU  | 2     | 52   | 1    | -       | 0/9/27/28  | 0/2/2/2 |
| 1   | 4AC  | 2     | 843  | 1    | -       | 0/11/29/30 | 0/2/2/2 |
| 1   | OMG  | 2     | 926  | 1    | -       | 1/5/27/28  | 0/3/3/3 |
| 1   | OMG  | 2     | 546  | 1    | -       | 0/5/27/28  | 0/3/3/3 |
| 1   | OMG  | 2     | 1061 | 1    | -       | 0/5/27/28  | 0/3/3/3 |
| 1   | OMG  | 2     | 672  | 1    | -       | 0/5/27/28  | 0/3/3/3 |
| 1   | 6MZ  | 2     | 1457 | 1,37 | -       | 0/5/27/28  | 0/3/3/3 |
| 1   | OMG  | 2     | 1194 | 1    | -       | 0/5/27/28  | 0/3/3/3 |
| 1   | 5MC  | 2     | 1368 | 1    | -       | 0/7/25/26  | 0/2/2/2 |
| 1   | OMC  | 2     | 538  | 1    | -       | 0/9/27/28  | 0/2/2/2 |
| 1   | OMC  | 2     | 313  | 1    | -       | 1/9/27/28  | 0/2/2/2 |
| 1   | OMG  | 2     | 399  | 1    | -       | 0/5/27/28  | 0/3/3/3 |
| 1   | 4AC  | 2     | 1466 | 1    | -       | 0/11/29/30 | 0/2/2/2 |
| 1   | A2M  | 2     | 494  | 1    | -       | 0/5/27/28  | 0/3/3/3 |
| 1   | OMC  | 2     | 1366 | 1    | -       | 0/9/27/28  | 0/2/2/2 |
| 1   | 4AC  | 2     | 1478 | 1    | -       | 0/11/29/30 | 0/2/2/2 |

All (59) bond length outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z     | Observed(Å) | Ideal(Å) |
|-----|-------|-----|------|-------|-------|-------------|----------|
| 1   | 2     | 15  | OMU  | C4-N3 | -3.15 | 1.32        | 1.38     |

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| Mol | Chain | Res  | Type | Atoms   | Z     | Observed(Å) | Ideal(Å) |
|-----|-------|------|------|---------|-------|-------------|----------|
| 1   | 2     | 399  | OMG  | C6-N1   | -3.13 | 1.33        | 1.37     |
| 30  | 4     | 55   | PSU  | C6-C5   | 3.12  | 1.39        | 1.35     |
| 1   | 2     | 1018 | OMG  | C6-N1   | -3.01 | 1.33        | 1.37     |
| 1   | 2     | 1061 | OMG  | C6-N1   | -3.00 | 1.33        | 1.37     |
| 1   | 2     | 672  | OMG  | C6-N1   | -2.99 | 1.33        | 1.37     |
| 1   | 2     | 1032 | OMU  | C4-N3   | -2.99 | 1.33        | 1.38     |
| 1   | 2     | 337  | OMG  | C6-N1   | -2.97 | 1.33        | 1.37     |
| 1   | 2     | 546  | OMG  | C6-N1   | -2.93 | 1.33        | 1.37     |
| 1   | 2     | 843  | 4AC  | C4-N3   | -2.91 | 1.27        | 1.32     |
| 1   | 2     | 865  | OMG  | C6-N1   | -2.89 | 1.33        | 1.37     |
| 1   | 2     | 52   | OMU  | C4-N3   | -2.86 | 1.33        | 1.38     |
| 1   | 2     | 905  | OMG  | C6-N1   | -2.84 | 1.33        | 1.37     |
| 1   | 2     | 15   | OMU  | C2-N3   | -2.82 | 1.32        | 1.38     |
| 1   | 2     | 926  | OMG  | C6-N1   | -2.78 | 1.33        | 1.37     |
| 1   | 2     | 1467 | 4AC  | C4-N3   | -2.71 | 1.28        | 1.32     |
| 1   | 2     | 1194 | OMG  | C6-N1   | -2.71 | 1.33        | 1.37     |
| 30  | 4     | 54   | 5MU  | C6-C5   | 2.63  | 1.38        | 1.34     |
| 30  | 4     | 55   | PSU  | C4-N3   | -2.61 | 1.34        | 1.38     |
| 1   | 2     | 52   | OMU  | C2-N3   | -2.60 | 1.33        | 1.38     |
| 1   | 2     | 1478 | 4AC  | C5-C4   | 2.58  | 1.46        | 1.40     |
| 1   | 2     | 1344 | OMU  | C4-N3   | -2.58 | 1.33        | 1.38     |
| 1   | 2     | 843  | 4AC  | C5-C4   | 2.58  | 1.46        | 1.40     |
| 1   | 2     | 930  | C4J  | O4'-C1' | -2.57 | 1.40        | 1.43     |
| 1   | 2     | 1467 | 4AC  | C5-C4   | 2.56  | 1.46        | 1.40     |
| 1   | 2     | 1032 | OMU  | C2-N3   | -2.56 | 1.33        | 1.38     |
| 1   | 2     | 1466 | 4AC  | C4-N3   | -2.55 | 1.28        | 1.32     |
| 1   | 2     | 1478 | 4AC  | C4-N3   | -2.55 | 1.28        | 1.32     |
| 30  | 4     | 54   | 5MU  | C4-N3   | -2.54 | 1.34        | 1.38     |
| 1   | 2     | 1466 | 4AC  | C5-C4   | 2.54  | 1.46        | 1.40     |
| 1   | 2     | 1368 | 5MC  | C6-N1   | -2.52 | 1.33        | 1.38     |
| 1   | 2     | 15   | OMU  | C5-C4   | -2.50 | 1.38        | 1.43     |
| 1   | 2     | 1477 | 4AC  | C5-C4   | 2.44  | 1.46        | 1.40     |
| 1   | 2     | 1477 | 4AC  | C4-N3   | -2.38 | 1.28        | 1.32     |
| 30  | 4     | 54   | 5MU  | C4-C5   | 2.38  | 1.48        | 1.44     |
| 1   | 2     | 1475 | MA6  | C5-C4   | 2.36  | 1.47        | 1.40     |
| 1   | 2     | 1457 | 6MZ  | C5-C4   | 2.32  | 1.47        | 1.40     |
| 1   | 2     | 1344 | OMU  | C2-N3   | -2.31 | 1.33        | 1.38     |
| 1   | 2     | 1032 | OMU  | C5-C4   | -2.31 | 1.38        | 1.43     |
| 1   | 2     | 1368 | 5MC  | C6-C5   | 2.31  | 1.38        | 1.34     |
| 30  | 4     | 54   | 5MU  | C6-N1   | -2.28 | 1.34        | 1.38     |
| 1   | 2     | 52   | OMU  | C5-C4   | -2.27 | 1.38        | 1.43     |
| 30  | 4     | 54   | 5MU  | C2-N1   | 2.25  | 1.42        | 1.38     |

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| Mol | Chain | Res  | Type | Atoms | Z     | Observed(Å) | Ideal(Å) |
|-----|-------|------|------|-------|-------|-------------|----------|
| 1   | 2     | 1344 | OMU  | C5-C4 | -2.24 | 1.38        | 1.43     |
| 1   | 2     | 843  | 4AC  | C4-N4 | -2.11 | 1.36        | 1.39     |
| 1   | 2     | 538  | OMC  | C6-N1 | -2.11 | 1.32        | 1.38     |
| 1   | 2     | 313  | OMC  | C6-N1 | -2.10 | 1.32        | 1.38     |
| 1   | 2     | 246  | OMC  | C5-C4 | -2.09 | 1.38        | 1.42     |
| 1   | 2     | 494  | A2M  | C5-C4 | 2.09  | 1.46        | 1.40     |
| 1   | 2     | 15   | OMU  | C6-N1 | -2.07 | 1.33        | 1.38     |
| 1   | 2     | 481  | OMC  | C6-N1 | -2.07 | 1.33        | 1.38     |
| 1   | 2     | 313  | OMC  | C5-C4 | -2.07 | 1.38        | 1.42     |
| 1   | 2     | 512  | OMC  | C5-C4 | -2.05 | 1.38        | 1.42     |
| 1   | 2     | 538  | OMC  | C5-C4 | -2.05 | 1.38        | 1.42     |
| 1   | 2     | 113  | OMC  | C6-N1 | -2.03 | 1.33        | 1.38     |
| 1   | 2     | 710  | OMC  | C5-C4 | -2.03 | 1.38        | 1.42     |
| 1   | 2     | 1060 | OMC  | C6-N1 | -2.02 | 1.33        | 1.38     |
| 1   | 2     | 512  | OMC  | C6-N1 | -2.02 | 1.33        | 1.38     |
| 1   | 2     | 710  | OMC  | C6-N1 | -2.02 | 1.33        | 1.38     |

All (93) bond angle outliers are listed below:

| Mol | Chain | Res  | Type | Atoms    | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|----------|-------|-------------|----------|
| 1   | 2     | 1457 | 6MZ  | C2-N1-C6 | 6.67  | 122.31      | 116.59   |
| 30  | 4     | 55   | PSU  | N1-C2-N3 | 5.78  | 121.67      | 115.13   |
| 30  | 4     | 54   | 5MU  | C4-N3-C2 | -5.17 | 120.66      | 127.35   |
| 1   | 2     | 15   | OMU  | C4-N3-C2 | -4.88 | 120.14      | 126.58   |
| 30  | 4     | 54   | 5MU  | N3-C2-N1 | 4.85  | 121.33      | 114.89   |
| 1   | 2     | 843  | 4AC  | O7-C7-N4 | 4.71  | 129.44      | 121.82   |
| 1   | 2     | 1478 | 4AC  | O7-C7-N4 | 4.64  | 129.32      | 121.82   |
| 1   | 2     | 52   | OMU  | C4-N3-C2 | -4.56 | 120.56      | 126.58   |
| 1   | 2     | 1032 | OMU  | C4-N3-C2 | -4.54 | 120.59      | 126.58   |
| 1   | 2     | 1477 | 4AC  | O7-C7-N4 | 4.49  | 129.08      | 121.82   |
| 1   | 2     | 1466 | 4AC  | O7-C7-N4 | 4.40  | 128.94      | 121.82   |
| 30  | 4     | 54   | 5MU  | C5-C4-N3 | 4.39  | 119.06      | 115.31   |
| 1   | 2     | 1344 | OMU  | C4-N3-C2 | -4.32 | 120.88      | 126.58   |
| 1   | 2     | 1467 | 4AC  | O7-C7-N4 | 4.30  | 128.78      | 121.82   |
| 1   | 2     | 52   | OMU  | N3-C2-N1 | 4.16  | 120.42      | 114.89   |
| 1   | 2     | 15   | OMU  | N3-C2-N1 | 4.15  | 120.40      | 114.89   |
| 1   | 2     | 1032 | OMU  | N3-C2-N1 | 4.15  | 120.40      | 114.89   |
| 1   | 2     | 15   | OMU  | C5-C4-N3 | 4.10  | 120.98      | 114.84   |
| 30  | 4     | 55   | PSU  | C4-N3-C2 | -4.01 | 120.56      | 126.34   |
| 1   | 2     | 1344 | OMU  | N3-C2-N1 | 3.84  | 119.99      | 114.89   |
| 1   | 2     | 1032 | OMU  | C5-C4-N3 | 3.78  | 120.50      | 114.84   |
| 30  | 4     | 54   | 5MU  | O4-C4-C5 | -3.75 | 120.56      | 124.90   |

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| Mol | Chain | Res  | Type | Atoms     | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|-----------|-------|-------------|----------|
| 1   | 2     | 52   | OMU  | C5-C4-N3  | 3.71  | 120.40      | 114.84   |
| 1   | 2     | 1344 | OMU  | C5-C4-N3  | 3.66  | 120.32      | 114.84   |
| 30  | 4     | 54   | 5MU  | C5-C6-N1  | -3.60 | 119.64      | 123.34   |
| 1   | 2     | 1477 | 4AC  | N4-C4-N3  | 3.57  | 119.85      | 113.85   |
| 1   | 2     | 1457 | 6MZ  | C4-C5-N7  | -3.47 | 105.78      | 109.40   |
| 1   | 2     | 1477 | 4AC  | C5-C4-N4  | -3.41 | 117.00      | 122.92   |
| 1   | 2     | 494  | A2M  | N3-C2-N1  | -3.38 | 123.39      | 128.68   |
| 30  | 4     | 55   | PSU  | O2-C2-N1  | -3.33 | 119.12      | 122.79   |
| 1   | 2     | 1475 | MA6  | N3-C2-N1  | -3.27 | 123.56      | 128.68   |
| 1   | 2     | 15   | OMU  | O4-C4-C5  | -3.26 | 119.43      | 125.16   |
| 1   | 2     | 1467 | 4AC  | CM7-C7-N4 | -3.25 | 109.67      | 115.29   |
| 1   | 2     | 1475 | MA6  | C4-C5-N7  | -3.25 | 106.01      | 109.40   |
| 1   | 2     | 1368 | 5MC  | C5-C6-N1  | -3.08 | 120.17      | 123.34   |
| 1   | 2     | 1344 | OMU  | O4-C4-C5  | -3.07 | 119.76      | 125.16   |
| 1   | 2     | 52   | OMU  | O4-C4-C5  | -3.06 | 119.78      | 125.16   |
| 1   | 2     | 1457 | 6MZ  | N3-C2-N1  | -2.97 | 124.03      | 128.68   |
| 1   | 2     | 1466 | 4AC  | C5-C4-N4  | -2.88 | 117.91      | 122.92   |
| 1   | 2     | 843  | 4AC  | CM7-C7-N4 | -2.88 | 110.32      | 115.29   |
| 1   | 2     | 1478 | 4AC  | C5-C4-N4  | -2.87 | 117.93      | 122.92   |
| 1   | 2     | 1466 | 4AC  | N4-C4-N3  | 2.85  | 118.63      | 113.85   |
| 1   | 2     | 1032 | OMU  | O4-C4-C5  | -2.85 | 120.16      | 125.16   |
| 1   | 2     | 1466 | 4AC  | CM7-C7-N4 | -2.84 | 110.38      | 115.29   |
| 30  | 4     | 32   | OMC  | O2-C2-N3  | -2.75 | 117.86      | 122.33   |
| 1   | 2     | 246  | OMC  | O2-C2-N3  | -2.75 | 117.86      | 122.33   |
| 1   | 2     | 1478 | 4AC  | CM7-C7-N4 | -2.74 | 110.55      | 115.29   |
| 1   | 2     | 1477 | 4AC  | C1'-N1-C2 | 2.74  | 124.53      | 118.42   |
| 1   | 2     | 1478 | 4AC  | N4-C4-N3  | 2.70  | 118.39      | 113.85   |
| 1   | 2     | 843  | 4AC  | C5-C4-N4  | -2.66 | 118.30      | 122.92   |
| 1   | 2     | 399  | OMG  | C5-C6-N1  | 2.57  | 118.50      | 113.95   |
| 1   | 2     | 1467 | 4AC  | C5-C4-N4  | -2.54 | 118.51      | 122.92   |
| 1   | 2     | 337  | OMG  | C5-C6-N1  | 2.52  | 118.41      | 113.95   |
| 1   | 2     | 1368 | 5MC  | C5-C4-N3  | -2.52 | 118.96      | 121.67   |
| 1   | 2     | 1477 | 4AC  | CM7-C7-N4 | -2.51 | 110.96      | 115.29   |
| 30  | 4     | 54   | 5MU  | O2-C2-N1  | -2.48 | 119.48      | 122.79   |
| 1   | 2     | 926  | OMG  | C8-N7-C5  | 2.47  | 107.69      | 102.99   |
| 1   | 2     | 313  | OMC  | O2-C2-N3  | -2.44 | 118.36      | 122.33   |
| 1   | 2     | 1061 | OMG  | C5-C6-N1  | 2.42  | 118.23      | 113.95   |
| 1   | 2     | 546  | OMG  | C5-C6-N1  | 2.42  | 118.23      | 113.95   |
| 1   | 2     | 1467 | 4AC  | N4-C4-N3  | 2.39  | 117.86      | 113.85   |
| 1   | 2     | 865  | OMG  | C5-C6-N1  | 2.38  | 118.16      | 113.95   |
| 1   | 2     | 1194 | OMG  | C8-N7-C5  | 2.38  | 107.53      | 102.99   |
| 1   | 2     | 481  | OMC  | C5-C4-N3  | -2.37 | 117.29      | 121.33   |

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| Mol | Chain | Res  | Type | Atoms     | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|-----------|-------|-------------|----------|
| 1   | 2     | 481  | OMC  | C6-C5-C4  | 2.37  | 121.33      | 117.50   |
| 1   | 2     | 905  | OMG  | C5-C6-N1  | 2.35  | 118.10      | 113.95   |
| 1   | 2     | 15   | OMU  | O2-C2-N1  | -2.34 | 119.67      | 122.79   |
| 1   | 2     | 865  | OMG  | C8-N7-C5  | 2.33  | 107.43      | 102.99   |
| 30  | 4     | 54   | 5MU  | C5M-C5-C4 | 2.33  | 121.33      | 118.77   |
| 1   | 2     | 1018 | OMG  | C5-C6-N1  | 2.33  | 118.06      | 113.95   |
| 1   | 2     | 926  | OMG  | C5-C6-N1  | 2.30  | 118.02      | 113.95   |
| 30  | 4     | 32   | OMC  | C1'-N1-C2 | 2.30  | 123.56      | 118.42   |
| 1   | 2     | 1194 | OMG  | C5-C6-N1  | 2.30  | 118.01      | 113.95   |
| 1   | 2     | 672  | OMG  | C5-C6-N1  | 2.30  | 118.01      | 113.95   |
| 1   | 2     | 905  | OMG  | C8-N7-C5  | 2.28  | 107.34      | 102.99   |
| 1   | 2     | 672  | OMG  | C8-N7-C5  | 2.27  | 107.32      | 102.99   |
| 1   | 2     | 843  | 4AC  | N4-C4-N3  | 2.27  | 117.67      | 113.85   |
| 1   | 2     | 1061 | OMG  | C8-N7-C5  | 2.26  | 107.29      | 102.99   |
| 1   | 2     | 1018 | OMG  | C8-N7-C5  | 2.25  | 107.28      | 102.99   |
| 1   | 2     | 481  | OMC  | N4-C4-N3  | 2.25  | 121.91      | 117.97   |
| 1   | 2     | 337  | OMG  | C8-N7-C5  | 2.20  | 107.18      | 102.99   |
| 1   | 2     | 1477 | 4AC  | O2-C2-N3  | -2.19 | 118.78      | 122.33   |
| 1   | 2     | 399  | OMG  | C8-N7-C5  | 2.18  | 107.15      | 102.99   |
| 1   | 2     | 52   | OMU  | C1'-N1-C2 | 2.18  | 121.52      | 117.57   |
| 1   | 2     | 546  | OMG  | C8-N7-C5  | 2.18  | 107.14      | 102.99   |
| 1   | 2     | 538  | OMC  | O2-C2-N3  | -2.10 | 118.91      | 122.33   |
| 30  | 4     | 54   | 5MU  | C5M-C5-C6 | -2.09 | 120.05      | 122.85   |
| 1   | 2     | 494  | A2M  | C4-C5-N7  | -2.09 | 107.22      | 109.40   |
| 1   | 2     | 1344 | OMU  | O2-C2-N1  | -2.06 | 120.04      | 122.79   |
| 1   | 2     | 399  | OMG  | O6-C6-C5  | -2.05 | 120.36      | 124.37   |
| 1   | 2     | 1477 | 4AC  | C1'-N1-C6 | -2.04 | 116.40      | 120.84   |
| 1   | 2     | 1344 | OMU  | C1'-N1-C2 | 2.02  | 121.23      | 117.57   |
| 1   | 2     | 1475 | MA6  | N1-C6-N6  | 2.02  | 119.18      | 117.06   |

There are no chirality outliers.

All (22) torsion outliers are listed below:

| Mol | Chain | Res | Type | Atoms           |
|-----|-------|-----|------|-----------------|
| 1   | 2     | 246 | OMC  | C3'-C4'-C5'-O5' |
| 30  | 4     | 20  | H2U  | O4'-C1'-N1-C6   |
| 1   | 2     | 930 | C4J  | C4'-C5'-O5'-P   |
| 1   | 2     | 246 | OMC  | O4'-C4'-C5'-O5' |
| 1   | 2     | 930 | C4J  | C3'-C4'-C5'-O5' |
| 30  | 4     | 20  | H2U  | O4'-C1'-N1-C2   |
| 30  | 4     | 32  | OMC  | C1'-C2'-O2'-CM2 |
| 1   | 2     | 865 | OMG  | C3'-C4'-C5'-O5' |

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| Mol | Chain | Res  | Type | Atoms           |
|-----|-------|------|------|-----------------|
| 1   | 2     | 926  | OMG  | C3'-C2'-O2'-CM2 |
| 1   | 2     | 865  | OMG  | C4'-C5'-O5'-P   |
| 1   | 2     | 930  | C4J  | N3-C3-C31-C32   |
| 30  | 4     | 20   | H2U  | C4'-C5'-O5'-P   |
| 30  | 4     | 32   | OMC  | C3'-C2'-O2'-CM2 |
| 1   | 2     | 337  | OMG  | C4'-C5'-O5'-P   |
| 30  | 4     | 32   | OMC  | C2'-C1'-N1-C6   |
| 30  | 4     | 55   | PSU  | O4'-C1'-C5-C4   |
| 1   | 2     | 246  | OMC  | C2'-C1'-N1-C2   |
| 1   | 2     | 313  | OMC  | C2'-C1'-N1-C2   |
| 30  | 4     | 32   | OMC  | C2'-C1'-N1-C2   |
| 1   | 2     | 1477 | 4AC  | C2'-C1'-N1-C2   |
| 1   | 2     | 865  | OMG  | O4'-C4'-C5'-O5' |
| 1   | 2     | 1477 | 4AC  | C2'-C1'-N1-C6   |

There are no ring outliers.

25 monomers are involved in 34 short contacts:

| Mol | Chain | Res  | Type | Clashes | Symm-Clashes |
|-----|-------|------|------|---------|--------------|
| 30  | 4     | 20   | H2U  | 1       | 0            |
| 1   | 2     | 337  | OMG  | 1       | 0            |
| 1   | 2     | 1344 | OMU  | 2       | 0            |
| 1   | 2     | 1018 | OMG  | 1       | 0            |
| 1   | 2     | 1477 | 4AC  | 2       | 0            |
| 1   | 2     | 113  | OMC  | 1       | 0            |
| 1   | 2     | 15   | OMU  | 1       | 0            |
| 1   | 2     | 481  | OMC  | 1       | 0            |
| 1   | 2     | 865  | OMG  | 2       | 0            |
| 1   | 2     | 1475 | MA6  | 1       | 0            |
| 1   | 2     | 710  | OMC  | 1       | 0            |
| 1   | 2     | 1060 | OMC  | 1       | 0            |
| 1   | 2     | 1032 | OMU  | 2       | 0            |
| 30  | 4     | 32   | OMC  | 1       | 0            |
| 1   | 2     | 905  | OMG  | 1       | 0            |
| 1   | 2     | 1467 | 4AC  | 1       | 0            |
| 1   | 2     | 52   | OMU  | 1       | 0            |
| 1   | 2     | 843  | 4AC  | 3       | 0            |
| 1   | 2     | 926  | OMG  | 2       | 0            |
| 1   | 2     | 1061 | OMG  | 1       | 0            |
| 1   | 2     | 672  | OMG  | 1       | 0            |
| 1   | 2     | 1368 | 5MC  | 1       | 0            |
| 1   | 2     | 1466 | 4AC  | 4       | 0            |

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| Mol | Chain | Res  | Type | Clashes | Symm-Clashes |
|-----|-------|------|------|---------|--------------|
| 1   | 2     | 1366 | OMC  | 1       | 0            |
| 1   | 2     | 1478 | 4AC  | 2       | 0            |

## 5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 106 ligands modelled in this entry, 66 are monoatomic - leaving 40 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 | $\# Z  > 2$ |
| 36  | SPM  | 2     | 1524 | -    | 13,13,13     | 0.11 | 0           | 12,12,12    | 0.13 | 0           |
| 36  | SPM  | 2     | 1522 | -    | 13,13,13     | 0.09 | 0           | 12,12,12    | 0.09 | 0           |
| 36  | SPM  | 2     | 1537 | -    | 13,13,13     | 0.13 | 0           | 12,12,12    | 0.11 | 0           |
| 36  | SPM  | 2     | 1510 | -    | 13,13,13     | 0.08 | 0           | 12,12,12    | 0.17 | 0           |
| 36  | SPM  | 2     | 1511 | -    | 13,13,13     | 0.07 | 0           | 12,12,12    | 0.11 | 0           |
| 36  | SPM  | 2     | 1532 | -    | 13,13,13     | 0.11 | 0           | 12,12,12    | 0.06 | 0           |
| 36  | SPM  | 2     | 1503 | -    | 13,13,13     | 0.08 | 0           | 12,12,12    | 0.17 | 0           |
| 39  | GTP  | 5     | 102  | 34   | 26,34,34     | 1.13 | 2 (7%)      | 32,54,54    | 1.47 | 6 (18%)     |
| 36  | SPM  | 2     | 1515 | -    | 13,13,13     | 0.08 | 0           | 12,12,12    | 0.12 | 0           |
| 36  | SPM  | 2     | 1514 | -    | 13,13,13     | 0.10 | 0           | 12,12,12    | 0.09 | 0           |
| 36  | SPM  | 2     | 1507 | -    | 13,13,13     | 0.08 | 0           | 12,12,12    | 0.12 | 0           |
| 36  | SPM  | 2     | 1538 | -    | 13,13,13     | 0.09 | 0           | 12,12,12    | 0.14 | 0           |
| 36  | SPM  | 2     | 1519 | -    | 13,13,13     | 0.10 | 0           | 12,12,12    | 0.08 | 0           |
| 36  | SPM  | 2     | 1531 | -    | 13,13,13     | 0.09 | 0           | 12,12,12    | 0.09 | 0           |
| 36  | SPM  | 2     | 1535 | -    | 13,13,13     | 0.12 | 0           | 12,12,12    | 0.07 | 0           |
| 36  | SPM  | 2     | 1525 | -    | 13,13,13     | 0.08 | 0           | 12,12,12    | 0.16 | 0           |
| 36  | SPM  | 2     | 1502 | -    | 13,13,13     | 0.11 | 0           | 12,12,12    | 0.06 | 0           |
| 36  | SPM  | 2     | 1530 | -    | 13,13,13     | 0.09 | 0           | 12,12,12    | 0.12 | 0           |
| 36  | SPM  | 2     | 1505 | -    | 13,13,13     | 0.07 | 0           | 12,12,12    | 0.21 | 0           |
| 36  | SPM  | 2     | 1521 | -    | 13,13,13     | 0.12 | 0           | 12,12,12    | 0.07 | 0           |
| 36  | SPM  | 2     | 1533 | -    | 13,13,13     | 0.11 | 0           | 12,12,12    | 0.08 | 0           |

| Mol | Type | Chain | Res  | Link | Bond lengths |      |          | Bond angles |      |          |
|-----|------|-------|------|------|--------------|------|----------|-------------|------|----------|
|     |      |       |      |      | Counts       | RMSZ | # Z  > 2 | Counts      | RMSZ | # Z  > 2 |
| 36  | SPM  | 2     | 1517 | -    | 13,13,13     | 0.07 | 0        | 12,12,12    | 0.18 | 0        |
| 36  | SPM  | 2     | 1516 | -    | 13,13,13     | 0.06 | 0        | 12,12,12    | 0.21 | 0        |
| 36  | SPM  | 2     | 1529 | -    | 13,13,13     | 0.12 | 0        | 12,12,12    | 0.06 | 0        |
| 36  | SPM  | 2     | 1504 | -    | 13,13,13     | 0.08 | 0        | 12,12,12    | 0.10 | 0        |
| 36  | SPM  | 2     | 1512 | -    | 13,13,13     | 0.11 | 0        | 12,12,12    | 0.09 | 0        |
| 36  | SPM  | 2     | 1520 | -    | 13,13,13     | 0.11 | 0        | 12,12,12    | 0.14 | 0        |
| 36  | SPM  | 2     | 1539 | -    | 13,13,13     | 0.09 | 0        | 12,12,12    | 0.12 | 0        |
| 36  | SPM  | 2     | 1526 | -    | 13,13,13     | 0.11 | 0        | 12,12,12    | 0.11 | 0        |
| 36  | SPM  | 2     | 1523 | -    | 13,13,13     | 0.08 | 0        | 12,12,12    | 0.19 | 0        |
| 36  | SPM  | 2     | 1528 | -    | 13,13,13     | 0.11 | 0        | 12,12,12    | 0.09 | 0        |
| 36  | SPM  | 2     | 1501 | -    | 13,13,13     | 0.08 | 0        | 12,12,12    | 0.12 | 0        |
| 36  | SPM  | 2     | 1534 | -    | 13,13,13     | 0.12 | 0        | 12,12,12    | 0.07 | 0        |
| 36  | SPM  | 2     | 1506 | -    | 13,13,13     | 0.09 | 0        | 12,12,12    | 0.10 | 0        |
| 36  | SPM  | 2     | 1513 | -    | 13,13,13     | 0.09 | 0        | 12,12,12    | 0.19 | 0        |
| 36  | SPM  | 2     | 1509 | -    | 13,13,13     | 0.06 | 0        | 12,12,12    | 0.14 | 0        |
| 36  | SPM  | 2     | 1518 | -    | 13,13,13     | 0.07 | 0        | 12,12,12    | 0.14 | 0        |
| 36  | SPM  | 2     | 1508 | -    | 13,13,13     | 0.06 | 0        | 12,12,12    | 0.12 | 0        |
| 36  | SPM  | 2     | 1527 | -    | 13,13,13     | 0.09 | 0        | 12,12,12    | 0.08 | 0        |
| 36  | SPM  | 2     | 1536 | -    | 13,13,13     | 0.12 | 0        | 12,12,12    | 0.08 | 0        |

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

| Mol | Type | Chain | Res  | Link | Chirals | Torsions   | Rings   |
|-----|------|-------|------|------|---------|------------|---------|
| 36  | SPM  | 2     | 1524 | -    | -       | 3/11/11/11 | -       |
| 36  | SPM  | 2     | 1522 | -    | -       | 2/11/11/11 | -       |
| 36  | SPM  | 2     | 1537 | -    | -       | 2/11/11/11 | -       |
| 36  | SPM  | 2     | 1510 | -    | -       | 1/11/11/11 | -       |
| 36  | SPM  | 2     | 1511 | -    | -       | 2/11/11/11 | -       |
| 36  | SPM  | 2     | 1532 | -    | -       | 9/11/11/11 | -       |
| 36  | SPM  | 2     | 1503 | -    | -       | 3/11/11/11 | -       |
| 39  | GTP  | 5     | 102  | 34   | -       | 6/18/38/38 | 0/3/3/3 |
| 36  | SPM  | 2     | 1515 | -    | -       | 2/11/11/11 | -       |
| 36  | SPM  | 2     | 1514 | -    | -       | 3/11/11/11 | -       |
| 36  | SPM  | 2     | 1507 | -    | -       | 4/11/11/11 | -       |
| 36  | SPM  | 2     | 1538 | -    | -       | 5/11/11/11 | -       |
| 36  | SPM  | 2     | 1519 | -    | -       | 2/11/11/11 | -       |
| 36  | SPM  | 2     | 1531 | -    | -       | 2/11/11/11 | -       |

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| Mol | Type | Chain | Res  | Link | Chirals | Torsions    | Rings |
|-----|------|-------|------|------|---------|-------------|-------|
| 36  | SPM  | 2     | 1535 | -    | -       | 5/11/11/11  | -     |
| 36  | SPM  | 2     | 1525 | -    | -       | 1/11/11/11  | -     |
| 36  | SPM  | 2     | 1502 | -    | -       | 11/11/11/11 | -     |
| 36  | SPM  | 2     | 1530 | -    | -       | 4/11/11/11  | -     |
| 36  | SPM  | 2     | 1505 | -    | -       | 4/11/11/11  | -     |
| 36  | SPM  | 2     | 1521 | -    | -       | 7/11/11/11  | -     |
| 36  | SPM  | 2     | 1533 | -    | -       | 1/11/11/11  | -     |
| 36  | SPM  | 2     | 1517 | -    | -       | 4/11/11/11  | -     |
| 36  | SPM  | 2     | 1516 | -    | -       | 0/11/11/11  | -     |
| 36  | SPM  | 2     | 1529 | -    | -       | 6/11/11/11  | -     |
| 36  | SPM  | 2     | 1504 | -    | -       | 2/11/11/11  | -     |
| 36  | SPM  | 2     | 1512 | -    | -       | 3/11/11/11  | -     |
| 36  | SPM  | 2     | 1520 | -    | -       | 4/11/11/11  | -     |
| 36  | SPM  | 2     | 1539 | -    | -       | 2/11/11/11  | -     |
| 36  | SPM  | 2     | 1526 | -    | -       | 4/11/11/11  | -     |
| 36  | SPM  | 2     | 1523 | -    | -       | 4/11/11/11  | -     |
| 36  | SPM  | 2     | 1528 | -    | -       | 4/11/11/11  | -     |
| 36  | SPM  | 2     | 1501 | -    | -       | 2/11/11/11  | -     |
| 36  | SPM  | 2     | 1534 | -    | -       | 9/11/11/11  | -     |
| 36  | SPM  | 2     | 1506 | -    | -       | 4/11/11/11  | -     |
| 36  | SPM  | 2     | 1513 | -    | -       | 1/11/11/11  | -     |
| 36  | SPM  | 2     | 1509 | -    | -       | 2/11/11/11  | -     |
| 36  | SPM  | 2     | 1518 | -    | -       | 4/11/11/11  | -     |
| 36  | SPM  | 2     | 1508 | -    | -       | 2/11/11/11  | -     |
| 36  | SPM  | 2     | 1527 | -    | -       | 3/11/11/11  | -     |
| 36  | SPM  | 2     | 1536 | -    | -       | 1/11/11/11  | -     |

All (2) bond length outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z     | Observed(Å) | Ideal(Å) |
|-----|-------|-----|------|-------|-------|-------------|----------|
| 39  | 5     | 102 | GTP  | C5-C6 | -3.94 | 1.39        | 1.47     |
| 39  | 5     | 102 | GTP  | C2-N3 | 2.18  | 1.38        | 1.33     |

All (6) bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms     | Z     | Observed(°) | Ideal(°) |
|-----|-------|-----|------|-----------|-------|-------------|----------|
| 39  | 5     | 102 | GTP  | PB-O3B-PG | -3.30 | 121.50      | 132.83   |

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| Mol | Chain | Res | Type | Atoms     | Z     | Observed(°) | Ideal(°) |
|-----|-------|-----|------|-----------|-------|-------------|----------|
| 39  | 5     | 102 | GTP  | PA-O3A-PB | -3.25 | 121.67      | 132.83   |
| 39  | 5     | 102 | GTP  | C5-C6-N1  | 3.17  | 119.55      | 113.95   |
| 39  | 5     | 102 | GTP  | C8-N7-C5  | 2.99  | 108.69      | 102.99   |
| 39  | 5     | 102 | GTP  | C2-N1-C6  | -2.81 | 119.92      | 125.10   |
| 39  | 5     | 102 | GTP  | O6-C6-C5  | -2.06 | 120.36      | 124.37   |

There are no chirality outliers.

All (140) torsion outliers are listed below:

| Mol | Chain | Res  | Type | Atoms           |
|-----|-------|------|------|-----------------|
| 36  | 2     | 1509 | SPM  | C12-C11-N10-C9  |
| 36  | 2     | 1520 | SPM  | C12-C11-N10-C9  |
| 36  | 2     | 1524 | SPM  | C3-C4-N5-C6     |
| 36  | 2     | 1525 | SPM  | C3-C4-N5-C6     |
| 36  | 2     | 1533 | SPM  | C7-C6-N5-C4     |
| 39  | 5     | 102  | GTP  | C5'-O5'-PA-O1A  |
| 36  | 2     | 1502 | SPM  | N5-C6-C7-C8     |
| 36  | 2     | 1507 | SPM  | C7-C8-C9-N10    |
| 36  | 2     | 1521 | SPM  | C7-C8-C9-N10    |
| 36  | 2     | 1528 | SPM  | C3-C4-N5-C6     |
| 36  | 2     | 1529 | SPM  | N5-C6-C7-C8     |
| 39  | 5     | 102  | GTP  | C3'-C4'-C5'-O5' |
| 36  | 2     | 1517 | SPM  | N10-C11-C12-C13 |
| 36  | 2     | 1532 | SPM  | N5-C6-C7-C8     |
| 36  | 2     | 1532 | SPM  | C7-C8-C9-N10    |
| 36  | 2     | 1502 | SPM  | C7-C8-C9-N10    |
| 36  | 2     | 1502 | SPM  | N10-C11-C12-C13 |
| 36  | 2     | 1521 | SPM  | N5-C6-C7-C8     |
| 36  | 2     | 1532 | SPM  | N10-C11-C12-C13 |
| 36  | 2     | 1501 | SPM  | C8-C9-N10-C11   |
| 36  | 2     | 1503 | SPM  | C8-C9-N10-C11   |
| 36  | 2     | 1512 | SPM  | C7-C6-N5-C4     |
| 36  | 2     | 1517 | SPM  | C3-C4-N5-C6     |
| 36  | 2     | 1519 | SPM  | C8-C9-N10-C11   |
| 36  | 2     | 1520 | SPM  | C8-C9-N10-C11   |
| 36  | 2     | 1522 | SPM  | C8-C9-N10-C11   |
| 36  | 2     | 1523 | SPM  | C7-C6-N5-C4     |
| 36  | 2     | 1535 | SPM  | C3-C4-N5-C6     |
| 39  | 5     | 102  | GTP  | O4'-C4'-C5'-O5' |
| 36  | 2     | 1529 | SPM  | C2-C3-C4-N5     |
| 36  | 2     | 1502 | SPM  | C3-C4-N5-C6     |
| 36  | 2     | 1506 | SPM  | C3-C4-N5-C6     |

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| Mol | Chain | Res  | Type | Atoms           |
|-----|-------|------|------|-----------------|
| 36  | 2     | 1507 | SPM  | C12-C11-N10-C9  |
| 36  | 2     | 1514 | SPM  | C8-C9-N10-C11   |
| 36  | 2     | 1517 | SPM  | C8-C9-N10-C11   |
| 36  | 2     | 1518 | SPM  | C3-C4-N5-C6     |
| 36  | 2     | 1520 | SPM  | C3-C4-N5-C6     |
| 36  | 2     | 1521 | SPM  | C7-C6-N5-C4     |
| 36  | 2     | 1522 | SPM  | C7-C6-N5-C4     |
| 36  | 2     | 1524 | SPM  | C8-C9-N10-C11   |
| 36  | 2     | 1527 | SPM  | C8-C9-N10-C11   |
| 36  | 2     | 1538 | SPM  | C8-C9-N10-C11   |
| 36  | 2     | 1529 | SPM  | C6-C7-C8-C9     |
| 36  | 2     | 1518 | SPM  | C7-C6-N5-C4     |
| 36  | 2     | 1521 | SPM  | C3-C4-N5-C6     |
| 36  | 2     | 1536 | SPM  | C3-C4-N5-C6     |
| 36  | 2     | 1534 | SPM  | C6-C7-C8-C9     |
| 36  | 2     | 1532 | SPM  | C6-C7-C8-C9     |
| 36  | 2     | 1521 | SPM  | C6-C7-C8-C9     |
| 36  | 2     | 1502 | SPM  | C2-C3-C4-N5     |
| 36  | 2     | 1512 | SPM  | C12-C11-N10-C9  |
| 36  | 2     | 1515 | SPM  | C8-C9-N10-C11   |
| 36  | 2     | 1527 | SPM  | C12-C11-N10-C9  |
| 36  | 2     | 1528 | SPM  | C7-C6-N5-C4     |
| 36  | 2     | 1528 | SPM  | C8-C9-N10-C11   |
| 36  | 2     | 1530 | SPM  | C3-C4-N5-C6     |
| 36  | 2     | 1531 | SPM  | C7-C6-N5-C4     |
| 36  | 2     | 1539 | SPM  | C3-C4-N5-C6     |
| 36  | 2     | 1523 | SPM  | C6-C7-C8-C9     |
| 36  | 2     | 1502 | SPM  | C11-C12-C13-N14 |
| 36  | 2     | 1521 | SPM  | C11-C12-C13-N14 |
| 36  | 2     | 1523 | SPM  | C11-C12-C13-N14 |
| 36  | 2     | 1502 | SPM  | C8-C9-N10-C11   |
| 36  | 2     | 1506 | SPM  | C12-C11-N10-C9  |
| 36  | 2     | 1535 | SPM  | C6-C7-C8-C9     |
| 36  | 2     | 1514 | SPM  | C3-C4-N5-C6     |
| 36  | 2     | 1532 | SPM  | C7-C6-N5-C4     |
| 36  | 2     | 1508 | SPM  | C3-C4-N5-C6     |
| 36  | 2     | 1529 | SPM  | C7-C6-N5-C4     |
| 36  | 2     | 1534 | SPM  | C7-C8-C9-N10    |
| 36  | 2     | 1502 | SPM  | C7-C6-N5-C4     |
| 36  | 2     | 1505 | SPM  | C12-C11-N10-C9  |
| 36  | 2     | 1509 | SPM  | C8-C9-N10-C11   |
| 36  | 2     | 1511 | SPM  | C12-C11-N10-C9  |

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| Mol | Chain | Res  | Type | Atoms           |
|-----|-------|------|------|-----------------|
| 36  | 2     | 1512 | SPM  | C3-C4-N5-C6     |
| 36  | 2     | 1518 | SPM  | C8-C9-N10-C11   |
| 36  | 2     | 1526 | SPM  | C8-C9-N10-C11   |
| 36  | 2     | 1534 | SPM  | C7-C6-N5-C4     |
| 36  | 2     | 1538 | SPM  | C3-C4-N5-C6     |
| 36  | 2     | 1521 | SPM  | N1-C2-C3-C4     |
| 36  | 2     | 1529 | SPM  | N1-C2-C3-C4     |
| 36  | 2     | 1532 | SPM  | N1-C2-C3-C4     |
| 36  | 2     | 1534 | SPM  | C11-C12-C13-N14 |
| 39  | 5     | 102  | GTP  | C5'-O5'-PA-O3A  |
| 36  | 2     | 1514 | SPM  | C12-C11-N10-C9  |
| 36  | 2     | 1534 | SPM  | C12-C11-N10-C9  |
| 39  | 5     | 102  | GTP  | C5'-O5'-PA-O2A  |
| 36  | 2     | 1503 | SPM  | C12-C11-N10-C9  |
| 36  | 2     | 1507 | SPM  | C8-C9-N10-C11   |
| 36  | 2     | 1528 | SPM  | C12-C11-N10-C9  |
| 36  | 2     | 1530 | SPM  | C7-C6-N5-C4     |
| 36  | 2     | 1531 | SPM  | C8-C9-N10-C11   |
| 36  | 2     | 1535 | SPM  | C12-C11-N10-C9  |
| 36  | 2     | 1532 | SPM  | C2-C3-C4-N5     |
| 36  | 2     | 1524 | SPM  | C7-C6-N5-C4     |
| 36  | 2     | 1505 | SPM  | C7-C6-N5-C4     |
| 36  | 2     | 1510 | SPM  | C3-C4-N5-C6     |
| 36  | 2     | 1513 | SPM  | C8-C9-N10-C11   |
| 36  | 2     | 1535 | SPM  | N10-C11-C12-C13 |
| 36  | 2     | 1508 | SPM  | C12-C11-N10-C9  |
| 36  | 2     | 1517 | SPM  | C7-C6-N5-C4     |
| 36  | 2     | 1527 | SPM  | C3-C4-N5-C6     |
| 36  | 2     | 1537 | SPM  | C7-C6-N5-C4     |
| 36  | 2     | 1538 | SPM  | C12-C11-N10-C9  |
| 36  | 2     | 1534 | SPM  | C2-C3-C4-N5     |
| 36  | 2     | 1526 | SPM  | C3-C4-N5-C6     |
| 36  | 2     | 1539 | SPM  | C7-C6-N5-C4     |
| 36  | 2     | 1502 | SPM  | N1-C2-C3-C4     |
| 36  | 2     | 1532 | SPM  | C11-C12-C13-N14 |
| 36  | 2     | 1534 | SPM  | N1-C2-C3-C4     |
| 36  | 2     | 1503 | SPM  | C3-C4-N5-C6     |
| 36  | 2     | 1506 | SPM  | C8-C9-N10-C11   |
| 36  | 2     | 1511 | SPM  | C3-C4-N5-C6     |
| 36  | 2     | 1530 | SPM  | C8-C9-N10-C11   |
| 36  | 2     | 1532 | SPM  | C3-C4-N5-C6     |
| 36  | 2     | 1534 | SPM  | C3-C4-N5-C6     |

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| Mol | Chain | Res  | Type | Atoms          |
|-----|-------|------|------|----------------|
| 36  | 2     | 1505 | SPM  | C8-C9-N10-C11  |
| 36  | 2     | 1515 | SPM  | C7-C6-N5-C4    |
| 36  | 2     | 1526 | SPM  | C12-C11-N10-C9 |
| 36  | 2     | 1535 | SPM  | C8-C9-N10-C11  |
| 36  | 2     | 1505 | SPM  | C7-C8-C9-N10   |
| 36  | 2     | 1506 | SPM  | C6-C7-C8-C9    |
| 36  | 2     | 1502 | SPM  | C6-C7-C8-C9    |
| 36  | 2     | 1501 | SPM  | C12-C11-N10-C9 |
| 36  | 2     | 1537 | SPM  | C12-C11-N10-C9 |
| 36  | 2     | 1538 | SPM  | C6-C7-C8-C9    |
| 36  | 2     | 1504 | SPM  | C8-C9-N10-C11  |
| 36  | 2     | 1507 | SPM  | C3-C4-N5-C6    |
| 36  | 2     | 1519 | SPM  | C3-C4-N5-C6    |
| 36  | 2     | 1526 | SPM  | C7-C6-N5-C4    |
| 36  | 2     | 1529 | SPM  | C8-C9-N10-C11  |
| 36  | 2     | 1530 | SPM  | C12-C11-N10-C9 |
| 36  | 2     | 1518 | SPM  | C6-C7-C8-C9    |
| 39  | 5     | 102  | GTP  | PG-O3B-PB-O2B  |
| 36  | 2     | 1520 | SPM  | C6-C7-C8-C9    |
| 36  | 2     | 1502 | SPM  | C12-C11-N10-C9 |
| 36  | 2     | 1523 | SPM  | C8-C9-N10-C11  |
| 36  | 2     | 1534 | SPM  | C8-C9-N10-C11  |
| 36  | 2     | 1504 | SPM  | C6-C7-C8-C9    |
| 36  | 2     | 1538 | SPM  | N5-C6-C7-C8    |

There are no ring outliers.

32 monomers are involved in 82 short contacts:

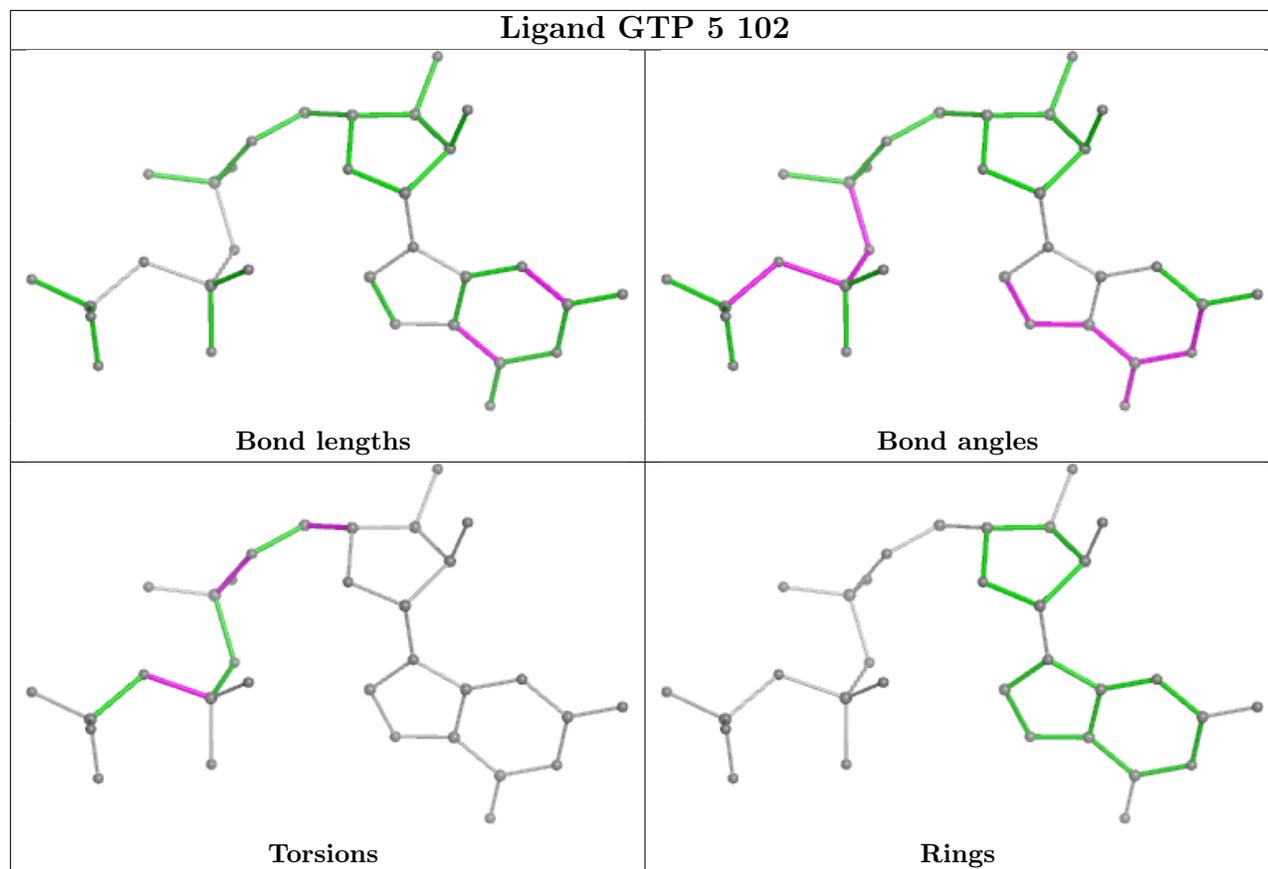
| Mol | Chain | Res  | Type | Clashes | Symm-Clashes |
|-----|-------|------|------|---------|--------------|
| 36  | 2     | 1524 | SPM  | 3       | 0            |
| 36  | 2     | 1522 | SPM  | 2       | 0            |
| 36  | 2     | 1537 | SPM  | 3       | 0            |
| 36  | 2     | 1510 | SPM  | 1       | 0            |
| 36  | 2     | 1511 | SPM  | 1       | 0            |
| 36  | 2     | 1532 | SPM  | 9       | 0            |
| 39  | 5     | 102  | GTP  | 1       | 0            |
| 36  | 2     | 1515 | SPM  | 2       | 0            |
| 36  | 2     | 1514 | SPM  | 3       | 0            |
| 36  | 2     | 1507 | SPM  | 1       | 0            |
| 36  | 2     | 1538 | SPM  | 2       | 0            |
| 36  | 2     | 1531 | SPM  | 1       | 0            |
| 36  | 2     | 1535 | SPM  | 8       | 0            |

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| Mol | Chain | Res  | Type | Clashes | Symm-Clashes |
|-----|-------|------|------|---------|--------------|
| 36  | 2     | 1525 | SPM  | 4       | 0            |
| 36  | 2     | 1502 | SPM  | 2       | 0            |
| 36  | 2     | 1530 | SPM  | 2       | 0            |
| 36  | 2     | 1521 | SPM  | 8       | 0            |
| 36  | 2     | 1533 | SPM  | 1       | 0            |
| 36  | 2     | 1517 | SPM  | 3       | 0            |
| 36  | 2     | 1516 | SPM  | 5       | 0            |
| 36  | 2     | 1529 | SPM  | 2       | 0            |
| 36  | 2     | 1512 | SPM  | 1       | 0            |
| 36  | 2     | 1520 | SPM  | 3       | 0            |
| 36  | 2     | 1526 | SPM  | 2       | 0            |
| 36  | 2     | 1523 | SPM  | 1       | 0            |
| 36  | 2     | 1528 | SPM  | 1       | 0            |
| 36  | 2     | 1501 | SPM  | 2       | 0            |
| 36  | 2     | 1534 | SPM  | 4       | 0            |
| 36  | 2     | 1513 | SPM  | 2       | 0            |
| 36  | 2     | 1509 | SPM  | 1       | 0            |
| 36  | 2     | 1518 | SPM  | 2       | 0            |
| 36  | 2     | 1527 | SPM  | 2       | 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.



## 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.

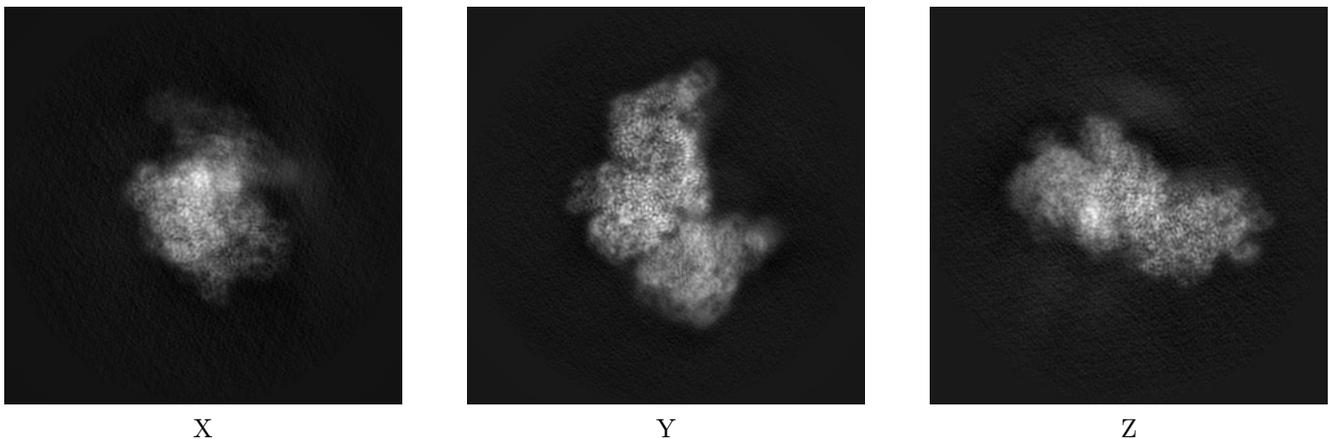
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-50724. These allow visual inspection of the internal detail of the map and identification of artifacts.

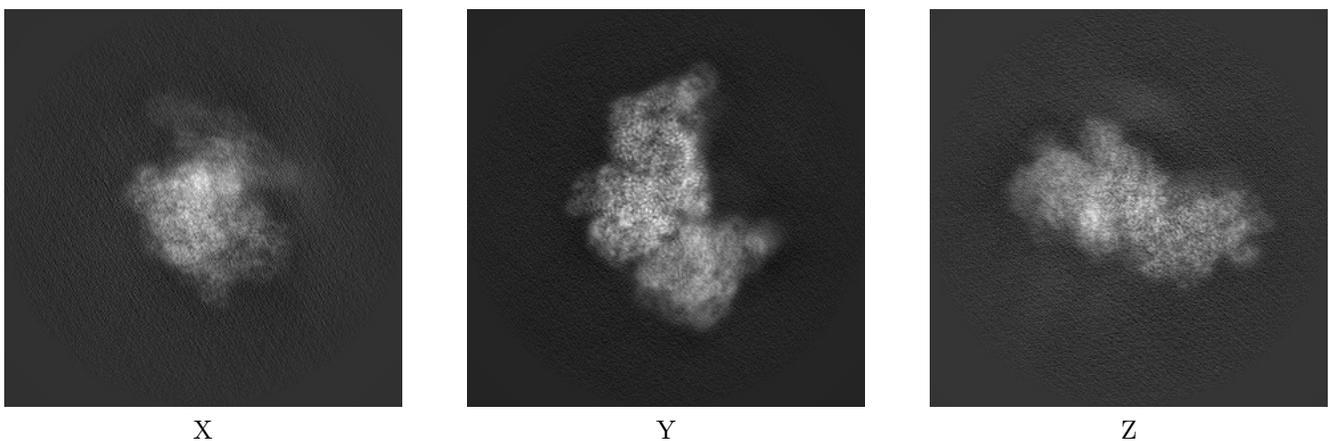
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

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

#### 6.1.1 Primary map



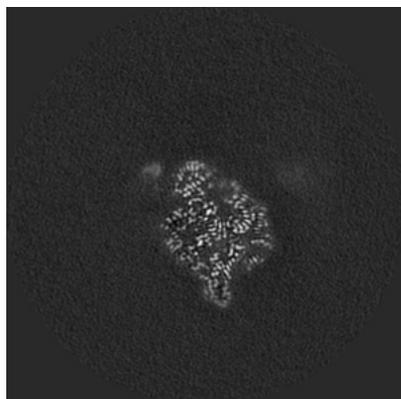
#### 6.1.2 Raw map



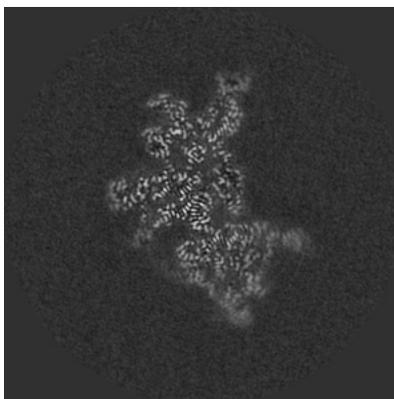
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices [i](#)

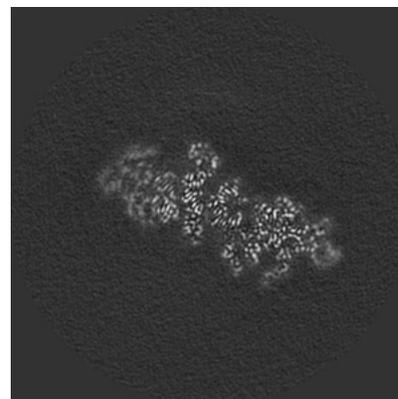
### 6.2.1 Primary map



X Index: 258

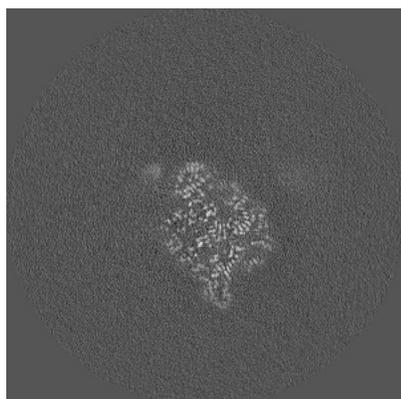


Y Index: 258

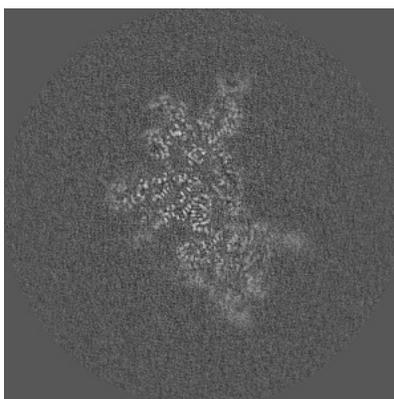


Z Index: 258

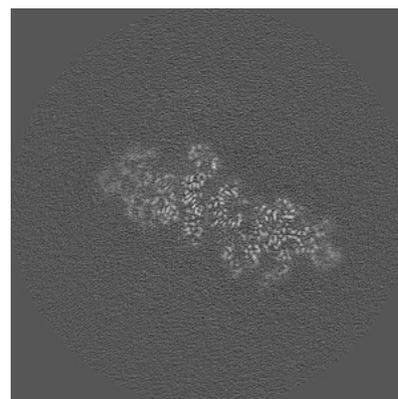
### 6.2.2 Raw map



X Index: 258



Y Index: 258

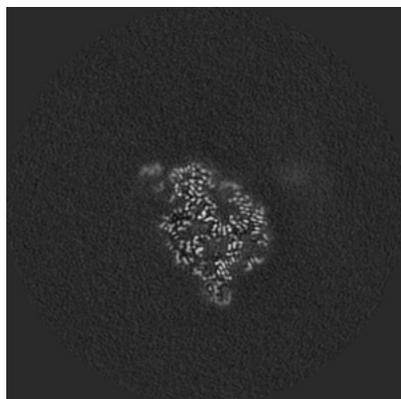


Z Index: 258

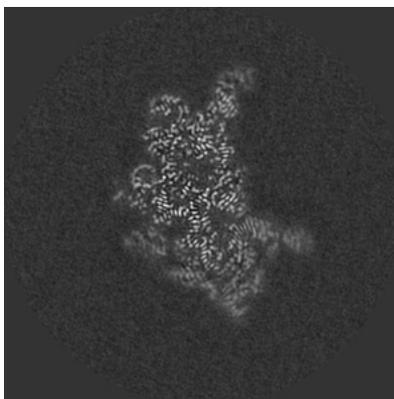
The images above show central slices of the map in three orthogonal directions.

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

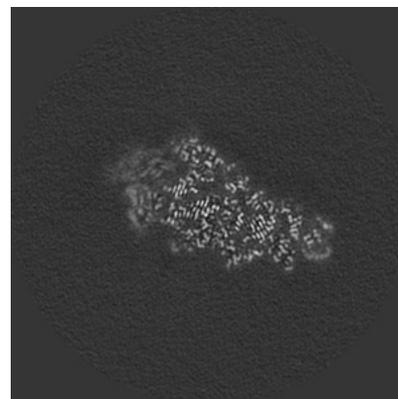
### 6.3.1 Primary map



X Index: 261

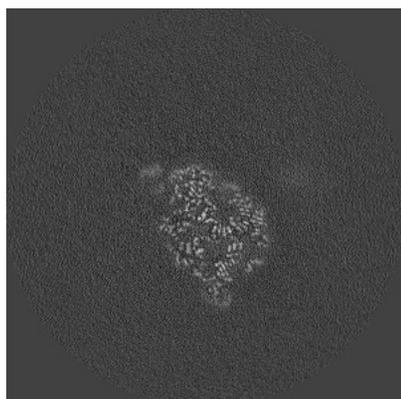


Y Index: 251

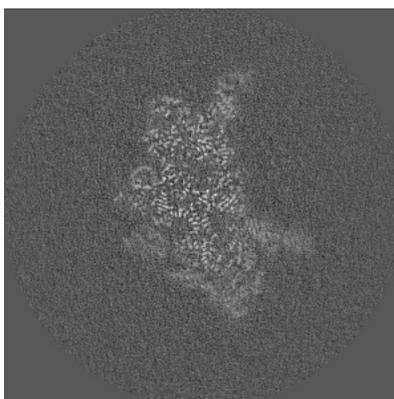


Z Index: 244

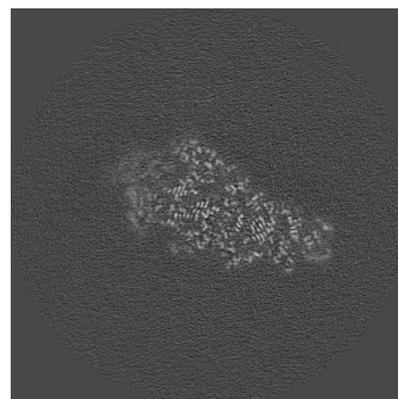
### 6.3.2 Raw map



X Index: 261



Y Index: 251

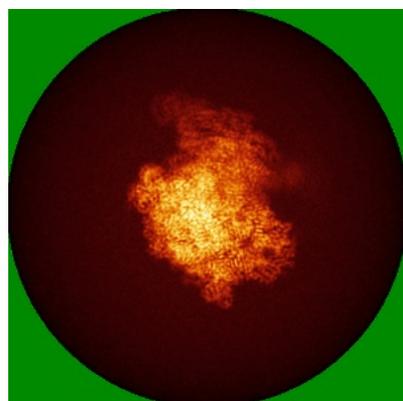


Z Index: 244

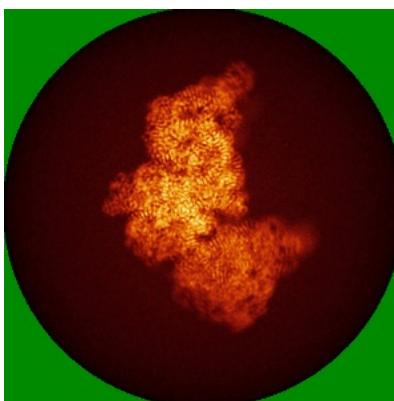
The images above show the largest variance slices of the map in three orthogonal directions.

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

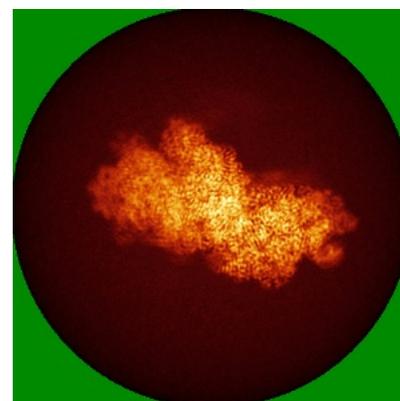
### 6.4.1 Primary map



X

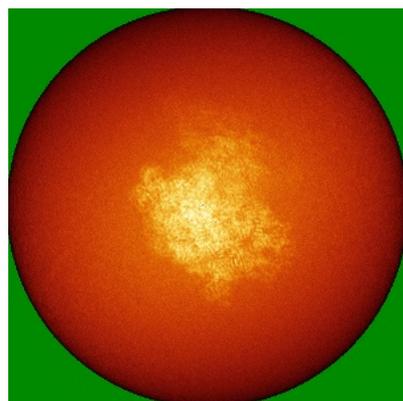


Y

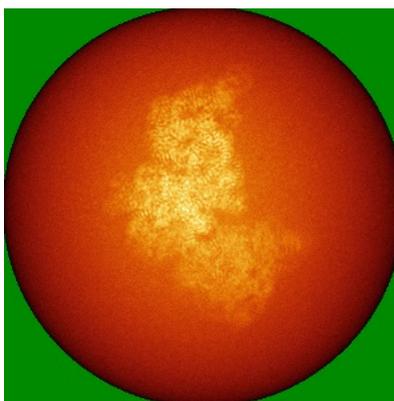


Z

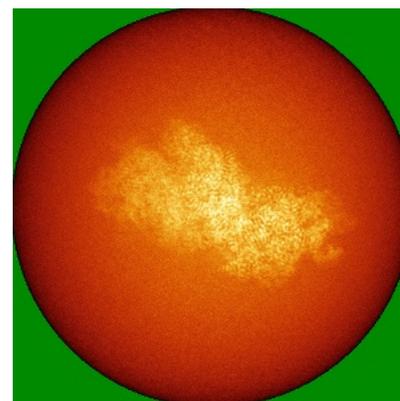
### 6.4.2 Raw map



X



Y



Z

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

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

### 6.5.1 Primary map



X



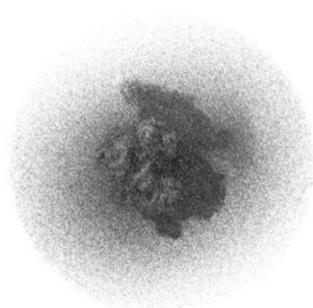
Y



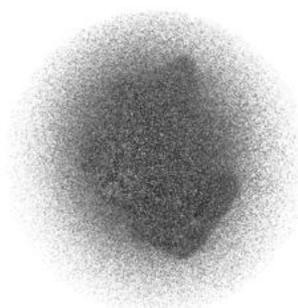
Z

The images above show the 3D surface view of the map at the recommended contour level 0.0045. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

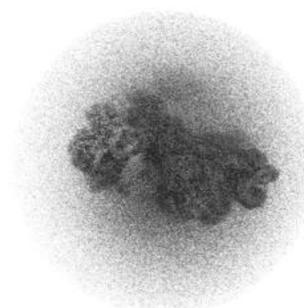
### 6.5.2 Raw map



X



Y



Z

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

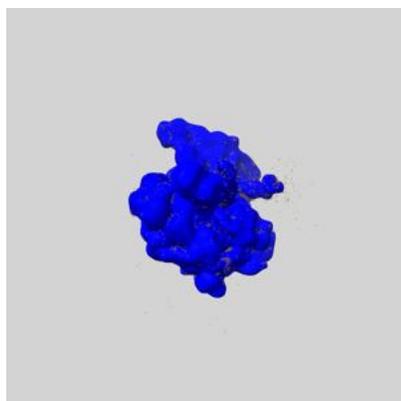
## 6.6 Mask visualisation [i](#)

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

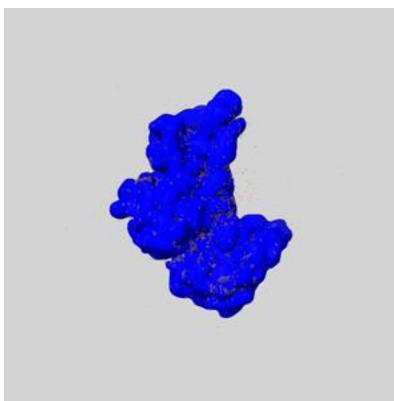
A mask typically either:

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

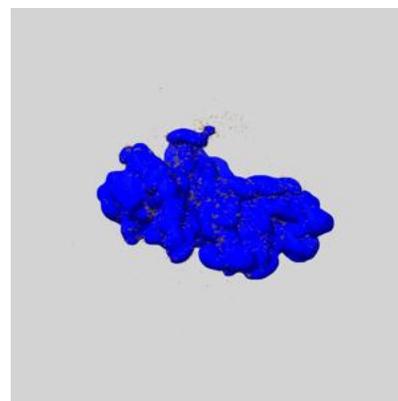
### 6.6.1 emd\_50724\_msk\_1.map [i](#)



X



Y

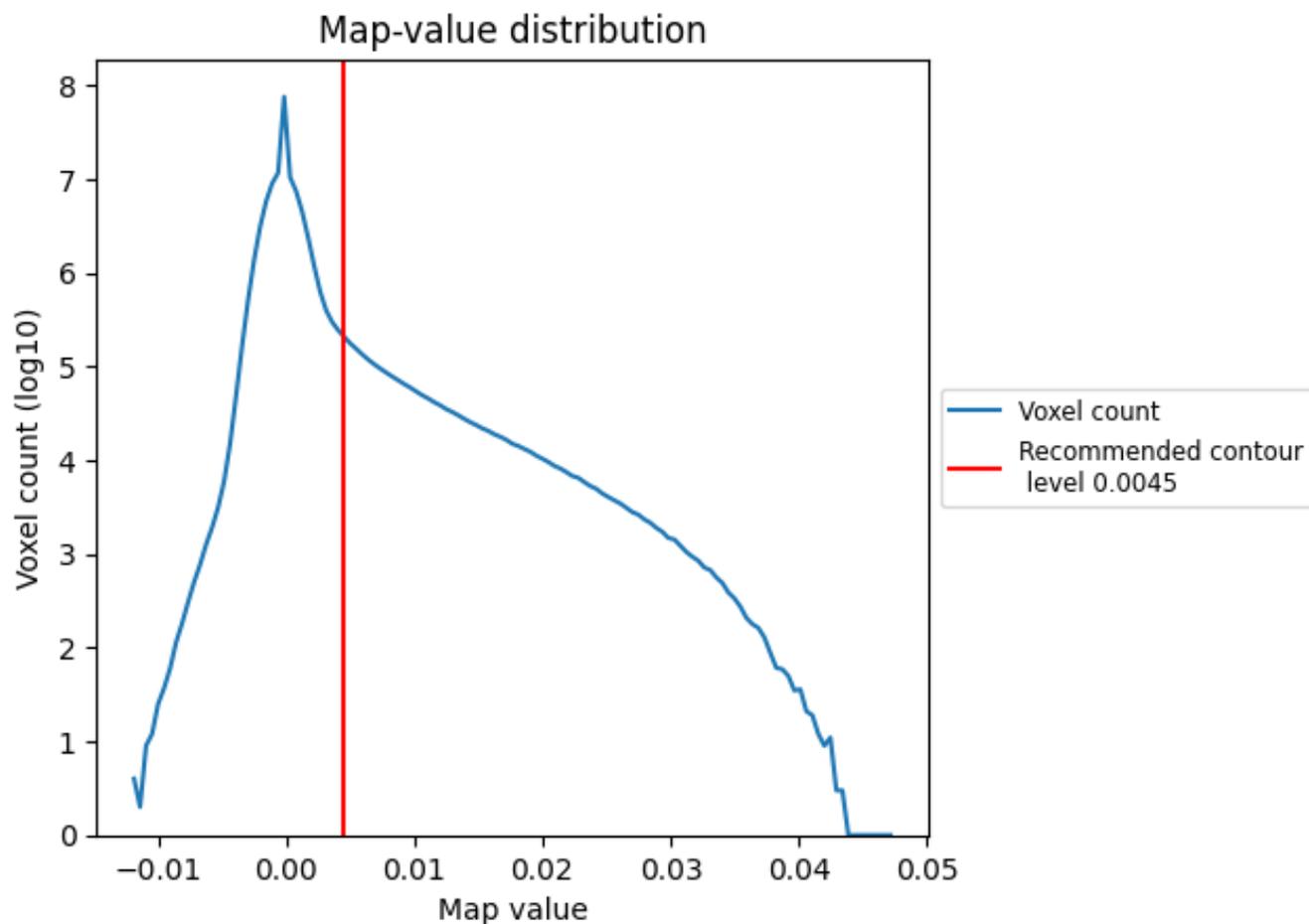


Z

## 7 Map analysis [i](#)

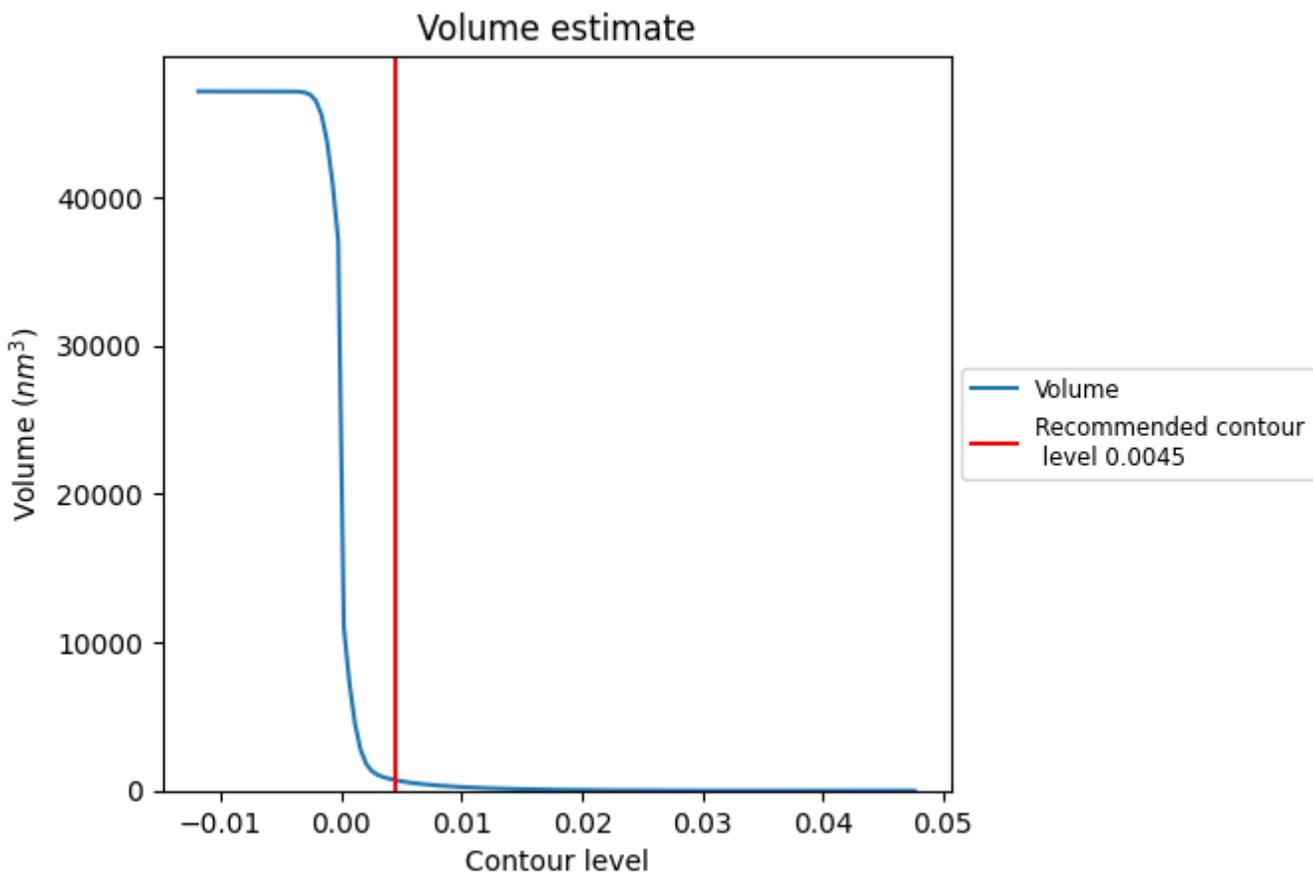
This section contains the results of statistical analysis of the map.

### 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.

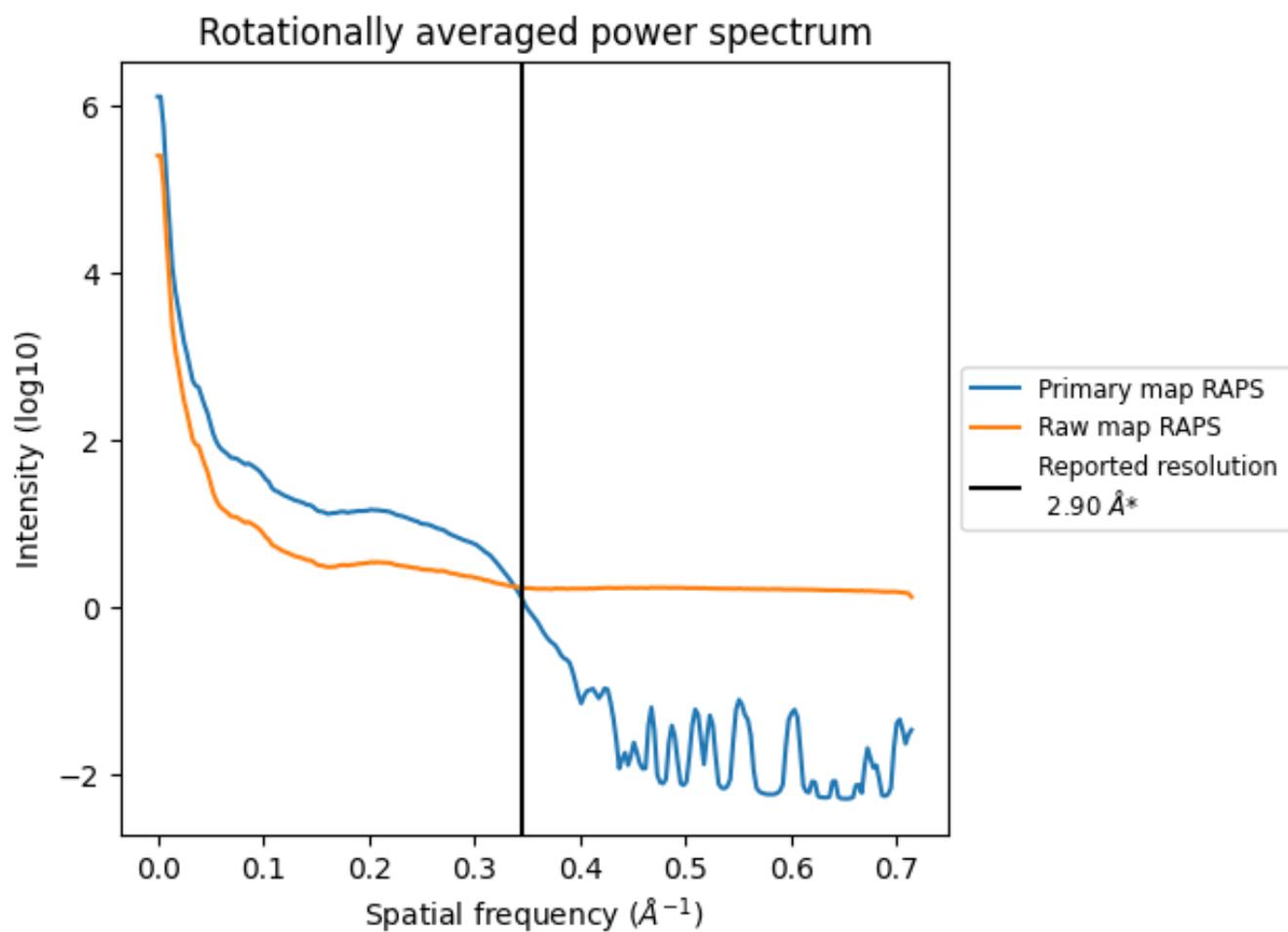
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 709  $\text{nm}^3$ ; this corresponds to an approximate mass of 640 kDa.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.

### 7.3 Rotationally averaged power spectrum i

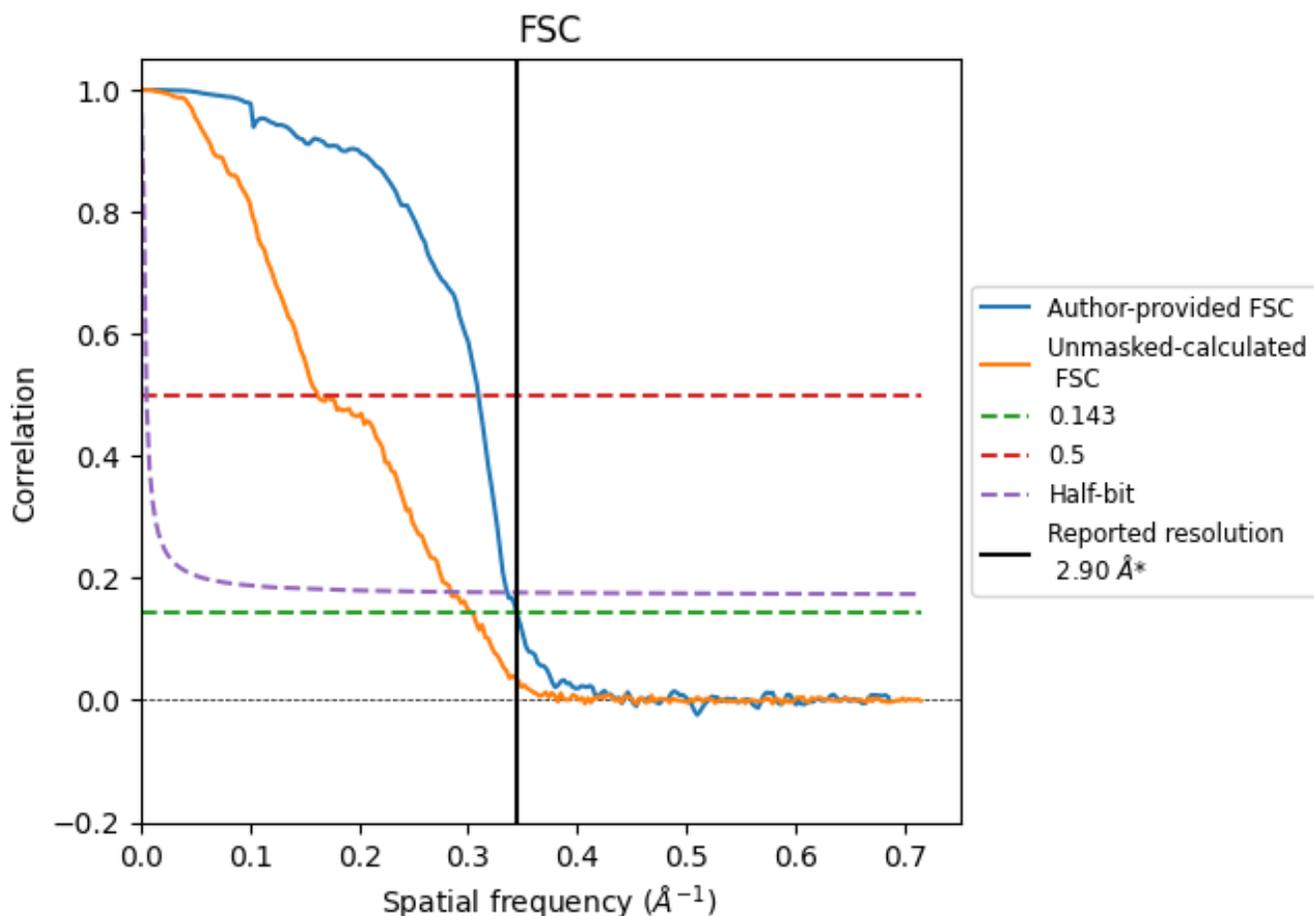


\*Reported resolution corresponds to spatial frequency of  $0.345 \text{ \AA}^{-1}$

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

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

### 8.1 FSC [i](#)



\*Reported resolution corresponds to spatial frequency of 0.345 Å<sup>-1</sup>

## 8.2 Resolution estimates [i](#)

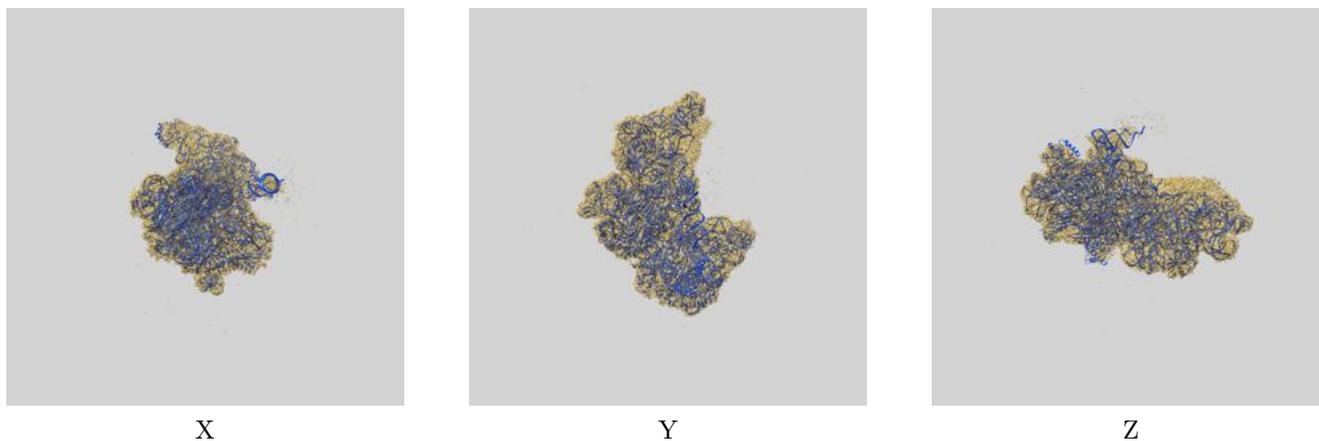
| Resolution estimate (Å)   | Estimation criterion (FSC cut-off) |      |          |
|---------------------------|------------------------------------|------|----------|
|                           | 0.143                              | 0.5  | Half-bit |
| Reported by author        | 2.90                               | -    | -        |
| Author-provided FSC curve | 2.90                               | 3.23 | 2.98     |
| Unmasked-calculated*      | 3.29                               | 6.17 | 3.52     |

\*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 3.29 differs from the reported value 2.9 by more than 10 %

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

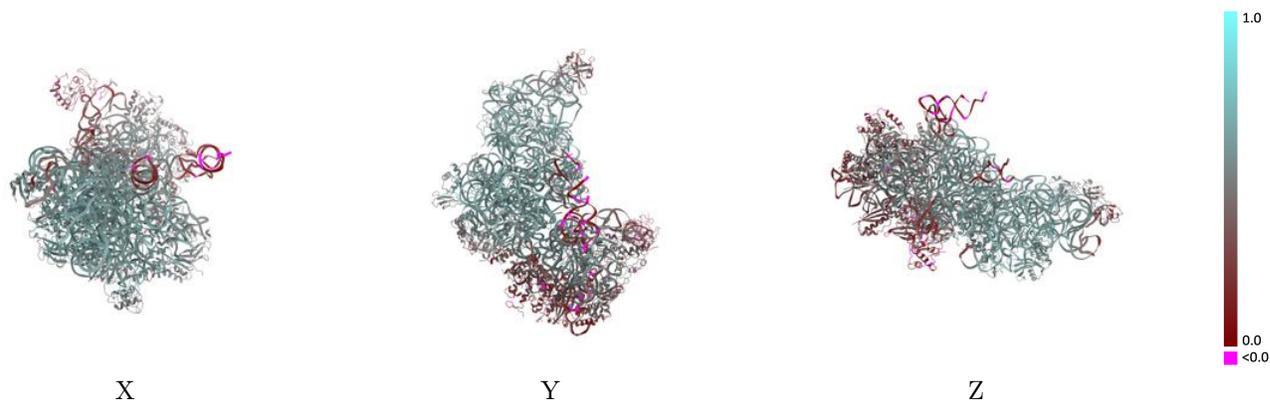
This section contains information regarding the fit between EMDB map EMD-50724 and PDB model 9FS6. Per-residue inclusion information can be found in section 3 on page 15.

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



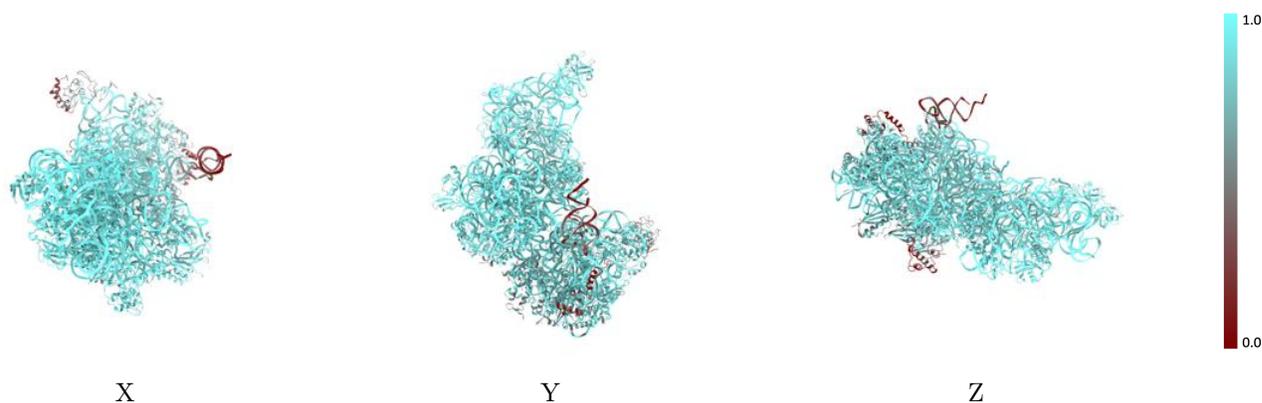
The images above show the 3D surface view of the map at the recommended contour level 0.0045 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



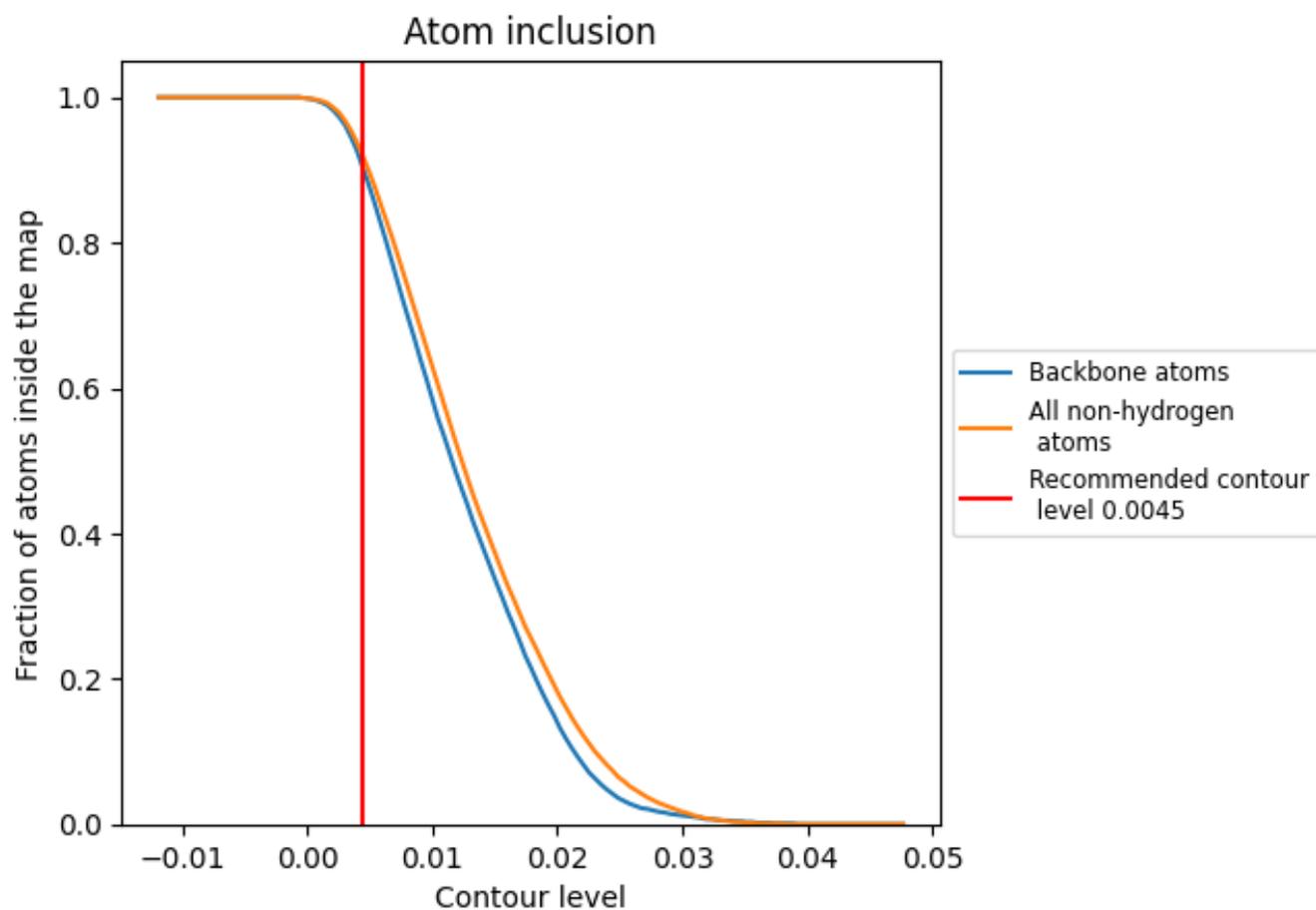
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.0045).

## 9.4 Atom inclusion [i](#)



At the recommended contour level, 90% of all backbone atoms, 92% of all non-hydrogen atoms, are inside the map.

## 9.5 Map-model fit summary

The table lists the average atom inclusion at the recommended contour level (0.0045) and Q-score for the entire model and for each chain.

| Chain | Atom inclusion   | Q-score  |
|-------|--|--|
| All   |  0.9170   |  0.5020   |
| 2     |  0.9890   |  0.5630   |
| 3     |  0.3250   |  0.1480   |
| 4     |  0.4510   |  0.1940   |
| 5     |  1.0000   |  0.5780   |
| A     |  0.9260   |  0.5060   |
| B     |  0.8830   |  0.4540   |
| C     |  0.9510   |  0.5540   |
| D     |  0.9700   |  0.5900   |
| E     |  0.9760   |  0.5940   |
| F     |  0.9640   |  0.5880   |
| G     |  0.8990   |  0.4210   |
| H     |  0.7870   |  0.3100   |
| I     |  0.9840   |  0.6110   |
| J     |  0.9660  |  0.5680  |
| K     |  0.8760 |  0.3820 |
| L     |  0.7920 |  0.3470 |
| M     |  0.9120 |  0.4910 |
| N     |  0.9770 |  0.5820 |
| O     |  0.8730 |  0.4350 |
| P     |  0.9810 |  0.5110 |
| Q     |  0.9540 |  0.5440 |
| R     |  0.9780 |  0.6050 |
| S     |  0.8930 |  0.3790 |
| T     |  0.8490 |  0.3970 |
| U     |  0.8890 |  0.3900 |
| V     |  0.9400 |  0.5490 |
| W     |  0.9530 |  0.5480 |
| X     |  0.7360 |  0.2790 |
| Y     |  0.4130 |  0.1340 |
| Z     |  0.8910 |  0.4320 |
| a     |  0.8710 |  0.3610 |
| b     |  0.9090 |  0.5140 |
| c     |  0.3830 |  0.2050 |
| d     |  0.7300 |  0.2360 |
| e     |  0.8370 |  0.5300 |

