



## Full wwPDB EM Validation Report ⓘ

Dec 8, 2025 – 05:56 pm GMT

PDB ID : 6QUL / pdb\_00006qul  
EMDB ID : EMD-4638  
Title : Structure of a bacterial 50S ribosomal subunit in complex with the novel quinoxolidinone antibiotic cadazolid  
Authors : Scaiola, A.; Leibundgut, M.; Boehringer, D.; Ritz, D.  
Deposited on : 2019-02-27  
Resolution : 3.00 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:

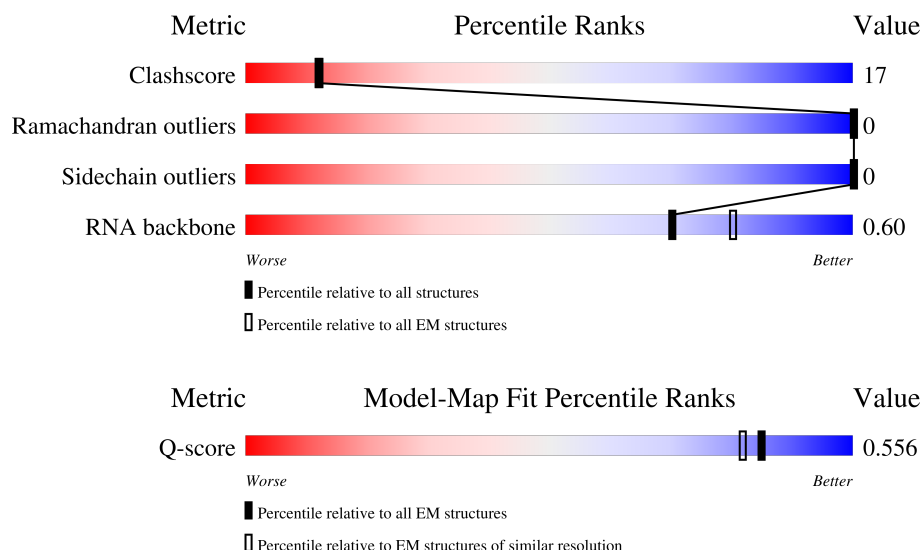
EMDB validation analysis : 0.0.1.dev129  
Mogul : 1.8.4, CSD as541be (2020)  
MolProbity : 4-5-2 with Phenix2.0  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
EM percentile statistics : 202505.v01 (Using data in the EMDB archive 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 3.00 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                       | 14081 ( 2.50 - 3.50 )                                    |

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   | 1     | 4      | <div> <div>50%</div> <div>25% 50% 25%</div> </div> |
| 2   | A     | 2795   | <div> <div>11%</div> <div>36% 57% 7%</div> </div>  |
| 3   | B     | 120    | <div> <div>15%</div> <div>39% 58% .</div> </div>   |

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| Mol | Chain | Length | Quality of chain |
|-----|-------|--------|------------------|
| 4   | C     | 273    |                  |
| 5   | D     | 209    |                  |
| 6   | E     | 201    |                  |
| 7   | F     | 179    |                  |
| 8   | G     | 177    |                  |
| 9   | H     | 149    |                  |
| 10  | K     | 142    |                  |
| 11  | L     | 123    |                  |
| 12  | M     | 144    |                  |
| 13  | N     | 136    |                  |
| 14  | O     | 127    |                  |
| 15  | P     | 117    |                  |
| 16  | Q     | 115    |                  |
| 17  | R     | 118    |                  |
| 18  | S     | 103    |                  |
| 19  | T     | 110    |                  |
| 20  | U     | 100    |                  |
| 21  | V     | 104    |                  |
| 22  | W     | 94     |                  |
| 23  | X     | 85     |                  |
| 24  | Y     | 78     |                  |
| 25  | Z     | 63     |                  |
| 26  | a     | 59     |                  |
| 27  | b     | 57     |                  |
| 28  | c     | 55     |                  |

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| Mol | Chain | Length | Quality of chain                                                                   |
|-----|-------|--------|------------------------------------------------------------------------------------|
| 29  | d     | 46     |  |
| 30  | e     | 65     |  |
| 31  | f     | 38     |  |

## 2 Entry composition

There are 36 unique types of molecules in this entry. The entry contains 87635 atoms, of which 28 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 P-site fMet-tRNA(fMet).

| Mol | Chain | Residues | Atoms |    |    |    |   | AltConf | Trace |
|-----|-------|----------|-------|----|----|----|---|---------|-------|
| 1   | 1     | 4        | Total | C  | N  | O  | P | 0       | 0     |
|     |       |          | 84    | 38 | 16 | 26 | 4 |         |       |

- Molecule 2 is a RNA chain called 23S rRNA.

| Mol | Chain | Residues | Atoms |       |       |       |      | AltConf | Trace |
|-----|-------|----------|-------|-------|-------|-------|------|---------|-------|
| 2   | A     | 2795     | Total | C     | N     | O     | P    | 3       | 0     |
|     |       |          | 60085 | 26803 | 11076 | 19408 | 2798 |         |       |

- Molecule 3 is a RNA chain called 5S rRNA.

| Mol | Chain | Residues | Atoms |      |     |     |     | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|-----|---------|-------|
| 3   | B     | 120      | Total | C    | N   | O   | P   | 0       | 0     |
|     |       |          | 2569  | 1144 | 468 | 837 | 120 |         |       |

- Molecule 4 is a protein called 50S ribosomal protein L2.

| Mol | Chain | Residues | Atoms |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 4   | C     | 271      | Total | C    | N   | O   | S | 0       | 0     |
|     |       |          | 2082  | 1288 | 423 | 364 | 7 |         |       |

- Molecule 5 is a protein called 50S ribosomal protein L3.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 5   | D     | 209      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1564  | 979 | 288 | 293 | 4 |         |       |

- Molecule 6 is a protein called 50S ribosomal protein L4.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 6   | E     | 201      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1551  | 974 | 283 | 289 | 5 |         |       |

- Molecule 7 is a protein called 50S ribosomal protein L5.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 7   | F     | 177      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1410  | 899 | 249 | 256 | 6 |         |       |

- Molecule 8 is a protein called 50S ribosomal protein L6.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 8   | G     | 176      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1322  | 832 | 243 | 245 | 2 |         |       |

- Molecule 9 is a protein called 50S ribosomal protein L9.

| Mol | Chain | Residues | Atoms |     |    |    |   | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 9   | H     | 50       | Total | C   | N  | O  | S | 0       | 0     |
|     |       |          | 384   | 247 | 68 | 68 | 1 |         |       |

- Molecule 10 is a protein called 50S ribosomal protein L13.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 10  | K     | 142      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1128  | 714 | 212 | 198 | 4 |         |       |

- Molecule 11 is a protein called 50S ribosomal protein L14.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 11  | L     | 123      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 946   | 593 | 181 | 166 | 6 |         |       |

- Molecule 12 is a protein called 50S ribosomal protein L15.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 12  | M     | 144      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1052  | 654 | 207 | 189 | 2 |         |       |

- Molecule 13 is a protein called 50S ribosomal protein L16.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 13  | N     | 136      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1073  | 686 | 205 | 176 | 6 |         |       |

- Molecule 14 is a protein called 50S ribosomal protein L17.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 14  | O     | 125      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 993   | 613 | 202 | 173 | 5 |         |       |

- Molecule 15 is a protein called 50S ribosomal protein L18.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 15  | P     | 117      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 899   | 557 | 179 | 162 | 1 |         |       |

- Molecule 16 is a protein called 50S ribosomal protein L19.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 16  | Q     | 114      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 916   | 574 | 179 | 162 | 1 |         |       |

- Molecule 17 is a protein called 50S ribosomal protein L20.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 17  | R     | 117      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 946   | 604 | 192 | 150 |   |         |       |

- Molecule 18 is a protein called 50S ribosomal protein L21.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 18  | S     | 103      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 815   | 516 | 153 | 144 | 2 |         |       |

- Molecule 19 is a protein called 50S ribosomal protein L22.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 19  | T     | 110      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 856   | 532 | 166 | 155 | 3 |         |       |

- Molecule 20 is a protein called 50S ribosomal protein L23.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 20  | U     | 95       | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 756   | 479 | 141 | 135 | 1 |         |       |

- Molecule 21 is a protein called 50S ribosomal protein L24.

| Mol | Chain | Residues | Atoms |     |     |     | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---------|-------|
| 21  | V     | 102      | Total | C   | N   | O   |         |       |
|     |       |          | 779   | 492 | 146 | 141 | 0       | 0     |

- Molecule 22 is a protein called 50S ribosomal protein L25.

| Mol | Chain | Residues | Atoms |     |     |     | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---------|-------|
| 22  | W     | 94       | Total | C   | N   | O   | S       |       |
|     |       |          | 752   | 479 | 137 | 133 | 3       | 0     |

- Molecule 23 is a protein called 50S ribosomal protein L27.

| Mol | Chain | Residues | Atoms |     |     |     | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---------|-------|
| 23  | X     | 76       | Total | C   | N   | O   | S       |       |
|     |       |          | 579   | 359 | 117 | 102 | 1       | 0     |

- Molecule 24 is a protein called 50S ribosomal protein L28.

| Mol | Chain | Residues | Atoms |     |     |     | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---------|-------|
| 24  | Y     | 77       | Total | C   | N   | O   | S       |       |
|     |       |          | 624   | 388 | 129 | 105 | 2       | 0     |

- Molecule 25 is a protein called 50S ribosomal protein L29.

| Mol | Chain | Residues | Atoms |     |    |    | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---------|-------|
| 25  | Z     | 62       | Total | C   | N  | O  | S       |       |
|     |       |          | 500   | 308 | 98 | 93 | 1       | 0     |

- Molecule 26 is a protein called 50S ribosomal protein L30.

| Mol | Chain | Residues | Atoms |     |    |    | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---------|-------|
| 26  | a     | 58       | Total | C   | N  | O  | S       |       |
|     |       |          | 448   | 281 | 87 | 78 | 2       | 0     |

- Molecule 27 is a protein called 50S ribosomal protein L32.

| Mol | Chain | Residues | Atoms |     |    |    | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---------|-------|
| 27  | b     | 56       | Total | C   | N  | O  | S       |       |
|     |       |          | 443   | 269 | 94 | 79 | 1       | 0     |

- Molecule 28 is a protein called 50S ribosomal protein L33.

| Mol | Chain | Residues | Atoms |     |    |    | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---------|-------|
| 28  | c     | 51       | Total | C   | N  | O  | 0       | 0     |
|     |       |          | 414   | 266 | 76 | 72 |         |       |

- Molecule 29 is a protein called 50S ribosomal protein L34.

| Mol | Chain | Residues | Atoms |     |    |    |   | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 29  | d     | 46       | Total | C   | N  | O  | S | 0       | 0     |
|     |       |          | 376   | 228 | 90 | 56 | 2 |         |       |

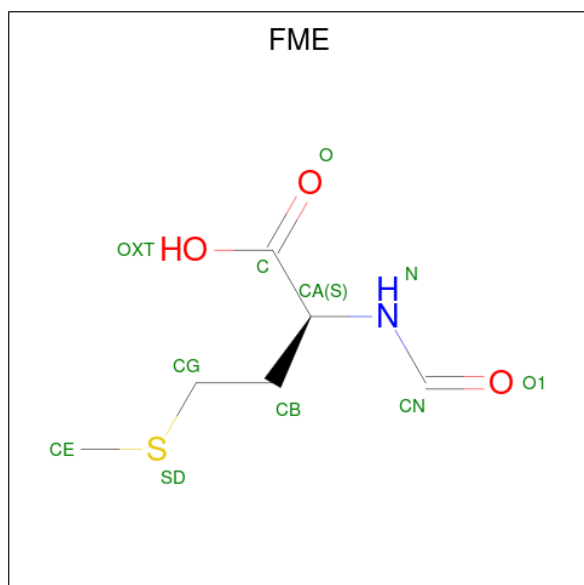
- Molecule 30 is a protein called 50S ribosomal protein L35.

| Mol | Chain | Residues | Atoms |     |     |    |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|----|---|---------|-------|
| 30  | e     | 64       | Total | C   | N   | O  | S | 0       | 0     |
|     |       |          | 503   | 323 | 105 | 73 | 2 |         |       |

- Molecule 31 is a protein called 50S ribosomal protein L36.

| Mol | Chain | Residues | Atoms |     |    |    |   | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 31  | f     | 38       | Total | C   | N  | O  | S | 0       | 0     |
|     |       |          | 301   | 185 | 65 | 47 | 4 |         |       |

- Molecule 32 is N-FORMYLMETHIONINE (CCD ID: FME) (formula:  $C_6H_{11}NO_3S$ ).

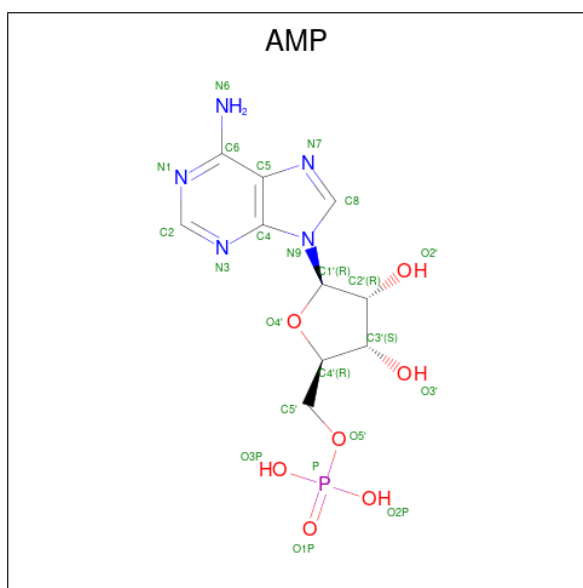


| Mol | Chain | Residues | Atoms |   |   |   |   | AltConf |
|-----|-------|----------|-------|---|---|---|---|---------|
| 32  | 1     | 1        | Total | C | N | O | S | 0       |
|     |       |          | 10    | 6 | 1 | 2 | 1 |         |

- Molecule 33 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

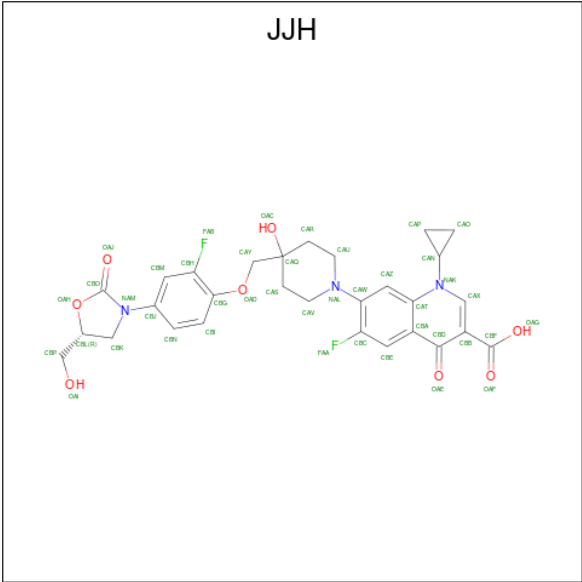
| Mol | Chain | Residues | Atoms |     | AltConf |
|-----|-------|----------|-------|-----|---------|
| 33  | 1     | 1        | Total | Mg  | 0       |
|     |       |          | 1     | 1   |         |
| 33  | A     | 369      | Total | Mg  | 0       |
|     |       |          | 369   | 369 |         |
| 33  | B     | 8        | Total | Mg  | 0       |
|     |       |          | 8     | 8   |         |
| 33  | C     | 1        | Total | Mg  | 0       |
|     |       |          | 1     | 1   |         |
| 33  | O     | 1        | Total | Mg  | 0       |
|     |       |          | 1     | 1   |         |
| 33  | R     | 1        | Total | Mg  | 0       |
|     |       |          | 1     | 1   |         |
| 33  | b     | 1        | Total | Mg  | 0       |
|     |       |          | 1     | 1   |         |

- Molecule 34 is ADENOSINE MONOPHOSPHATE (CCD ID: AMP) (formula: C<sub>10</sub>H<sub>14</sub>N<sub>5</sub>O<sub>7</sub>P).



| Mol | Chain | Residues | Atoms |    |   |   |   | AltConf |
|-----|-------|----------|-------|----|---|---|---|---------|
| 34  | A     | 1        | Total | C  | N | O | P | 0       |
|     |       |          | 22    | 10 | 5 | 6 | 1 |         |

- Molecule 35 is cadazolid (CCD ID: JJH) (formula: C<sub>29</sub>H<sub>29</sub>F<sub>2</sub>N<sub>3</sub>O<sub>8</sub>) (labeled as "Ligand of Interest" by depositor).



| Mol | Chain | Residues | Atoms |    |   |    |   |   | AltConf |
|-----|-------|----------|-------|----|---|----|---|---|---------|
| 35  | A     | 1        | Total | C  | F | H  | N | O | 0       |
|     |       |          | 70    | 29 | 2 | 28 | 3 | 8 |         |

- Molecule 36 is ZINC ION (CCD ID: ZN) (formula: Zn).

| Mol | Chain | Residues | Atoms |    | AltConf |
|-----|-------|----------|-------|----|---------|
| 36  | f     | 1        | Total | Zn | 0       |
|     |       |          | 1     | 1  |         |

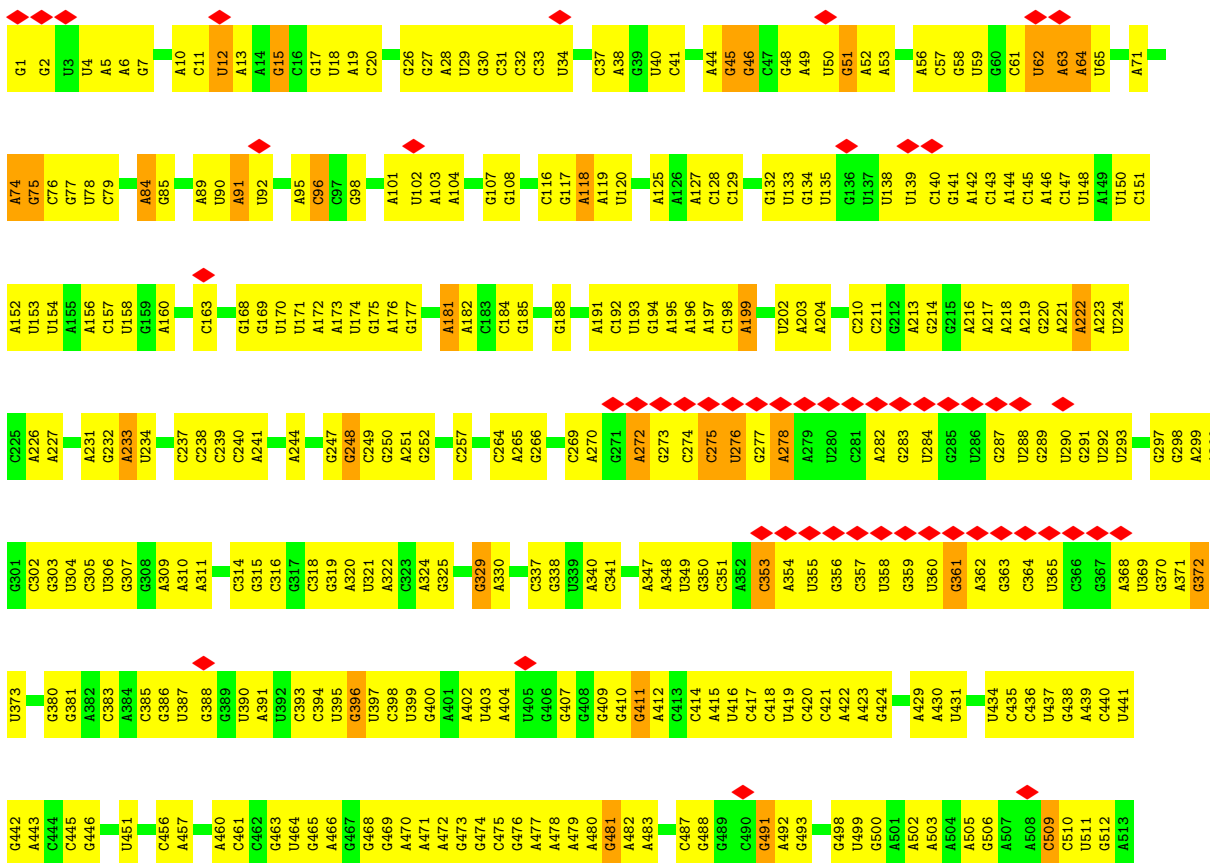
### 3 Residue-property plots

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

#### • Molecule 1: P-site fMet-tRNA(fMet)

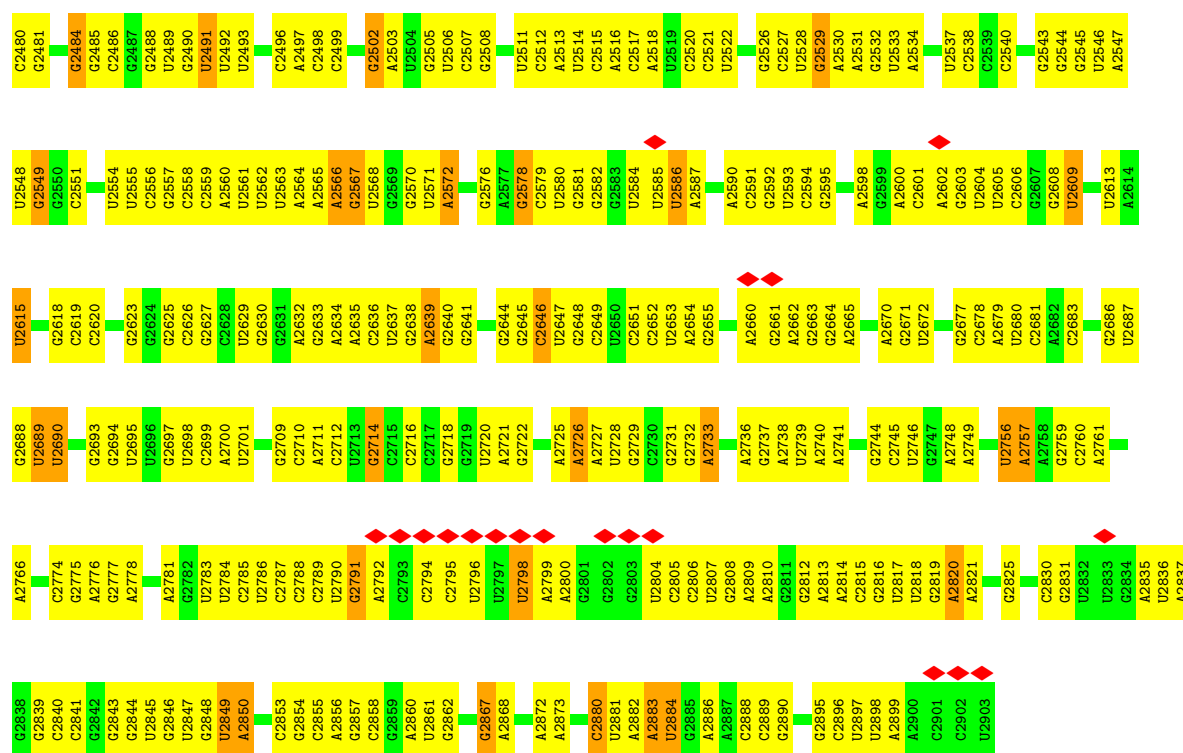


#### • Molecule 2: 23S rRNA

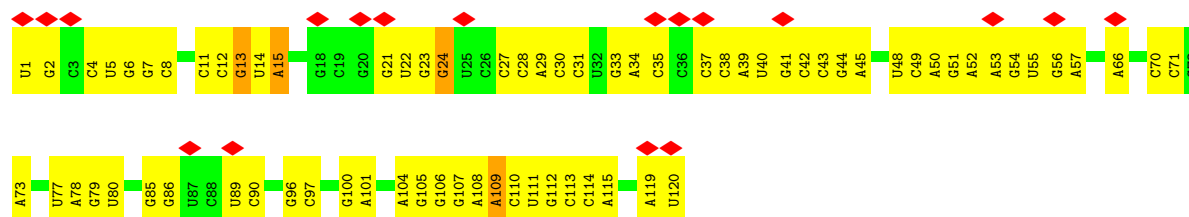




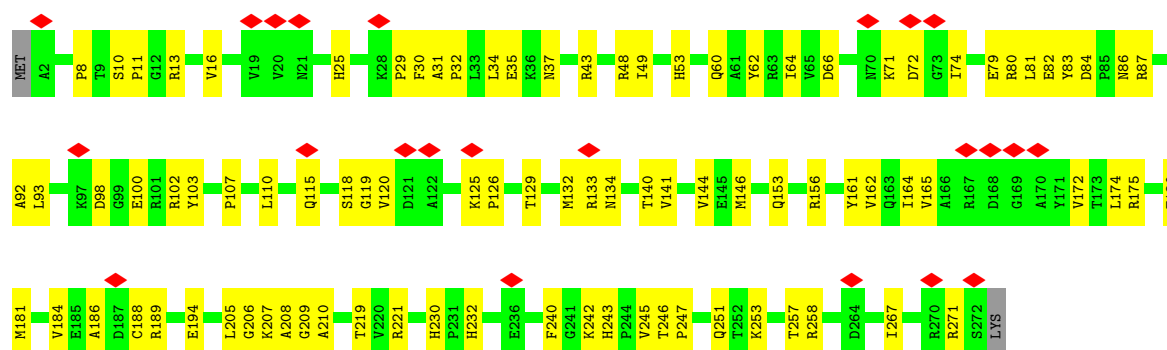




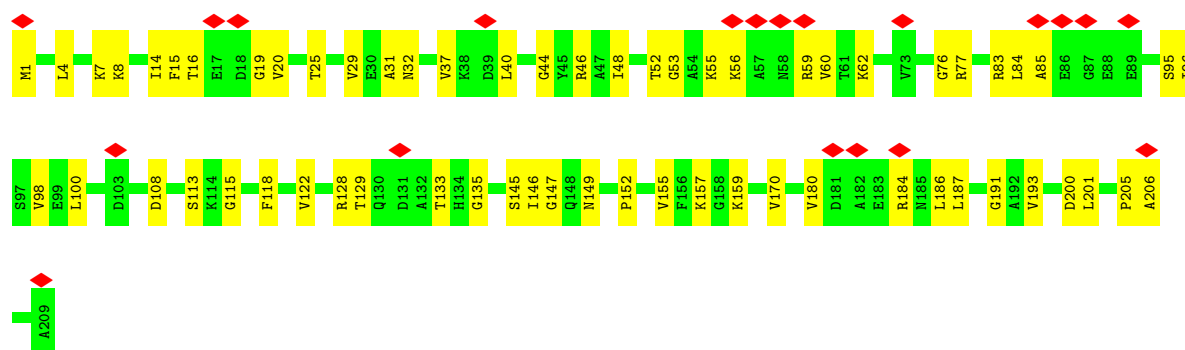
### • Molecule 3: 5S rRNA



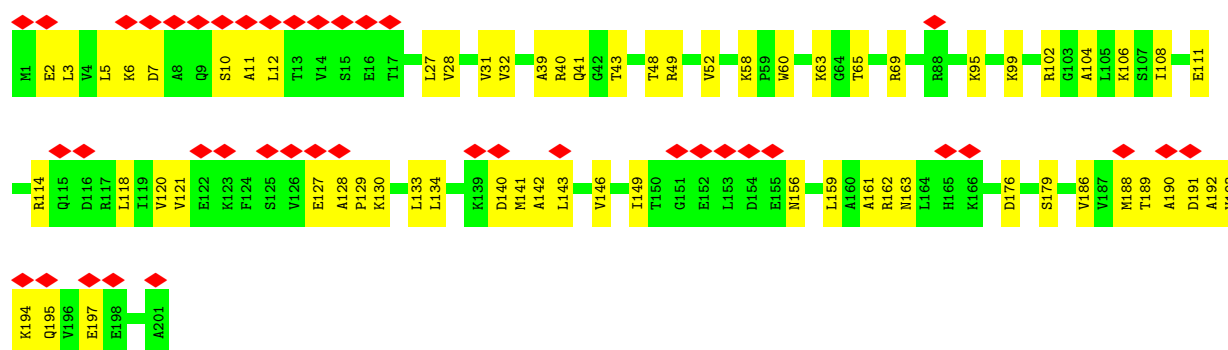
### • Molecule 4: 50S ribosomal protein L2



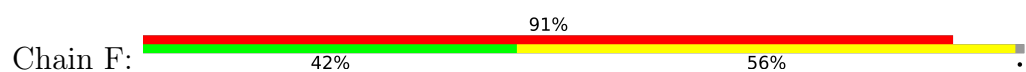
### • Molecule 5: 50S ribosomal protein L3



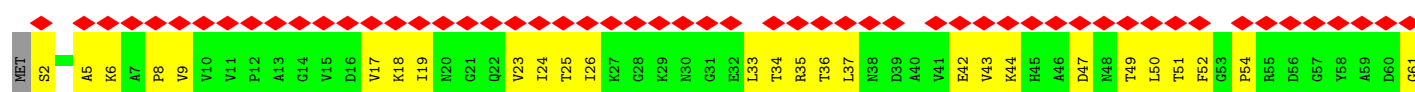
• Molecule 6: 50S ribosomal protein L4

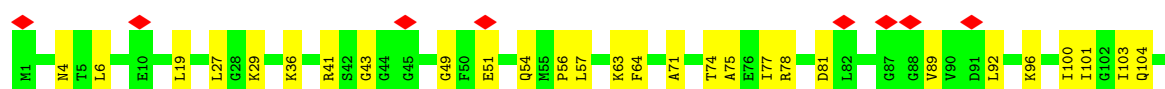


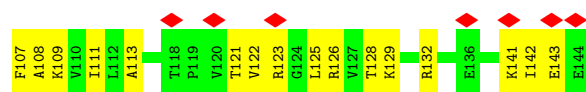
• Molecule 7: 50S ribosomal protein L5



• Molecule 8: 50S ribosomal protein L6







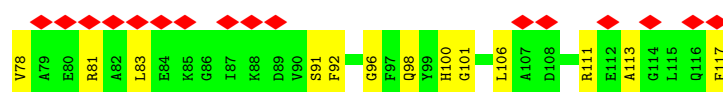
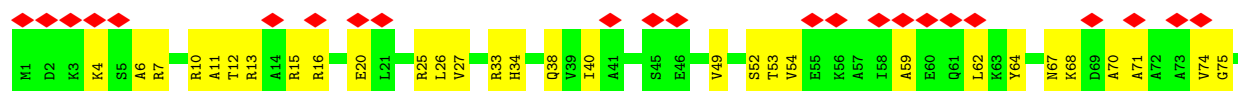
- Molecule 13: 50S ribosomal protein L16



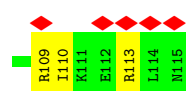
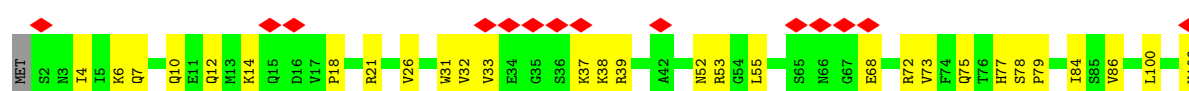
- Molecule 14: 50S ribosomal protein L17



- Molecule 15: 50S ribosomal protein L18

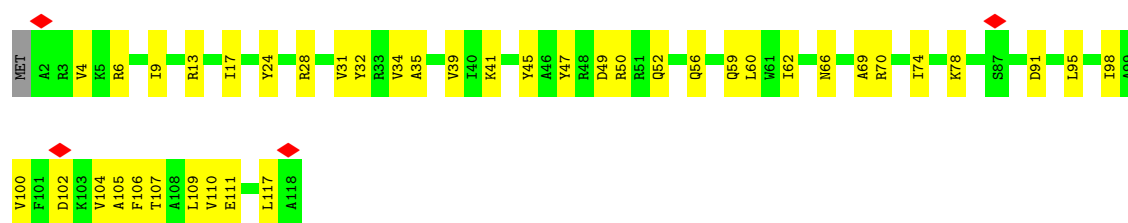


- Molecule 16: 50S ribosomal protein L19



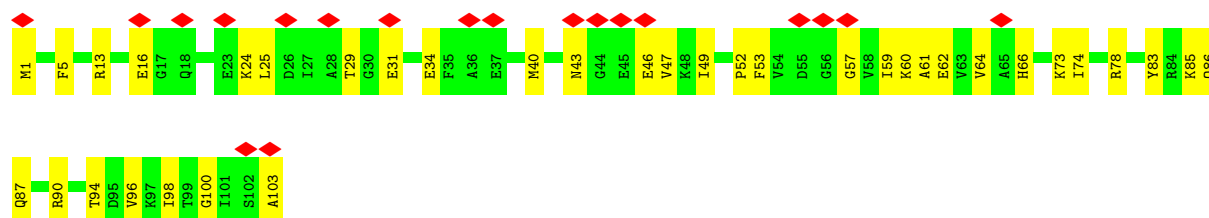
- Molecule 17: 50S ribosomal protein L20

Chain R: 



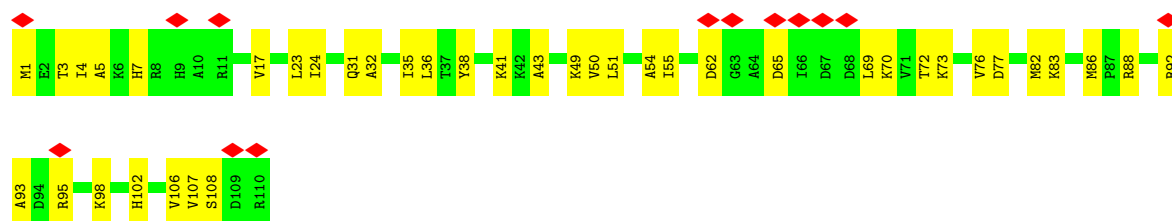
- Molecule 18: 50S ribosomal protein L21

Chain S: 



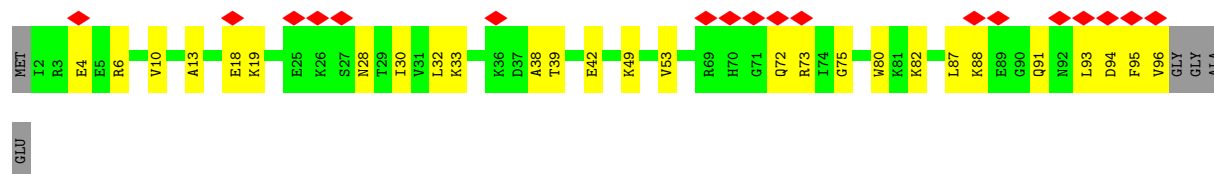
- Molecule 19: 50S ribosomal protein L22

Chain T: 



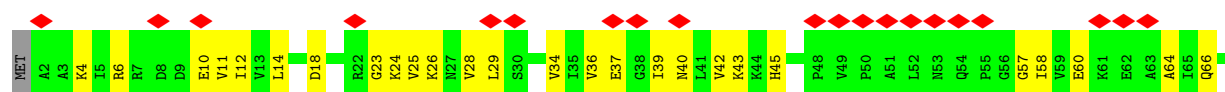
- Molecule 20: 50S ribosomal protein L23

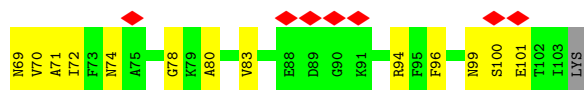
Chain U: 



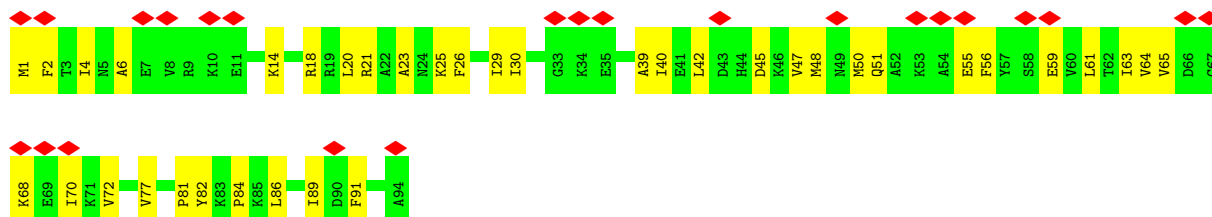
- Molecule 21: 50S ribosomal protein L24

Chain V: 





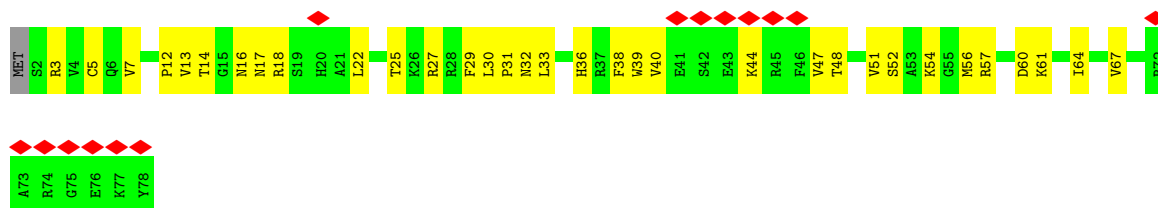
- Molecule 22: 50S ribosomal protein L25



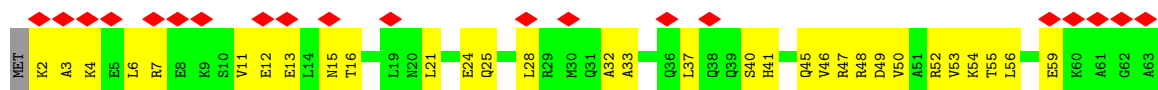
- Molecule 23: 50S ribosomal protein L27



- Molecule 24: 50S ribosomal protein L28



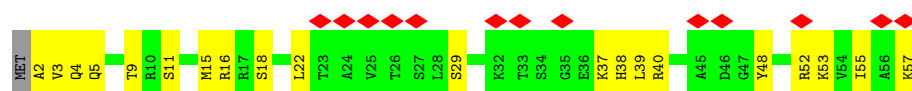
- Molecule 25: 50S ribosomal protein L29



- Molecule 26: 50S ribosomal protein L30



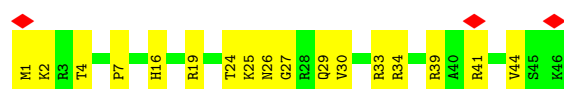
- Molecule 27: 50S ribosomal protein L32



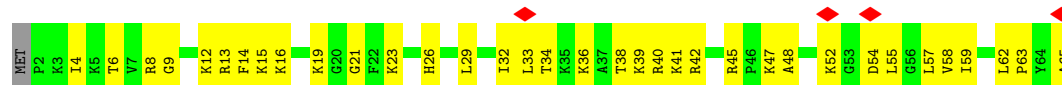
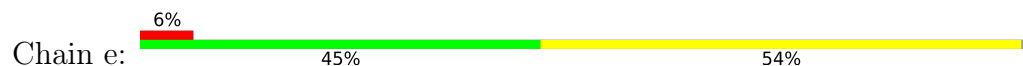
- Molecule 28: 50S ribosomal protein L33



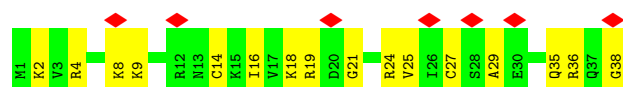
- Molecule 29: 50S ribosomal protein L34



- Molecule 30: 50S ribosomal protein L35



- Molecule 31: 50S ribosomal protein L36



## 4 Experimental information

| Property                             | Value                                   | Source    |
|--------------------------------------|-----------------------------------------|-----------|
| EM reconstruction method             | SINGLE PARTICLE                         | Depositor |
| Imposed symmetry                     | POINT, C1                               | Depositor |
| Number of particles used             | 59148                                   | Depositor |
| Resolution determination method      | FSC 0.143 CUT-OFF                       | Depositor |
| CTF correction method                | PHASE FLIPPING AND AMPLITUDE CORRECTION | Depositor |
| Microscope                           | FEI TITAN KRIOS                         | Depositor |
| Voltage (kV)                         | 300                                     | Depositor |
| Electron dose ( $e^-/\text{\AA}^2$ ) | 1.14                                    | Depositor |
| Minimum defocus (nm)                 | Not provided                            |           |
| Maximum defocus (nm)                 | Not provided                            |           |
| Magnification                        | Not provided                            |           |
| Image detector                       | FEI FALCON II (4k x 4k)                 | Depositor |
| Maximum map value                    | 0.616                                   | Depositor |
| Minimum map value                    | -0.384                                  | Depositor |
| Average map value                    | 0.002                                   | Depositor |
| Map value standard deviation         | 0.026                                   | Depositor |
| Recommended contour level            | 0.1                                     | Depositor |
| Map size (Å)                         | 312.91, 312.91, 302.12                  | wwPDB     |
| Map dimensions                       | 290, 290, 280                           | wwPDB     |
| Map angles (°)                       | 90.0, 90.0, 90.0                        | wwPDB     |
| Pixel spacing (Å)                    | 1.079, 1.079, 1.079                     | 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: MG, AMP, FME, JJH, ZN

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

| Mol | Chain | Bond lengths |             | Bond angles |             |
|-----|-------|--------------|-------------|-------------|-------------|
|     |       | RMSZ         | $\# Z  > 5$ | RMSZ        | $\# Z  > 5$ |
| 1   | 1     | 0.10         | 0/93        | 0.35        | 0/142       |
| 2   | A     | 0.10         | 0/67296     | 0.20        | 0/104979    |
| 3   | B     | 0.08         | 0/2872      | 0.16        | 0/4478      |
| 4   | C     | 0.14         | 0/2121      | 0.36        | 0/2852      |
| 5   | D     | 0.12         | 0/1585      | 0.34        | 0/2134      |
| 6   | E     | 0.12         | 0/1570      | 0.32        | 0/2113      |
| 7   | F     | 0.14         | 0/1434      | 0.39        | 0/1926      |
| 8   | G     | 0.13         | 0/1342      | 0.35        | 0/1816      |
| 9   | H     | 0.14         | 0/389       | 0.41        | 0/523       |
| 10  | K     | 0.12         | 0/1151      | 0.30        | 0/1551      |
| 11  | L     | 0.14         | 0/955       | 0.33        | 0/1279      |
| 12  | M     | 0.15         | 0/1061      | 0.39        | 0/1413      |
| 13  | N     | 0.13         | 0/1092      | 0.32        | 0/1460      |
| 14  | O     | 0.13         | 0/1006      | 0.37        | 0/1345      |
| 15  | P     | 0.11         | 0/909       | 0.31        | 0/1219      |
| 16  | Q     | 0.13         | 0/928       | 0.34        | 0/1242      |
| 17  | R     | 0.13         | 0/959       | 0.34        | 0/1278      |
| 18  | S     | 0.12         | 0/828       | 0.30        | 0/1107      |
| 19  | T     | 0.12         | 0/863       | 0.32        | 0/1156      |
| 20  | U     | 0.10         | 0/763       | 0.30        | 0/1021      |
| 21  | V     | 0.12         | 0/787       | 0.33        | 0/1051      |
| 22  | W     | 0.13         | 0/765       | 0.33        | 0/1025      |
| 23  | X     | 0.13         | 0/586       | 0.36        | 0/776       |
| 24  | Y     | 0.12         | 0/634       | 0.35        | 0/848       |
| 25  | Z     | 0.10         | 0/501       | 0.32        | 0/667       |
| 26  | a     | 0.11         | 0/452       | 0.29        | 0/605       |
| 27  | b     | 0.12         | 0/449       | 0.32        | 0/599       |
| 28  | c     | 0.12         | 0/421       | 0.31        | 0/561       |
| 29  | d     | 0.13         | 0/379       | 0.38        | 0/498       |
| 30  | e     | 0.13         | 0/512       | 0.36        | 0/676       |
| 31  | f     | 0.12         | 0/302       | 0.30        | 0/397       |
| All | All   | 0.11         | 0/95005     | 0.24        | 0/142737    |

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

## 5.2 Too-close contacts

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

| Mol | Chain | Non-H | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|-------|----------|----------|---------|--------------|
| 1   | 1     | 84    | 0        | 44       | 2       | 0            |
| 2   | A     | 60085 | 0        | 30220    | 1583    | 0            |
| 3   | B     | 2569  | 0        | 1301     | 66      | 0            |
| 4   | C     | 2082  | 0        | 2154     | 83      | 0            |
| 5   | D     | 1564  | 0        | 1616     | 61      | 0            |
| 6   | E     | 1551  | 0        | 1619     | 53      | 0            |
| 7   | F     | 1410  | 0        | 1444     | 102     | 0            |
| 8   | G     | 1322  | 0        | 1371     | 68      | 0            |
| 9   | H     | 384   | 0        | 405      | 21      | 0            |
| 10  | K     | 1128  | 0        | 1162     | 36      | 0            |
| 11  | L     | 946   | 0        | 1023     | 50      | 0            |
| 12  | M     | 1052  | 0        | 1129     | 43      | 0            |
| 13  | N     | 1073  | 0        | 1157     | 35      | 0            |
| 14  | O     | 993   | 0        | 1034     | 41      | 0            |
| 15  | P     | 899   | 0        | 935      | 38      | 0            |
| 16  | Q     | 916   | 0        | 962      | 31      | 0            |
| 17  | R     | 946   | 0        | 1019     | 33      | 0            |
| 18  | S     | 815   | 0        | 839      | 28      | 0            |
| 19  | T     | 856   | 0        | 922      | 32      | 0            |
| 20  | U     | 756   | 0        | 817      | 22      | 0            |
| 21  | V     | 779   | 0        | 831      | 32      | 0            |
| 22  | W     | 752   | 0        | 780      | 40      | 0            |
| 23  | X     | 579   | 0        | 594      | 14      | 0            |
| 24  | Y     | 624   | 0        | 652      | 34      | 0            |
| 25  | Z     | 500   | 0        | 531      | 28      | 0            |
| 26  | a     | 448   | 0        | 488      | 26      | 0            |
| 27  | b     | 443   | 0        | 458      | 22      | 0            |
| 28  | c     | 414   | 0        | 442      | 16      | 0            |
| 29  | d     | 376   | 0        | 418      | 15      | 0            |
| 30  | e     | 503   | 0        | 572      | 43      | 0            |

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| Mol | Chain | Non-H | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|-------|----------|----------|---------|--------------|
| 31  | f     | 301   | 0        | 340      | 16      | 0            |
| 32  | 1     | 10    | 0        | 10       | 0       | 0            |
| 33  | 1     | 1     | 0        | 0        | 0       | 0            |
| 33  | A     | 369   | 0        | 0        | 0       | 0            |
| 33  | B     | 8     | 0        | 0        | 0       | 0            |
| 33  | C     | 1     | 0        | 0        | 0       | 0            |
| 33  | O     | 1     | 0        | 0        | 0       | 0            |
| 33  | R     | 1     | 0        | 0        | 0       | 0            |
| 33  | b     | 1     | 0        | 0        | 0       | 0            |
| 34  | A     | 22    | 0        | 12       | 1       | 0            |
| 35  | A     | 42    | 28       | 0        | 0       | 0            |
| 36  | f     | 1     | 0        | 0        | 0       | 0            |
| All | All   | 87607 | 28       | 57301    | 2423    | 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 17.

All (2423) 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) |
|------------------|-------------------|--------------------------|-------------------|
| 2:A:775:G:H4'    | 2:A:776:G:H5'     | 1.45                     | 0.97              |
| 13:N:77:PRO:HG2  | 13:N:80:VAL:HG21  | 1.47                     | 0.96              |
| 20:U:53:VAL:HG11 | 20:U:87:LEU:HD13  | 1.48                     | 0.94              |
| 7:F:108:VAL:HG11 | 7:F:176:PRO:HG2   | 1.47                     | 0.93              |
| 8:G:164:TYR:HB2  | 8:G:167:GLU:HG2   | 1.50                     | 0.91              |
| 2:A:1009:A:H5'   | 17:R:59:GLN:HG3   | 1.53                     | 0.90              |
| 7:F:12:VAL:HG13  | 7:F:16:LEU:HD13   | 1.53                     | 0.89              |
| 2:A:45:G:H5'     | 2:A:46:G:H5'      | 1.56                     | 0.88              |
| 21:V:28:VAL:HG12 | 21:V:34:VAL:HG12  | 1.54                     | 0.88              |
| 8:G:44:LYS:HB2   | 8:G:51:THR:HB     | 1.58                     | 0.86              |
| 2:A:545:U:H3     | 2:A:548:G:H1      | 1.22                     | 0.86              |
| 13:N:75:GLU:HB2  | 13:N:90:GLU:HG3   | 1.55                     | 0.86              |
| 19:T:4:ILE:HG12  | 19:T:106:VAL:HG22 | 1.57                     | 0.86              |
| 26:a:6:LYS:HG2   | 26:a:37:GLU:HG2   | 1.57                     | 0.85              |
| 4:C:29:PRO:HG2   | 4:C:34:LEU:HD11   | 1.58                     | 0.85              |
| 2:A:2508:G:H1    | 2:A:2580:U:H3     | 1.26                     | 0.84              |
| 2:A:1597:A:H5''  | 2:A:1598:A:H5'    | 1.58                     | 0.84              |
| 11:L:102:PRO:HB3 | 11:L:121:GLU:HB3  | 1.58                     | 0.84              |
| 2:A:181:A:H1'    | 2:A:435:C:H5'     | 1.60                     | 0.84              |
| 2:A:479:A:H4'    | 2:A:480:A:H5'     | 1.61                     | 0.83              |
| 8:G:37:LEU:HD13  | 8:G:68:ALA:HB1    | 1.60                     | 0.83              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 5:D:56:LYS:HB2   | 5:D:59:ARG:HB2   | 1.61                     | 0.82              |
| 11:L:108:ARG:HG3 | 11:L:113:MET:HE1 | 1.61                     | 0.82              |
| 7:F:69:LYS:HE3   | 7:F:84:PRO:HG3   | 1.61                     | 0.82              |
| 7:F:142:ASP:HB3  | 7:F:145:LYS:HD3  | 1.59                     | 0.82              |
| 6:E:5:LEU:HD11   | 6:E:12:LEU:HD23  | 1.60                     | 0.81              |
| 13:N:20:LEU:HD13 | 22:W:81:PRO:HG2  | 1.62                     | 0.81              |
| 16:Q:14:LYS:HE2  | 16:Q:77:HIS:HA   | 1.63                     | 0.81              |
| 7:F:160:ALA:HB1  | 7:F:165:GLU:HB2  | 1.63                     | 0.81              |
| 31:f:18:LYS:HE2  | 31:f:21:GLY:HA2  | 1.61                     | 0.81              |
| 7:F:103:LEU:HA   | 7:F:107:ALA:HB3  | 1.64                     | 0.80              |
| 2:A:1798:U:H5''  | 4:C:258:ARG:HB2  | 1.64                     | 0.79              |
| 2:A:1645:G:H5''  | 2:A:1646:C:H5'   | 1.64                     | 0.79              |
| 2:A:1664:A:H61   | 2:A:1996:C:H42   | 1.27                     | 0.79              |
| 12:M:57:LEU:HD22 | 30:e:54:ASP:HB3  | 1.64                     | 0.78              |
| 2:A:358:U:H2'    | 2:A:359:G:H8     | 1.49                     | 0.77              |
| 25:Z:2:LYS:HE3   | 25:Z:6:LEU:HD11  | 1.67                     | 0.76              |
| 6:E:149:ILE:HB   | 6:E:188:MET:HG2  | 1.68                     | 0.76              |
| 2:A:820:A:H4'    | 2:A:836:G:H22    | 1.51                     | 0.76              |
| 7:F:34:ILE:HG12  | 7:F:156:ILE:HG12 | 1.67                     | 0.76              |
| 2:A:2343:U:HO2'  | 2:A:2373:G:HO2'  | 1.27                     | 0.76              |
| 7:F:12:VAL:HG22  | 7:F:172:ALA:HB1  | 1.68                     | 0.76              |
| 2:A:834:G:H5'    | 30:e:57:LEU:HD11 | 1.68                     | 0.75              |
| 2:A:1125:G:OP2   | 2:A:1126:A:O2'   | 2.03                     | 0.75              |
| 18:S:24:LYS:HA   | 18:S:94:THR:HG23 | 1.68                     | 0.75              |
| 3:B:30:C:H1'     | 3:B:57:A:H61     | 1.51                     | 0.74              |
| 9:H:40:THR:OG1   | 9:H:43:ASN:OD1   | 2.05                     | 0.74              |
| 29:d:24:THR:HG23 | 29:d:27:GLY:H    | 1.52                     | 0.74              |
| 2:A:1942:C:OP2   | 2:A:1943:U:O2'   | 2.05                     | 0.74              |
| 22:W:55:GLU:HB2  | 22:W:59:GLU:HG2  | 1.67                     | 0.74              |
| 2:A:1048:A:H1'   | 2:A:1112:G:H21   | 1.52                     | 0.74              |
| 2:A:2511:U:OP1   | 5:D:128:ARG:NH1  | 2.21                     | 0.74              |
| 6:E:41:GLN:HG2   | 6:E:43:THR:HG23  | 1.69                     | 0.74              |
| 2:A:764:A:H5'    | 4:C:209:GLY:HA2  | 1.70                     | 0.74              |
| 4:C:232:HIS:HA   | 4:C:242:LYS:HD2  | 1.68                     | 0.74              |
| 7:F:103:LEU:HD12 | 7:F:107:ALA:HB3  | 1.69                     | 0.73              |
| 2:A:2304:G:H4'   | 7:F:130:MET:HA   | 1.70                     | 0.73              |
| 8:G:35:ARG:HG2   | 8:G:71:LEU:HD21  | 1.71                     | 0.73              |
| 13:N:53:MET:HG3  | 13:N:120:ALA:HB2 | 1.70                     | 0.73              |
| 2:A:992:C:OP1    | 17:R:47:TYR:OH   | 2.07                     | 0.72              |
| 2:A:1068:G:N2    | 2:A:1095:A:O2'   | 2.22                     | 0.72              |
| 2:A:1082:U:H3'   | 2:A:1083:U:H5''  | 1.71                     | 0.72              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 24:Y:12:PRO:HB3  | 24:Y:30:LEU:HD23 | 1.71                     | 0.72              |
| 2:A:1818:U:OP2   | 4:C:156:ARG:NH1  | 2.22                     | 0.72              |
| 4:C:245:VAL:HG12 | 4:C:251:GLN:HA   | 1.69                     | 0.72              |
| 2:A:219:A:N3     | 2:A:234:U:O2'    | 2.23                     | 0.72              |
| 2:A:1664:A:H61   | 2:A:1996:C:N4    | 1.87                     | 0.72              |
| 2:A:2683:C:O2    | 11:L:70:ARG:NH2  | 2.22                     | 0.72              |
| 2:A:1044:C:H4'   | 2:A:1048:A:H5'   | 1.72                     | 0.72              |
| 2:A:1826:G:O2'   | 2:A:1971:U:OP2   | 2.07                     | 0.71              |
| 2:A:775:G:H5'    | 2:A:777:G:H1'    | 1.71                     | 0.71              |
| 7:F:110:ARG:HB2  | 7:F:137:ILE:HG23 | 1.73                     | 0.71              |
| 8:G:25:THR:HA    | 8:G:34:THR:HG22  | 1.73                     | 0.70              |
| 8:G:86:LYS:HG3   | 8:G:165:ALA:HB2  | 1.72                     | 0.70              |
| 14:O:121:LYS:HA  | 14:O:124:ALA:HB3 | 1.71                     | 0.70              |
| 4:C:132:MET:HE2  | 4:C:188:CYS:HB2  | 1.74                     | 0.70              |
| 17:R:105:ALA:HB1 | 18:S:40:MET:HE1  | 1.73                     | 0.70              |
| 30:e:33:LEU:HA   | 30:e:36:LYS:HD2  | 1.74                     | 0.70              |
| 2:A:2566:A:N1    | 11:L:28:SER:OG   | 2.23                     | 0.70              |
| 5:D:14:ILE:HD13  | 16:Q:12:GLN:HE22 | 1.56                     | 0.69              |
| 2:A:845:A:O2'    | 2:A:846:U:O4'    | 2.09                     | 0.69              |
| 3:B:1:U:H2'      | 3:B:2:G:H8       | 1.56                     | 0.69              |
| 7:F:125:ARG:O    | 7:F:127:ASN:ND2  | 2.24                     | 0.69              |
| 10:K:114:LEU:HG  | 10:K:118:MET:HE3 | 1.74                     | 0.69              |
| 2:A:1797:G:O2'   | 4:C:257:THR:OG1  | 2.10                     | 0.69              |
| 8:G:17:VAL:HG12  | 8:G:26:ILE:HG13  | 1.73                     | 0.69              |
| 2:A:276:U:O2'    | 2:A:278:A:N7     | 2.20                     | 0.69              |
| 2:A:2506:U:OP2   | 2:A:2576:G:N1    | 2.25                     | 0.69              |
| 2:A:224:U:O4     | 2:A:419:U:O2'    | 2.11                     | 0.69              |
| 2:A:1654:A:O2'   | 5:D:118:PHE:O    | 2.11                     | 0.69              |
| 2:A:1779:U:OP2   | 2:A:1784:A:N6    | 2.21                     | 0.69              |
| 2:A:2285:C:OP2   | 28:c:6:ARG:NE    | 2.26                     | 0.69              |
| 25:Z:21:LEU:HB3  | 25:Z:50:VAL:HG12 | 1.75                     | 0.69              |
| 2:A:1800:C:H3'   | 4:C:146:MET:HE1  | 1.76                     | 0.68              |
| 2:A:84:A:N1      | 2:A:98:G:O2'     | 2.27                     | 0.68              |
| 2:A:1918:A:O2'   | 2:A:1920:C:N4    | 2.26                     | 0.68              |
| 5:D:25:THR:OG1   | 5:D:191:GLY:O    | 2.11                     | 0.68              |
| 8:G:33:LEU:HB3   | 8:G:75:MET:HE3   | 1.75                     | 0.68              |
| 19:T:38:TYR:OH   | 27:b:37:LYS:O    | 2.12                     | 0.68              |
| 2:A:698:C:O2'    | 2:A:734:A:N6     | 2.26                     | 0.68              |
| 22:W:4:ILE:HB    | 22:W:63:ILE:HD13 | 1.76                     | 0.68              |
| 2:A:320:A:N3     | 6:E:163:ASN:ND2  | 2.41                     | 0.68              |
| 2:A:249:C:O2     | 30:e:12:LYS:NZ   | 2.26                     | 0.68              |

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| Atom-1            | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|--------------------|--------------------------|-------------------|
| 2:A:1019:U:OP1    | 2:A:1035:U:O2'     | 2.10                     | 0.68              |
| 2:A:210:C:OP1     | 29:d:29:GLN:NE2    | 2.27                     | 0.68              |
| 2:A:414:C:O2      | 2:A:1864:U:O2'     | 2.12                     | 0.68              |
| 2:A:411:G:OP2     | 2:A:2406:A:O2'     | 2.12                     | 0.68              |
| 2:A:2898:U:H2'    | 2:A:2899:A:H8      | 1.59                     | 0.68              |
| 2:A:2491:U:H5'    | 2:A:2570:G:H5''    | 1.74                     | 0.67              |
| 21:V:40:ASN:ND2   | 21:V:64:ALA:O      | 2.27                     | 0.67              |
| 23:X:25:ARG:HG3   | 23:X:31:VAL:HG11   | 1.76                     | 0.67              |
| 2:A:577:G:O2'     | 2:A:1254:A:OP1     | 2.12                     | 0.67              |
| 2:A:2303:G:O2'    | 7:F:121:SER:O      | 2.08                     | 0.67              |
| 24:Y:36:HIS:HB2   | 24:Y:56:MET:HE1    | 1.74                     | 0.67              |
| 2:A:2258:C:O2'    | 2:A:2427:C:OP2     | 2.11                     | 0.67              |
| 12:M:19:LEU:HD23  | 12:M:27:LEU:HD13   | 1.76                     | 0.67              |
| 19:T:86:MET:HE3   | 19:T:88:ARG:HD3    | 1.76                     | 0.67              |
| 2:A:1132:U:H3'    | 2:A:1133:A:H5''    | 1.75                     | 0.67              |
| 2:A:2328:A:H2'    | 2:A:2329:U:C6      | 2.30                     | 0.67              |
| 11:L:114:LYS:HE3  | 11:L:118:LEU:HD11  | 1.75                     | 0.67              |
| 2:A:1264:A:OP1    | 27:b:16:ARG:NH1    | 2.28                     | 0.67              |
| 2:A:381:G:OP1     | 24:Y:18:ARG:NH2    | 2.28                     | 0.67              |
| 2:A:993:G:OP1     | 17:R:50:ARG:NE     | 2.25                     | 0.66              |
| 2:A:1250:G:H5''   | 17:R:6:ARG:HD3     | 1.76                     | 0.66              |
| 2:A:2298:A:OP1    | 7:F:71:ARG:NH2     | 2.28                     | 0.66              |
| 21:V:14:LEU:HD11  | 21:V:71:ALA:HB2    | 1.77                     | 0.66              |
| 2:A:1866:A:N6     | 2:A:1875:G:O2'     | 2.28                     | 0.66              |
| 12:M:132:ARG:HG3  | 12:M:142:ILE:HD12  | 1.76                     | 0.66              |
| 12:M:141:LYS:NZ   | 12:M:143:GLU:OE1   | 2.26                     | 0.66              |
| 9:H:41:LYS:HA     | 9:H:44:ILE:HG12    | 1.76                     | 0.66              |
| 2:A:380:G:H5'     | 24:Y:18:ARG:HG2    | 1.78                     | 0.66              |
| 2:A:1094:U:H1'    | 2:A:1097:U:H5      | 1.60                     | 0.66              |
| 8:G:123:ALA:HB2   | 8:G:133:LEU:HG     | 1.77                     | 0.66              |
| 2:A:1432:G:H2'    | 2:A:1433:A:C8      | 2.31                     | 0.66              |
| 2:A:117:G:OP2     | 2:A:119:A:O2'      | 2.13                     | 0.66              |
| 2:A:239:C:HO2'    | 2:A:622:G:HO2'     | 1.44                     | 0.66              |
| 2:A:2602[B]:A:H3' | 2:A:2603[B]:G:H5'' | 1.77                     | 0.66              |
| 2:A:2756:U:OP2    | 31:f:19:ARG:NE     | 2.27                     | 0.66              |
| 19:T:24:ILE:HD13  | 19:T:36:LEU:HD11   | 1.76                     | 0.66              |
| 25:Z:50:VAL:HA    | 25:Z:53:VAL:HG12   | 1.78                     | 0.66              |
| 2:A:743:A:O2'     | 2:A:1659:G:OP1     | 2.12                     | 0.66              |
| 8:G:19:ILE:HG12   | 8:G:24:ILE:HG23    | 1.76                     | 0.66              |
| 2:A:2848:G:O2'    | 2:A:2867:G:N2      | 2.28                     | 0.65              |
| 5:D:29:VAL:HB     | 5:D:98:VAL:HG12    | 1.78                     | 0.65              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 2:A:476:G:N1     | 2:A:479:A:OP2     | 2.29                     | 0.65              |
| 2:A:1149:G:H2'   | 2:A:1150:C:C6     | 2.30                     | 0.65              |
| 2:A:1340:U:OP2   | 20:U:82:LYS:NZ    | 2.30                     | 0.65              |
| 7:F:101:GLU:O    | 7:F:105:THR:HG22  | 1.97                     | 0.65              |
| 21:V:12:ILE:HG21 | 21:V:80:ALA:HB2   | 1.79                     | 0.65              |
| 2:A:197:A:N6     | 2:A:2430:A:O2'    | 2.30                     | 0.65              |
| 2:A:1392:A:N6    | 20:U:18:GLU:OE1   | 2.29                     | 0.65              |
| 2:A:2798:U:H4'   | 2:A:2799:A:H5'    | 1.79                     | 0.65              |
| 2:A:1270:C:H5''  | 2:A:1271:G:H5'    | 1.79                     | 0.65              |
| 2:A:1564:C:H2'   | 2:A:1565:C:C6     | 2.32                     | 0.65              |
| 2:A:1827:U:OP1   | 2:A:1971:U:O2'    | 2.15                     | 0.65              |
| 2:A:1853:A:N6    | 2:A:1888:G:O2'    | 2.29                     | 0.65              |
| 2:A:601:C:O2'    | 2:A:605:G:OP1     | 2.14                     | 0.65              |
| 2:A:1715:G:O2'   | 2:A:1743:G:O6     | 2.12                     | 0.65              |
| 2:A:1757:A:O2'   | 2:A:1758:U:OP1    | 2.12                     | 0.65              |
| 6:E:48:THR:O     | 6:E:52:VAL:HG23   | 1.97                     | 0.65              |
| 2:A:329:G:OP2    | 21:V:69:ASN:ND2   | 2.29                     | 0.65              |
| 5:D:55:LYS:HD3   | 5:D:60:VAL:HG22   | 1.77                     | 0.65              |
| 2:A:160:A:N3     | 2:A:2208:C:O2'    | 2.30                     | 0.64              |
| 2:A:1485:U:H2'   | 2:A:1486:U:C6     | 2.32                     | 0.64              |
| 3:B:66:A:OP2     | 3:B:108:A:N6      | 2.26                     | 0.64              |
| 5:D:32:ASN:ND2   | 5:D:52:THR:OG1    | 2.29                     | 0.64              |
| 2:A:188:G:H5'    | 24:Y:14:THR:HG21  | 1.79                     | 0.64              |
| 2:A:2619:C:OP1   | 5:D:157:LYS:NZ    | 2.28                     | 0.64              |
| 2:A:671:C:OP1    | 12:M:43:GLY:N     | 2.26                     | 0.64              |
| 2:A:2291:U:H2'   | 2:A:2292:U:C6     | 2.33                     | 0.64              |
| 2:A:2562:U:H4'   | 11:L:25:LEU:HD22  | 1.79                     | 0.64              |
| 2:A:1387:A:H5'   | 2:A:1469:A:H1'    | 1.80                     | 0.64              |
| 2:A:2086:U:H2'   | 2:A:2087:G:C8     | 2.33                     | 0.64              |
| 6:E:159:LEU:HD22 | 6:E:162:ARG:HH11  | 1.62                     | 0.64              |
| 11:L:69:VAL:HG21 | 11:L:104:THR:HG21 | 1.79                     | 0.64              |
| 28:c:8:LYS:HE3   | 30:e:34:THR:HG21  | 1.78                     | 0.64              |
| 2:A:1211:C:H3'   | 2:A:1212:G:H5'    | 1.79                     | 0.64              |
| 12:M:78:ARG:HG2  | 12:M:113:ALA:HB3  | 1.80                     | 0.64              |
| 22:W:2:PHE:HB2   | 22:W:61:LEU:HD22  | 1.80                     | 0.64              |
| 2:A:2350:C:OP2   | 30:e:45:ARG:NH2   | 2.30                     | 0.64              |
| 22:W:30:ILE:HD11 | 22:W:40:ILE:HD13  | 1.79                     | 0.64              |
| 2:A:1746:A:H2'   | 2:A:1747:U:C6     | 2.33                     | 0.64              |
| 8:G:107:LEU:HD13 | 8:G:152:ARG:HB2   | 1.80                     | 0.64              |
| 2:A:1264:A:OP2   | 2:A:1265:A:O2'    | 2.11                     | 0.64              |
| 5:D:25:THR:HG21  | 5:D:193:VAL:HG22  | 1.80                     | 0.64              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 26:a:6:LYS:HB2   | 26:a:58:GLU:HG2  | 1.80                     | 0.64              |
| 2:A:807:U:OP2    | 12:M:41:ARG:NH1  | 2.28                     | 0.63              |
| 2:A:1057:A:N6    | 2:A:1087:G:OP2   | 2.31                     | 0.63              |
| 4:C:205:LEU:HB3  | 4:C:210:ALA:HB3  | 1.79                     | 0.63              |
| 11:L:76:VAL:HG12 | 16:Q:73:VAL:HB   | 1.80                     | 0.63              |
| 19:T:17:VAL:HG12 | 19:T:76:VAL:HG21 | 1.80                     | 0.63              |
| 2:A:703:U:H2'    | 2:A:704:G:O4'    | 1.98                     | 0.63              |
| 2:A:729:G:O2'    | 2:A:763:G:H4'    | 1.98                     | 0.63              |
| 2:A:878:A:H3'    | 2:A:879:G:H8     | 1.64                     | 0.63              |
| 2:A:1301:A:O2'   | 2:A:1607:C:N3    | 2.27                     | 0.63              |
| 7:F:101:GLU:HA   | 7:F:104:ILE:HG12 | 1.79                     | 0.63              |
| 2:A:1028:A:OP2   | 2:A:1126:A:N6    | 2.26                     | 0.63              |
| 2:A:2547:A:H2'   | 2:A:2548:U:C6    | 2.33                     | 0.63              |
| 18:S:25:LEU:H    | 18:S:94:THR:HG21 | 1.62                     | 0.63              |
| 2:A:1754:A:N1    | 2:A:2716:C:O2'   | 2.27                     | 0.63              |
| 2:A:2639:A:H2'   | 2:A:2640:G:O4'   | 1.97                     | 0.63              |
| 20:U:30:ILE:HD12 | 20:U:32:LEU:HD21 | 1.79                     | 0.63              |
| 2:A:2530:A:N7    | 8:G:172:LYS:NZ   | 2.41                     | 0.63              |
| 2:A:529:A:OP2    | 10:K:116:ARG:NH2 | 2.24                     | 0.63              |
| 2:A:1386:C:H2'   | 2:A:1387:A:C8    | 2.34                     | 0.63              |
| 2:A:2304:G:H22   | 2:A:2312:U:H3    | 1.46                     | 0.63              |
| 7:F:126:GLY:HA3  | 7:F:160:ALA:HB3  | 1.81                     | 0.63              |
| 21:V:36:VAL:HB   | 21:V:39:ILE:HB   | 1.81                     | 0.63              |
| 2:A:1818:U:O2'   | 4:C:153:GLN:O    | 2.12                     | 0.63              |
| 2:A:2291:U:OP1   | 2:A:2380:C:O2'   | 2.17                     | 0.63              |
| 9:H:3:VAL:HB     | 9:H:36:ALA:HB1   | 1.80                     | 0.63              |
| 2:A:605:G:OP1    | 6:E:99:LYS:NZ    | 2.30                     | 0.62              |
| 21:V:11:VAL:CG1  | 21:V:70:VAL:HB   | 2.29                     | 0.62              |
| 2:A:1816:C:N4    | 4:C:35:GLU:OE2   | 2.25                     | 0.62              |
| 27:b:55:ILE:HG22 | 27:b:57:LYS:H    | 1.64                     | 0.62              |
| 3:B:43:C:O2      | 7:F:92:ARG:NH2   | 2.32                     | 0.62              |
| 7:F:94:GLU:O     | 7:F:98:GLU:HG3   | 2.00                     | 0.62              |
| 19:T:5:ALA:HB3   | 19:T:54:ALA:HB2  | 1.81                     | 0.62              |
| 2:A:306:U:H2'    | 2:A:307:G:O4'    | 2.00                     | 0.62              |
| 2:A:589:U:H2'    | 2:A:590:A:H8     | 1.63                     | 0.62              |
| 2:A:1048:A:H1'   | 2:A:1112:G:N2    | 2.15                     | 0.62              |
| 2:A:240:C:OP2    | 2:A:241:A:O2'    | 2.10                     | 0.62              |
| 2:A:414:C:H1'    | 2:A:1864:U:H1'   | 1.82                     | 0.62              |
| 7:F:115:ARG:O    | 7:F:178:ARG:NH2  | 2.33                     | 0.62              |
| 2:A:515:A:H1'    | 2:A:581:C:H1'    | 1.81                     | 0.62              |
| 2:A:878:A:N6     | 2:A:899:A:O2'    | 2.32                     | 0.62              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:A:976:G:HO2'   | 2:A:1155:A:HO2'  | 1.44                     | 0.62              |
| 2:A:2474:U:OP2   | 2:A:2475:C:N4    | 2.27                     | 0.62              |
| 2:A:2788:C:O2'   | 2:A:2809:A:N3    | 2.32                     | 0.62              |
| 11:L:19:VAL:HB   | 11:L:41:ILE:HD12 | 1.82                     | 0.62              |
| 2:A:2799:A:O2'   | 2:A:2800:A:H5''  | 2.00                     | 0.62              |
| 10:K:1:MET:HE1   | 18:S:13:ARG:HB3  | 1.81                     | 0.62              |
| 2:A:1869:G:N2    | 2:A:1871:A:O2'   | 2.32                     | 0.62              |
| 2:A:2491:U:C5'   | 2:A:2570:G:H5''  | 2.30                     | 0.62              |
| 25:Z:12:GLU:O    | 25:Z:16:THR:HG23 | 1.98                     | 0.62              |
| 2:A:1296:G:OP1   | 2:A:2709:G:O2'   | 2.14                     | 0.61              |
| 2:A:400:G:N7     | 24:Y:57:ARG:NH1  | 2.44                     | 0.61              |
| 2:A:1567:G:OP2   | 4:C:83:TYR:OH    | 2.15                     | 0.61              |
| 2:A:1727:C:H2'   | 2:A:1728:C:C6    | 2.36                     | 0.61              |
| 3:B:77:U:OP1     | 22:W:21:ARG:NH1  | 2.31                     | 0.61              |
| 10:K:13:ARG:NH1  | 10:K:49:ASP:O    | 2.31                     | 0.61              |
| 13:N:41:LEU:HG   | 13:N:96:ILE:HG13 | 1.81                     | 0.61              |
| 2:A:1433:A:H2'   | 2:A:1434:A:C8    | 2.35                     | 0.61              |
| 2:A:2286:G:H4'   | 2:A:2287:A:O4'   | 2.00                     | 0.61              |
| 13:N:66:ARG:NH1  | 13:N:104:GLU:OE2 | 2.33                     | 0.61              |
| 2:A:675:A:OP1    | 6:E:58:LYS:NZ    | 2.27                     | 0.61              |
| 2:A:910:A:H2'    | 2:A:911:A:C8     | 2.35                     | 0.61              |
| 2:A:1581:G:H2'   | 2:A:1582:C:C6    | 2.34                     | 0.61              |
| 2:A:2071:A:H2'   | 2:A:2072:C:C6    | 2.35                     | 0.61              |
| 4:C:107:PRO:HG2  | 4:C:110:LEU:HD23 | 1.81                     | 0.61              |
| 2:A:926:G:H2'    | 2:A:927:A:H8     | 1.66                     | 0.61              |
| 2:A:1682:G:H2'   | 2:A:1683:U:C6    | 2.36                     | 0.61              |
| 6:E:189:THR:OG1  | 6:E:191:ASP:OD1  | 2.14                     | 0.61              |
| 7:F:26:MET:SD    | 7:F:30:ARG:NH1   | 2.73                     | 0.61              |
| 13:N:17:ASN:O    | 13:N:38:ARG:NH1  | 2.33                     | 0.61              |
| 2:A:1799:G:OP1   | 4:C:258:ARG:NH1  | 2.33                     | 0.61              |
| 6:E:12:LEU:HD21  | 6:E:120:VAL:HG11 | 1.82                     | 0.61              |
| 8:G:23:VAL:HA    | 8:G:36:THR:HA    | 1.81                     | 0.61              |
| 2:A:125:A:OP2    | 29:d:19:ARG:NH2  | 2.31                     | 0.61              |
| 2:A:1485:U:H2'   | 2:A:1486:U:H6    | 1.64                     | 0.61              |
| 2:A:1515:A:H3'   | 2:A:1516:G:H8    | 1.66                     | 0.61              |
| 2:A:1589:U:H2'   | 2:A:1590:A:H8    | 1.66                     | 0.61              |
| 2:A:2070:A:H2'   | 2:A:2071:A:C8    | 2.35                     | 0.61              |
| 24:Y:17:ASN:HD21 | 24:Y:27:ARG:HB3  | 1.66                     | 0.61              |
| 2:A:45:G:C5'     | 2:A:46:G:H5'     | 2.30                     | 0.61              |
| 2:A:548:G:H2'    | 2:A:549:G:C8     | 2.35                     | 0.61              |
| 2:A:2898:U:H2'   | 2:A:2899:A:C8    | 2.36                     | 0.61              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 12:M:81:ASP:HB3  | 12:M:100:ILE:HD13 | 1.83                     | 0.61              |
| 15:P:68:LYS:HE2  | 15:P:101:GLY:HA2  | 1.83                     | 0.61              |
| 2:A:576:U:H2'    | 2:A:577:G:C8      | 2.35                     | 0.60              |
| 2:A:2215:C:H2'   | 2:A:2216:G:C8     | 2.37                     | 0.60              |
| 2:A:1814:G:OP2   | 2:A:1815:A:O2'    | 2.09                     | 0.60              |
| 2:A:2070:A:H2'   | 2:A:2071:A:H8     | 1.66                     | 0.60              |
| 2:A:2727:A:O2'   | 2:A:2728:U:H5'    | 2.01                     | 0.60              |
| 4:C:120:VAL:HG13 | 4:C:134:ASN:HD21  | 1.65                     | 0.60              |
| 23:X:66:LYS:HG3  | 23:X:85:GLU:OE2   | 2.01                     | 0.60              |
| 2:A:1437:C:HO2'  | 2:A:1516:G:HO2'   | 1.50                     | 0.60              |
| 2:A:2014:A:H2'   | 2:A:2015:A:C8     | 2.36                     | 0.60              |
| 25:Z:2:LYS:HE2   | 25:Z:52:ARG:HE    | 1.65                     | 0.60              |
| 2:A:90:U:OP2     | 2:A:91:A:O2'      | 2.11                     | 0.60              |
| 2:A:2532:G:N2    | 2:A:2663:G:O2'    | 2.35                     | 0.60              |
| 2:A:2810:A:H4'   | 5:D:62:LYS:HD2    | 1.84                     | 0.60              |
| 17:R:49:ASP:HA   | 17:R:52:GLN:HB2   | 1.82                     | 0.60              |
| 2:A:829:A:N7     | 2:A:2247:A:O2'    | 2.34                     | 0.60              |
| 12:M:51:GLU:OE2  | 30:e:57:LEU:HD13  | 2.00                     | 0.60              |
| 2:A:807:U:O2'    | 2:A:2060:A:N1     | 2.32                     | 0.60              |
| 2:A:1802:A:H2'   | 2:A:1803:A:C8     | 2.37                     | 0.60              |
| 8:G:87:LEU:HD12  | 8:G:162:VAL:CG1   | 2.32                     | 0.60              |
| 8:G:118:PRO:HD2  | 8:G:121:ILE:HG21  | 1.82                     | 0.60              |
| 2:A:75:G:H4'     | 25:Z:48:ARG:NH2   | 2.17                     | 0.60              |
| 2:A:720:U:H2'    | 2:A:721:A:C8      | 2.36                     | 0.60              |
| 2:A:1287:A:O2'   | 2:A:1288:G:H5'    | 2.01                     | 0.60              |
| 2:A:2025:C:H2'   | 2:A:2026:U:C6     | 2.37                     | 0.60              |
| 2:A:2323:G:O2'   | 2:A:2324:U:H5'    | 2.02                     | 0.60              |
| 2:A:832:U:H2'    | 2:A:833:A:C8      | 2.37                     | 0.59              |
| 2:A:894:U:H2'    | 2:A:895:U:C6      | 2.37                     | 0.59              |
| 2:A:2788:C:H2'   | 2:A:2789:C:C6     | 2.37                     | 0.59              |
| 25:Z:11:VAL:O    | 25:Z:15:ASN:ND2   | 2.35                     | 0.59              |
| 2:A:307:G:N1     | 2:A:310:A:OP2     | 2.29                     | 0.59              |
| 2:A:1669:A:O2'   | 2:A:2549:G:OP1    | 2.14                     | 0.59              |
| 2:A:2687:U:H2'   | 2:A:2688:G:O4'    | 2.02                     | 0.59              |
| 14:O:29:VAL:HG11 | 14:O:75:ILE:HG23  | 1.83                     | 0.59              |
| 2:A:685:A:N1     | 2:A:787:C:H1'     | 2.17                     | 0.59              |
| 2:A:729:G:OP1    | 4:C:13:ARG:HG2    | 2.03                     | 0.59              |
| 2:A:918:A:N3     | 3:B:80:U:O2'      | 2.33                     | 0.59              |
| 2:A:1496:A:H2'   | 2:A:1498:C:C5     | 2.38                     | 0.59              |
| 2:A:2306:C:OP2   | 2:A:2307:G:O2'    | 2.13                     | 0.59              |
| 7:F:102:ARG:HA   | 7:F:106:ILE:CD1   | 2.33                     | 0.59              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:A:1360:G:H2'   | 2:A:1361:G:H5'   | 1.84                     | 0.59              |
| 6:E:111:GLU:OE1  | 6:E:114:ARG:NH1  | 2.35                     | 0.59              |
| 7:F:102:ARG:HA   | 7:F:106:ILE:HD13 | 1.83                     | 0.59              |
| 2:A:396:G:H1'    | 24:Y:29:PHE:HB3  | 1.83                     | 0.59              |
| 2:A:463:G:N2     | 2:A:466:A:OP2    | 2.25                     | 0.59              |
| 2:A:580:U:H2'    | 2:A:581:C:H6     | 1.67                     | 0.59              |
| 2:A:1361:G:H2'   | 2:A:1362:C:H6    | 1.67                     | 0.59              |
| 2:A:2290:G:H2'   | 2:A:2291:U:C6    | 2.38                     | 0.59              |
| 2:A:2641:G:H5''  | 10:K:78:THR:HB   | 1.84                     | 0.59              |
| 3:B:7:G:OP1      | 15:P:4:LYS:NZ    | 2.27                     | 0.59              |
| 28:c:11:LEU:N    | 28:c:21:TYR:O    | 2.35                     | 0.59              |
| 2:A:926:G:H2'    | 2:A:927:A:C8     | 2.37                     | 0.59              |
| 2:A:1712:U:OP2   | 2:A:1713:A:O2'   | 2.13                     | 0.59              |
| 2:A:2074:U:H2'   | 2:A:2075:U:C6    | 2.37                     | 0.59              |
| 2:A:2637:U:H2'   | 2:A:2638:G:O4'   | 2.02                     | 0.59              |
| 10:K:125:TYR:OH  | 10:K:132:HIS:NE2 | 2.27                     | 0.59              |
| 2:A:859:G:O2'    | 2:A:916:G:O6     | 2.20                     | 0.59              |
| 2:A:2557:G:H2'   | 2:A:2558:C:C6    | 2.38                     | 0.59              |
| 3:B:8:C:OP1      | 15:P:15:ARG:NH2  | 2.31                     | 0.59              |
| 2:A:570:G:H2'    | 2:A:2030:A:N7    | 2.18                     | 0.59              |
| 2:A:1445:G:O6    | 2:A:1466:U:O2    | 2.20                     | 0.59              |
| 7:F:117:LEU:HD11 | 7:F:130:MET:HE2  | 1.85                     | 0.59              |
| 2:A:2644:G:O2'   | 2:A:2645:G:H5'   | 2.03                     | 0.59              |
| 5:D:48:ILE:HG23  | 5:D:84:LEU:HD11  | 1.85                     | 0.59              |
| 2:A:435:C:H2'    | 2:A:436:C:H5'    | 1.85                     | 0.58              |
| 2:A:720:U:H2'    | 2:A:721:A:H8     | 1.67                     | 0.58              |
| 2:A:2540:C:O2'   | 2:A:2740:A:N3    | 2.33                     | 0.58              |
| 7:F:105:THR:HG23 | 7:F:106:ILE:HD12 | 1.84                     | 0.58              |
| 2:A:156:A:H2'    | 2:A:157:C:C6     | 2.38                     | 0.58              |
| 2:A:2215:C:H2'   | 2:A:2216:G:H8    | 1.68                     | 0.58              |
| 2:A:2731:G:H2'   | 2:A:2732:G:C8    | 2.38                     | 0.58              |
| 5:D:16:THR:HG22  | 5:D:20:VAL:O     | 2.02                     | 0.58              |
| 7:F:40:VAL:HG11  | 7:F:43:ALA:HB2   | 1.85                     | 0.58              |
| 2:A:2243:U:H2'   | 2:A:2244:U:C6    | 2.39                     | 0.58              |
| 2:A:2529:G:H4'   | 8:G:175:LYS:HG3  | 1.84                     | 0.58              |
| 2:A:2804:U:H2'   | 2:A:2805:C:C6    | 2.39                     | 0.58              |
| 11:L:58:LEU:HA   | 11:L:89:ASN:HD22 | 1.67                     | 0.58              |
| 2:A:582:A:H2'    | 2:A:583:G:H8     | 1.69                     | 0.58              |
| 2:A:1026:G:OP1   | 2:A:1134:A:O2'   | 2.21                     | 0.58              |
| 2:A:1808:A:H3'   | 2:A:1809:A:C8    | 2.39                     | 0.58              |
| 2:A:287:G:H2'    | 2:A:288:U:C6     | 2.38                     | 0.58              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:A:391:A:H1'    | 2:A:411:G:O4'    | 2.03                     | 0.58              |
| 2:A:742:A:H2'    | 2:A:743:A:C8     | 2.38                     | 0.58              |
| 2:A:2366:A:H4'   | 23:X:62:LYS:HE3  | 1.86                     | 0.58              |
| 15:P:4:LYS:HD2   | 15:P:7:ARG:HH21  | 1.68                     | 0.58              |
| 19:T:82:MET:CG   | 19:T:98:LYS:HB2  | 2.33                     | 0.58              |
| 2:A:177:G:OP2    | 2:A:177:G:N2     | 2.21                     | 0.58              |
| 2:A:1433:A:N1    | 2:A:1560:G:O6    | 2.37                     | 0.58              |
| 2:A:2193:G:H2'   | 2:A:2194:U:C6    | 2.38                     | 0.58              |
| 2:A:2567:G:H2'   | 2:A:2568:U:C6    | 2.38                     | 0.58              |
| 2:A:2595:G:N2    | 2:A:2598:A:OP2   | 2.26                     | 0.58              |
| 7:F:29:PRO:HB2   | 7:F:169:LEU:HD13 | 1.86                     | 0.58              |
| 2:A:32:C:H2'     | 2:A:33:C:C6      | 2.38                     | 0.58              |
| 2:A:833:A:H2'    | 2:A:834:G:C8     | 2.39                     | 0.58              |
| 2:A:1454:C:C5    | 14:O:64:ARG:HG2  | 2.39                     | 0.58              |
| 2:A:2365:G:N7    | 30:e:39:LYS:NZ   | 2.47                     | 0.58              |
| 3:B:49:C:H2'     | 3:B:50:A:C8      | 2.38                     | 0.58              |
| 2:A:1297:C:OP1   | 2:A:2710:C:H4'   | 2.03                     | 0.58              |
| 2:A:1469:A:H2'   | 2:A:1470:A:C8    | 2.38                     | 0.58              |
| 2:A:1495:A:H2    | 2:A:1578:U:H1'   | 1.69                     | 0.58              |
| 2:A:2508:G:O6    | 2:A:2580:U:O4    | 2.21                     | 0.58              |
| 17:R:24:TYR:HB3  | 17:R:28:ARG:HB2  | 1.86                     | 0.58              |
| 2:A:832:U:H2'    | 2:A:833:A:H8     | 1.69                     | 0.58              |
| 2:A:2652:C:H2'   | 2:A:2653:U:O4'   | 2.04                     | 0.58              |
| 9:H:9:VAL:CG1    | 9:H:12:LEU:HB2   | 2.34                     | 0.58              |
| 11:L:41:ILE:HD11 | 11:L:86:LEU:CD2  | 2.34                     | 0.58              |
| 13:N:50:ARG:HD3  | 13:N:65:ILE:HD11 | 1.86                     | 0.58              |
| 18:S:1:MET:HG3   | 18:S:43:ASN:OD1  | 2.03                     | 0.58              |
| 22:W:70:ILE:HG22 | 22:W:72:VAL:HG13 | 1.86                     | 0.58              |
| 2:A:611:C:H2'    | 2:A:612:G:O4'    | 2.04                     | 0.57              |
| 2:A:1270:C:H5''  | 2:A:1271:G:C5'   | 2.34                     | 0.57              |
| 2:A:1874:C:H2'   | 2:A:1875:G:O4'   | 2.03                     | 0.57              |
| 8:G:33:LEU:HD12  | 8:G:79:VAL:HG13  | 1.85                     | 0.57              |
| 10:K:7:LYS:O     | 10:K:11:VAL:HG13 | 2.03                     | 0.57              |
| 12:M:19:LEU:HD23 | 12:M:27:LEU:HB3  | 1.86                     | 0.57              |
| 17:R:9:ILE:O     | 17:R:13:ARG:HG3  | 2.04                     | 0.57              |
| 2:A:227:A:C2     | 2:A:2407:A:H1'   | 2.38                     | 0.57              |
| 2:A:778:G:H5''   | 4:C:48:ARG:HD2   | 1.87                     | 0.57              |
| 2:A:912:C:O2'    | 2:A:913:U:H5'    | 2.03                     | 0.57              |
| 2:A:1854:A:H4'   | 2:A:2233:U:H4'   | 1.84                     | 0.57              |
| 2:A:2094:A:O2'   | 2:A:2095:A:H5'   | 2.05                     | 0.57              |
| 2:A:2233:U:H2'   | 2:A:2234:G:C8    | 2.39                     | 0.57              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 22:W:4:ILE:HB    | 22:W:63:ILE:CD1  | 2.34                     | 0.57              |
| 22:W:50:MET:HE2  | 22:W:56:PHE:HE1  | 1.70                     | 0.57              |
| 2:A:2375:G:N2    | 2:A:2378:A:OP2   | 2.35                     | 0.57              |
| 3:B:37:C:O2      | 15:P:100:HIS:NE2 | 2.28                     | 0.57              |
| 2:A:590:A:H2'    | 2:A:591:U:C6     | 2.38                     | 0.57              |
| 2:A:1292:G:H2'   | 2:A:1293:C:C6    | 2.39                     | 0.57              |
| 2:A:2271:G:OP1   | 23:X:18:ALA:HB1  | 2.05                     | 0.57              |
| 13:N:36:VAL:HG12 | 22:W:82:TYR:HB2  | 1.86                     | 0.57              |
| 13:N:53:MET:HE3  | 13:N:117:PHE:HE1 | 1.69                     | 0.57              |
| 22:W:77:VAL:HG21 | 22:W:86:LEU:HD22 | 1.86                     | 0.57              |
| 31:f:2:LYS:HG3   | 31:f:4:ARG:HG3   | 1.86                     | 0.57              |
| 2:A:514:A:N3     | 2:A:581:C:O2'    | 2.35                     | 0.57              |
| 2:A:1856:U:H2'   | 2:A:1857:G:O4'   | 2.04                     | 0.57              |
| 2:A:2556:C:H2'   | 2:A:2557:G:O4'   | 2.03                     | 0.57              |
| 3:B:38:C:H2'     | 3:B:39:A:C8      | 2.39                     | 0.57              |
| 3:B:40:U:N3      | 3:B:44:G:OP2     | 2.28                     | 0.57              |
| 2:A:222:A:N6     | 2:A:232:G:H1'    | 2.19                     | 0.57              |
| 2:A:399:U:O4     | 24:Y:54:LYS:NZ   | 2.38                     | 0.57              |
| 2:A:1086:A:O2'   | 2:A:1087:G:N7    | 2.37                     | 0.57              |
| 2:A:1486:U:H2'   | 2:A:1487:U:H6    | 1.69                     | 0.57              |
| 2:A:1794:A:H2'   | 2:A:1795:C:H6    | 1.70                     | 0.57              |
| 2:A:2011:U:H2'   | 2:A:2012:G:O4'   | 2.04                     | 0.57              |
| 2:A:2282:G:H4'   | 2:A:2389:G:O2'   | 2.03                     | 0.57              |
| 2:A:2311:A:N3    | 7:F:85:ILE:HD11  | 2.18                     | 0.57              |
| 2:A:2324:U:H3'   | 2:A:2325:G:H5''  | 1.86                     | 0.57              |
| 3:B:104:A:H2'    | 3:B:105:G:O4'    | 2.05                     | 0.57              |
| 5:D:31:ALA:HB1   | 5:D:95:SER:OG    | 2.05                     | 0.57              |
| 21:V:18:ASP:OD2  | 21:V:40:ASN:N    | 2.33                     | 0.57              |
| 2:A:305:C:H2'    | 2:A:306:U:C6     | 2.39                     | 0.57              |
| 2:A:355:U:H2'    | 2:A:356:G:H8     | 1.70                     | 0.57              |
| 2:A:1149:G:H2'   | 2:A:1150:C:H6    | 1.69                     | 0.57              |
| 2:A:1638:C:H1'   | 2:A:2698:U:O2'   | 2.05                     | 0.57              |
| 2:A:2020:A:H5'   | 27:b:9:THR:HG21  | 1.87                     | 0.57              |
| 2:A:2066:C:O2'   | 2:A:2067:G:H5'   | 2.05                     | 0.57              |
| 7:F:103:LEU:HD12 | 7:F:107:ALA:CB   | 2.35                     | 0.57              |
| 30:e:6:THR:HG22  | 30:e:63:PRO:HD2  | 1.87                     | 0.57              |
| 31:f:16:ILE:HG12 | 31:f:25:VAL:HG22 | 1.86                     | 0.57              |
| 2:A:77:G:H2'     | 2:A:78:U:C6      | 2.40                     | 0.57              |
| 2:A:355:U:H2'    | 2:A:356:G:C8     | 2.39                     | 0.57              |
| 2:A:492:A:H2'    | 2:A:493:G:O4'    | 2.05                     | 0.57              |
| 2:A:848:C:H2'    | 2:A:849:A:H8     | 1.68                     | 0.57              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:A:1794:A:H2'   | 2:A:1795:C:C6    | 2.40                     | 0.57              |
| 2:A:1954:G:O2'   | 2:A:1956:U:O4    | 2.08                     | 0.57              |
| 2:A:2196:C:H2'   | 2:A:2197:U:C6    | 2.40                     | 0.57              |
| 2:A:2305:U:C2    | 7:F:151:GLY:HA3  | 2.39                     | 0.57              |
| 2:A:2314:A:OP1   | 7:F:88:LYS:NZ    | 2.38                     | 0.57              |
| 2:A:2537:U:H2'   | 2:A:2538:C:C6    | 2.40                     | 0.57              |
| 9:H:30:LEU:HB3   | 9:H:36:ALA:HB3   | 1.87                     | 0.57              |
| 2:A:645:C:H2'    | 2:A:647:G:N7     | 2.20                     | 0.57              |
| 2:A:1051:G:H1    | 2:A:1108:U:H3    | 1.53                     | 0.57              |
| 2:A:1361:G:H2'   | 2:A:1362:C:C6    | 2.39                     | 0.57              |
| 2:A:1394:U:H2'   | 2:A:1395:A:O4'   | 2.05                     | 0.57              |
| 2:A:1505:A:H2'   | 2:A:1506:U:O4'   | 2.04                     | 0.57              |
| 2:A:2329:U:H2'   | 2:A:2330:G:C8    | 2.39                     | 0.57              |
| 2:A:357:C:H2'    | 2:A:358:U:C6     | 2.40                     | 0.57              |
| 2:A:445:C:H2'    | 2:A:446:G:O4'    | 2.04                     | 0.57              |
| 2:A:522:A:H2'    | 2:A:523:C:C6     | 2.40                     | 0.57              |
| 2:A:1353:A:H2'   | 2:A:1354:A:H8    | 1.70                     | 0.57              |
| 2:A:1437:C:O2'   | 2:A:1516:G:O2'   | 2.21                     | 0.57              |
| 2:A:1684:G:H2'   | 2:A:1685:C:C6    | 2.40                     | 0.57              |
| 2:A:2516:A:O2'   | 2:A:2517:C:H5'   | 2.05                     | 0.57              |
| 2:A:372:G:H5''   | 24:Y:61:LYS:HD3  | 1.87                     | 0.56              |
| 2:A:402:A:H2'    | 2:A:403:U:H5'    | 1.87                     | 0.56              |
| 2:A:586:A:N1     | 2:A:809:G:O2'    | 2.36                     | 0.56              |
| 2:A:1069:A:H4'   | 2:A:1070:A:H5''  | 1.87                     | 0.56              |
| 2:A:1649:G:O2'   | 14:O:106:ASP:OD2 | 2.14                     | 0.56              |
| 2:A:2464:G:H2'   | 2:A:2465:C:H6    | 1.69                     | 0.56              |
| 2:A:2636:C:H2'   | 2:A:2637:U:C6    | 2.40                     | 0.56              |
| 18:S:24:LYS:HA   | 18:S:94:THR:CG2  | 2.35                     | 0.56              |
| 2:A:170:U:H2'    | 2:A:171:U:H6     | 1.70                     | 0.56              |
| 2:A:687:C:H1'    | 29:d:4:THR:HG22  | 1.86                     | 0.56              |
| 2:A:1932:A:H2'   | 2:A:1933:G:O4'   | 2.05                     | 0.56              |
| 3:B:42:C:C5      | 7:F:66:LEU:HD22  | 2.39                     | 0.56              |
| 24:Y:7:VAL:HG23  | 24:Y:51:VAL:HG12 | 1.87                     | 0.56              |
| 26:a:48:ILE:HG21 | 26:a:57:VAL:HG21 | 1.86                     | 0.56              |
| 2:A:471:A:H2'    | 2:A:472:A:O4'    | 2.05                     | 0.56              |
| 2:A:851:C:OP1    | 26:a:19:LYS:HE2  | 2.06                     | 0.56              |
| 2:A:880:G:H22    | 2:A:897:C:H42    | 1.52                     | 0.56              |
| 2:A:1442:U:H2'   | 2:A:1443:U:C6    | 2.40                     | 0.56              |
| 2:A:1447:C:H2'   | 2:A:1448:G:H8    | 1.70                     | 0.56              |
| 2:A:1521:G:OP2   | 2:A:1522:A:O2'   | 2.11                     | 0.56              |
| 2:A:1710:G:H4'   | 2:A:2858:C:O2    | 2.05                     | 0.56              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 2:A:2038:G:H2'   | 2:A:2039:U:O4'    | 2.05                     | 0.56              |
| 2:A:2295:C:O2'   | 2:A:2296:U:H5'    | 2.05                     | 0.56              |
| 2:A:2419:U:H5''  | 28:c:22:THR:HG21  | 1.87                     | 0.56              |
| 2:A:2581:G:OP2   | 2:A:2581:G:N2     | 2.23                     | 0.56              |
| 2:A:2850:A:N7    | 2:A:2868:A:O2'    | 2.28                     | 0.56              |
| 3:B:55:U:O3'     | 7:F:24:SER:OG     | 2.22                     | 0.56              |
| 7:F:29:PRO:HB2   | 7:F:169:LEU:CD1   | 2.35                     | 0.56              |
| 20:U:4:GLU:OE1   | 20:U:49:LYS:HE2   | 2.05                     | 0.56              |
| 2:A:248:G:O5'    | 2:A:249:C:H5''    | 2.06                     | 0.56              |
| 2:A:580:U:H2'    | 2:A:581:C:C6      | 2.40                     | 0.56              |
| 2:A:1056:G:O2'   | 2:A:1086:A:H1'    | 2.06                     | 0.56              |
| 2:A:1079:C:H2'   | 2:A:1080:A:C8     | 2.40                     | 0.56              |
| 2:A:1710:G:H2'   | 2:A:1711:A:C8     | 2.40                     | 0.56              |
| 2:A:2300:C:H2'   | 2:A:2301:C:C6     | 2.41                     | 0.56              |
| 2:A:2618:G:H21   | 5:D:155:VAL:HG21  | 1.71                     | 0.56              |
| 8:G:72:LEU:O     | 8:G:76:VAL:HG13   | 2.06                     | 0.56              |
| 2:A:1353:A:H2'   | 2:A:1354:A:C8     | 2.40                     | 0.56              |
| 7:F:38:MET:HE1   | 7:F:150:ARG:HD2   | 1.88                     | 0.56              |
| 8:G:137:ASP:OD1  | 8:G:140:VAL:HG23  | 2.05                     | 0.56              |
| 2:A:360:U:H2'    | 2:A:361:G:O4'     | 2.06                     | 0.56              |
| 2:A:697:G:H2'    | 2:A:698:C:C6      | 2.40                     | 0.56              |
| 3:B:49:C:H2'     | 3:B:50:A:H8       | 1.70                     | 0.56              |
| 2:A:322:A:H5'    | 2:A:340:A:H1'     | 1.88                     | 0.56              |
| 2:A:696:G:H1     | 2:A:766:U:H3      | 1.54                     | 0.56              |
| 2:A:1319:C:O2'   | 2:A:1320:C:H5'    | 2.06                     | 0.56              |
| 2:A:1747:U:H2'   | 2:A:1748:C:C6     | 2.41                     | 0.56              |
| 2:A:1857:G:O2'   | 2:A:1884:G:N2     | 2.39                     | 0.56              |
| 2:A:2533:U:H2'   | 2:A:2534:A:O4'    | 2.04                     | 0.56              |
| 2:A:1037:G:O2'   | 2:A:1038:G:H5'    | 2.06                     | 0.56              |
| 2:A:1281:G:H2'   | 2:A:1282:U:C6     | 2.40                     | 0.56              |
| 2:A:1447:C:O2'   | 2:A:1544:A:N3     | 2.36                     | 0.56              |
| 2:A:1664:A:N6    | 2:A:1996:C:H42    | 1.98                     | 0.56              |
| 15:P:62:LEU:HD22 | 15:P:70:ALA:HA    | 1.87                     | 0.56              |
| 16:Q:26:VAL:HG12 | 16:Q:86:VAL:HG22  | 1.88                     | 0.56              |
| 2:A:1071:G:H2'   | 2:A:1072:C:C6     | 2.41                     | 0.56              |
| 2:A:2257:U:O2'   | 2:A:2258:C:H5'    | 2.06                     | 0.56              |
| 2:A:2489:U:H2'   | 2:A:2490:G:O4'    | 2.06                     | 0.56              |
| 2:A:2845:U:H5''  | 16:Q:52:ASN:O     | 2.05                     | 0.56              |
| 8:G:44:LYS:N     | 8:G:51:THR:O      | 2.27                     | 0.56              |
| 10:K:4:PHE:CD2   | 17:R:100:VAL:HG11 | 2.41                     | 0.56              |
| 14:O:30:ARG:NH2  | 14:O:75:ILE:HD11  | 2.20                     | 0.56              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:A:1059:G:H2'   | 2:A:1060:U:C5    | 2.41                     | 0.56              |
| 2:A:1625:C:O2'   | 2:A:1626:A:H5'   | 2.05                     | 0.56              |
| 3:B:1:U:H2'      | 3:B:2:G:C8       | 2.40                     | 0.56              |
| 2:A:12:U:O2      | 2:A:2626:C:H4'   | 2.06                     | 0.55              |
| 2:A:760:G:H2'    | 2:A:761:A:O4'    | 2.05                     | 0.55              |
| 2:A:833:A:H2'    | 2:A:834:G:H8     | 1.70                     | 0.55              |
| 2:A:1286:A:H1'   | 2:A:1288:G:OP2   | 2.06                     | 0.55              |
| 2:A:2328:A:H2'   | 2:A:2329:U:H6    | 1.69                     | 0.55              |
| 2:A:2391:G:H3'   | 30:e:32:ILE:HD12 | 1.88                     | 0.55              |
| 4:C:120:VAL:HG13 | 4:C:134:ASN:ND2  | 2.21                     | 0.55              |
| 13:N:110:GLU:O   | 13:N:114:ARG:HG3 | 2.06                     | 0.55              |
| 22:W:77:VAL:CG2  | 22:W:86:LEU:HD22 | 2.36                     | 0.55              |
| 2:A:434:U:O2     | 2:A:435:C:N4     | 2.35                     | 0.55              |
| 2:A:1469:A:H2'   | 2:A:1470:A:H8    | 1.71                     | 0.55              |
| 2:A:1809:A:H2'   | 2:A:1810:A:C8    | 2.41                     | 0.55              |
| 2:A:2795:C:H2'   | 2:A:2796:U:C6    | 2.41                     | 0.55              |
| 15:P:34:HIS:ND1  | 15:P:53:THR:OG1  | 2.34                     | 0.55              |
| 15:P:92:PHE:HB2  | 15:P:117:PHE:CE1 | 2.41                     | 0.55              |
| 2:A:722:A:H2'    | 2:A:723:C:C6     | 2.42                     | 0.55              |
| 2:A:848:C:H2'    | 2:A:849:A:C8     | 2.41                     | 0.55              |
| 2:A:2671:G:H2'   | 2:A:2672:U:C6    | 2.42                     | 0.55              |
| 8:G:94:TYR:HA    | 8:G:106:SER:O    | 2.06                     | 0.55              |
| 2:A:534:U:O2'    | 17:R:49:ASP:OD2  | 2.15                     | 0.55              |
| 2:A:590:A:H2'    | 2:A:591:U:H6     | 1.72                     | 0.55              |
| 2:A:1443:U:H2'   | 2:A:1444:G:H8    | 1.72                     | 0.55              |
| 2:A:1846:G:H2'   | 2:A:1847:A:N9    | 2.21                     | 0.55              |
| 2:A:582:A:H2'    | 2:A:583:G:C8     | 2.41                     | 0.55              |
| 2:A:654:A:O2'    | 2:A:655:A:H5'    | 2.07                     | 0.55              |
| 2:A:2292:U:H2'   | 2:A:2293:G:C8    | 2.42                     | 0.55              |
| 9:H:1:MET:HE3    | 9:H:23:ALA:HA    | 1.88                     | 0.55              |
| 28:c:17:THR:HG21 | 28:c:43:VAL:HG23 | 1.89                     | 0.55              |
| 2:A:64:A:H2'     | 2:A:65:U:C6      | 2.41                     | 0.55              |
| 2:A:680:C:H2'    | 2:A:681:G:C8     | 2.41                     | 0.55              |
| 2:A:1592:C:O2'   | 2:A:1593:A:H5'   | 2.07                     | 0.55              |
| 2:A:2299:U:H2'   | 2:A:2300:C:C6    | 2.42                     | 0.55              |
| 2:A:2830:C:O3'   | 5:D:56:LYS:HE3   | 2.07                     | 0.55              |
| 2:A:2831:G:O2'   | 2:A:2884:U:OP1   | 2.24                     | 0.55              |
| 5:D:52:THR:O     | 5:D:77:ARG:HG2   | 2.07                     | 0.55              |
| 8:G:87:LEU:HD23  | 8:G:87:LEU:H     | 1.72                     | 0.55              |
| 8:G:117:LEU:HB3  | 8:G:121:ILE:HG23 | 1.89                     | 0.55              |
| 2:A:632:A:H2'    | 2:A:633:A:C8     | 2.41                     | 0.55              |

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| Atom-1          | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|-----------------|------------------|--------------------------|-------------------|
| 2:A:1729:U:H3'  | 2:A:1730:C:O4'   | 2.07                     | 0.55              |
| 7:F:8:TYR:HB2   | 7:F:173:PHE:CZ   | 2.42                     | 0.55              |
| 7:F:40:VAL:HG21 | 7:F:50:LEU:HD23  | 1.89                     | 0.55              |
| 15:P:52:SER:OG  | 15:P:54:VAL:HG22 | 2.06                     | 0.55              |
| 2:A:356:G:H2'   | 2:A:357:C:C6     | 2.42                     | 0.55              |
| 2:A:709:U:H2'   | 2:A:710:U:C6     | 2.41                     | 0.55              |
| 2:A:856:G:H2'   | 2:A:857:G:C8     | 2.42                     | 0.55              |
| 2:A:973:A:H5'   | 2:A:1188:U:H1'   | 1.88                     | 0.55              |
| 2:A:2580:U:O2'  | 2:A:2581:G:H5'   | 2.07                     | 0.55              |
| 8:G:99:LYS:N    | 8:G:102:VAL:O    | 2.29                     | 0.55              |
| 20:U:13:ALA:HB1 | 25:Z:33:ALA:HB1  | 1.88                     | 0.55              |
| 2:A:934:U:H2'   | 2:A:935:C:C6     | 2.41                     | 0.55              |
| 2:A:2050:C:H2'  | 2:A:2051:A:O4'   | 2.07                     | 0.55              |
| 2:A:2317:A:H2'  | 2:A:2318:G:O4'   | 2.07                     | 0.55              |
| 2:A:2646:C:H2'  | 2:A:2647:U:O4'   | 2.06                     | 0.55              |
| 4:C:230:HIS:CD2 | 4:C:247:PRO:HB3  | 2.42                     | 0.55              |
| 16:Q:7:GLN:HA   | 16:Q:10:GLN:HE21 | 1.70                     | 0.55              |
| 18:S:29:THR:OG1 | 18:S:64:VAL:O    | 2.24                     | 0.55              |
| 30:e:33:LEU:HA  | 30:e:36:LYS:CD   | 2.37                     | 0.55              |
| 2:A:364:C:H2'   | 2:A:365:U:C6     | 2.42                     | 0.55              |
| 2:A:593:U:H2'   | 2:A:594:U:C6     | 2.42                     | 0.55              |
| 2:A:947:A:H2'   | 2:A:948:C:C6     | 2.41                     | 0.55              |
| 2:A:1652:A:H2'  | 2:A:1653:G:O4'   | 2.06                     | 0.55              |
| 3:B:66:A:H61    | 3:B:107:G:H2'    | 1.72                     | 0.55              |
| 7:F:33:LYS:HD3  | 7:F:92:ARG:NH1   | 2.21                     | 0.55              |
| 7:F:119:ALA:O   | 7:F:167:ARG:NE   | 2.38                     | 0.55              |
| 10:K:69:ARG:O   | 10:K:89:PHE:HB3  | 2.06                     | 0.55              |
| 2:A:589:U:H2'   | 2:A:590:A:C8     | 2.41                     | 0.54              |
| 2:A:634:C:H2'   | 2:A:635:C:C6     | 2.41                     | 0.54              |
| 2:A:680:C:H2'   | 2:A:681:G:H8     | 1.72                     | 0.54              |
| 2:A:813:U:H2'   | 2:A:814:C:H6     | 1.71                     | 0.54              |
| 2:A:2364:C:H2'  | 2:A:2365:G:O4'   | 2.07                     | 0.54              |
| 9:H:31:VAL:HB   | 9:H:32:PRO:HD3   | 1.90                     | 0.54              |
| 25:Z:55:THR:O   | 25:Z:59:GLU:HG3  | 2.06                     | 0.54              |
| 2:A:1858:A:H2'  | 2:A:1859:U:O4'   | 2.07                     | 0.54              |
| 4:C:132:MET:HE1 | 4:C:184:VAL:CG1  | 2.37                     | 0.54              |
| 2:A:959:A:H2'   | 2:A:960:A:C8     | 2.43                     | 0.54              |
| 2:A:1901:A:OP2  | 4:C:253:LYS:NZ   | 2.33                     | 0.54              |
| 2:A:2547:A:H2'  | 2:A:2548:U:H6    | 1.71                     | 0.54              |
| 2:A:2709:G:OP1  | 14:O:18:GLN:NE2  | 2.40                     | 0.54              |
| 4:C:71:LYS:HG2  | 4:C:74:ILE:HD12  | 1.88                     | 0.54              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 7:F:5:HIS:HB2    | 7:F:97:TRP:CD1   | 2.43                     | 0.54              |
| 7:F:122:PHE:CZ   | 7:F:170:LEU:HD12 | 2.42                     | 0.54              |
| 8:G:107:LEU:HD13 | 8:G:152:ARG:CB   | 2.38                     | 0.54              |
| 2:A:592:A:C2     | 30:e:4:ILE:HD11  | 2.42                     | 0.54              |
| 2:A:629:G:N3     | 2:A:639:U:O2'    | 2.40                     | 0.54              |
| 2:A:1887:C:H2'   | 2:A:1888:G:O4'   | 2.07                     | 0.54              |
| 2:A:1890:A:H2'   | 2:A:1891:G:O4'   | 2.07                     | 0.54              |
| 8:G:155:GLU:OE1  | 8:G:157:TYR:HB2  | 2.08                     | 0.54              |
| 25:Z:24:GLU:O    | 25:Z:28:LEU:HG   | 2.07                     | 0.54              |
| 2:A:29:U:H2'     | 2:A:30:G:C8      | 2.43                     | 0.54              |
| 2:A:538:A:H2'    | 2:A:539:G:O4'    | 2.08                     | 0.54              |
| 2:A:721:A:H2'    | 2:A:722:A:C8     | 2.43                     | 0.54              |
| 2:A:814:C:H1'    | 2:A:1225:G:H21   | 1.72                     | 0.54              |
| 2:A:1211:C:H3'   | 2:A:1212:G:C5'   | 2.37                     | 0.54              |
| 2:A:1383:A:H2'   | 2:A:1384:A:C8    | 2.42                     | 0.54              |
| 2:A:1703:G:H2'   | 2:A:1704:C:C6    | 2.42                     | 0.54              |
| 8:G:170:ARG:HH22 | 31:f:29:ALA:HA   | 1.72                     | 0.54              |
| 9:H:27:ARG:NH2   | 24:Y:60:ASP:OD2  | 2.39                     | 0.54              |
| 14:O:38:LEU:HB3  | 14:O:39:PRO:HD3  | 1.89                     | 0.54              |
| 2:A:231:A:H2'    | 2:A:232:G:O4'    | 2.07                     | 0.54              |
| 2:A:825:A:H2'    | 2:A:826:U:C6     | 2.42                     | 0.54              |
| 2:A:1687:G:H2'   | 2:A:1688:U:C6    | 2.43                     | 0.54              |
| 2:A:2335:A:OP1   | 15:P:13:ARG:HD2  | 2.06                     | 0.54              |
| 5:D:29:VAL:HB    | 5:D:98:VAL:CG1   | 2.38                     | 0.54              |
| 8:G:92:VAL:HG12  | 8:G:160:LYS:HZ3  | 1.73                     | 0.54              |
| 22:W:64:VAL:HA   | 22:W:68:LYS:O    | 2.08                     | 0.54              |
| 26:a:4:THR:CG2   | 26:a:37:GLU:HB3  | 2.38                     | 0.54              |
| 26:a:4:THR:HG21  | 26:a:37:GLU:HB3  | 1.89                     | 0.54              |
| 2:A:542:C:H2'    | 2:A:543:G:C8     | 2.42                     | 0.54              |
| 2:A:969:G:H2'    | 2:A:970:U:C6     | 2.42                     | 0.54              |
| 2:A:1024:G:OP2   | 2:A:1025:G:O2'   | 2.26                     | 0.54              |
| 2:A:1486:U:H2'   | 2:A:1487:U:C6    | 2.43                     | 0.54              |
| 2:A:1556:C:H2'   | 2:A:1557:C:C6    | 2.43                     | 0.54              |
| 2:A:1720:U:H2'   | 2:A:1721:G:O4'   | 2.08                     | 0.54              |
| 5:D:1:MET:HG2    | 5:D:205:PRO:HG2  | 1.89                     | 0.54              |
| 18:S:5:PHE:HB3   | 18:S:59:ILE:HD12 | 1.90                     | 0.54              |
| 24:Y:17:ASN:OD1  | 24:Y:27:ARG:HD2  | 2.07                     | 0.54              |
| 24:Y:36:HIS:CB   | 24:Y:56:MET:HE1  | 2.37                     | 0.54              |
| 2:A:5:A:H2'      | 2:A:6:A:H8       | 1.73                     | 0.54              |
| 2:A:145:C:H2'    | 2:A:146:A:H8     | 1.73                     | 0.54              |
| 2:A:636:G:OP1    | 12:M:129:LYS:HG3 | 2.07                     | 0.54              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 2:A:819:A:H5''   | 2:A:973:A:N1      | 2.23                     | 0.54              |
| 2:A:1761:C:H2'   | 2:A:1762:A:O4'    | 2.07                     | 0.54              |
| 2:A:1879:C:H2'   | 2:A:1880:U:O4'    | 2.08                     | 0.54              |
| 4:C:165:VAL:HG21 | 4:C:181:MET:HE1   | 1.89                     | 0.54              |
| 9:H:1:MET:N      | 9:H:21:VAL:O      | 2.28                     | 0.54              |
| 12:M:89:VAL:HG21 | 12:M:123:ARG:CZ   | 2.38                     | 0.54              |
| 27:b:38:HIS:ND1  | 27:b:39:LEU:O     | 2.40                     | 0.54              |
| 2:A:297:G:H2'    | 2:A:298:G:O4'     | 2.08                     | 0.54              |
| 2:A:1282:U:H2'   | 2:A:1283:G:O4'    | 2.08                     | 0.54              |
| 2:A:2020:A:H5'   | 27:b:9:THR:CG2    | 2.38                     | 0.54              |
| 2:A:2095:A:H2'   | 2:A:2096:C:C6     | 2.42                     | 0.54              |
| 2:A:2324:U:H3'   | 2:A:2325:G:C5'    | 2.38                     | 0.54              |
| 2:A:2461:A:H2'   | 2:A:2462:C:C6     | 2.43                     | 0.54              |
| 2:A:2774:C:H2'   | 2:A:2775:G:O4'    | 2.08                     | 0.54              |
| 2:A:2819:G:O2'   | 2:A:2820:A:H5''   | 2.08                     | 0.54              |
| 7:F:123:ASP:OD1  | 7:F:127:ASN:HB2   | 2.07                     | 0.54              |
| 30:e:14:PHE:C    | 30:e:15:LYS:HD2   | 2.33                     | 0.54              |
| 2:A:5:A:H2'      | 2:A:6:A:C8        | 2.43                     | 0.54              |
| 2:A:1419:A:O2'   | 2:A:1421:G:N7     | 2.35                     | 0.54              |
| 2:A:1440:U:H2'   | 2:A:1441:G:C8     | 2.42                     | 0.54              |
| 2:A:1652:A:OP1   | 14:O:8:ARG:HD3    | 2.08                     | 0.54              |
| 2:A:2457:U:O2'   | 2:A:2458:G:H5'    | 2.08                     | 0.54              |
| 2:A:2625:G:H2'   | 2:A:2626:C:C6     | 2.43                     | 0.54              |
| 2:A:2646:C:OP2   | 2:A:2732:G:O2'    | 2.25                     | 0.54              |
| 2:A:2677:G:H2'   | 2:A:2678:C:C6     | 2.43                     | 0.54              |
| 2:A:2749:A:H5''  | 8:G:2:SER:HB3     | 1.90                     | 0.54              |
| 10:K:73:VAL:CG1  | 10:K:86:GLN:HB2   | 2.37                     | 0.54              |
| 11:L:63:VAL:HA   | 11:L:107:LEU:HD11 | 1.89                     | 0.54              |
| 2:A:1292:G:H2'   | 2:A:1293:C:H6     | 1.72                     | 0.53              |
| 2:A:1571:A:H2'   | 2:A:1572:A:C8     | 2.43                     | 0.53              |
| 2:A:2502:G:H5''  | 2:A:2503:A:H5''   | 1.89                     | 0.53              |
| 26:a:36:VAL:HG12 | 26:a:38:ARG:HG2   | 1.89                     | 0.53              |
| 2:A:192:C:H2'    | 2:A:193:U:H5'     | 1.90                     | 0.53              |
| 2:A:2332:C:OP1   | 23:X:77:ARG:NH2   | 2.41                     | 0.53              |
| 2:A:2443:C:OP1   | 6:E:63:LYS:HD3    | 2.08                     | 0.53              |
| 4:C:161:TYR:HB3  | 4:C:194:GLU:HG2   | 1.89                     | 0.53              |
| 16:Q:18:PRO:HG3  | 16:Q:84:ILE:O     | 2.08                     | 0.53              |
| 21:V:66:GLN:HB2  | 21:V:69:ASN:ND2   | 2.23                     | 0.53              |
| 2:A:732:C:H2'    | 2:A:733:G:O4'     | 2.08                     | 0.53              |
| 2:A:814:C:H1'    | 2:A:1225:G:N2     | 2.23                     | 0.53              |
| 2:A:1831:G:H2'   | 2:A:1832:C:C6     | 2.44                     | 0.53              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 3:B:22:U:H2'      | 3:B:23:G:C8       | 2.43                     | 0.53              |
| 5:D:7:LYS:HE3     | 5:D:77:ARG:NH1    | 2.24                     | 0.53              |
| 5:D:108:ASP:OD1   | 5:D:206:ALA:HA    | 2.08                     | 0.53              |
| 5:D:186:LEU:HD21  | 16:Q:4:ILE:CG2    | 2.38                     | 0.53              |
| 2:A:127:A:H5''    | 2:A:128:C:O4'     | 2.07                     | 0.53              |
| 2:A:324:A:H2'     | 2:A:325:G:O4'     | 2.09                     | 0.53              |
| 2:A:579:G:H2'     | 2:A:580:U:C6      | 2.43                     | 0.53              |
| 2:A:813:U:H2'     | 2:A:814:C:C6      | 2.43                     | 0.53              |
| 2:A:1409:U:H2'    | 2:A:1410:G:H8     | 1.73                     | 0.53              |
| 2:A:2412:A:H2'    | 2:A:2413:G:O4'    | 2.08                     | 0.53              |
| 2:A:2637:U:H5''   | 5:D:83:ARG:NH2    | 2.23                     | 0.53              |
| 13:N:53:MET:HE1   | 13:N:103:TYR:HB3  | 1.91                     | 0.53              |
| 16:Q:100:LEU:HD11 | 16:Q:110:ILE:HD11 | 1.91                     | 0.53              |
| 20:U:53:VAL:HG13  | 20:U:91:GLN:HB3   | 1.89                     | 0.53              |
| 27:b:29:SER:OG    | 27:b:40:ARG:HG2   | 2.07                     | 0.53              |
| 2:A:368:A:O2'     | 2:A:369:U:H5'     | 2.09                     | 0.53              |
| 2:A:542:C:H2'     | 2:A:543:G:H8      | 1.73                     | 0.53              |
| 2:A:2236:U:H2'    | 2:A:2237:G:O4'    | 2.09                     | 0.53              |
| 3:B:50:A:OP2      | 15:P:67:ASN:HA    | 2.09                     | 0.53              |
| 3:B:53:A:H2'      | 3:B:54:G:O4'      | 2.08                     | 0.53              |
| 4:C:144:VAL:HG21  | 4:C:162:VAL:HG21  | 1.91                     | 0.53              |
| 16:Q:37:LYS:NZ    | 16:Q:39:ARG:HD3   | 2.23                     | 0.53              |
| 22:W:48:MET:O     | 22:W:51:GLN:HG3   | 2.08                     | 0.53              |
| 31:f:9:LYS:HE3    | 31:f:14:CYS:O     | 2.08                     | 0.53              |
| 2:A:156:A:H2'     | 2:A:157:C:H6      | 1.73                     | 0.53              |
| 2:A:479:A:C4'     | 2:A:480:A:H5'     | 2.36                     | 0.53              |
| 2:A:713:G:H2'     | 2:A:714:U:C6      | 2.43                     | 0.53              |
| 2:A:796:C:H2'     | 2:A:797:G:C8      | 2.42                     | 0.53              |
| 2:A:876:C:H2'     | 2:A:877:A:C1'     | 2.39                     | 0.53              |
| 2:A:975:A:H1'     | 2:A:990:A:C2      | 2.44                     | 0.53              |
| 3:B:30:C:H2'      | 3:B:31:C:H5'      | 1.91                     | 0.53              |
| 4:C:62:TYR:HA     | 4:C:86:ASN:HD21   | 1.74                     | 0.53              |
| 5:D:56:LYS:HB2    | 5:D:59:ARG:CB     | 2.37                     | 0.53              |
| 7:F:61:SER:OG     | 7:F:91:LEU:HD21   | 2.08                     | 0.53              |
| 8:G:118:PRO:O     | 8:G:121:ILE:HG22  | 2.08                     | 0.53              |
| 17:R:105:ALA:HB1  | 18:S:40:MET:CE    | 2.38                     | 0.53              |
| 25:Z:46:VAL:O     | 25:Z:50:VAL:HG13  | 2.08                     | 0.53              |
| 2:A:581:C:H2'     | 2:A:582:A:H8      | 1.73                     | 0.53              |
| 2:A:1311:G:OP2    | 2:A:1311:G:N2     | 2.24                     | 0.53              |
| 2:A:1386:C:H2'    | 2:A:1387:A:H8     | 1.73                     | 0.53              |
| 2:A:2095:A:H2'    | 2:A:2096:C:H6     | 1.74                     | 0.53              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:A:2329:U:H2'   | 2:A:2330:G:H8    | 1.74                     | 0.53              |
| 3:B:7:G:H1'      | 15:P:38:GLN:HE22 | 1.74                     | 0.53              |
| 10:K:8:PRO:O     | 10:K:11:VAL:HG22 | 2.09                     | 0.53              |
| 14:O:33:ILE:HG13 | 14:O:114:GLU:HB3 | 1.91                     | 0.53              |
| 23:X:47:ALA:HB1  | 23:X:51:VAL:O    | 2.09                     | 0.53              |
| 25:Z:6:LEU:HB2   | 25:Z:56:LEU:HD12 | 1.91                     | 0.53              |
| 2:A:559:G:N2     | 17:R:49:ASP:OD1  | 2.41                     | 0.53              |
| 2:A:609:A:H2'    | 2:A:610:C:O4'    | 2.09                     | 0.53              |
| 2:A:955:U:OP1    | 13:N:86:LYS:NZ   | 2.40                     | 0.53              |
| 2:A:1094:U:H1'   | 2:A:1097:U:C5    | 2.42                     | 0.53              |
| 2:A:1440:U:H2'   | 2:A:1441:G:H8    | 1.74                     | 0.53              |
| 2:A:1625:C:H2'   | 2:A:1626:A:O4'   | 2.08                     | 0.53              |
| 2:A:2468:A:OP2   | 2:A:2476:A:N6    | 2.41                     | 0.53              |
| 9:H:2:GLN:NE2    | 9:H:20:ASN:OD1   | 2.41                     | 0.53              |
| 30:e:42:ARG:HG3  | 30:e:45:ARG:NH2  | 2.24                     | 0.53              |
| 31:f:2:LYS:HE3   | 31:f:4:ARG:HG2   | 1.91                     | 0.53              |
| 2:A:482:A:H4'    | 21:V:45:HIS:ND1  | 2.24                     | 0.53              |
| 2:A:572:A:H5''   | 2:A:573:U:OP2    | 2.09                     | 0.53              |
| 2:A:1070:A:H2'   | 2:A:1097:U:OP1   | 2.09                     | 0.53              |
| 2:A:1212:G:H1'   | 2:A:1237:A:N6    | 2.23                     | 0.53              |
| 2:A:1482:G:H1'   | 2:A:1509:A:N1    | 2.23                     | 0.53              |
| 2:A:1589:U:H2'   | 2:A:1590:A:C8    | 2.44                     | 0.53              |
| 2:A:1914:C:H2'   | 2:A:1915:U:C6    | 2.44                     | 0.53              |
| 2:A:1958:C:O2'   | 2:A:1959:G:H5'   | 2.09                     | 0.53              |
| 2:A:2586:U:H2'   | 2:A:2587:A:O4'   | 2.09                     | 0.53              |
| 2:A:244:A:OP2    | 30:e:8:ARG:NH2   | 2.41                     | 0.53              |
| 2:A:1084:A:N3    | 2:A:1105:U:O2'   | 2.40                     | 0.53              |
| 2:A:1447:C:H2'   | 2:A:1448:G:C8    | 2.44                     | 0.53              |
| 2:A:1483:G:H2'   | 2:A:1484:U:C6    | 2.43                     | 0.53              |
| 2:A:1684:G:H2'   | 2:A:1685:C:H6    | 1.73                     | 0.53              |
| 2:A:1870:C:H2'   | 2:A:1871:A:C5    | 2.44                     | 0.53              |
| 2:A:2199:A:N1    | 2:A:2226:C:N4    | 2.56                     | 0.53              |
| 7:F:50:LEU:CD1   | 7:F:84:PRO:HB2   | 2.38                     | 0.53              |
| 2:A:191:A:H2'    | 2:A:192:C:C6     | 2.44                     | 0.52              |
| 2:A:283:G:H2'    | 2:A:284:U:O4'    | 2.09                     | 0.52              |
| 2:A:483:A:O4'    | 21:V:45:HIS:HB3  | 2.08                     | 0.52              |
| 2:A:682:G:H5'    | 29:d:26:ASN:CG   | 2.34                     | 0.52              |
| 2:A:1526:C:H2'   | 2:A:1527:G:O4'   | 2.09                     | 0.52              |
| 2:A:1645:G:H5''  | 2:A:1646:C:C5'   | 2.35                     | 0.52              |
| 2:A:2081:U:H2'   | 2:A:2082:A:H8    | 1.74                     | 0.52              |
| 7:F:110:ARG:HB2  | 7:F:137:ILE:CG2  | 2.37                     | 0.52              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 15:P:49:VAL:HG11 | 15:P:81:ARG:HB2   | 1.90                     | 0.52              |
| 2:A:742:A:H2'    | 2:A:743:A:H8      | 1.73                     | 0.52              |
| 2:A:2246:G:H2'   | 2:A:2247:A:C8     | 2.45                     | 0.52              |
| 2:A:2281:A:O2'   | 2:A:2282:G:H5'    | 2.07                     | 0.52              |
| 2:A:2395:C:H2'   | 2:A:2396:G:O4'    | 2.09                     | 0.52              |
| 4:C:72:ASP:OD1   | 4:C:189:ARG:NH1   | 2.42                     | 0.52              |
| 28:c:5:ILE:O     | 28:c:28:ARG:NH2   | 2.29                     | 0.52              |
| 2:A:668:A:H2'    | 2:A:670:A:H62     | 1.74                     | 0.52              |
| 2:A:871:U:H2'    | 2:A:872:U:C6      | 2.44                     | 0.52              |
| 2:A:905:A:H2'    | 2:A:906:U:H5'     | 1.90                     | 0.52              |
| 2:A:1370:C:H2'   | 2:A:1371:G:O4'    | 2.09                     | 0.52              |
| 2:A:1570:A:H2'   | 2:A:1571:A:C8     | 2.43                     | 0.52              |
| 2:A:2098:U:H2'   | 2:A:2099:U:O4'    | 2.09                     | 0.52              |
| 2:A:2655:G:O2'   | 2:A:2664:G:O6     | 2.25                     | 0.52              |
| 6:E:6:LYS:HE2    | 6:E:141:MET:HB3   | 1.90                     | 0.52              |
| 11:L:107:LEU:O   | 11:L:116:ILE:HD11 | 2.09                     | 0.52              |
| 2:A:773:U:O2'    | 4:C:48:ARG:HD3    | 2.09                     | 0.52              |
| 2:A:1275:A:N1    | 2:A:1295:C:O2'    | 2.36                     | 0.52              |
| 2:A:1790:C:O2'   | 4:C:208:ALA:HB2   | 2.08                     | 0.52              |
| 2:A:2305:U:H2'   | 2:A:2306:C:C6     | 2.44                     | 0.52              |
| 2:A:2464:G:H2'   | 2:A:2465:C:C6     | 2.44                     | 0.52              |
| 5:D:19:GLY:HA2   | 16:Q:79:PRO:HG2   | 1.91                     | 0.52              |
| 10:K:6:ALA:O     | 10:K:48:VAL:HG21  | 2.09                     | 0.52              |
| 20:U:72:GLN:HG3  | 20:U:73:ARG:NH1   | 2.23                     | 0.52              |
| 2:A:2377:A:H2'   | 2:A:2378:A:C8     | 2.44                     | 0.52              |
| 2:A:2853:C:H2'   | 2:A:2854:G:H8     | 1.75                     | 0.52              |
| 3:B:48:U:H2'     | 3:B:49:C:H6       | 1.75                     | 0.52              |
| 8:G:89:LEU:HD23  | 8:G:94:TYR:HB3    | 1.90                     | 0.52              |
| 20:U:38:ALA:HA   | 20:U:42:GLU:OE2   | 2.08                     | 0.52              |
| 2:A:597:G:H2'    | 2:A:598:U:C6      | 2.45                     | 0.52              |
| 2:A:704:G:H1'    | 2:A:727:A:N6      | 2.24                     | 0.52              |
| 2:A:2074:U:H2'   | 2:A:2075:U:H6     | 1.74                     | 0.52              |
| 2:A:2078:C:O2'   | 2:A:2079:U:H5'    | 2.10                     | 0.52              |
| 6:E:60:TRP:CD1   | 6:E:65:THR:HG21   | 2.45                     | 0.52              |
| 8:G:52:PHE:CZ    | 8:G:72:LEU:HD12   | 2.45                     | 0.52              |
| 2:A:639:U:H2'    | 2:A:640:C:C6      | 2.44                     | 0.52              |
| 2:A:741:U:H2'    | 2:A:742:A:C8      | 2.45                     | 0.52              |
| 2:A:784:G:H5'    | 2:A:785:G:OP1     | 2.09                     | 0.52              |
| 2:A:902:C:O2'    | 2:A:903:C:H5'     | 2.10                     | 0.52              |
| 2:A:1000:A:H2'   | 2:A:1001:A:C8     | 2.44                     | 0.52              |
| 2:A:1046:A:H3'   | 2:A:1047:G:C5'    | 2.39                     | 0.52              |

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| Atom-1            | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|------------------|--------------------------|-------------------|
| 3:B:51:G:H5''     | 15:P:64:TYR:CD2  | 2.45                     | 0.52              |
| 7:F:36:LEU:HB2    | 7:F:89:VAL:HG12  | 1.92                     | 0.52              |
| 8:G:17:VAL:HG12   | 8:G:26:ILE:CG1   | 2.40                     | 0.52              |
| 19:T:3:THR:OG1    | 19:T:62:ASP:OD2  | 2.28                     | 0.52              |
| 2:A:64:A:O2'      | 20:U:75:GLY:HA3  | 2.09                     | 0.52              |
| 2:A:272:A:H2'     | 2:A:273:G:C8     | 2.45                     | 0.52              |
| 2:A:457:A:N1      | 2:A:470:A:H5''   | 2.24                     | 0.52              |
| 2:A:554:U:O2'     | 2:A:555:G:H5'    | 2.10                     | 0.52              |
| 2:A:755:U:H2'     | 2:A:756:A:C8     | 2.45                     | 0.52              |
| 2:A:1166:G:H2'    | 2:A:1167:C:C6    | 2.45                     | 0.52              |
| 2:A:2241:A:H2'    | 2:A:2242:G:C8    | 2.45                     | 0.52              |
| 2:A:2427:C:C5'    | 2:A:2429:G:H5'   | 2.40                     | 0.52              |
| 2:A:2632:A:H2'    | 2:A:2633:G:C8    | 2.45                     | 0.52              |
| 8:G:140:VAL:O     | 8:G:144:VAL:HG23 | 2.10                     | 0.52              |
| 24:Y:17:ASN:ND2   | 24:Y:27:ARG:HB3  | 2.25                     | 0.52              |
| 2:A:633:A:O2'     | 2:A:2404:U:OP1   | 2.25                     | 0.52              |
| 2:A:2362:C:OP1    | 30:e:40:ARG:NE   | 2.43                     | 0.52              |
| 4:C:35:GLU:HG3    | 4:C:64:ILE:HD11  | 1.92                     | 0.52              |
| 7:F:56:ASP:OD2    | 7:F:135:GLN:HG3  | 2.10                     | 0.52              |
| 19:T:82:MET:HG3   | 19:T:98:LYS:HB2  | 1.92                     | 0.52              |
| 2:A:350:G:H2'     | 2:A:351:C:O4'    | 2.10                     | 0.52              |
| 2:A:1829:A:H3'    | 2:A:1830:C:H6    | 1.75                     | 0.52              |
| 2:A:2291:U:O2'    | 2:A:2374:C:O2    | 2.28                     | 0.52              |
| 2:A:2405:G:O2'    | 2:A:2411:A:N6    | 2.43                     | 0.52              |
| 17:R:109:LEU:HD23 | 18:S:49:ILE:HD13 | 1.92                     | 0.52              |
| 22:W:14:LYS:O     | 22:W:18:ARG:HG3  | 2.10                     | 0.52              |
| 26:a:24:LEU:HD11  | 26:a:54:MET:SD   | 2.50                     | 0.52              |
| 2:A:414:C:H2'     | 2:A:415:A:C8     | 2.45                     | 0.51              |
| 2:A:511:U:H2'     | 2:A:512:G:H5'    | 1.91                     | 0.51              |
| 2:A:551:G:O2'     | 2:A:552:U:H5'    | 2.11                     | 0.51              |
| 2:A:818:G:N1      | 2:A:1188:U:OP2   | 2.28                     | 0.51              |
| 2:A:1340:U:OP1    | 20:U:19:LYS:NZ   | 2.38                     | 0.51              |
| 2:A:1571:A:H2'    | 2:A:1572:A:H8    | 1.73                     | 0.51              |
| 2:A:2321:U:H3'    | 2:A:2322:A:C5'   | 2.41                     | 0.51              |
| 2:A:2364:C:H4'    | 23:X:56:ASP:OD1  | 2.10                     | 0.51              |
| 2:A:479:A:H1'     | 2:A:481:G:H5''   | 1.92                     | 0.51              |
| 2:A:581:C:H2'     | 2:A:582:A:C8     | 2.44                     | 0.51              |
| 2:A:924:G:H2'     | 2:A:925:A:H8     | 1.75                     | 0.51              |
| 2:A:967:U:H2'     | 2:A:968:C:C6     | 2.45                     | 0.51              |
| 2:A:1542:U:H2'    | 2:A:1543:G:O4'   | 2.10                     | 0.51              |
| 2:A:2064:C:H2'    | 2:A:2065:C:H6    | 1.75                     | 0.51              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 11:L:116:ILE:HG23 | 11:L:122:VAL:HG21 | 1.92                     | 0.51              |
| 2:A:1081:U:H2'    | 2:A:1082:U:C6     | 2.46                     | 0.51              |
| 2:A:1125:G:H5'    | 31:f:38:GLY:HA2   | 1.91                     | 0.51              |
| 2:A:1316:U:H2'    | 2:A:1317:G:C8     | 2.45                     | 0.51              |
| 2:A:1431:A:O2'    | 2:A:1432:G:H5'    | 2.11                     | 0.51              |
| 2:A:1465:G:H2'    | 2:A:1466:U:O4'    | 2.10                     | 0.51              |
| 2:A:1854:A:C4'    | 2:A:2233:U:H4'    | 2.40                     | 0.51              |
| 2:A:2398:U:H2'    | 2:A:2399:G:H8     | 1.75                     | 0.51              |
| 2:A:2400:G:O2'    | 2:A:2401:U:H5'    | 2.11                     | 0.51              |
| 5:D:180:VAL:HG22  | 5:D:187:LEU:CD1   | 2.40                     | 0.51              |
| 7:F:105:THR:CG2   | 7:F:106:ILE:HD12  | 2.39                     | 0.51              |
| 11:L:19:VAL:CB    | 11:L:41:ILE:HD12  | 2.41                     | 0.51              |
| 2:A:477:A:H2'     | 2:A:478:A:C8      | 2.46                     | 0.51              |
| 2:A:532:A:H4'     | 2:A:533:G:C8      | 2.45                     | 0.51              |
| 2:A:1482:G:H2'    | 2:A:1483:G:H8     | 1.75                     | 0.51              |
| 2:A:1871:A:H1'    | 2:A:1872:A:C2     | 2.46                     | 0.51              |
| 2:A:2210:U:H4'    | 2:A:2211:A:H5'    | 1.91                     | 0.51              |
| 2:A:2290:G:H2'    | 2:A:2291:U:H6     | 1.74                     | 0.51              |
| 2:A:2897:U:H2'    | 2:A:2898:U:C6     | 2.46                     | 0.51              |
| 7:F:12:VAL:HG13   | 7:F:16:LEU:CD1    | 2.35                     | 0.51              |
| 8:G:87:LEU:HD12   | 8:G:162:VAL:HG11  | 1.91                     | 0.51              |
| 2:A:1736:U:O2'    | 2:A:1737:G:H5'    | 2.10                     | 0.51              |
| 2:A:1922:G:H2'    | 2:A:1923:U:C6     | 2.46                     | 0.51              |
| 2:A:2228:G:H2'    | 2:A:2229:U:C6     | 2.45                     | 0.51              |
| 2:A:2467:C:H2'    | 2:A:2468:A:O4'    | 2.10                     | 0.51              |
| 2:A:2619:C:O2'    | 2:A:2620:C:H5'    | 2.11                     | 0.51              |
| 2:A:2787:C:O2'    | 2:A:2788:C:H5'    | 2.10                     | 0.51              |
| 7:F:37:ASN:O      | 7:F:153:ASP:HB2   | 2.10                     | 0.51              |
| 22:W:6:ALA:HB2    | 22:W:42:LEU:HD23  | 1.93                     | 0.51              |
| 2:A:248:G:H5'     | 2:A:250:G:N7      | 2.26                     | 0.51              |
| 2:A:638:G:H2'     | 2:A:639:U:C6      | 2.46                     | 0.51              |
| 2:A:1018:U:O2'    | 2:A:1120:G:N2     | 2.41                     | 0.51              |
| 2:A:2197:U:O2'    | 2:A:2198:A:H2'    | 2.11                     | 0.51              |
| 2:A:2514:U:H2'    | 2:A:2515:C:C6     | 2.46                     | 0.51              |
| 2:A:2819:G:H2'    | 2:A:2821:A:N7     | 2.25                     | 0.51              |
| 3:B:28:C:H2'      | 3:B:29:A:C8       | 2.45                     | 0.51              |
| 8:G:52:PHE:CE1    | 8:G:72:LEU:HD12   | 2.44                     | 0.51              |
| 17:R:107:THR:O    | 17:R:111:GLU:HG2  | 2.09                     | 0.51              |
| 2:A:468:G:N7      | 29:d:39:ARG:NH2   | 2.55                     | 0.51              |
| 2:A:613:A:H2'     | 2:A:614:A:O4'     | 2.11                     | 0.51              |
| 2:A:741:U:H2'     | 2:A:742:A:H8      | 1.75                     | 0.51              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 2:A:1090:A:C2    | 2:A:1102:C:H1'    | 2.45                     | 0.51              |
| 2:A:1845:G:O2'   | 2:A:1846:G:H5'    | 2.11                     | 0.51              |
| 2:A:2334:U:H5'   | 15:P:12:THR:HB    | 1.92                     | 0.51              |
| 2:A:2576:G:O2'   | 2:A:2579:C:OP2    | 2.28                     | 0.51              |
| 2:A:2836:U:H2'   | 2:A:2837:A:C8     | 2.45                     | 0.51              |
| 3:B:109:A:O2'    | 3:B:110:C:H5'     | 2.10                     | 0.51              |
| 2:A:19:A:H2'     | 2:A:20:C:H6       | 1.76                     | 0.51              |
| 2:A:644:A:H2'    | 2:A:645:C:O4'     | 2.11                     | 0.51              |
| 2:A:1077:A:H2'   | 2:A:1078:U:H5'    | 1.93                     | 0.51              |
| 2:A:1405:U:H2'   | 2:A:1406:U:H6     | 1.76                     | 0.51              |
| 2:A:2467:C:O2'   | 2:A:2468:A:H5'    | 2.11                     | 0.51              |
| 2:A:2804:U:H2'   | 2:A:2805:C:H6     | 1.73                     | 0.51              |
| 12:M:49:GLY:O    | 12:M:56:PRO:HB3   | 2.11                     | 0.51              |
| 2:A:19:A:H2'     | 2:A:20:C:C6       | 2.46                     | 0.51              |
| 2:A:1520:U:H2'   | 2:A:1521:G:O4'    | 2.10                     | 0.51              |
| 2:A:2648:G:H2'   | 2:A:2649:C:C6     | 2.46                     | 0.51              |
| 4:C:205:LEU:HB3  | 4:C:210:ALA:CB    | 2.40                     | 0.51              |
| 10:K:36:LEU:O    | 10:K:51:GLY:HA3   | 2.10                     | 0.51              |
| 18:S:40:MET:HE3  | 18:S:47:VAL:CG1   | 2.41                     | 0.51              |
| 2:A:145:C:H2'    | 2:A:146:A:C8      | 2.45                     | 0.51              |
| 2:A:150:U:H2'    | 2:A:151:C:C6      | 2.46                     | 0.51              |
| 2:A:347:A:H2'    | 2:A:348:A:C8      | 2.45                     | 0.51              |
| 2:A:544:C:H2'    | 2:A:545:U:C6      | 2.46                     | 0.51              |
| 2:A:1601:G:O2'   | 2:A:1602:U:H5'    | 2.11                     | 0.51              |
| 2:A:2537:U:H2'   | 2:A:2538:C:H6     | 1.75                     | 0.51              |
| 2:A:2578:G:N7    | 5:D:145:SER:HB3   | 2.26                     | 0.51              |
| 3:B:79:G:N7      | 22:W:14:LYS:NZ    | 2.59                     | 0.51              |
| 3:B:106:G:H2'    | 3:B:107:G:O4'     | 2.11                     | 0.51              |
| 2:A:147:C:O2'    | 2:A:148:U:H5'     | 2.11                     | 0.50              |
| 2:A:1036:G:O2'   | 2:A:1037:G:H5'    | 2.11                     | 0.50              |
| 2:A:1038:G:H2'   | 2:A:1039:A:C8     | 2.46                     | 0.50              |
| 2:A:1141:U:H4'   | 2:A:1142:A:O4'    | 2.11                     | 0.50              |
| 2:A:1147:A:O2'   | 2:A:1148:U:H5'    | 2.10                     | 0.50              |
| 2:A:1280:G:O2'   | 2:A:1281:G:H5'    | 2.11                     | 0.50              |
| 2:A:1821:A:H2'   | 2:A:1822:C:C6     | 2.46                     | 0.50              |
| 2:A:2419:U:P     | 30:e:33:LEU:HD13  | 2.51                     | 0.50              |
| 2:A:2430:A:C3'   | 2:A:2431:U:H5'    | 2.41                     | 0.50              |
| 12:M:109:LYS:HE2 | 12:M:128:THR:HG22 | 1.91                     | 0.50              |
| 19:T:17:VAL:HA   | 19:T:43:ALA:HB1   | 1.92                     | 0.50              |
| 2:A:552:U:H2'    | 2:A:553:G:H8      | 1.76                     | 0.50              |
| 2:A:764:A:O2'    | 2:A:765:C:H5'     | 2.11                     | 0.50              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 2:A:807:U:OP1    | 12:M:36:LYS:HD3   | 2.11                     | 0.50              |
| 2:A:877:A:H5'    | 2:A:878:A:OP1     | 2.11                     | 0.50              |
| 2:A:1145:C:O2'   | 2:A:1146:C:H5'    | 2.10                     | 0.50              |
| 2:A:1243:C:H1'   | 12:M:4:ASN:O      | 2.11                     | 0.50              |
| 2:A:1515:A:H2'   | 2:A:1516:G:O4'    | 2.11                     | 0.50              |
| 2:A:1897:G:H2'   | 2:A:1898:U:C6     | 2.46                     | 0.50              |
| 2:A:2209:G:OP2   | 2:A:2210:U:O2'    | 2.28                     | 0.50              |
| 24:Y:13:VAL:CG2  | 24:Y:29:PHE:HB2   | 2.41                     | 0.50              |
| 2:A:282:A:H2'    | 2:A:283:G:C8      | 2.46                     | 0.50              |
| 2:A:314:C:O2'    | 2:A:315:G:H5'     | 2.10                     | 0.50              |
| 2:A:1069:A:C2    | 2:A:1096:A:H5''   | 2.46                     | 0.50              |
| 2:A:1283:G:H1'   | 2:A:1329:U:O2     | 2.10                     | 0.50              |
| 2:A:1425:G:H2'   | 2:A:1426:G:C8     | 2.46                     | 0.50              |
| 2:A:1812:U:H2'   | 2:A:1813:G:C8     | 2.46                     | 0.50              |
| 2:A:2321:U:H5'   | 2:A:2322:A:OP2    | 2.11                     | 0.50              |
| 2:A:2376:A:H2'   | 2:A:2377:A:O4'    | 2.11                     | 0.50              |
| 2:A:2419:U:OP2   | 30:e:33:LEU:HD13  | 2.10                     | 0.50              |
| 2:A:2520:C:O2'   | 2:A:2521:C:H5'    | 2.11                     | 0.50              |
| 2:A:2627:G:O2'   | 2:A:2781:A:N1     | 2.39                     | 0.50              |
| 2:A:2737:G:H2'   | 2:A:2738:A:C8     | 2.47                     | 0.50              |
| 2:A:315:G:H2'    | 2:A:316:C:C6      | 2.46                     | 0.50              |
| 2:A:387:U:H4'    | 2:A:388:G:O4'     | 2.11                     | 0.50              |
| 2:A:678:C:H2'    | 2:A:679:C:C6      | 2.46                     | 0.50              |
| 2:A:933:A:H5'    | 2:A:934:U:OP2     | 2.11                     | 0.50              |
| 2:A:1019:U:H2'   | 2:A:1020:A:C8     | 2.46                     | 0.50              |
| 2:A:1661:G:O2'   | 2:A:1662:U:H5'    | 2.12                     | 0.50              |
| 2:A:1812:U:H2'   | 2:A:1813:G:H8     | 1.76                     | 0.50              |
| 2:A:2034:U:O2'   | 2:A:2035:G:H5'    | 2.11                     | 0.50              |
| 2:A:2394:C:N3    | 34:A:3001:AMP:O2' | 2.43                     | 0.50              |
| 2:A:2467:C:O2    | 13:N:123:LYS:NZ   | 2.43                     | 0.50              |
| 11:L:108:ARG:HA  | 11:L:116:ILE:CD1  | 2.42                     | 0.50              |
| 12:M:51:GLU:HG3  | 12:M:56:PRO:HA    | 1.93                     | 0.50              |
| 14:O:35:LYS:HB2  | 14:O:112:TYR:CE1  | 2.46                     | 0.50              |
| 15:P:26:LEU:HD12 | 15:P:38:GLN:O     | 2.11                     | 0.50              |
| 22:W:50:MET:HE2  | 22:W:56:PHE:CE1   | 2.46                     | 0.50              |
| 2:A:363:G:O2'    | 2:A:364:C:H5'     | 2.11                     | 0.50              |
| 2:A:764:A:H5'    | 4:C:209:GLY:CA    | 2.40                     | 0.50              |
| 2:A:1853:A:O2'   | 2:A:2234:G:H5'    | 2.12                     | 0.50              |
| 2:A:2073:C:O2'   | 2:A:2074:U:H5'    | 2.11                     | 0.50              |
| 2:A:2680:U:O2'   | 2:A:2681:C:H5'    | 2.11                     | 0.50              |
| 2:A:2889:C:H2'   | 2:A:2890:G:O4'    | 2.12                     | 0.50              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 11:L:103:VAL:HB  | 11:L:107:LEU:HD12 | 1.94                     | 0.50              |
| 19:T:51:LEU:O    | 19:T:55:ILE:HG13  | 2.12                     | 0.50              |
| 2:A:937:C:OP1    | 30:e:52:LYS:HE2   | 2.11                     | 0.50              |
| 2:A:2480:C:H2'   | 2:A:2481:G:O4'    | 2.11                     | 0.50              |
| 7:F:127:ASN:OD1  | 7:F:157:THR:HA    | 2.12                     | 0.50              |
| 15:P:11:ALA:HB2  | 15:P:96:GLY:N     | 2.26                     | 0.50              |
| 20:U:30:ILE:HD11 | 20:U:32:LEU:HD11  | 1.94                     | 0.50              |
| 21:V:72:ILE:HG21 | 21:V:83:VAL:CG2   | 2.41                     | 0.50              |
| 25:Z:2:LYS:HE3   | 25:Z:6:LEU:CD1    | 2.39                     | 0.50              |
| 28:c:39:PHE:CZ   | 28:c:44:ARG:HA    | 2.47                     | 0.50              |
| 2:A:84:A:H4'     | 2:A:85:G:O5'      | 2.12                     | 0.50              |
| 2:A:107:G:O2'    | 2:A:108:G:H5'     | 2.11                     | 0.50              |
| 2:A:1827:U:H5'   | 2:A:1971:U:H4'    | 1.92                     | 0.50              |
| 2:A:1948:G:O2'   | 2:A:1949:G:H5'    | 2.12                     | 0.50              |
| 6:E:5:LEU:HD11   | 6:E:12:LEU:CD2    | 2.38                     | 0.50              |
| 13:N:35:ALA:HB1  | 13:N:126:ILE:HD12 | 1.92                     | 0.50              |
| 15:P:92:PHE:HB2  | 15:P:117:PHE:HE1  | 1.77                     | 0.50              |
| 18:S:83:TYR:OH   | 18:S:85:LYS:HE3   | 2.12                     | 0.50              |
| 2:A:358:U:H2'    | 2:A:359:G:C8      | 2.38                     | 0.50              |
| 2:A:445:C:O2'    | 2:A:446:G:H5'     | 2.12                     | 0.50              |
| 2:A:665:U:O2'    | 2:A:666:A:H5'     | 2.11                     | 0.50              |
| 2:A:987:C:H2'    | 2:A:988:A:O4'     | 2.11                     | 0.50              |
| 2:A:1521:G:H5''  | 2:A:1522:A:OP2    | 2.12                     | 0.50              |
| 2:A:2250:G:O2'   | 2:A:2496:C:OP1    | 2.17                     | 0.50              |
| 6:E:191:ASP:O    | 6:E:195:GLN:HG3   | 2.11                     | 0.50              |
| 14:O:12:ARG:O    | 14:O:17:ARG:NH2   | 2.45                     | 0.50              |
| 15:P:6:ALA:O     | 15:P:10:ARG:HG3   | 2.12                     | 0.50              |
| 20:U:6:ARG:O     | 20:U:10:VAL:HG13  | 2.10                     | 0.50              |
| 1:1:75:C:H5''    | 1:1:76:A:OP2      | 2.11                     | 0.50              |
| 2:A:796:C:H2'    | 2:A:797:G:H8      | 1.76                     | 0.50              |
| 2:A:960:A:H5''   | 2:A:961:C:OP1     | 2.12                     | 0.50              |
| 2:A:2086:U:H2'   | 2:A:2087:G:H8     | 1.73                     | 0.50              |
| 2:A:2313:C:H5''  | 7:F:88:LYS:HD3    | 1.94                     | 0.50              |
| 2:A:2476:A:H2'   | 2:A:2477:U:O4'    | 2.12                     | 0.50              |
| 2:A:2686:G:H2'   | 2:A:2687:U:C6     | 2.47                     | 0.50              |
| 2:A:2812:G:H2'   | 2:A:2813:A:O4'    | 2.12                     | 0.50              |
| 11:L:14:SER:HB2  | 11:L:86:LEU:HD12  | 1.93                     | 0.50              |
| 15:P:70:ALA:O    | 15:P:74:VAL:HG23  | 2.12                     | 0.50              |
| 21:V:83:VAL:HG13 | 21:V:94:ARG:HB3   | 1.94                     | 0.50              |
| 27:b:48:TYR:CE2  | 27:b:53:LYS:HB2   | 2.47                     | 0.50              |
| 2:A:948:C:H2'    | 2:A:949:G:H8      | 1.77                     | 0.49              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:A:1075:C:H2'   | 2:A:1076:C:C6    | 2.46                     | 0.49              |
| 2:A:1316:U:H2'   | 2:A:1317:G:H8    | 1.77                     | 0.49              |
| 2:A:1405:U:H2'   | 2:A:1406:U:C6    | 2.46                     | 0.49              |
| 2:A:2064:C:H2'   | 2:A:2065:C:C6    | 2.46                     | 0.49              |
| 2:A:2229:U:H2'   | 2:A:2230:G:H8    | 1.77                     | 0.49              |
| 2:A:2466:C:O2'   | 2:A:2467:C:H5'   | 2.12                     | 0.49              |
| 2:A:2880:C:H1'   | 14:O:92:GLY:O    | 2.11                     | 0.49              |
| 3:B:28:C:H2'     | 3:B:29:A:H8      | 1.77                     | 0.49              |
| 3:B:66:A:N6      | 3:B:107:G:H2'    | 2.26                     | 0.49              |
| 7:F:132:VAL:N    | 7:F:152:LEU:O    | 2.45                     | 0.49              |
| 22:W:1:MET:HA    | 22:W:1:MET:HE3   | 1.93                     | 0.49              |
| 2:A:170:U:H2'    | 2:A:171:U:C6     | 2.46                     | 0.49              |
| 2:A:364:C:O2'    | 2:A:365:U:H5'    | 2.11                     | 0.49              |
| 2:A:1672:A:C2    | 2:A:2582:G:H5'   | 2.48                     | 0.49              |
| 2:A:1797:G:O2'   | 2:A:1798:U:H5'   | 2.12                     | 0.49              |
| 2:A:1825:U:H2'   | 2:A:1826:G:C8    | 2.46                     | 0.49              |
| 22:W:2:PHE:HD2   | 22:W:50:MET:HE3  | 1.77                     | 0.49              |
| 27:b:55:ILE:HG22 | 27:b:57:LYS:N    | 2.25                     | 0.49              |
| 2:A:52:A:H2'     | 2:A:53:A:C8      | 2.47                     | 0.49              |
| 2:A:417:C:H2'    | 2:A:418:C:C6     | 2.48                     | 0.49              |
| 2:A:580:U:O3'    | 17:R:31:VAL:HG13 | 2.12                     | 0.49              |
| 2:A:678:C:H2'    | 2:A:679:C:H6     | 1.76                     | 0.49              |
| 2:A:1190:G:H2'   | 2:A:1191:G:H8    | 1.76                     | 0.49              |
| 2:A:1495:A:H2'   | 2:A:1496:A:C8    | 2.47                     | 0.49              |
| 2:A:1628:G:O2'   | 2:A:1629:U:H5'   | 2.12                     | 0.49              |
| 2:A:1796:U:H2'   | 2:A:1797:G:C8    | 2.48                     | 0.49              |
| 2:A:1800:C:C3'   | 4:C:146:MET:HE1  | 2.41                     | 0.49              |
| 2:A:2474:U:H3'   | 2:A:2475:C:C5    | 2.47                     | 0.49              |
| 8:G:9:VAL:CG2    | 8:G:69:ARG:HG2   | 2.42                     | 0.49              |
| 26:a:51:VAL:O    | 26:a:55:VAL:HG22 | 2.11                     | 0.49              |
| 2:A:600:G:N2     | 2:A:605:G:O3'    | 2.44                     | 0.49              |
| 2:A:604:G:O2'    | 2:A:605:G:H5'    | 2.13                     | 0.49              |
| 2:A:629:G:H1'    | 2:A:639:U:H1'    | 1.94                     | 0.49              |
| 2:A:772:C:O2'    | 2:A:773:U:H5'    | 2.13                     | 0.49              |
| 2:A:1009:A:H5'   | 17:R:59:GLN:CG   | 2.35                     | 0.49              |
| 2:A:1018:U:O2'   | 2:A:1019:U:H5'   | 2.13                     | 0.49              |
| 2:A:1567:G:OP1   | 4:C:60:GLN:NE2   | 2.36                     | 0.49              |
| 2:A:2055:C:H5'   | 2:A:2056:G:O5'   | 2.12                     | 0.49              |
| 2:A:2292:U:H2'   | 2:A:2293:G:H8    | 1.76                     | 0.49              |
| 2:A:2333:A:H5'   | 2:A:2335:A:H1'   | 1.94                     | 0.49              |
| 2:A:2653:U:OP2   | 2:A:2654:A:O2'   | 2.25                     | 0.49              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 6:E:41:GLN:HG2   | 6:E:43:THR:CG2   | 2.39                     | 0.49              |
| 7:F:43:ALA:O     | 7:F:47:LYS:HD2   | 2.12                     | 0.49              |
| 12:M:92:LEU:HG   | 12:M:96:LYS:HE3  | 1.93                     | 0.49              |
| 2:A:291:G:O2'    | 2:A:292:U:H5'    | 2.13                     | 0.49              |
| 2:A:749:A:H4'    | 2:A:1271:G:N3    | 2.28                     | 0.49              |
| 2:A:858:G:N3     | 2:A:2268:A:H2'   | 2.27                     | 0.49              |
| 2:A:1239:G:H2'   | 2:A:1240:U:O4'   | 2.13                     | 0.49              |
| 2:A:1588:G:O2'   | 2:A:1589:U:H5'   | 2.13                     | 0.49              |
| 2:A:2266:A:H4'   | 2:A:2267:A:N3    | 2.28                     | 0.49              |
| 14:O:117:ASP:OD2 | 14:O:121:LYS:NZ  | 2.45                     | 0.49              |
| 26:a:9:GLN:HB2   | 26:a:29:LEU:HD13 | 1.95                     | 0.49              |
| 2:A:726:G:H5''   | 2:A:1432:G:H1'   | 1.94                     | 0.49              |
| 2:A:1596:A:O2'   | 2:A:1597:A:H5'   | 2.12                     | 0.49              |
| 2:A:2470:G:O2'   | 2:A:2471:A:H5'   | 2.11                     | 0.49              |
| 27:b:52:ARG:HB2  | 27:b:52:ARG:NH2  | 2.28                     | 0.49              |
| 2:A:6:A:O2'      | 2:A:7:G:H5'      | 2.13                     | 0.49              |
| 2:A:566:U:O2'    | 2:A:567:U:H5'    | 2.12                     | 0.49              |
| 2:A:711:G:H1     | 2:A:720:U:H3     | 1.61                     | 0.49              |
| 2:A:1118:C:H2'   | 2:A:1119:U:O4'   | 2.13                     | 0.49              |
| 2:A:1730:C:O2    | 2:A:1731:G:N1    | 2.46                     | 0.49              |
| 2:A:2473:U:O2    | 2:A:2473:U:H2'   | 2.13                     | 0.49              |
| 5:D:4:LEU:HD21   | 5:D:96:ILE:CG2   | 2.43                     | 0.49              |
| 6:E:127:GLU:HG2  | 6:E:133:LEU:HD13 | 1.93                     | 0.49              |
| 7:F:4:LEU:HG     | 7:F:101:GLU:HB3  | 1.93                     | 0.49              |
| 7:F:68:THR:N     | 7:F:86:GLY:O     | 2.43                     | 0.49              |
| 24:Y:12:PRO:HB3  | 24:Y:30:LEU:CD2  | 2.41                     | 0.49              |
| 24:Y:64:ILE:HD12 | 24:Y:67:VAL:CG2  | 2.43                     | 0.49              |
| 31:f:2:LYS:HE3   | 31:f:4:ARG:CG    | 2.43                     | 0.49              |
| 2:A:222:A:H61    | 2:A:232:G:H1'    | 1.77                     | 0.49              |
| 2:A:223:A:N1     | 2:A:407:G:O2'    | 2.38                     | 0.49              |
| 2:A:418:C:H2'    | 2:A:419:U:C6     | 2.47                     | 0.49              |
| 2:A:420:C:O2'    | 2:A:421:C:H5'    | 2.12                     | 0.49              |
| 2:A:949:G:O2'    | 2:A:950:G:H5'    | 2.13                     | 0.49              |
| 2:A:1442:U:H2'   | 2:A:1443:U:H6    | 1.78                     | 0.49              |
| 2:A:1710:G:H2'   | 2:A:1711:A:H8    | 1.76                     | 0.49              |
| 2:A:1854:A:N6    | 2:A:1888:G:H1'   | 2.28                     | 0.49              |
| 2:A:2467:C:OP2   | 31:f:4:ARG:NH2   | 2.46                     | 0.49              |
| 2:A:2661:G:H2'   | 2:A:2662:A:O4'   | 2.13                     | 0.49              |
| 6:E:118:LEU:HD12 | 6:E:186:VAL:HB   | 1.94                     | 0.49              |
| 14:O:72:ASP:O    | 14:O:76:VAL:HG23 | 2.13                     | 0.49              |
| 2:A:30:G:H2'     | 2:A:31:C:C6      | 2.48                     | 0.49              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 2:A:172:A:H2'    | 2:A:173:A:C8      | 2.47                     | 0.49              |
| 2:A:754:U:H2'    | 2:A:755:U:C6      | 2.48                     | 0.49              |
| 2:A:1637:A:H4'   | 2:A:2711:A:O2'    | 2.12                     | 0.49              |
| 2:A:1773:A:N7    | 2:A:1829:A:H1'    | 2.28                     | 0.49              |
| 2:A:2334:U:C2    | 15:P:16:ARG:HG3   | 2.48                     | 0.49              |
| 2:A:2348:U:P     | 30:e:38:THR:HG21  | 2.52                     | 0.49              |
| 7:F:69:LYS:HA    | 7:F:84:PRO:HA     | 1.95                     | 0.49              |
| 11:L:122:VAL:O   | 11:L:123:LEU:HD23 | 2.13                     | 0.49              |
| 21:V:11:VAL:HG11 | 21:V:70:VAL:HB    | 1.95                     | 0.49              |
| 2:A:729:G:P      | 4:C:13:ARG:HG2    | 2.53                     | 0.49              |
| 2:A:1007:C:H5''  | 10:K:37:ARG:NH2   | 2.28                     | 0.49              |
| 2:A:1946:U:O2'   | 2:A:1947:C:H5'    | 2.13                     | 0.49              |
| 2:A:2071:A:H2'   | 2:A:2072:C:H6     | 1.78                     | 0.49              |
| 2:A:2461:A:H2'   | 2:A:2462:C:H6     | 1.77                     | 0.49              |
| 2:A:2471:A:H2'   | 2:A:2472:G:O4'    | 2.13                     | 0.49              |
| 2:A:2557:G:H2'   | 2:A:2558:C:H6     | 1.78                     | 0.49              |
| 2:A:2844:G:H2'   | 2:A:2845:U:O4'    | 2.13                     | 0.49              |
| 2:A:2895:G:H2'   | 2:A:2896:C:C6     | 2.47                     | 0.49              |
| 4:C:25:HIS:CG    | 4:C:80:ARG:HD2    | 2.48                     | 0.49              |
| 4:C:115:GLN:O    | 4:C:125:LYS:NZ    | 2.38                     | 0.49              |
| 8:G:43:VAL:O     | 8:G:44:LYS:HE2    | 2.13                     | 0.49              |
| 19:T:73:LYS:HB2  | 19:T:106:VAL:HB   | 1.95                     | 0.49              |
| 2:A:198:C:O2'    | 2:A:199:A:H5'     | 2.13                     | 0.48              |
| 2:A:371:A:H1'    | 24:Y:61:LYS:NZ    | 2.28                     | 0.48              |
| 2:A:419:U:H2'    | 2:A:420:C:C6      | 2.48                     | 0.48              |
| 2:A:1383:A:H1'   | 2:A:1405:U:O2'    | 2.12                     | 0.48              |
| 2:A:1680:U:H2'   | 2:A:1681:G:O4'    | 2.13                     | 0.48              |
| 2:A:1877:A:H2'   | 2:A:1878:G:O4'    | 2.12                     | 0.48              |
| 2:A:2376:A:O2'   | 15:P:111:ARG:NH2  | 2.43                     | 0.48              |
| 4:C:107:PRO:HG2  | 4:C:110:LEU:CD2   | 2.43                     | 0.48              |
| 15:P:64:TYR:HB3  | 15:P:67:ASN:ND2   | 2.28                     | 0.48              |
| 20:U:39:THR:OG1  | 20:U:42:GLU:HG2   | 2.13                     | 0.48              |
| 20:U:94:ASP:OD2  | 20:U:96:VAL:HG13  | 2.13                     | 0.48              |
| 30:e:33:LEU:O    | 30:e:41:LYS:HD3   | 2.12                     | 0.48              |
| 2:A:373:U:H4'    | 2:A:423:A:O2'     | 2.13                     | 0.48              |
| 2:A:394:C:O2'    | 2:A:395:U:H5'     | 2.13                     | 0.48              |
| 2:A:721:A:H2'    | 2:A:722:A:H8      | 1.77                     | 0.48              |
| 2:A:2040:G:H2'   | 2:A:2041:U:O4'    | 2.13                     | 0.48              |
| 2:A:2847:U:H2'   | 2:A:2848:G:O4'    | 2.13                     | 0.48              |
| 2:A:2855:C:O2'   | 2:A:2856:A:H5'    | 2.13                     | 0.48              |
| 5:D:113:SER:HB3  | 5:D:170:VAL:HG21  | 1.95                     | 0.48              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 7:F:77:PHE:HB2   | 7:F:79:ILE:HG12   | 1.96                     | 0.48              |
| 7:F:102:ARG:HG2  | 7:F:106:ILE:HD13  | 1.94                     | 0.48              |
| 8:G:5:ALA:HB2    | 8:G:66:GLY:N      | 2.27                     | 0.48              |
| 8:G:75:MET:O     | 8:G:79:VAL:HG22   | 2.13                     | 0.48              |
| 16:Q:4:ILE:O     | 16:Q:7:GLN:HG3    | 2.13                     | 0.48              |
| 20:U:33:LYS:HG2  | 20:U:80:TRP:CE3   | 2.47                     | 0.48              |
| 2:A:74:A:H4'     | 2:A:75:G:O5'      | 2.14                     | 0.48              |
| 2:A:402:A:C2'    | 2:A:403:U:H5'     | 2.42                     | 0.48              |
| 2:A:637:A:H4'    | 2:A:638:G:O5'     | 2.13                     | 0.48              |
| 2:A:1853:A:H2'   | 2:A:1854:A:H8     | 1.78                     | 0.48              |
| 2:A:2305:U:O4    | 7:F:38:MET:HA     | 2.13                     | 0.48              |
| 2:A:2489:U:O2'   | 2:A:2490:G:H5'    | 2.13                     | 0.48              |
| 2:A:2641:G:OP1   | 10:K:78:THR:HG22  | 2.13                     | 0.48              |
| 2:A:2816:G:O2'   | 2:A:2817:U:H5'    | 2.14                     | 0.48              |
| 2:A:2818:U:H4'   | 2:A:2837:A:H4'    | 1.95                     | 0.48              |
| 2:A:2853:C:H2'   | 2:A:2854:G:C8     | 2.48                     | 0.48              |
| 4:C:140:THR:HG23 | 4:C:161:TYR:HB2   | 1.95                     | 0.48              |
| 5:D:46:ARG:NH1   | 5:D:85:ALA:O      | 2.46                     | 0.48              |
| 5:D:146:ILE:HA   | 5:D:159:LYS:NZ    | 2.28                     | 0.48              |
| 7:F:120:LYS:O    | 7:F:120:LYS:HD3   | 2.13                     | 0.48              |
| 9:H:15:LEU:HD12  | 9:H:15:LEU:O      | 2.13                     | 0.48              |
| 11:L:66:LYS:HA   | 11:L:79:PHE:O     | 2.12                     | 0.48              |
| 12:M:96:LYS:HD3  | 12:M:103:ILE:HD12 | 1.96                     | 0.48              |
| 15:P:27:VAL:HG21 | 15:P:40:ILE:HD13  | 1.95                     | 0.48              |
| 30:e:54:ASP:O    | 30:e:58:VAL:HG23  | 2.13                     | 0.48              |
| 2:A:150:U:H2'    | 2:A:151:C:H6      | 1.79                     | 0.48              |
| 2:A:282:A:H2'    | 2:A:283:G:H8      | 1.79                     | 0.48              |
| 2:A:640:C:O2'    | 2:A:641:U:H5'     | 2.13                     | 0.48              |
| 2:A:1435:G:H2'   | 2:A:1436:G:C8     | 2.48                     | 0.48              |
| 2:A:2016:U:H1'   | 27:b:3:VAL:HG21   | 1.95                     | 0.48              |
| 2:A:2559:C:O2'   | 2:A:2560:A:H5'    | 2.13                     | 0.48              |
| 7:F:69:LYS:CE    | 7:F:84:PRO:HG3    | 2.39                     | 0.48              |
| 10:K:76:HIS:O    | 10:K:84:ILE:HD12  | 2.13                     | 0.48              |
| 16:Q:31:TRP:CE3  | 16:Q:38:LYS:HE2   | 2.49                     | 0.48              |
| 2:A:348:A:H2'    | 2:A:349:U:O4'     | 2.14                     | 0.48              |
| 2:A:794:A:H2'    | 2:A:795:C:C6      | 2.48                     | 0.48              |
| 2:A:2418:A:OP1   | 30:e:45:ARG:HD3   | 2.13                     | 0.48              |
| 2:A:2759:G:H1'   | 8:G:35:ARG:NH2    | 2.28                     | 0.48              |
| 7:F:108:VAL:HG11 | 7:F:176:PRO:CG    | 2.32                     | 0.48              |
| 7:F:108:VAL:HB   | 7:F:109:PRO:HD3   | 1.96                     | 0.48              |
| 7:F:122:PHE:CE2  | 7:F:128:TYR:HB2   | 2.49                     | 0.48              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 8:G:9:VAL:HB     | 8:G:50:LEU:HB2   | 1.95                     | 0.48              |
| 22:W:48:MET:HE2  | 22:W:84:PRO:O    | 2.14                     | 0.48              |
| 25:Z:47:ARG:O    | 25:Z:50:VAL:HG22 | 2.13                     | 0.48              |
| 2:A:599:A:O2'    | 2:A:600:G:H5'    | 2.13                     | 0.48              |
| 2:A:696:G:O2'    | 2:A:697:G:H5'    | 2.13                     | 0.48              |
| 2:A:831:G:H2'    | 2:A:832:U:O4'    | 2.13                     | 0.48              |
| 2:A:843:G:H2'    | 2:A:844:A:C8     | 2.49                     | 0.48              |
| 2:A:963:U:O2'    | 2:A:964:C:H5'    | 2.14                     | 0.48              |
| 2:A:1625:C:C2'   | 2:A:1626:A:H5'   | 2.43                     | 0.48              |
| 2:A:2430:A:N3    | 2:A:2430:A:H2'   | 2.28                     | 0.48              |
| 2:A:2547:A:H4'   | 11:L:29:HIS:NE2  | 2.29                     | 0.48              |
| 4:C:43:ARG:HA    | 4:C:48:ARG:O     | 2.13                     | 0.48              |
| 6:E:194:LYS:O    | 6:E:197:GLU:HG2  | 2.14                     | 0.48              |
| 12:M:64:PHE:CZ   | 30:e:15:LYS:HD3  | 2.49                     | 0.48              |
| 14:O:9:GLN:O     | 14:O:17:ARG:HD3  | 2.13                     | 0.48              |
| 25:Z:50:VAL:O    | 25:Z:54:LYS:HG3  | 2.14                     | 0.48              |
| 30:e:6:THR:HG22  | 30:e:63:PRO:HG2  | 1.95                     | 0.48              |
| 2:A:615:U:O4     | 6:E:39:ALA:HB2   | 2.14                     | 0.48              |
| 2:A:1153:C:H2'   | 2:A:1154:G:O4'   | 2.14                     | 0.48              |
| 2:A:1321:A:H5'   | 2:A:1322:A:OP2   | 2.14                     | 0.48              |
| 2:A:1548:A:H2'   | 2:A:1549:A:C8    | 2.48                     | 0.48              |
| 2:A:1591:A:H2'   | 2:A:1592:C:C6    | 2.49                     | 0.48              |
| 2:A:2312:U:H5'   | 7:F:85:ILE:HG21  | 1.95                     | 0.48              |
| 3:B:11:C:OP1     | 23:X:72:LYS:HE3  | 2.14                     | 0.48              |
| 5:D:122:VAL:HG21 | 5:D:129:THR:HG22 | 1.95                     | 0.48              |
| 13:N:47:GLU:OE2  | 13:N:50:ARG:NH1  | 2.32                     | 0.48              |
| 18:S:61:ALA:HB1  | 18:S:96:VAL:HB   | 1.95                     | 0.48              |
| 2:A:133:U:O2'    | 2:A:134:G:H5'    | 2.13                     | 0.48              |
| 2:A:143:C:H2'    | 2:A:144:A:H8     | 1.78                     | 0.48              |
| 2:A:275:C:H3'    | 2:A:276:U:H5''   | 1.95                     | 0.48              |
| 2:A:287:G:H2'    | 2:A:288:U:H6     | 1.77                     | 0.48              |
| 2:A:523:C:O2'    | 2:A:524:G:H5'    | 2.14                     | 0.48              |
| 2:A:672:C:O2'    | 2:A:673:C:H5'    | 2.13                     | 0.48              |
| 2:A:784:G:H4'    | 2:A:785:G:O5'    | 2.14                     | 0.48              |
| 2:A:918:A:H5''   | 3:B:97:C:O2'     | 2.14                     | 0.48              |
| 2:A:1668:A:O2'   | 2:A:1674:G:N7    | 2.39                     | 0.48              |
| 2:A:1745:A:O2'   | 2:A:1746:A:H5'   | 2.14                     | 0.48              |
| 2:A:2241:A:H2'   | 2:A:2242:G:H8    | 1.79                     | 0.48              |
| 2:A:2615:U:O4    | 27:b:2:ALA:HB1   | 2.13                     | 0.48              |
| 2:A:2632:A:H2'   | 2:A:2633:G:H8    | 1.77                     | 0.48              |
| 2:A:2857:G:N2    | 2:A:2860:A:OP2   | 2.28                     | 0.48              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 2:A:2888:C:H2'    | 2:A:2889:C:C6     | 2.48                     | 0.48              |
| 3:B:85:G:O2'      | 3:B:86:G:H5'      | 2.13                     | 0.48              |
| 7:F:122:PHE:HZ    | 7:F:170:LEU:HD12  | 1.78                     | 0.48              |
| 14:O:72:ASP:HB3   | 14:O:75:ILE:HD13  | 1.95                     | 0.48              |
| 22:W:20:LEU:HB3   | 22:W:25:LYS:O     | 2.13                     | 0.48              |
| 2:A:77:G:H2'      | 2:A:78:U:H6       | 1.78                     | 0.48              |
| 2:A:775:G:C4'     | 2:A:776:G:H5'     | 2.30                     | 0.48              |
| 2:A:876:C:H2'     | 2:A:877:A:H1'     | 1.95                     | 0.48              |
| 2:A:921:C:O2'     | 2:A:922:C:H5'     | 2.13                     | 0.48              |
| 2:A:1009:A:O2'    | 2:A:1010:A:O4'    | 2.29                     | 0.48              |
| 2:A:1697:G:OP2    | 2:A:1698:A:O2'    | 2.22                     | 0.48              |
| 2:A:2051:A:H4'    | 5:D:146:ILE:HG12  | 1.96                     | 0.48              |
| 2:A:2427:C:H5'    | 2:A:2429:G:H5'    | 1.94                     | 0.48              |
| 2:A:2570:G:H2'    | 2:A:2571:U:O4'    | 2.14                     | 0.48              |
| 2:A:2602[B]:A:H3' | 2:A:2603[B]:G:C5' | 2.44                     | 0.48              |
| 3:B:13:G:O2'      | 3:B:15:A:H5''     | 2.14                     | 0.48              |
| 7:F:38:MET:CE     | 7:F:150:ARG:HD2   | 2.43                     | 0.48              |
| 11:L:41:ILE:HD11  | 11:L:86:LEU:HD21  | 1.94                     | 0.48              |
| 11:L:79:PHE:HB3   | 16:Q:68:GLU:OE2   | 2.14                     | 0.48              |
| 18:S:74:ILE:HB    | 18:S:87:GLN:HG2   | 1.95                     | 0.48              |
| 21:V:83:VAL:CG1   | 21:V:94:ARG:HB3   | 2.44                     | 0.48              |
| 2:A:132:G:O2'     | 2:A:133:U:H5'     | 2.14                     | 0.48              |
| 2:A:729:G:C8      | 4:C:207:LYS:HD2   | 2.49                     | 0.48              |
| 2:A:857:G:H2'     | 2:A:858:G:O4'     | 2.14                     | 0.48              |
| 2:A:1028:A:N6     | 2:A:1125:G:H2'    | 2.29                     | 0.48              |
| 2:A:1993:U:H4'    | 5:D:133:THR:OG1   | 2.14                     | 0.48              |
| 2:A:2221:G:O2'    | 2:A:2222:C:H5'    | 2.13                     | 0.48              |
| 2:A:2299:U:H2'    | 2:A:2300:C:H6     | 1.77                     | 0.48              |
| 2:A:2521:C:O2'    | 2:A:2522:U:H5'    | 2.14                     | 0.48              |
| 2:A:2563:U:H2'    | 2:A:2565:A:OP2    | 2.14                     | 0.48              |
| 6:E:31:VAL:HG21   | 6:E:104:ALA:CB    | 2.44                     | 0.48              |
| 11:L:34:GLY:O     | 11:L:62:VAL:HB    | 2.14                     | 0.48              |
| 17:R:106:PHE:O    | 17:R:110:VAL:HG23 | 2.14                     | 0.48              |
| 19:T:1:MET:HE3    | 19:T:62:ASP:HB3   | 1.96                     | 0.48              |
| 19:T:7:HIS:HB2    | 19:T:50:VAL:HG22  | 1.95                     | 0.48              |
| 21:V:26:LYS:HD2   | 21:V:37:GLU:HG3   | 1.94                     | 0.48              |
| 23:X:36:ILE:HD13  | 23:X:39:ARG:HH11  | 1.77                     | 0.48              |
| 2:A:152:A:H2'     | 2:A:153:U:C6      | 2.48                     | 0.47              |
| 2:A:221:A:C4      | 2:A:233:A:H1'     | 2.49                     | 0.47              |
| 2:A:292:U:O2'     | 2:A:293:U:H5'     | 2.14                     | 0.47              |
| 2:A:657:U:H2'     | 2:A:658:U:C6      | 2.49                     | 0.47              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 2:A:727:A:O2'    | 2:A:728:G:H5'     | 2.13                     | 0.47              |
| 2:A:1160:G:O2'   | 2:A:1161:C:H5'    | 2.14                     | 0.47              |
| 2:A:1199:U:H1'   | 17:R:4:VAL:HG22   | 1.95                     | 0.47              |
| 2:A:1255:U:O5'   | 2:A:1256:G:H5''   | 2.13                     | 0.47              |
| 2:A:1409:U:H2'   | 2:A:1410:G:C8     | 2.49                     | 0.47              |
| 2:A:1777:U:O2'   | 2:A:1778:U:H5'    | 2.13                     | 0.47              |
| 2:A:1798:U:OP2   | 4:C:271:ARG:NH1   | 2.36                     | 0.47              |
| 2:A:2283:C:O5'   | 2:A:2389:G:O2'    | 2.32                     | 0.47              |
| 6:E:7:ASP:OD2    | 6:E:7:ASP:N       | 2.44                     | 0.47              |
| 2:A:27:G:O2'     | 2:A:28:A:OP2      | 2.25                     | 0.47              |
| 2:A:194:G:H2'    | 2:A:195:A:O4'     | 2.13                     | 0.47              |
| 2:A:793:A:OP2    | 2:A:2071:A:O2'    | 2.30                     | 0.47              |
| 2:A:812:C:H5''   | 2:A:1250:G:O2'    | 2.13                     | 0.47              |
| 2:A:828:U:H4'    | 2:A:831:G:N1      | 2.29                     | 0.47              |
| 2:A:1198:U:H2'   | 2:A:1199:U:C6     | 2.49                     | 0.47              |
| 2:A:1441:G:H2'   | 2:A:1442:U:C6     | 2.49                     | 0.47              |
| 2:A:1443:U:H2'   | 2:A:1444:G:C8     | 2.48                     | 0.47              |
| 2:A:1753:G:N2    | 2:A:1755:A:H3'    | 2.29                     | 0.47              |
| 2:A:1881:C:H2'   | 2:A:1882:U:O4'    | 2.14                     | 0.47              |
| 2:A:2352:A:H2'   | 2:A:2353:G:H5'    | 1.96                     | 0.47              |
| 2:A:2760:C:O2'   | 2:A:2761:A:H5'    | 2.13                     | 0.47              |
| 3:B:114:C:H2'    | 3:B:115:A:H8      | 1.79                     | 0.47              |
| 4:C:66:ASP:OD2   | 4:C:102:ARG:HD3   | 2.13                     | 0.47              |
| 11:L:112:PHE:O   | 11:L:116:ILE:HD12 | 2.14                     | 0.47              |
| 15:P:62:LEU:HD13 | 15:P:64:TYR:O     | 2.13                     | 0.47              |
| 17:R:78:LYS:O    | 17:R:117:LEU:HD11 | 2.14                     | 0.47              |
| 2:A:78:U:H2'     | 2:A:79:C:H6       | 1.79                     | 0.47              |
| 2:A:498:G:O2'    | 2:A:499:U:H5'     | 2.14                     | 0.47              |
| 2:A:521:U:H2'    | 2:A:522:A:H8      | 1.79                     | 0.47              |
| 2:A:662:G:O2'    | 2:A:663:G:H5'     | 2.14                     | 0.47              |
| 2:A:745:G:O2'    | 2:A:748:G:H1'     | 2.14                     | 0.47              |
| 2:A:987:C:O2'    | 2:A:1000:A:N3     | 2.40                     | 0.47              |
| 2:A:1474:U:H2'   | 2:A:1475:G:H5'    | 1.96                     | 0.47              |
| 2:A:2016:U:H1'   | 27:b:3:VAL:CG2    | 2.44                     | 0.47              |
| 2:A:2648:G:H2'   | 2:A:2649:C:H6     | 1.79                     | 0.47              |
| 2:A:2698:U:H2'   | 2:A:2699:C:C6     | 2.50                     | 0.47              |
| 2:A:2785:C:H2'   | 2:A:2786:U:C6     | 2.49                     | 0.47              |
| 3:B:5:U:O2'      | 3:B:6:G:H5'       | 2.14                     | 0.47              |
| 22:W:4:ILE:CG2   | 22:W:42:LEU:HD22  | 2.44                     | 0.47              |
| 25:Z:4:LYS:HD3   | 25:Z:7:ARG:NH1    | 2.29                     | 0.47              |
| 25:Z:41:HIS:O    | 25:Z:45:GLN:HG3   | 2.15                     | 0.47              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:A:275:C:H3'    | 2:A:276:U:C5'    | 2.45                     | 0.47              |
| 2:A:1164:C:H2'   | 2:A:1165:A:H8    | 1.79                     | 0.47              |
| 2:A:1187:G:H5''  | 18:S:83:TYR:CE1  | 2.50                     | 0.47              |
| 2:A:1939:U:OP1   | 2:A:2604:U:O2'   | 2.32                     | 0.47              |
| 2:A:2300:C:H2'   | 2:A:2301:C:H6    | 1.77                     | 0.47              |
| 2:A:2700:A:H2'   | 2:A:2701:U:H6    | 1.79                     | 0.47              |
| 6:E:134:LEU:CD2  | 6:E:161:ALA:HB2  | 2.45                     | 0.47              |
| 8:G:5:ALA:HB2    | 8:G:66:GLY:CA    | 2.44                     | 0.47              |
| 10:K:76:HIS:CE1  | 10:K:85:LYS:HB2  | 2.49                     | 0.47              |
| 11:L:110:GLU:OE2 | 11:L:111:LYS:HG3 | 2.14                     | 0.47              |
| 13:N:26:VAL:HA   | 13:N:104:GLU:OE2 | 2.14                     | 0.47              |
| 16:Q:52:ASN:O    | 16:Q:53:ARG:HD3  | 2.14                     | 0.47              |
| 2:A:58:G:O2'     | 2:A:59:U:H5'     | 2.15                     | 0.47              |
| 2:A:78:U:H2'     | 2:A:79:C:C6      | 2.49                     | 0.47              |
| 2:A:929:U:O2     | 26:a:26:GLY:HA2  | 2.14                     | 0.47              |
| 2:A:1268:A:H2'   | 2:A:1269:A:O4'   | 2.14                     | 0.47              |
| 2:A:1399:C:O2'   | 2:A:1400:U:H5'   | 2.14                     | 0.47              |
| 2:A:1969:A:H2'   | 2:A:1972:G:H21   | 1.78                     | 0.47              |
| 2:A:2398:U:H2'   | 2:A:2399:G:C8    | 2.50                     | 0.47              |
| 2:A:2508:G:HO2'  | 2:A:2554:U:HO2'  | 1.63                     | 0.47              |
| 2:A:2679:A:H5'   | 5:D:170:VAL:HG11 | 1.97                     | 0.47              |
| 2:A:2840:C:O2'   | 2:A:2841:C:H5'   | 2.14                     | 0.47              |
| 2:A:2846:G:H2'   | 2:A:2847:U:C6    | 2.49                     | 0.47              |
| 4:C:53:HIS:CE1   | 4:C:219:THR:HG23 | 2.49                     | 0.47              |
| 4:C:72:ASP:HA    | 4:C:118:SER:O    | 2.14                     | 0.47              |
| 7:F:56:ASP:O     | 7:F:60:ILE:HG13  | 2.14                     | 0.47              |
| 13:N:24:THR:HG22 | 13:N:99:GLY:O    | 2.15                     | 0.47              |
| 18:S:43:ASN:O    | 18:S:46:GLU:HB3  | 2.14                     | 0.47              |
| 31:f:8:LYS:O     | 31:f:35:GLN:NE2  | 2.47                     | 0.47              |
| 2:A:290:U:H2'    | 2:A:291:G:H8     | 1.80                     | 0.47              |
| 2:A:603:A:H4'    | 2:A:604:G:O5'    | 2.15                     | 0.47              |
| 2:A:729:G:C5     | 4:C:207:LYS:HB2  | 2.50                     | 0.47              |
| 2:A:905:A:C2'    | 2:A:906:U:H5'    | 2.45                     | 0.47              |
| 2:A:1591:A:H2'   | 2:A:1592:C:H6    | 1.79                     | 0.47              |
| 2:A:2000:C:OP1   | 14:O:5:LYS:NZ    | 2.37                     | 0.47              |
| 2:A:2099:U:H2'   | 2:A:2100:G:H8    | 1.79                     | 0.47              |
| 2:A:2273:A:H2'   | 2:A:2274:A:C8    | 2.50                     | 0.47              |
| 6:E:12:LEU:HD12  | 6:E:12:LEU:O     | 2.15                     | 0.47              |
| 7:F:117:LEU:HD12 | 7:F:130:MET:HG3  | 1.95                     | 0.47              |
| 9:H:37:VAL:CG2   | 9:H:38:PRO:HD2   | 2.44                     | 0.47              |
| 11:L:10:VAL:HG21 | 11:L:16:ALA:HB3  | 1.95                     | 0.47              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 21:V:10:GLU:O    | 21:V:72:ILE:HD12 | 2.15                     | 0.47              |
| 2:A:289:G:H2'    | 2:A:290:U:C6     | 2.50                     | 0.47              |
| 2:A:347:A:H2'    | 2:A:348:A:H8     | 1.80                     | 0.47              |
| 2:A:372:G:O2'    | 2:A:400:G:O6     | 2.28                     | 0.47              |
| 2:A:388:G:O6     | 2:A:390:U:O2'    | 2.22                     | 0.47              |
| 2:A:479:A:H4'    | 2:A:480:A:C5'    | 2.39                     | 0.47              |
| 2:A:896:A:H5'    | 2:A:897:C:OP2    | 2.15                     | 0.47              |
| 2:A:995:C:O2     | 10:K:3:THR:OG1   | 2.28                     | 0.47              |
| 2:A:1231:U:H2'   | 2:A:1232:G:H8    | 1.78                     | 0.47              |
| 2:A:1355:G:O2'   | 2:A:1356:G:H5'   | 2.15                     | 0.47              |
| 2:A:1435:G:H2'   | 2:A:1436:G:H8    | 1.80                     | 0.47              |
| 2:A:2700:A:H2'   | 2:A:2701:U:C6    | 2.49                     | 0.47              |
| 2:A:2739:U:O2'   | 2:A:2740:A:H5'   | 2.14                     | 0.47              |
| 2:A:2821:A:OP2   | 5:D:115:GLY:N    | 2.40                     | 0.47              |
| 7:F:8:TYR:CD1    | 7:F:12:VAL:HB    | 2.50                     | 0.47              |
| 8:G:2:SER:O      | 8:G:6:LYS:HG3    | 2.15                     | 0.47              |
| 8:G:47:ASP:N     | 8:G:47:ASP:OD1   | 2.48                     | 0.47              |
| 10:K:46:PRO:HD3  | 17:R:60:LEU:HD13 | 1.97                     | 0.47              |
| 11:L:64:ARG:HD3  | 11:L:102:PRO:O   | 2.14                     | 0.47              |
| 22:W:4:ILE:HG21  | 22:W:42:LEU:HD22 | 1.97                     | 0.47              |
| 23:X:36:ILE:HD13 | 23:X:39:ARG:NH1  | 2.30                     | 0.47              |
| 24:Y:38:PHE:N    | 24:Y:47:VAL:O    | 2.29                     | 0.47              |
| 2:A:48:G:N2      | 2:A:177:G:OP2    | 2.48                     | 0.47              |
| 2:A:61:C:O2'     | 2:A:62:U:H5'     | 2.15                     | 0.47              |
| 2:A:203:A:OP2    | 2:A:204:A:O2'    | 2.17                     | 0.47              |
| 2:A:219:A:H2'    | 2:A:220:G:O4'    | 2.15                     | 0.47              |
| 2:A:499:U:H2'    | 2:A:500:G:O4'    | 2.14                     | 0.47              |
| 2:A:625:G:H2'    | 2:A:626:A:C8     | 2.49                     | 0.47              |
| 2:A:971:G:H2'    | 2:A:972:A:O4'    | 2.14                     | 0.47              |
| 2:A:2812:G:H2'   | 2:A:2813:A:C8    | 2.50                     | 0.47              |
| 8:G:105:LEU:HD21 | 8:G:131:ILE:HD11 | 1.97                     | 0.47              |
| 17:R:91:ASP:O    | 17:R:95:LEU:HG   | 2.14                     | 0.47              |
| 18:S:16:GLU:OE1  | 18:S:100:GLY:HA2 | 2.15                     | 0.47              |
| 22:W:6:ALA:HB1   | 22:W:40:ILE:HB   | 1.96                     | 0.47              |
| 2:A:176:A:O2'    | 2:A:177:G:H5'    | 2.14                     | 0.47              |
| 2:A:430:A:H5''   | 2:A:431:U:OP2    | 2.15                     | 0.47              |
| 2:A:789:A:H3'    | 2:A:790:U:H5'    | 1.97                     | 0.47              |
| 2:A:1025:G:H4'   | 2:A:1026:G:OP2   | 2.15                     | 0.47              |
| 2:A:1213:A:H2'   | 2:A:1214:A:C8    | 2.50                     | 0.47              |
| 2:A:1433:A:O2'   | 2:A:1434:A:H5'   | 2.15                     | 0.47              |
| 2:A:1863:G:H2'   | 2:A:1864:U:C6    | 2.49                     | 0.47              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:A:2663:G:H2'   | 2:A:2664:G:O4'   | 2.14                     | 0.47              |
| 3:B:100:G:H2'    | 3:B:101:A:O4'    | 2.14                     | 0.47              |
| 4:C:240:PHE:O    | 4:C:242:LYS:HG2  | 2.15                     | 0.47              |
| 5:D:15:PHE:CD2   | 16:Q:55:LEU:HD11 | 2.49                     | 0.47              |
| 5:D:56:LYS:O     | 5:D:60:VAL:HG23  | 2.15                     | 0.47              |
| 12:M:51:GLU:O    | 12:M:54:GLN:HG2  | 2.15                     | 0.47              |
| 12:M:77:ILE:HD11 | 12:M:101:ILE:CG2 | 2.45                     | 0.47              |
| 13:N:112:LEU:O   | 13:N:115:GLU:HG2 | 2.15                     | 0.47              |
| 2:A:15:G:H4'     | 27:b:18:SER:HB3  | 1.96                     | 0.47              |
| 2:A:579:G:H2'    | 2:A:580:U:H6     | 1.79                     | 0.47              |
| 2:A:744:U:H2'    | 2:A:745:G:O4'    | 2.14                     | 0.47              |
| 7:F:102:ARG:HD2  | 7:F:140:GLU:OE2  | 2.15                     | 0.47              |
| 8:G:96:ALA:N     | 8:G:128:GLN:O    | 2.48                     | 0.47              |
| 14:O:24:MET:HE1  | 14:O:40:LYS:HD3  | 1.96                     | 0.47              |
| 18:S:57:GLY:HA2  | 18:S:103:ALA:O   | 2.15                     | 0.47              |
| 19:T:41:LYS:HE2  | 27:b:22:LEU:HD11 | 1.95                     | 0.47              |
| 22:W:29:ILE:HD12 | 22:W:39:ALA:HA   | 1.96                     | 0.47              |
| 25:Z:2:LYS:HG2   | 25:Z:3:ALA:H     | 1.80                     | 0.47              |
| 2:A:61:C:O4'     | 25:Z:40:SER:HB3  | 2.15                     | 0.46              |
| 2:A:479:A:H1'    | 2:A:481:G:C5'    | 2.45                     | 0.46              |
| 2:A:500:G:N2     | 2:A:502:A:H3'    | 2.30                     | 0.46              |
| 2:A:598:U:H2'    | 2:A:599:A:H8     | 1.80                     | 0.46              |
| 2:A:671:C:H2'    | 2:A:672:C:C6     | 2.50                     | 0.46              |
| 2:A:1916:A:H2'   | 2:A:1917:U:O4'   | 2.15                     | 0.46              |
| 2:A:1928:A:H2'   | 2:A:1929:G:O4'   | 2.16                     | 0.46              |
| 2:A:2233:U:H2'   | 2:A:2234:G:H8    | 1.76                     | 0.46              |
| 2:A:2849:U:H4'   | 2:A:2868:A:C2    | 2.50                     | 0.46              |
| 3:B:33:G:H2'     | 3:B:34:A:O4'     | 2.15                     | 0.46              |
| 8:G:9:VAL:HG23   | 8:G:69:ARG:HG2   | 1.97                     | 0.46              |
| 19:T:23:LEU:HD21 | 27:b:22:LEU:O    | 2.15                     | 0.46              |
| 21:V:99:ASN:ND2  | 21:V:101:GLU:OE2 | 2.47                     | 0.46              |
| 26:a:44:ILE:HD13 | 26:a:47:MET:HE2  | 1.97                     | 0.46              |
| 2:A:653:U:H4'    | 2:A:654:A:O5'    | 2.15                     | 0.46              |
| 2:A:706:A:H61    | 2:A:725:G:H1'    | 1.79                     | 0.46              |
| 2:A:1457:U:H5''  | 2:A:1458:U:OP1   | 2.15                     | 0.46              |
| 2:A:1501:G:O2'   | 2:A:1502:A:H5'   | 2.16                     | 0.46              |
| 2:A:2246:G:H2'   | 2:A:2247:A:H8    | 1.79                     | 0.46              |
| 2:A:2651:C:O2'   | 2:A:2652:C:H5'   | 2.15                     | 0.46              |
| 17:R:52:GLN:O    | 17:R:56:GLN:HG3  | 2.15                     | 0.46              |
| 2:A:29:U:H2'     | 2:A:30:G:H8      | 1.81                     | 0.46              |
| 2:A:118:A:OP2    | 2:A:119:A:H2'    | 2.15                     | 0.46              |

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| Atom-1          | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|-----------------|------------------|--------------------------|-------------------|
| 2:A:197:A:H4'   | 2:A:2069:G:OP2   | 2.15                     | 0.46              |
| 2:A:1404:C:O2'  | 2:A:1405:U:H5'   | 2.15                     | 0.46              |
| 2:A:1786:A:H1'  | 2:A:1938:A:N6    | 2.29                     | 0.46              |
| 2:A:1817:G:H2'  | 2:A:1818:U:H5'   | 1.98                     | 0.46              |
| 2:A:2290:G:O2'  | 2:A:2291:U:H5'   | 2.14                     | 0.46              |
| 8:G:33:LEU:HB3  | 8:G:75:MET:CE    | 2.44                     | 0.46              |
| 11:L:1:MET:SD   | 11:L:67:LYS:HE3  | 2.56                     | 0.46              |
| 27:b:11:SER:O   | 27:b:15:MET:HG3  | 2.15                     | 0.46              |
| 2:A:144:A:H2'   | 2:A:145:C:C6     | 2.50                     | 0.46              |
| 2:A:319:G:H2'   | 2:A:320:A:O4'    | 2.15                     | 0.46              |
| 2:A:319:G:O2'   | 2:A:320:A:H5'    | 2.15                     | 0.46              |
| 2:A:755:U:H2'   | 2:A:756:A:H8     | 1.79                     | 0.46              |
| 2:A:807:U:O2    | 6:E:69:ARG:NH2   | 2.45                     | 0.46              |
| 2:A:1056:G:HO2' | 2:A:1086:A:H1'   | 1.81                     | 0.46              |
| 2:A:1562:U:H2'  | 2:A:1563:U:O4'   | 2.15                     | 0.46              |
| 2:A:1863:G:H4'  | 2:A:2411:A:H4'   | 1.98                     | 0.46              |
| 2:A:2262:U:O2'  | 2:A:2263:C:H5'   | 2.15                     | 0.46              |
| 2:A:2507:C:H2'  | 2:A:2508:G:O4'   | 2.15                     | 0.46              |
| 2:A:2880:C:HO2' | 14:O:90:ARG:HD3  | 1.79                     | 0.46              |
| 6:E:31:VAL:HG21 | 6:E:104:ALA:HB2  | 1.98                     | 0.46              |
| 8:G:89:LEU:HG   | 8:G:162:VAL:HG22 | 1.97                     | 0.46              |
| 2:A:414:C:H2'   | 2:A:415:A:H8     | 1.79                     | 0.46              |
| 2:A:645:C:H2'   | 2:A:647:G:C8     | 2.50                     | 0.46              |
| 2:A:722:A:H2'   | 2:A:723:C:H6     | 1.80                     | 0.46              |
| 2:A:1749:A:O2'  | 2:A:1750:G:H5'   | 2.15                     | 0.46              |
| 2:A:1965:C:H5'' | 2:A:1966:A:H2'   | 1.97                     | 0.46              |
| 2:A:2636:C:H2'  | 2:A:2637:U:H6    | 1.81                     | 0.46              |
| 2:A:2836:U:H2'  | 2:A:2837:A:H8    | 1.81                     | 0.46              |
| 4:C:119:GLY:HA2 | 4:C:189:ARG:NH1  | 2.29                     | 0.46              |
| 5:D:146:ILE:HA  | 5:D:159:LYS:HZ2  | 1.80                     | 0.46              |
| 16:Q:106:LYS:HA | 16:Q:109:ARG:HD2 | 1.97                     | 0.46              |
| 22:W:6:ALA:HB2  | 22:W:42:LEU:CD2  | 2.45                     | 0.46              |
| 2:A:173:A:H2'   | 2:A:174:U:C6     | 2.50                     | 0.46              |
| 2:A:213:A:O2'   | 2:A:214:G:H5'    | 2.15                     | 0.46              |
| 2:A:416:U:H2'   | 2:A:417:C:O4'    | 2.16                     | 0.46              |
| 2:A:948:C:H1'   | 2:A:984:A:C8     | 2.50                     | 0.46              |
| 2:A:1075:C:H2'  | 2:A:1076:C:H6    | 1.81                     | 0.46              |
| 2:A:1401:G:H2'  | 2:A:1402:U:C6    | 2.51                     | 0.46              |
| 2:A:1585:C:H2'  | 2:A:1586:A:O4'   | 2.15                     | 0.46              |
| 2:A:1990:C:H2'  | 2:A:1991:U:C1'   | 2.46                     | 0.46              |
| 2:A:2295:C:OP1  | 15:P:10:ARG:NH2  | 2.48                     | 0.46              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:A:2820:A:H4'   | 14:O:3:HIS:CG    | 2.50                     | 0.46              |
| 3:B:105:G:O2'    | 3:B:106:G:H5'    | 2.15                     | 0.46              |
| 4:C:16:VAL:HG22  | 4:C:206:GLY:HA3  | 1.98                     | 0.46              |
| 6:E:149:ILE:HG22 | 6:E:192:ALA:HB1  | 1.97                     | 0.46              |
| 8:G:52:PHE:CE2   | 8:G:69:ARG:HA    | 2.50                     | 0.46              |
| 20:U:33:LYS:HE2  | 20:U:80:TRP:CD2  | 2.50                     | 0.46              |
| 26:a:12:SER:HB2  | 26:a:32:ILE:HD11 | 1.98                     | 0.46              |
| 2:A:289:G:H2'    | 2:A:290:U:H6     | 1.81                     | 0.46              |
| 2:A:843:G:O2'    | 2:A:844:A:H5'    | 2.16                     | 0.46              |
| 2:A:928:A:O2'    | 2:A:929:U:H5'    | 2.16                     | 0.46              |
| 2:A:1365:A:OP1   | 24:Y:3:ARG:NE    | 2.40                     | 0.46              |
| 2:A:2585:U:H4'   | 2:A:2586:U:H5''  | 1.96                     | 0.46              |
| 4:C:43:ARG:NH2   | 4:C:49:ILE:HD11  | 2.30                     | 0.46              |
| 4:C:133:ARG:HB3  | 4:C:186:ALA:HB1  | 1.96                     | 0.46              |
| 5:D:1:MET:HE3    | 5:D:100:LEU:HG   | 1.98                     | 0.46              |
| 7:F:136:ILE:CG2  | 7:F:146:VAL:HG11 | 2.46                     | 0.46              |
| 22:W:6:ALA:CB    | 22:W:40:ILE:HD12 | 2.46                     | 0.46              |
| 29:d:30:VAL:HG22 | 29:d:33:ARG:NH1  | 2.30                     | 0.46              |
| 2:A:4:U:H2'      | 2:A:5:A:C8       | 2.51                     | 0.46              |
| 2:A:521:U:H2'    | 2:A:522:A:C8     | 2.51                     | 0.46              |
| 2:A:1636:U:H2'   | 2:A:1637:A:C8    | 2.51                     | 0.46              |
| 2:A:1651:G:H4'   | 14:O:39:PRO:HG2  | 1.98                     | 0.46              |
| 2:A:1827:U:OP2   | 4:C:221:ARG:HD2  | 2.16                     | 0.46              |
| 2:A:1853:A:H1'   | 2:A:2234:G:O4'   | 2.16                     | 0.46              |
| 2:A:1870:C:H2'   | 2:A:1871:A:N7    | 2.31                     | 0.46              |
| 2:A:2420:C:P     | 30:e:34:THR:HB   | 2.56                     | 0.46              |
| 2:A:2528:U:O2'   | 2:A:2530:A:OP1   | 2.19                     | 0.46              |
| 2:A:2806:C:H2'   | 2:A:2807:U:O4'   | 2.16                     | 0.46              |
| 2:A:2899:A:H5'   | 10:K:136:GLN:OE1 | 2.15                     | 0.46              |
| 3:B:48:U:H2'     | 3:B:49:C:C6      | 2.50                     | 0.46              |
| 6:E:5:LEU:HD13   | 6:E:10:SER:O     | 2.16                     | 0.46              |
| 11:L:71:ARG:NH2  | 11:L:123:LEU:O   | 2.48                     | 0.46              |
| 14:O:100:CYS:SG  | 14:O:101:GLY:N   | 2.87                     | 0.46              |
| 30:e:9:GLY:O     | 30:e:13:ARG:HD3  | 2.16                     | 0.46              |
| 2:A:396:G:O3'    | 24:Y:31:PRO:HA   | 2.16                     | 0.46              |
| 2:A:476:G:H4'    | 2:A:502:A:N1     | 2.31                     | 0.46              |
| 2:A:487:C:H2'    | 2:A:488:G:O4'    | 2.16                     | 0.46              |
| 2:A:878:A:H3'    | 2:A:879:G:C8     | 2.48                     | 0.46              |
| 2:A:962:G:H4'    | 2:A:2496:C:O2'   | 2.16                     | 0.46              |
| 2:A:2327:A:H2'   | 2:A:2328:A:C8    | 2.50                     | 0.46              |
| 2:A:2341:G:O2'   | 2:A:2342:C:H5'   | 2.15                     | 0.46              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:A:2580:U:H5''  | 5:D:135:GLY:O    | 2.16                     | 0.46              |
| 5:D:31:ALA:HA    | 5:D:96:ILE:O     | 2.16                     | 0.46              |
| 13:N:54:THR:HG22 | 13:N:59:ARG:HG3  | 1.98                     | 0.46              |
| 14:O:114:GLU:HG3 | 14:O:118:ARG:HE  | 1.81                     | 0.46              |
| 18:S:52:PRO:HG2  | 18:S:53:PHE:CD2  | 2.51                     | 0.46              |
| 26:a:44:ILE:O    | 26:a:48:ILE:HG13 | 2.16                     | 0.46              |
| 28:c:9:ILE:HD12  | 28:c:51:GLU:HG3  | 1.96                     | 0.46              |
| 2:A:659:G:H4'    | 6:E:95:LYS:HB3   | 1.97                     | 0.46              |
| 2:A:1109:C:H2'   | 2:A:1110:G:N9    | 2.31                     | 0.46              |
| 2:A:1310:G:C2'   | 2:A:1311:G:H5'   | 2.46                     | 0.46              |
| 2:A:1430:G:H2'   | 2:A:1431:A:C8    | 2.51                     | 0.46              |
| 2:A:1597:A:C5'   | 2:A:1598:A:H5'   | 2.39                     | 0.46              |
| 2:A:1854:A:H61   | 2:A:1888:G:H1'   | 1.80                     | 0.46              |
| 2:A:2745:C:H2'   | 2:A:2746:U:C6    | 2.50                     | 0.46              |
| 2:A:2896:C:O2'   | 2:A:2897:U:H5'   | 2.14                     | 0.46              |
| 7:F:6:ASP:OD1    | 7:F:6:ASP:N      | 2.49                     | 0.46              |
| 7:F:134:GLU:HA   | 7:F:150:ARG:O    | 2.16                     | 0.46              |
| 12:M:89:VAL:HG21 | 12:M:123:ARG:NH2 | 2.30                     | 0.46              |
| 13:N:75:GLU:HB2  | 13:N:90:GLU:CG   | 2.35                     | 0.46              |
| 21:V:6:ARG:O     | 21:V:25:VAL:HG21 | 2.16                     | 0.46              |
| 2:A:152:A:H2'    | 2:A:153:U:H6     | 1.80                     | 0.45              |
| 2:A:226:A:O2'    | 2:A:227:A:H5'    | 2.16                     | 0.45              |
| 2:A:322:A:H5'    | 2:A:340:A:C1'    | 2.46                     | 0.45              |
| 2:A:628:G:O2'    | 2:A:629:G:H5'    | 2.15                     | 0.45              |
| 2:A:687:C:H5''   | 29:d:2:LYS:HE2   | 1.98                     | 0.45              |
| 2:A:1165:A:O2'   | 2:A:1166:G:H5'   | 2.15                     | 0.45              |
| 2:A:1407:G:O2'   | 2:A:1408:G:H5'   | 2.16                     | 0.45              |
| 2:A:2366:A:H2'   | 2:A:2367:G:O4'   | 2.16                     | 0.45              |
| 2:A:2809:A:H2'   | 2:A:2810:A:C8    | 2.51                     | 0.45              |
| 3:B:11:C:O2'     | 3:B:12:C:H5'     | 2.15                     | 0.45              |
| 3:B:113:C:H2'    | 3:B:114:C:C6     | 2.51                     | 0.45              |
| 4:C:37:ASN:HB2   | 4:C:62:TYR:HB2   | 1.97                     | 0.45              |
| 13:N:20:LEU:HD13 | 22:W:81:PRO:CG   | 2.40                     | 0.45              |
| 2:A:89:A:O2'     | 2:A:90:U:H5'     | 2.16                     | 0.45              |
| 2:A:656:G:H2'    | 2:A:657:U:C6     | 2.50                     | 0.45              |
| 2:A:1400:U:H2'   | 2:A:1401:G:C8    | 2.51                     | 0.45              |
| 2:A:2272:U:H5''  | 2:A:2273:A:OP1   | 2.16                     | 0.45              |
| 2:A:2677:G:H2'   | 2:A:2678:C:H6    | 1.79                     | 0.45              |
| 2:A:2785:C:H2'   | 2:A:2786:U:H6    | 1.81                     | 0.45              |
| 3:B:50:A:P       | 15:P:67:ASN:HA   | 2.56                     | 0.45              |
| 16:Q:75:GLN:HB2  | 16:Q:78:SER:HB2  | 1.96                     | 0.45              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 22:W:30:ILE:HA   | 22:W:91:PHE:O    | 2.16                     | 0.45              |
| 2:A:40:U:O2'     | 2:A:41:C:H5'     | 2.15                     | 0.45              |
| 2:A:269:C:O2'    | 2:A:270:A:H5'    | 2.17                     | 0.45              |
| 2:A:597:G:O2'    | 2:A:598:U:H5'    | 2.16                     | 0.45              |
| 2:A:752:A:H3'    | 29:d:1:MET:CE    | 2.46                     | 0.45              |
| 2:A:864:G:H2'    | 2:A:865:C:C6     | 2.51                     | 0.45              |
| 2:A:1039:A:O2'   | 22:W:45:ASP:OD2  | 2.14                     | 0.45              |
| 2:A:1076:C:H2'   | 2:A:1077:A:C8    | 2.52                     | 0.45              |
| 2:A:1085:A:H1'   | 2:A:1105:U:H1'   | 1.97                     | 0.45              |
| 2:A:1278:C:OP1   | 14:O:36:THR:HG22 | 2.16                     | 0.45              |
| 2:A:2191:A:O2'   | 2:A:2192:U:H5'   | 2.16                     | 0.45              |
| 2:A:2392:A:OP1   | 30:e:32:ILE:HD12 | 2.16                     | 0.45              |
| 2:A:2580:U:H3'   | 2:A:2581:G:C2    | 2.51                     | 0.45              |
| 2:A:2886:A:N1    | 27:b:40:ARG:HD2  | 2.30                     | 0.45              |
| 3:B:21:G:O2'     | 3:B:22:U:H5'     | 2.17                     | 0.45              |
| 7:F:60:ILE:HG22  | 7:F:99:PHE:HE2   | 1.81                     | 0.45              |
| 8:G:98:VAL:HG12  | 8:G:103:ILE:HG12 | 1.98                     | 0.45              |
| 13:N:58:LYS:O    | 13:N:60:GLN:NE2  | 2.49                     | 0.45              |
| 20:U:30:ILE:CD1  | 20:U:32:LEU:HD21 | 2.47                     | 0.45              |
| 23:X:62:LYS:HB3  | 23:X:62:LYS:HE2  | 1.80                     | 0.45              |
| 2:A:95:A:H2'     | 2:A:96:C:O4'     | 2.15                     | 0.45              |
| 2:A:1083:U:H2'   | 2:A:1085:A:OP2   | 2.15                     | 0.45              |
| 2:A:1259:G:O2'   | 2:A:1260:A:H5'   | 2.15                     | 0.45              |
| 2:A:1376:C:H2'   | 2:A:1377:G:O4'   | 2.16                     | 0.45              |
| 2:A:1446:C:H2'   | 2:A:1447:C:C6    | 2.51                     | 0.45              |
| 2:A:1614:A:C2    | 19:T:93:ALA:HB2  | 2.52                     | 0.45              |
| 2:A:1831:G:O2'   | 2:A:1832:C:H5'   | 2.16                     | 0.45              |
| 2:A:1842:G:H1'   | 4:C:243:HIS:CD2  | 2.51                     | 0.45              |
| 2:A:1910:G:H2'   | 2:A:1911:U:O4'   | 2.16                     | 0.45              |
| 2:A:2794:C:H2'   | 2:A:2795:C:C6    | 2.52                     | 0.45              |
| 3:B:27:C:O2'     | 3:B:28:C:H5'     | 2.17                     | 0.45              |
| 7:F:102:ARG:O    | 7:F:106:ILE:HB   | 2.17                     | 0.45              |
| 21:V:72:ILE:HG21 | 21:V:83:VAL:HG23 | 1.98                     | 0.45              |
| 2:A:318:C:O2'    | 2:A:319:G:H5'    | 2.15                     | 0.45              |
| 2:A:538:A:H4'    | 10:K:7:LYS:HG2   | 1.98                     | 0.45              |
| 2:A:566:U:OP1    | 12:M:29:LYS:HE2  | 2.17                     | 0.45              |
| 2:A:1429:G:H2'   | 2:A:1430:G:H8    | 1.82                     | 0.45              |
| 2:A:1657:U:O2'   | 2:A:1658:C:H5'   | 2.16                     | 0.45              |
| 2:A:2030:A:N3    | 2:A:2499:C:H5''  | 2.32                     | 0.45              |
| 2:A:2052:A:O4'   | 5:D:147:GLY:HA3  | 2.17                     | 0.45              |
| 2:A:2240:U:O2'   | 2:A:2241:A:H5'   | 2.17                     | 0.45              |

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| Atom-1            | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|------------------|--------------------------|-------------------|
| 2:A:2289:G:O2'    | 2:A:2290:G:H5'   | 2.17                     | 0.45              |
| 2:A:2531:A:OP1    | 8:G:175:LYS:HB3  | 2.16                     | 0.45              |
| 2:A:2555:U:H2'    | 2:A:2556:C:H5'   | 1.98                     | 0.45              |
| 2:A:2602[B]:A:H2' | 2:A:2602[B]:A:N3 | 2.32                     | 0.45              |
| 2:A:2880:C:O2'    | 14:O:90:ARG:HD3  | 2.17                     | 0.45              |
| 15:P:25:ARG:HA    | 15:P:91:SER:O    | 2.16                     | 0.45              |
| 19:T:77:ASP:HB2   | 19:T:102:HIS:HB2 | 1.99                     | 0.45              |
| 2:A:169:G:O2'     | 2:A:170:U:H5'    | 2.16                     | 0.45              |
| 2:A:191:A:H2'     | 2:A:192:C:H6     | 1.81                     | 0.45              |
| 2:A:353:C:O2      | 2:A:353:C:H2'    | 2.17                     | 0.45              |
| 2:A:476:G:N2      | 2:A:478:A:H3'    | 2.32                     | 0.45              |
| 2:A:565:C:H2'     | 2:A:566:U:C6     | 2.52                     | 0.45              |
| 2:A:671:C:H2'     | 2:A:672:C:H6     | 1.82                     | 0.45              |
| 2:A:687:C:O4'     | 29:d:4:THR:HA    | 2.16                     | 0.45              |
| 2:A:729:G:C6      | 4:C:207:LYS:HB2  | 2.52                     | 0.45              |
| 2:A:747:U:O2'     | 19:T:92:ARG:NH2  | 2.50                     | 0.45              |
| 2:A:925:A:O2'     | 2:A:926:G:H5'    | 2.16                     | 0.45              |
| 2:A:1082:U:H3'    | 2:A:1083:U:C5'   | 2.45                     | 0.45              |
| 2:A:1558:C:H4'    | 2:A:1559:U:O5'   | 2.16                     | 0.45              |
| 2:A:1773:A:H2'    | 2:A:1774:C:H5'   | 1.99                     | 0.45              |
| 2:A:2210:U:H4'    | 2:A:2211:A:C5'   | 2.46                     | 0.45              |
| 2:A:2484:G:OP1    | 13:N:44:ARG:NH2  | 2.38                     | 0.45              |
| 2:A:2818:U:H4'    | 2:A:2837:A:C4'   | 2.46                     | 0.45              |
| 4:C:180:GLU:OE2   | 4:C:267:ILE:HG23 | 2.17                     | 0.45              |
| 5:D:16:THR:CG2    | 5:D:20:VAL:HB    | 2.46                     | 0.45              |
| 7:F:103:LEU:O     | 7:F:108:VAL:HG23 | 2.17                     | 0.45              |
| 19:T:83:LYS:HD2   | 19:T:95:ARG:HH11 | 1.81                     | 0.45              |
| 2:A:96:C:H4'      | 25:Z:41:HIS:CE1  | 2.52                     | 0.45              |
| 2:A:1922:G:H2'    | 2:A:1923:U:H6    | 1.80                     | 0.45              |
| 2:A:2592:G:H2'    | 2:A:2593:U:C6    | 2.51                     | 0.45              |
| 2:A:2808:G:O2'    | 2:A:2890:G:O6    | 2.20                     | 0.45              |
| 5:D:40:LEU:HD23   | 5:D:44:GLY:C     | 2.41                     | 0.45              |
| 6:E:190:ALA:O     | 6:E:193:VAL:HG12 | 2.17                     | 0.45              |
| 7:F:30:ARG:O      | 7:F:159:THR:HG23 | 2.17                     | 0.45              |
| 11:L:14:SER:HA    | 11:L:51:LYS:HD2  | 1.99                     | 0.45              |
| 18:S:66:HIS:ND1   | 18:S:94:THR:HG22 | 2.32                     | 0.45              |
| 21:V:45:HIS:CD2   | 21:V:58:ILE:HG12 | 2.50                     | 0.45              |
| 31:f:25:VAL:HB    | 31:f:35:GLN:HG2  | 1.99                     | 0.45              |
| 2:A:644:A:H2'     | 2:A:645:C:C4'    | 2.47                     | 0.45              |
| 2:A:1088:A:N3     | 2:A:1088:A:H2'   | 2.32                     | 0.45              |
| 2:A:1484:U:H2'    | 2:A:1485:U:H5''  | 1.99                     | 0.45              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 2:A:2031:A:C6    | 2:A:2498:C:H1'    | 2.52                     | 0.45              |
| 2:A:2352:A:C2'   | 2:A:2353:G:H5'    | 2.47                     | 0.45              |
| 3:B:106:G:O2'    | 3:B:107:G:H5'     | 2.17                     | 0.45              |
| 8:G:95:ARG:HB3   | 8:G:128:GLN:OE1   | 2.17                     | 0.45              |
| 14:O:95:THR:HG22 | 14:O:115:LEU:HD23 | 1.98                     | 0.45              |
| 16:Q:106:LYS:HA  | 16:Q:109:ARG:CD   | 2.47                     | 0.45              |
| 19:T:1:MET:HE3   | 19:T:62:ASP:CG    | 2.42                     | 0.45              |
| 26:a:24:LEU:HD11 | 26:a:54:MET:CE    | 2.47                     | 0.45              |
| 30:e:55:LEU:HG   | 30:e:59:ILE:HD11  | 1.98                     | 0.45              |
| 2:A:17:G:H2'     | 2:A:18:U:C6       | 2.51                     | 0.45              |
| 2:A:597:G:H2'    | 2:A:598:U:H6      | 1.82                     | 0.45              |
| 2:A:605:G:H1'    | 2:A:657:U:H1'     | 1.99                     | 0.45              |
| 2:A:634:C:H2'    | 2:A:635:C:H6      | 1.79                     | 0.45              |
| 2:A:708:G:H2'    | 2:A:709:U:C6      | 2.52                     | 0.45              |
| 2:A:1153:C:H5''  | 17:R:62:ILE:HD13  | 1.98                     | 0.45              |
| 2:A:1213:A:H2'   | 2:A:1214:A:H8     | 1.82                     | 0.45              |
| 2:A:1491:G:H5'   | 4:C:98:ASP:OD2    | 2.17                     | 0.45              |
| 2:A:1495:A:C2    | 2:A:1578:U:H1'    | 2.50                     | 0.45              |
| 2:A:1831:G:H2'   | 2:A:1832:C:H6     | 1.82                     | 0.45              |
| 2:A:1862:G:O2'   | 2:A:1863:G:H5'    | 2.17                     | 0.45              |
| 2:A:2000:C:O2'   | 2:A:2001:C:H5'    | 2.17                     | 0.45              |
| 2:A:2513:A:H2'   | 2:A:2514:U:C6     | 2.52                     | 0.45              |
| 2:A:2783:U:H2'   | 2:A:2784:U:C6     | 2.52                     | 0.45              |
| 6:E:28:VAL:HG12  | 12:M:6:LEU:HD13   | 1.98                     | 0.45              |
| 6:E:140:ASP:OD1  | 6:E:141:MET:HG2   | 2.16                     | 0.45              |
| 7:F:50:LEU:HD23  | 7:F:50:LEU:HA     | 1.86                     | 0.45              |
| 12:M:109:LYS:HA  | 12:M:126:ARG:O    | 2.17                     | 0.45              |
| 24:Y:32:ASN:O    | 24:Y:52:SER:HA    | 2.16                     | 0.45              |
| 25:Z:2:LYS:CE    | 25:Z:6:LEU:HD11   | 2.44                     | 0.45              |
| 2:A:443:A:N7     | 6:E:40:ARG:HG2    | 2.32                     | 0.45              |
| 2:A:527:C:H41    | 2:A:2777:G:HO2'   | 1.62                     | 0.45              |
| 2:A:839:U:H2'    | 2:A:840:C:C6      | 2.52                     | 0.45              |
| 2:A:975:A:H5'    | 18:S:78:ARG:HH22  | 1.82                     | 0.45              |
| 2:A:1220:G:O2'   | 2:A:1221:C:H5'    | 2.16                     | 0.45              |
| 2:A:1309:G:H4'   | 29:d:7:PRO:HB2    | 1.98                     | 0.45              |
| 2:A:1844:C:O2'   | 2:A:1845:G:H5'    | 2.16                     | 0.45              |
| 2:A:2298:A:H2'   | 2:A:2299:U:O4'    | 2.16                     | 0.45              |
| 2:A:2365:G:O6    | 30:e:39:LYS:HE3   | 2.17                     | 0.45              |
| 2:A:2637:U:C2'   | 2:A:2638:G:H5'    | 2.47                     | 0.45              |
| 2:A:2690:U:O2'   | 2:A:2872:A:H1'    | 2.17                     | 0.45              |
| 2:A:2699:C:H2'   | 2:A:2700:A:H8     | 1.82                     | 0.45              |

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| Atom-1          | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|-----------------|------------------|--------------------------|-------------------|
| 5:D:15:PHE:HD2  | 16:Q:55:LEU:HD11 | 1.82                     | 0.45              |
| 7:F:73:SER:OG   | 7:F:80:ARG:HD3   | 2.16                     | 0.45              |
| 13:N:8:LYS:HD2  | 13:N:9:PHE:CE2   | 2.51                     | 0.45              |
| 24:Y:36:HIS:O   | 24:Y:48:THR:HA   | 2.17                     | 0.45              |
| 2:A:863:A:O2'   | 2:A:864:G:H5'    | 2.16                     | 0.44              |
| 2:A:981:A:OP2   | 2:A:982:C:N4     | 2.38                     | 0.44              |
| 2:A:1829:A:H3'  | 2:A:1830:C:C6    | 2.52                     | 0.44              |
| 2:A:1893:C:H2'  | 2:A:1894:C:H5'   | 1.98                     | 0.44              |
| 2:A:2346:A:H3'  | 2:A:2347:C:H5''  | 1.99                     | 0.44              |
| 3:B:51:G:O2'    | 3:B:52:A:H5'     | 2.16                     | 0.44              |
| 5:D:53:GLY:O    | 5:D:76:GLY:HA2   | 2.17                     | 0.44              |
| 6:E:176:ASP:OD1 | 6:E:179:SER:OG   | 2.27                     | 0.44              |
| 7:F:66:LEU:O    | 7:F:87:CYS:HA    | 2.17                     | 0.44              |
| 8:G:117:LEU:HB3 | 8:G:121:ILE:CG2  | 2.47                     | 0.44              |
| 10:K:12:LYS:O   | 10:K:41:LYS:NZ   | 2.51                     | 0.44              |
| 21:V:42:VAL:O   | 21:V:60:GLU:HA   | 2.16                     | 0.44              |
| 2:A:806:C:OP2   | 12:M:41:ARG:NH1  | 2.42                     | 0.44              |
| 2:A:1361:G:O2'  | 2:A:1362:C:H5'   | 2.18                     | 0.44              |
| 2:A:1601:G:H2'  | 2:A:1602:U:O4'   | 2.17                     | 0.44              |
| 2:A:2331:G:O2'  | 2:A:2336:A:N1    | 2.37                     | 0.44              |
| 4:C:31:ALA:HB3  | 4:C:32:PRO:HD3   | 2.00                     | 0.44              |
| 5:D:7:LYS:NZ    | 5:D:200:ASP:HB3  | 2.32                     | 0.44              |
| 24:Y:3:ARG:O    | 24:Y:12:PRO:HD3  | 2.17                     | 0.44              |
| 2:A:12:U:H2'    | 2:A:13:A:H5'     | 1.98                     | 0.44              |
| 2:A:153:U:H2'   | 2:A:154:U:C6     | 2.52                     | 0.44              |
| 2:A:397:U:O2'   | 2:A:398:C:H5'    | 2.18                     | 0.44              |
| 2:A:631:A:OP1   | 30:e:47:LYS:NZ   | 2.28                     | 0.44              |
| 2:A:664:G:O2'   | 2:A:940:G:OP1    | 2.22                     | 0.44              |
| 2:A:1006:C:O2'  | 2:A:1007:C:H5'   | 2.17                     | 0.44              |
| 2:A:1637:A:H5'  | 2:A:1760:C:O2'   | 2.17                     | 0.44              |
| 2:A:1853:A:H2'  | 2:A:1854:A:C8    | 2.52                     | 0.44              |
| 2:A:2281:A:C2'  | 2:A:2282:G:H5'   | 2.46                     | 0.44              |
| 2:A:2600:A:H2'  | 2:A:2601[A]:C:C6 | 2.52                     | 0.44              |
| 2:A:574:A:N6    | 2:A:2034:U:OP1   | 2.51                     | 0.44              |
| 2:A:651:G:OP1   | 30:e:19:LYS:HB2  | 2.18                     | 0.44              |
| 2:A:768:G:O2'   | 2:A:769:U:H5'    | 2.18                     | 0.44              |
| 2:A:1913:A:H4'  | 2:A:1914:C:OP2   | 2.17                     | 0.44              |
| 2:A:2634:A:O2'  | 2:A:2635:A:H5'   | 2.17                     | 0.44              |
| 4:C:246:THR:HB  | 4:C:247:PRO:HD2  | 2.00                     | 0.44              |
| 6:E:3:LEU:O     | 6:E:11:ALA:HA    | 2.17                     | 0.44              |
| 7:F:122:PHE:HA  | 7:F:127:ASN:O    | 2.17                     | 0.44              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 9:H:2:GLN:HB2    | 9:H:39:ALA:HB3   | 1.99                     | 0.44              |
| 9:H:9:VAL:HG13   | 9:H:12:LEU:HB2   | 1.99                     | 0.44              |
| 11:L:51:LYS:HZ3  | 11:L:96:GLY:HA2  | 1.81                     | 0.44              |
| 19:T:1:MET:HE3   | 19:T:62:ASP:CB   | 2.47                     | 0.44              |
| 21:V:96:PHE:O    | 21:V:100:SER:HA  | 2.17                     | 0.44              |
| 31:f:14:CYS:SG   | 31:f:27:CYS:HB2  | 2.57                     | 0.44              |
| 2:A:418:C:H2'    | 2:A:419:U:H6     | 1.83                     | 0.44              |
| 2:A:443:A:C6     | 6:E:40:ARG:HD2   | 2.52                     | 0.44              |
| 2:A:569:U:H2'    | 2:A:570:G:O4'    | 2.17                     | 0.44              |
| 2:A:727:A:H2'    | 2:A:728:G:O4'    | 2.17                     | 0.44              |
| 2:A:755:U:O2'    | 2:A:756:A:H5'    | 2.18                     | 0.44              |
| 2:A:896:A:H3'    | 2:A:897:C:H5'    | 1.99                     | 0.44              |
| 2:A:984:A:H2'    | 2:A:984:A:N3     | 2.33                     | 0.44              |
| 2:A:1057:A:N7    | 2:A:1086:A:H2'   | 2.33                     | 0.44              |
| 2:A:1118:C:H3'   | 2:A:1119:U:H5''  | 2.00                     | 0.44              |
| 2:A:1750:G:O2'   | 2:A:1751:U:H5'   | 2.17                     | 0.44              |
| 2:A:1824:G:O3'   | 4:C:247:PRO:HD3  | 2.17                     | 0.44              |
| 2:A:1890:A:C2    | 2:A:1891:G:H1'   | 2.52                     | 0.44              |
| 2:A:2028:U:H2'   | 2:A:2029:G:C8    | 2.53                     | 0.44              |
| 2:A:2394:C:H5''  | 12:M:63:LYS:HE2  | 1.98                     | 0.44              |
| 2:A:2514:U:H2'   | 2:A:2515:C:H6    | 1.82                     | 0.44              |
| 2:A:2790:U:H4'   | 2:A:2791:G:OP1   | 2.18                     | 0.44              |
| 3:B:119:A:H2'    | 3:B:120:U:O4'    | 2.17                     | 0.44              |
| 4:C:30:PHE:CE2   | 4:C:32:PRO:HG2   | 2.53                     | 0.44              |
| 4:C:141:VAL:HG23 | 4:C:162:VAL:CG2  | 2.48                     | 0.44              |
| 14:O:6:SER:HB3   | 14:O:46:ARG:HH22 | 1.82                     | 0.44              |
| 16:Q:6:LYS:O     | 16:Q:10:GLN:HG2  | 2.18                     | 0.44              |
| 25:Z:25:GLN:HB2  | 25:Z:46:VAL:HG11 | 1.99                     | 0.44              |
| 2:A:128:C:H2'    | 2:A:129:C:C6     | 2.53                     | 0.44              |
| 2:A:156:A:O2'    | 2:A:157:C:H5'    | 2.18                     | 0.44              |
| 2:A:188:G:H5'    | 24:Y:14:THR:CG2  | 2.47                     | 0.44              |
| 2:A:397:U:H5''   | 24:Y:32:ASN:HB2  | 1.99                     | 0.44              |
| 2:A:554:U:H2'    | 2:A:555:G:O4'    | 2.18                     | 0.44              |
| 2:A:620:G:H4'    | 2:A:621:A:O5'    | 2.18                     | 0.44              |
| 2:A:784:G:O2'    | 2:A:785:G:H5''   | 2.17                     | 0.44              |
| 2:A:810:U:C5     | 12:M:29:LYS:HG2  | 2.53                     | 0.44              |
| 2:A:1185:G:H5''  | 2:A:1186:G:OP1   | 2.17                     | 0.44              |
| 2:A:1288:G:OP2   | 2:A:1288:G:N2    | 2.23                     | 0.44              |
| 2:A:1604:C:H2'   | 2:A:1605:C:C6    | 2.53                     | 0.44              |
| 2:A:1627:G:O2'   | 2:A:1628:G:H5'   | 2.18                     | 0.44              |
| 2:A:1693:U:H4'   | 2:A:1694:C:OP2   | 2.18                     | 0.44              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 2:A:2007:U:O2'   | 2:A:2008:C:H5'    | 2.17                     | 0.44              |
| 2:A:2056:G:H4'   | 27:b:5:GLN:NE2    | 2.33                     | 0.44              |
| 2:A:2437:G:O2'   | 2:A:2438:U:H5'    | 2.18                     | 0.44              |
| 12:M:78:ARG:HG2  | 12:M:113:ALA:CB   | 2.46                     | 0.44              |
| 19:T:31:GLN:O    | 19:T:35:ILE:HG13  | 2.17                     | 0.44              |
| 22:W:30:ILE:HD11 | 22:W:40:ILE:CD1   | 2.47                     | 0.44              |
| 29:d:34:ARG:NH1  | 29:d:41:ARG:O     | 2.51                     | 0.44              |
| 2:A:1:G:H2'      | 2:A:2:G:H8        | 1.82                     | 0.44              |
| 2:A:475:C:O2     | 2:A:479:A:N6      | 2.51                     | 0.44              |
| 2:A:1003:G:O2'   | 2:A:1010:A:N1     | 2.44                     | 0.44              |
| 2:A:1164:C:H2'   | 2:A:1165:A:C8     | 2.52                     | 0.44              |
| 2:A:1275:A:H4'   | 2:A:1276:A:O5'    | 2.18                     | 0.44              |
| 2:A:1301:A:H4'   | 2:A:1302:A:OP1    | 2.18                     | 0.44              |
| 2:A:1432:G:H2'   | 2:A:1433:A:H8     | 1.82                     | 0.44              |
| 2:A:1824:G:O2'   | 2:A:1825:U:H5'    | 2.18                     | 0.44              |
| 2:A:2586:U:OP2   | 2:A:2608:G:N2     | 2.44                     | 0.44              |
| 2:A:2670:A:O2'   | 2:A:2671:G:H5'    | 2.17                     | 0.44              |
| 2:A:2710:C:H2'   | 2:A:2711:A:C8     | 2.53                     | 0.44              |
| 3:B:4:C:O2'      | 3:B:5:U:H5'       | 2.18                     | 0.44              |
| 3:B:33:G:O2'     | 3:B:34:A:H5'      | 2.18                     | 0.44              |
| 3:B:78:A:H2'     | 3:B:79:G:O4'      | 2.17                     | 0.44              |
| 4:C:161:TYR:CB   | 4:C:194:GLU:HG2   | 2.47                     | 0.44              |
| 10:K:101:ILE:O   | 10:K:105:VAL:HG23 | 2.18                     | 0.44              |
| 21:V:24:LYS:HB3  | 21:V:37:GLU:OE1   | 2.18                     | 0.44              |
| 28:c:5:ILE:HB    | 28:c:28:ARG:NH2   | 2.33                     | 0.44              |
| 2:A:103:A:H2'    | 2:A:104:A:O4'     | 2.18                     | 0.44              |
| 2:A:250:G:H2'    | 2:A:251:A:C8      | 2.52                     | 0.44              |
| 2:A:422:A:H2'    | 2:A:423:A:O4'     | 2.18                     | 0.44              |
| 2:A:532:A:N7     | 2:A:2021:C:O2'    | 2.44                     | 0.44              |
| 2:A:706:A:N6     | 2:A:725:G:H1'     | 2.32                     | 0.44              |
| 2:A:717:C:H2'    | 2:A:718:A:H5'     | 2.00                     | 0.44              |
| 2:A:740:C:O2'    | 2:A:741:U:H5'     | 2.18                     | 0.44              |
| 2:A:804:A:H2'    | 2:A:806:C:C4      | 2.53                     | 0.44              |
| 2:A:849:A:H2'    | 2:A:850:U:C6      | 2.52                     | 0.44              |
| 2:A:2028:U:H2'   | 2:A:2029:G:O4'    | 2.18                     | 0.44              |
| 2:A:2399:G:O2'   | 2:A:2400:G:H5'    | 2.18                     | 0.44              |
| 2:A:2515:C:H2'   | 2:A:2516:A:H8     | 1.82                     | 0.44              |
| 2:A:2605:U:H2'   | 2:A:2606:C:C6     | 2.53                     | 0.44              |
| 3:B:27:C:OP1     | 15:P:34:HIS:NE2   | 2.42                     | 0.44              |
| 4:C:79:GLU:HB2   | 4:C:93:LEU:O      | 2.18                     | 0.44              |
| 7:F:34:ILE:O     | 7:F:91:LEU:HB2    | 2.18                     | 0.44              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 7:F:135:GLN:OE1  | 7:F:135:GLN:N    | 2.49                     | 0.44              |
| 12:M:51:GLU:CG   | 12:M:56:PRO:HA   | 2.48                     | 0.44              |
| 14:O:32:GLU:O    | 14:O:114:GLU:HB2 | 2.17                     | 0.44              |
| 24:Y:16:ASN:HA   | 24:Y:25:THR:O    | 2.17                     | 0.44              |
| 26:a:27:LEU:CD2  | 26:a:47:MET:HE3  | 2.48                     | 0.44              |
| 2:A:729:G:OP2    | 4:C:13:ARG:HD3   | 2.17                     | 0.44              |
| 2:A:780:G:H2'    | 2:A:782:A:N7     | 2.33                     | 0.44              |
| 2:A:1029:A:H2'   | 2:A:1030:C:O4'   | 2.18                     | 0.44              |
| 2:A:1270:C:H5''  | 2:A:1271:G:O5'   | 2.18                     | 0.44              |
| 2:A:1474:U:C2'   | 2:A:1475:G:H5'   | 2.48                     | 0.44              |
| 2:A:1772:A:H2'   | 2:A:1773:A:O3'   | 2.17                     | 0.44              |
| 2:A:2193:G:H2'   | 2:A:2194:U:H6    | 1.83                     | 0.44              |
| 4:C:161:TYR:CG   | 4:C:194:GLU:HG2  | 2.53                     | 0.44              |
| 4:C:164:ILE:HG23 | 4:C:172:VAL:CG1  | 2.48                     | 0.44              |
| 4:C:175:ARG:HG3  | 4:C:181:MET:SD   | 2.58                     | 0.44              |
| 13:N:53:MET:HE3  | 13:N:117:PHE:CE1 | 2.51                     | 0.44              |
| 23:X:34:GLY:N    | 23:X:61:ALA:O    | 2.40                     | 0.44              |
| 2:A:30:G:H2'     | 2:A:31:C:H6      | 1.83                     | 0.43              |
| 2:A:184:C:H2'    | 2:A:185:G:H8     | 1.83                     | 0.43              |
| 2:A:393:C:O2'    | 2:A:394:C:H5'    | 2.17                     | 0.43              |
| 2:A:435:C:C2'    | 2:A:436:C:H5'    | 2.47                     | 0.43              |
| 2:A:438:G:H2'    | 2:A:439:A:C8     | 2.53                     | 0.43              |
| 2:A:536:G:H2'    | 2:A:537:G:O4'    | 2.18                     | 0.43              |
| 2:A:553:G:H2'    | 2:A:554:U:H6     | 1.83                     | 0.43              |
| 2:A:636:G:OP1    | 12:M:129:LYS:NZ  | 2.40                     | 0.43              |
| 2:A:673:C:O2'    | 2:A:674:G:H5'    | 2.18                     | 0.43              |
| 2:A:1100:C:H2'   | 2:A:1101:U:O4'   | 2.18                     | 0.43              |
| 2:A:1431:A:H2'   | 2:A:1432:G:H8    | 1.83                     | 0.43              |
| 2:A:2345:G:N3    | 2:A:2381:A:H2'   | 2.33                     | 0.43              |
| 7:F:111:ILE:HD12 | 7:F:114:PHE:CE1  | 2.52                     | 0.43              |
| 10:K:19:ASP:OD1  | 10:K:21:THR:HG22 | 2.18                     | 0.43              |
| 15:P:33:ARG:HG2  | 15:P:34:HIS:CD2  | 2.53                     | 0.43              |
| 22:W:77:VAL:HG23 | 22:W:89:ILE:HG12 | 2.00                     | 0.43              |
| 26:a:27:LEU:HD23 | 26:a:47:MET:HE3  | 2.00                     | 0.43              |
| 28:c:14:SER:OG   | 28:c:48:ILE:HG23 | 2.17                     | 0.43              |
| 2:A:4:U:H2'      | 2:A:5:A:H8       | 1.83                     | 0.43              |
| 2:A:103:A:C2     | 2:A:104:A:H1'    | 2.54                     | 0.43              |
| 2:A:370:G:O2'    | 2:A:423:A:H3'    | 2.18                     | 0.43              |
| 2:A:1323:C:O2'   | 2:A:1324:G:H5'   | 2.18                     | 0.43              |
| 2:A:1363:C:O2'   | 2:A:1809:A:H1'   | 2.18                     | 0.43              |
| 2:A:1389:G:O2'   | 2:A:1390:U:H5'   | 2.18                     | 0.43              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 2:A:1591:A:O2'   | 2:A:1592:C:H5'    | 2.18                     | 0.43              |
| 2:A:1682:G:H2'   | 2:A:1683:U:H6     | 1.80                     | 0.43              |
| 2:A:1838:C:H4'   | 2:A:1839:G:C8     | 2.53                     | 0.43              |
| 2:A:1973:G:H2'   | 2:A:1974:C:C6     | 2.52                     | 0.43              |
| 2:A:2019:A:H4'   | 17:R:34:VAL:HG21  | 1.99                     | 0.43              |
| 5:D:7:LYS:HE3    | 5:D:77:ARG:CZ     | 2.49                     | 0.43              |
| 7:F:117:LEU:CD1  | 7:F:130:MET:HG3   | 2.47                     | 0.43              |
| 11:L:105:ARG:NH2 | 16:Q:32:VAL:HB    | 2.33                     | 0.43              |
| 12:M:75:ALA:O    | 12:M:108:ALA:HA   | 2.17                     | 0.43              |
| 13:N:34:LYS:HE2  | 13:N:99:GLY:O     | 2.19                     | 0.43              |
| 13:N:42:THR:O    | 13:N:46:ILE:HG13  | 2.19                     | 0.43              |
| 15:P:27:VAL:CG2  | 15:P:40:ILE:HD13  | 2.48                     | 0.43              |
| 17:R:66:ASN:O    | 17:R:70:ARG:HG3   | 2.18                     | 0.43              |
| 25:Z:3:ALA:O     | 25:Z:7:ARG:NH1    | 2.51                     | 0.43              |
| 30:e:23:LYS:HA   | 30:e:48:ALA:O     | 2.18                     | 0.43              |
| 2:A:27:G:N2      | 2:A:512:G:H1'     | 2.33                     | 0.43              |
| 2:A:419:U:H2'    | 2:A:420:C:H6      | 1.82                     | 0.43              |
| 2:A:1130:U:C2    | 2:A:2025:C:H5''   | 2.54                     | 0.43              |
| 2:A:1495:A:N3    | 2:A:1578:U:O2'    | 2.38                     | 0.43              |
| 2:A:1651:G:H5'   | 14:O:39:PRO:HG2   | 2.00                     | 0.43              |
| 2:A:1652:A:O2'   | 2:A:1653:G:H5'    | 2.18                     | 0.43              |
| 2:A:1757:A:O3'   | 2:A:1758:U:H4'    | 2.17                     | 0.43              |
| 2:A:1791:A:H4'   | 4:C:205:LEU:HB2   | 2.01                     | 0.43              |
| 2:A:1796:U:H2'   | 2:A:1797:G:H8     | 1.82                     | 0.43              |
| 2:A:2087:G:H2'   | 2:A:2088:A:H8     | 1.83                     | 0.43              |
| 3:B:54:G:O2'     | 3:B:55:U:H5'      | 2.18                     | 0.43              |
| 5:D:7:LYS:HZ1    | 5:D:200:ASP:HB3   | 1.82                     | 0.43              |
| 7:F:25:VAL:O     | 7:F:28:VAL:HG22   | 2.18                     | 0.43              |
| 10:K:78:THR:HG21 | 10:K:85:LYS:NZ    | 2.34                     | 0.43              |
| 10:K:98:GLU:O    | 10:K:102:GLU:HG3  | 2.17                     | 0.43              |
| 15:P:53:THR:O    | 15:P:59:ALA:HB2   | 2.17                     | 0.43              |
| 17:R:102:ASP:OD1 | 17:R:104:VAL:HG22 | 2.18                     | 0.43              |
| 2:A:337:C:H2'    | 2:A:338:G:O4'     | 2.19                     | 0.43              |
| 2:A:364:C:H2'    | 2:A:365:U:H6      | 1.84                     | 0.43              |
| 2:A:440:C:O2'    | 2:A:441:U:H5'     | 2.19                     | 0.43              |
| 2:A:1432:G:O2'   | 2:A:1433:A:H5'    | 2.19                     | 0.43              |
| 2:A:1530:G:O2'   | 2:A:1531:C:H5'    | 2.19                     | 0.43              |
| 2:A:1681:G:P     | 2:A:1757:A:H61    | 2.41                     | 0.43              |
| 2:A:1897:G:H2'   | 2:A:1898:U:H6     | 1.83                     | 0.43              |
| 2:A:1955:U:H2'   | 2:A:2551:C:O2'    | 2.18                     | 0.43              |
| 2:A:2359:C:O2'   | 2:A:2360:G:H5'    | 2.17                     | 0.43              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:A:2547:A:H4'   | 11:L:29:HIS:CD2  | 2.53                     | 0.43              |
| 3:B:51:G:H2'     | 3:B:52:A:C8      | 2.53                     | 0.43              |
| 8:G:54:PRO:HB3   | 8:G:61:GLY:HA3   | 2.00                     | 0.43              |
| 17:R:35:ALA:O    | 17:R:39:VAL:HG23 | 2.18                     | 0.43              |
| 17:R:47:TYR:HD2  | 17:R:50:ARG:HH21 | 1.67                     | 0.43              |
| 26:a:5:ILE:O     | 26:a:37:GLU:HA   | 2.18                     | 0.43              |
| 2:A:576:U:H2'    | 2:A:577:G:H8     | 1.80                     | 0.43              |
| 2:A:1038:G:O2'   | 2:A:1039:A:H5'   | 2.18                     | 0.43              |
| 2:A:1410:G:H2'   | 2:A:1411:U:C6    | 2.54                     | 0.43              |
| 3:B:106:G:H2'    | 3:B:107:G:C8     | 2.54                     | 0.43              |
| 5:D:8:LYS:HB2    | 5:D:201:LEU:HD11 | 2.00                     | 0.43              |
| 5:D:16:THR:O     | 16:Q:79:PRO:HG3  | 2.19                     | 0.43              |
| 6:E:102:ARG:O    | 6:E:106:LYS:HG3  | 2.18                     | 0.43              |
| 10:K:49:ASP:OD1  | 10:K:121:LYS:NZ  | 2.50                     | 0.43              |
| 15:P:75:GLY:HA2  | 15:P:78:VAL:HG12 | 2.00                     | 0.43              |
| 19:T:24:ILE:HB   | 19:T:32:ALA:HB1  | 1.98                     | 0.43              |
| 20:U:53:VAL:CG1  | 20:U:91:GLN:HB3  | 2.49                     | 0.43              |
| 22:W:23:ALA:O    | 22:W:25:LYS:HG3  | 2.18                     | 0.43              |
| 22:W:63:ILE:HG22 | 22:W:65:VAL:HG23 | 1.99                     | 0.43              |
| 25:Z:2:LYS:NZ    | 25:Z:49:ASP:OD1  | 2.23                     | 0.43              |
| 2:A:49:A:O5'     | 2:A:51:G:H5'     | 2.18                     | 0.43              |
| 2:A:202:U:H2'    | 2:A:203:A:O4'    | 2.18                     | 0.43              |
| 2:A:251:A:H2'    | 2:A:252:G:O4'    | 2.19                     | 0.43              |
| 2:A:500:G:N1     | 2:A:503:A:OP2    | 2.48                     | 0.43              |
| 2:A:693:A:O2'    | 2:A:694:U:H5'    | 2.18                     | 0.43              |
| 2:A:745:G:H2'    | 2:A:746:U:H5'    | 2.00                     | 0.43              |
| 2:A:786:C:O2'    | 2:A:787:C:H5'    | 2.17                     | 0.43              |
| 2:A:825:A:H2'    | 2:A:826:U:H6     | 1.82                     | 0.43              |
| 2:A:1412:U:H2'   | 2:A:1413:A:C8    | 2.53                     | 0.43              |
| 2:A:1427:A:H4'   | 2:A:1428:C:O5'   | 2.18                     | 0.43              |
| 2:A:1694:C:OP1   | 4:C:8:PRO:HG3    | 2.18                     | 0.43              |
| 2:A:1757:A:HO2'  | 2:A:1758:U:P     | 2.39                     | 0.43              |
| 2:A:1771:C:H2'   | 2:A:1772:A:C8    | 2.53                     | 0.43              |
| 2:A:1911:U:H2'   | 2:A:1918:A:C2    | 2.54                     | 0.43              |
| 2:A:2030:A:C2    | 2:A:2499:C:H5''  | 2.54                     | 0.43              |
| 2:A:2355:G:O2'   | 2:A:2356:U:H5'   | 2.17                     | 0.43              |
| 2:A:2592:G:H2'   | 2:A:2593:U:H6    | 1.83                     | 0.43              |
| 2:A:2626:C:O2'   | 2:A:2627:G:H5'   | 2.19                     | 0.43              |
| 9:H:1:MET:HE3    | 9:H:23:ALA:CA    | 2.49                     | 0.43              |
| 11:L:105:ARG:HG2 | 11:L:123:LEU:C   | 2.44                     | 0.43              |
| 13:N:62:LYS:HD3  | 13:N:64:TRP:CZ2  | 2.54                     | 0.43              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 14:O:25:ALA:O    | 14:O:29:VAL:HG23 | 2.19                     | 0.43              |
| 17:R:17:ILE:HG13 | 17:R:32:TYR:HE1  | 1.84                     | 0.43              |
| 17:R:69:ALA:HB1  | 17:R:74:ILE:HG23 | 2.00                     | 0.43              |
| 26:a:7:ILE:HD11  | 26:a:48:ILE:HD11 | 2.00                     | 0.43              |
| 2:A:64:A:H2'     | 2:A:65:U:H6      | 1.81                     | 0.43              |
| 2:A:237:C:O2'    | 2:A:238:C:H5'    | 2.17                     | 0.43              |
| 2:A:303:G:H2'    | 2:A:304:U:C6     | 2.54                     | 0.43              |
| 2:A:594:U:H2'    | 2:A:595:C:C6     | 2.54                     | 0.43              |
| 2:A:624:C:O2'    | 2:A:657:U:H5''   | 2.19                     | 0.43              |
| 2:A:638:G:H2'    | 2:A:639:U:H6     | 1.84                     | 0.43              |
| 2:A:645:C:O2'    | 2:A:646:U:H5''   | 2.18                     | 0.43              |
| 2:A:1014:A:O2'   | 2:A:1015:U:H5'   | 2.17                     | 0.43              |
| 2:A:1264:A:O5'   | 2:A:1265:A:H2'   | 2.19                     | 0.43              |
| 4:C:107:PRO:HG2  | 4:C:110:LEU:CG   | 2.48                     | 0.43              |
| 7:F:4:LEU:HD12   | 7:F:100:PHE:HB3  | 2.00                     | 0.43              |
| 7:F:100:PHE:O    | 7:F:104:ILE:HG23 | 2.18                     | 0.43              |
| 7:F:130:MET:O    | 7:F:154:ILE:N    | 2.41                     | 0.43              |
| 11:L:22:ILE:HG12 | 11:L:40:LYS:O    | 2.19                     | 0.43              |
| 12:M:63:LYS:HG2  | 30:e:13:ARG:HD2  | 1.99                     | 0.43              |
| 13:N:33:LEU:HD13 | 13:N:117:PHE:HB3 | 2.00                     | 0.43              |
| 22:W:51:GLN:HG2  | 22:W:86:LEU:HD11 | 1.99                     | 0.43              |
| 2:A:172:A:H2'    | 2:A:173:A:H8     | 1.84                     | 0.43              |
| 2:A:175:G:O2'    | 2:A:176:A:H5'    | 2.18                     | 0.43              |
| 2:A:217:A:H2'    | 2:A:218:A:O4'    | 2.18                     | 0.43              |
| 2:A:264:C:O2'    | 2:A:265:A:H2'    | 2.18                     | 0.43              |
| 2:A:659:G:O2'    | 6:E:95:LYS:O     | 2.31                     | 0.43              |
| 2:A:671:C:O2'    | 2:A:672:C:H5'    | 2.19                     | 0.43              |
| 2:A:673:C:OP1    | 6:E:49:ARG:NH2   | 2.48                     | 0.43              |
| 2:A:775:G:H5'    | 2:A:777:G:C1'    | 2.45                     | 0.43              |
| 2:A:1006:C:O2'   | 10:K:108:MET:O   | 2.32                     | 0.43              |
| 2:A:1148:U:O2'   | 2:A:1149:G:H5'   | 2.18                     | 0.43              |
| 2:A:1446:C:O2'   | 2:A:1447:C:H5'   | 2.18                     | 0.43              |
| 2:A:1456:G:O2'   | 2:A:1457:U:H5'   | 2.19                     | 0.43              |
| 2:A:1502:A:H2'   | 2:A:1503:A:C8    | 2.54                     | 0.43              |
| 2:A:1683:U:H2'   | 2:A:1684:G:C8    | 2.53                     | 0.43              |
| 2:A:1827:U:O2'   | 2:A:1828:G:H5'   | 2.18                     | 0.43              |
| 2:A:1882:U:O2'   | 2:A:1883:U:H5'   | 2.19                     | 0.43              |
| 2:A:2321:U:H3'   | 2:A:2322:A:H5''  | 2.01                     | 0.43              |
| 2:A:2585:U:H4'   | 2:A:2586:U:C5'   | 2.49                     | 0.43              |
| 2:A:2615:U:C2    | 27:b:4:GLN:HA    | 2.53                     | 0.43              |
| 2:A:2689:U:H4'   | 2:A:2690:U:OP2   | 2.19                     | 0.43              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:A:2725:A:O2'   | 2:A:2726:A:H2'   | 2.19                     | 0.43              |
| 9:H:2:GLN:HB2    | 9:H:39:ALA:CB    | 2.49                     | 0.43              |
| 11:L:77:ILE:HD11 | 16:Q:72:ARG:CZ   | 2.48                     | 0.43              |
| 16:Q:33:VAL:CG2  | 16:Q:38:LYS:HG2  | 2.49                     | 0.43              |
| 17:R:98:ILE:HG23 | 17:R:105:ALA:HB3 | 2.00                     | 0.43              |
| 24:Y:5:CYS:HB2   | 24:Y:33:LEU:HD21 | 2.00                     | 0.43              |
| 26:a:6:LYS:HG2   | 26:a:37:GLU:CG   | 2.38                     | 0.43              |
| 2:A:475:C:H4'    | 2:A:510:C:H5'    | 2.01                     | 0.43              |
| 2:A:528:A:H5''   | 10:K:113:PRO:HG3 | 2.01                     | 0.43              |
| 2:A:558:U:OP1    | 10:K:113:PRO:HD2 | 2.19                     | 0.43              |
| 2:A:656:G:O2'    | 2:A:657:U:H5'    | 2.18                     | 0.43              |
| 2:A:1130:U:N3    | 2:A:2025:C:OP1   | 2.42                     | 0.43              |
| 2:A:1953:A:O2'   | 2:A:2559:C:O2    | 2.35                     | 0.43              |
| 2:A:1975:G:H2'   | 2:A:1976:U:O4'   | 2.19                     | 0.43              |
| 2:A:2491:U:H5'   | 2:A:2570:G:C5'   | 2.48                     | 0.43              |
| 2:A:2721:A:H2'   | 2:A:2722:G:O4'   | 2.19                     | 0.43              |
| 3:B:111:U:H2'    | 3:B:112:G:H8     | 1.84                     | 0.43              |
| 7:F:106:ILE:HG21 | 7:F:139:PRO:HG2  | 2.00                     | 0.43              |
| 7:F:129:SER:HA   | 7:F:155:THR:HA   | 2.01                     | 0.43              |
| 10:K:37:ARG:HG3  | 10:K:118:MET:SD  | 2.59                     | 0.43              |
| 10:K:97:PRO:HG2  | 10:K:126:ALA:HB2 | 2.00                     | 0.43              |
| 13:N:47:GLU:O    | 13:N:51:ARG:HG3  | 2.18                     | 0.43              |
| 14:O:59:SER:OG   | 14:O:62:ASN:HB2  | 2.19                     | 0.43              |
| 22:W:26:PHE:HZ   | 22:W:47:VAL:HG11 | 1.84                     | 0.43              |
| 2:A:473:G:C2'    | 2:A:474:G:H5'    | 2.49                     | 0.43              |
| 2:A:506:G:H5''   | 2:A:509:C:H1'    | 2.01                     | 0.43              |
| 2:A:541:A:O2'    | 2:A:542:C:H5'    | 2.19                     | 0.43              |
| 2:A:594:U:H2'    | 2:A:595:C:H6     | 1.83                     | 0.43              |
| 2:A:738:G:O2'    | 2:A:739:A:H5'    | 2.19                     | 0.43              |
| 2:A:929:U:O2'    | 2:A:930:G:H5'    | 2.19                     | 0.43              |
| 2:A:1046:A:H3'   | 2:A:1047:G:H5'   | 2.00                     | 0.43              |
| 2:A:1446:C:H2'   | 2:A:1447:C:H6    | 1.84                     | 0.43              |
| 2:A:2766:A:N3    | 2:A:2766:A:H2'   | 2.33                     | 0.43              |
| 2:A:2814:A:H2'   | 2:A:2815:C:H6    | 1.83                     | 0.43              |
| 2:A:2855:C:H2'   | 2:A:2856:A:H8    | 1.84                     | 0.43              |
| 4:C:174:LEU:O    | 4:C:181:MET:HA   | 2.19                     | 0.43              |
| 6:E:129:PRO:HB3  | 6:E:156:ASN:HA   | 2.00                     | 0.43              |
| 7:F:57:LEU:HD12  | 7:F:87:CYS:SG    | 2.58                     | 0.43              |
| 12:M:71:ALA:HA   | 12:M:74:THR:HG22 | 2.01                     | 0.43              |
| 22:W:4:ILE:CG1   | 22:W:50:MET:HE1  | 2.49                     | 0.43              |
| 25:Z:32:ALA:HB2  | 25:Z:37:LEU:HD23 | 2.01                     | 0.43              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:A:171:U:O2'    | 2:A:172:A:H5'    | 2.19                     | 0.42              |
| 2:A:533:G:H2'    | 2:A:534:U:C6     | 2.53                     | 0.42              |
| 2:A:1450:G:O2'   | 2:A:1451:C:H5'   | 2.19                     | 0.42              |
| 2:A:1722:A:N6    | 2:A:1738:G:H1'   | 2.33                     | 0.42              |
| 2:A:2305:U:O2    | 7:F:151:GLY:HA3  | 2.19                     | 0.42              |
| 4:C:110:LEU:HD21 | 4:C:126:PRO:O    | 2.19                     | 0.42              |
| 6:E:5:LEU:HD22   | 6:E:10:SER:OG    | 2.19                     | 0.42              |
| 16:Q:21:ARG:HD3  | 16:Q:113:ARG:CZ  | 2.49                     | 0.42              |
| 22:W:2:PHE:CB    | 22:W:61:LEU:HD22 | 2.48                     | 0.42              |
| 24:Y:13:VAL:HG23 | 24:Y:29:PHE:HB2  | 2.01                     | 0.42              |
| 2:A:78:U:O2'     | 2:A:79:C:H5'     | 2.19                     | 0.42              |
| 2:A:429:A:H2'    | 2:A:430:A:C8     | 2.55                     | 0.42              |
| 2:A:631:A:OP2    | 30:e:23:LYS:NZ   | 2.38                     | 0.42              |
| 2:A:675:A:N3     | 2:A:2443:C:O2'   | 2.45                     | 0.42              |
| 2:A:878:A:H5'    | 2:A:879:G:OP2    | 2.18                     | 0.42              |
| 2:A:1323:C:C2'   | 2:A:1324:G:H5'   | 2.49                     | 0.42              |
| 2:A:1482:G:H2'   | 2:A:1483:G:C8    | 2.54                     | 0.42              |
| 2:A:1515:A:H1'   | 2:A:1557:C:H1'   | 2.01                     | 0.42              |
| 2:A:1759:A:O2'   | 2:A:2714:G:H1'   | 2.19                     | 0.42              |
| 2:A:1856:U:O2'   | 2:A:1857:G:H5'   | 2.19                     | 0.42              |
| 2:A:2572:A:H2'   | 5:D:149:ASN:ND2  | 2.34                     | 0.42              |
| 2:A:2590:A:H2'   | 2:A:2591:C:H6    | 1.84                     | 0.42              |
| 2:A:2816:G:H1'   | 2:A:2883:A:O2'   | 2.18                     | 0.42              |
| 2:A:2839:G:O2'   | 14:O:92:GLY:HA2  | 2.19                     | 0.42              |
| 4:C:10:SER:HB2   | 4:C:11:PRO:HD2   | 2.01                     | 0.42              |
| 4:C:93:LEU:HD13  | 4:C:103:TYR:CE1  | 2.53                     | 0.42              |
| 5:D:186:LEU:HD21 | 16:Q:4:ILE:HG23  | 2.01                     | 0.42              |
| 8:G:9:VAL:C      | 8:G:49:THR:HG23  | 2.44                     | 0.42              |
| 9:H:4:ILE:HG13   | 9:H:18:GLN:HB3   | 2.01                     | 0.42              |
| 13:N:82:MET:HE2  | 13:N:82:MET:HA   | 2.01                     | 0.42              |
| 17:R:109:LEU:CD2 | 18:S:49:ILE:HD13 | 2.48                     | 0.42              |
| 18:S:31:GLU:O    | 18:S:62:GLU:HG3  | 2.20                     | 0.42              |
| 2:A:151:C:H2'    | 2:A:152:A:H8     | 1.85                     | 0.42              |
| 2:A:153:U:H2'    | 2:A:154:U:H6     | 1.84                     | 0.42              |
| 2:A:210:C:O2'    | 2:A:211:C:H5'    | 2.19                     | 0.42              |
| 2:A:1021:A:H3'   | 2:A:1021:A:N3    | 2.34                     | 0.42              |
| 2:A:1456:G:H2'   | 2:A:1457:U:C6    | 2.54                     | 0.42              |
| 2:A:1642:G:O2'   | 2:A:1643:G:H5'   | 2.19                     | 0.42              |
| 2:A:1681:G:N2    | 2:A:1763:G:OP2   | 2.39                     | 0.42              |
| 2:A:1736:U:H2'   | 2:A:1737:G:O4'   | 2.19                     | 0.42              |
| 2:A:2027:G:O2'   | 2:A:2028:U:H5'   | 2.20                     | 0.42              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:A:2898:U:O2'   | 10:K:134:ALA:O   | 2.26                     | 0.42              |
| 20:U:93:LEU:HD23 | 20:U:95:PHE:CE2  | 2.54                     | 0.42              |
| 2:A:31:C:O2'     | 2:A:32:C:H5'     | 2.20                     | 0.42              |
| 2:A:37:C:O2'     | 2:A:38:A:H5'     | 2.20                     | 0.42              |
| 2:A:396:G:C1'    | 24:Y:29:PHE:HB3  | 2.48                     | 0.42              |
| 2:A:997:G:O2'    | 2:A:998:C:H5'    | 2.20                     | 0.42              |
| 2:A:1187:G:N2    | 2:A:1188:U:O4    | 2.52                     | 0.42              |
| 2:A:1212:G:H1'   | 2:A:1237:A:H61   | 1.84                     | 0.42              |
| 2:A:1383:A:O2'   | 2:A:1384:A:O4'   | 2.22                     | 0.42              |
| 2:A:1637:A:O2'   | 2:A:1638:C:H5'   | 2.20                     | 0.42              |
| 2:A:1910:G:O2'   | 2:A:1911:U:H5'   | 2.20                     | 0.42              |
| 2:A:1979:U:O2'   | 2:A:1980:G:H5'   | 2.19                     | 0.42              |
| 2:A:2693:G:O2'   | 2:A:2694:G:H5'   | 2.20                     | 0.42              |
| 3:B:14:U:O3'     | 3:B:107:G:O2'    | 2.37                     | 0.42              |
| 6:E:28:VAL:O     | 6:E:32:VAL:HG13  | 2.19                     | 0.42              |
| 7:F:98:GLU:O     | 7:F:101:GLU:HG2  | 2.19                     | 0.42              |
| 7:F:152:LEU:HD23 | 7:F:154:ILE:HD11 | 2.02                     | 0.42              |
| 10:K:15:TRP:O    | 10:K:137:PRO:HA  | 2.19                     | 0.42              |
| 19:T:86:MET:HE2  | 19:T:86:MET:HB3  | 1.90                     | 0.42              |
| 23:X:65:GLY:HA3  | 23:X:82:ILE:HG23 | 2.02                     | 0.42              |
| 2:A:98:G:H1'     | 2:A:103:A:H1'    | 2.00                     | 0.42              |
| 2:A:181:A:H2'    | 2:A:182:A:C8     | 2.55                     | 0.42              |
| 2:A:257:C:O2     | 12:M:104:GLN:NE2 | 2.53                     | 0.42              |
| 2:A:273:G:O2'    | 2:A:274:C:H5'    | 2.19                     | 0.42              |
| 2:A:321:U:OP2    | 6:E:130:LYS:HA   | 2.19                     | 0.42              |
| 2:A:851:C:O4'    | 26:a:47:MET:HG2  | 2.20                     | 0.42              |
| 2:A:898:C:H2'    | 2:A:899:A:O4'    | 2.20                     | 0.42              |
| 2:A:966:G:H2'    | 2:A:967:U:C6     | 2.55                     | 0.42              |
| 2:A:1019:U:O2'   | 2:A:1021:A:N7    | 2.40                     | 0.42              |
| 2:A:1222:U:H2'   | 2:A:1223:G:C8    | 2.54                     | 0.42              |
| 2:A:1545:A:H2'   | 2:A:1546:G:O4'   | 2.20                     | 0.42              |
| 2:A:1951:U:H2'   | 2:A:1953:A:OP2   | 2.19                     | 0.42              |
| 2:A:2039:U:H2'   | 2:A:2040:G:C8    | 2.54                     | 0.42              |
| 2:A:2081:U:H2'   | 2:A:2082:A:C8    | 2.54                     | 0.42              |
| 2:A:2759:G:H1'   | 8:G:35:ARG:HH21  | 1.85                     | 0.42              |
| 3:B:23:G:H5''    | 3:B:24:G:OP1     | 2.20                     | 0.42              |
| 5:D:56:LYS:HD2   | 5:D:59:ARG:HG3   | 2.00                     | 0.42              |
| 7:F:4:LEU:HD23   | 7:F:4:LEU:HA     | 1.90                     | 0.42              |
| 11:L:2:ILE:HG21  | 11:L:8:LEU:HD11  | 2.01                     | 0.42              |
| 11:L:51:LYS:NZ   | 11:L:96:GLY:HA2  | 2.35                     | 0.42              |
| 12:M:19:LEU:CD2  | 12:M:27:LEU:HD13 | 2.48                     | 0.42              |

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| Atom-1            | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|------------------|--------------------------|-------------------|
| 12:M:122:VAL:HG12 | 12:M:125:LEU:HB2 | 2.02                     | 0.42              |
| 17:R:41:LYS:HG3   | 17:R:45:TYR:CE2  | 2.54                     | 0.42              |
| 18:S:34:GLU:OE2   | 18:S:60:LYS:NZ   | 2.53                     | 0.42              |
| 23:X:26:PHE:O     | 23:X:67:VAL:HB   | 2.19                     | 0.42              |
| 2:A:91:A:H4'      | 2:A:92:U:O4'     | 2.20                     | 0.42              |
| 2:A:282:A:O2'     | 2:A:283:G:H5'    | 2.20                     | 0.42              |
| 2:A:299:A:H2'     | 2:A:300:A:C8     | 2.54                     | 0.42              |
| 2:A:468:G:H2'     | 2:A:469:G:O4'    | 2.19                     | 0.42              |
| 2:A:543:G:H2'     | 2:A:544:C:C6     | 2.55                     | 0.42              |
| 2:A:988:A:P       | 26:a:12:SER:HB3  | 2.60                     | 0.42              |
| 2:A:1437:C:H2'    | 2:A:1438:U:C6    | 2.55                     | 0.42              |
| 2:A:1561:C:H2'    | 2:A:1562:U:C6    | 2.55                     | 0.42              |
| 2:A:1799:G:OP1    | 4:C:258:ARG:HD2  | 2.18                     | 0.42              |
| 2:A:1883:U:C2'    | 2:A:1884:G:H5'   | 2.50                     | 0.42              |
| 2:A:1998:A:H2'    | 2:A:1999:C:C6    | 2.54                     | 0.42              |
| 2:A:2561:U:O2     | 11:L:23:LYS:HE3  | 2.18                     | 0.42              |
| 6:E:27:LEU:O      | 6:E:31:VAL:HG23  | 2.20                     | 0.42              |
| 6:E:142:ALA:C     | 6:E:143:LEU:HD12 | 2.44                     | 0.42              |
| 18:S:61:ALA:HB2   | 18:S:98:ILE:HD13 | 2.02                     | 0.42              |
| 24:Y:39:TRP:CZ2   | 24:Y:44:LYS:HD3  | 2.55                     | 0.42              |
| 28:c:10:LYS:HD3   | 28:c:54:ILE:HA   | 2.00                     | 0.42              |
| 2:A:11:C:H2'      | 2:A:12:U:H5'     | 2.02                     | 0.42              |
| 2:A:116:C:H2'     | 2:A:117:G:O4'    | 2.20                     | 0.42              |
| 2:A:239:C:H1'     | 2:A:621:A:H2     | 1.84                     | 0.42              |
| 2:A:736:C:H2'     | 2:A:737:C:C6     | 2.54                     | 0.42              |
| 2:A:909:A:H2'     | 2:A:912:C:H5     | 1.84                     | 0.42              |
| 2:A:1086:A:H3'    | 2:A:1086:A:N3    | 2.35                     | 0.42              |
| 2:A:1283:G:N1     | 2:A:1286:A:OP2   | 2.51                     | 0.42              |
| 2:A:1378:A:O2'    | 2:A:1380:G:OP2   | 2.38                     | 0.42              |
| 2:A:1528:A:OP2    | 2:A:1543:G:N2    | 2.53                     | 0.42              |
| 2:A:1995:U:OP2    | 2:A:1996:C:O2'   | 2.32                     | 0.42              |
| 2:A:2193:G:O2'    | 2:A:2194:U:H5'   | 2.19                     | 0.42              |
| 2:A:2313:C:H4'    | 7:F:88:LYS:HD3   | 2.02                     | 0.42              |
| 2:A:2369:A:O2'    | 2:A:2370:G:H5'   | 2.20                     | 0.42              |
| 6:E:2:GLU:HB3     | 6:E:11:ALA:HB1   | 2.02                     | 0.42              |
| 8:G:37:LEU:HD13   | 8:G:68:ALA:CB    | 2.40                     | 0.42              |
| 8:G:76:VAL:HA     | 8:G:79:VAL:HG22  | 2.02                     | 0.42              |
| 12:M:92:LEU:O     | 12:M:96:LYS:HG3  | 2.20                     | 0.42              |
| 31:f:14:CYS:HB3   | 31:f:25:VAL:CG1  | 2.50                     | 0.42              |
| 2:A:1080:A:O2'    | 2:A:1081:U:H5'   | 2.19                     | 0.42              |
| 2:A:1431:A:H2'    | 2:A:1432:G:C8    | 2.55                     | 0.42              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 2:A:1480:C:H2'   | 2:A:1481:U:O4'    | 2.20                     | 0.42              |
| 2:A:1705:A:O2'   | 2:A:1706:C:H5'    | 2.19                     | 0.42              |
| 2:A:1735:A:H2'   | 2:A:1736:U:O4'    | 2.20                     | 0.42              |
| 2:A:1864:U:H5''  | 2:A:2410:G:O2'    | 2.19                     | 0.42              |
| 2:A:2084:C:H2'   | 2:A:2085:U:O4'    | 2.19                     | 0.42              |
| 2:A:2386:A:O2'   | 2:A:2387:U:H5'    | 2.19                     | 0.42              |
| 2:A:2450:A:OP1   | 2:A:2497:A:O2'    | 2.25                     | 0.42              |
| 2:A:2484:G:H1'   | 13:N:123:LYS:HD2  | 2.01                     | 0.42              |
| 7:F:57:LEU:HD23  | 7:F:57:LEU:HA     | 1.93                     | 0.42              |
| 9:H:29:PHE:O     | 9:H:33:GLN:HB2    | 2.19                     | 0.42              |
| 15:P:83:LEU:HD11 | 15:P:113:ALA:O    | 2.19                     | 0.42              |
| 18:S:34:GLU:HG2  | 18:S:60:LYS:HG2   | 2.01                     | 0.42              |
| 28:c:36:LEU:C    | 28:c:48:ILE:HD12  | 2.45                     | 0.42              |
| 30:e:14:PHE:O    | 30:e:15:LYS:HD2   | 2.20                     | 0.42              |
| 2:A:62:U:H3'     | 2:A:63:A:C8       | 2.55                     | 0.42              |
| 2:A:354:A:H2'    | 2:A:355:U:C6      | 2.55                     | 0.42              |
| 2:A:460:A:H2'    | 2:A:461:C:O4'     | 2.20                     | 0.42              |
| 2:A:627:A:C5     | 12:M:111:ILE:HD12 | 2.54                     | 0.42              |
| 2:A:709:U:H2'    | 2:A:710:U:H6      | 1.83                     | 0.42              |
| 2:A:754:U:H2'    | 2:A:755:U:H6      | 1.85                     | 0.42              |
| 2:A:1009:A:H2'   | 2:A:1010:A:C8     | 2.55                     | 0.42              |
| 2:A:1943:U:O4'   | 2:A:1945:G:H5'    | 2.19                     | 0.42              |
| 2:A:2485:G:O3'   | 13:N:125:PRO:HB3  | 2.20                     | 0.42              |
| 2:A:2697:G:H2'   | 2:A:2698:U:O4'    | 2.19                     | 0.42              |
| 2:A:2720:U:H4'   | 2:A:2845:U:O2'    | 2.20                     | 0.42              |
| 2:A:2736:A:O2'   | 2:A:2737:G:H5'    | 2.20                     | 0.42              |
| 2:A:2740:A:H2'   | 2:A:2741:A:C8     | 2.55                     | 0.42              |
| 2:A:2813:A:H2'   | 2:A:2814:A:H8     | 1.84                     | 0.42              |
| 3:B:113:C:H2'    | 3:B:114:C:H6      | 1.84                     | 0.42              |
| 4:C:84:ASP:OD2   | 4:C:87:ARG:NE     | 2.40                     | 0.42              |
| 9:H:8:LYS:HE2    | 9:H:14:SER:HB3    | 2.02                     | 0.42              |
| 18:S:73:LYS:HE3  | 18:S:86:GLN:HB3   | 2.02                     | 0.42              |
| 19:T:17:VAL:HA   | 19:T:43:ALA:CB    | 2.49                     | 0.42              |
| 19:T:65:ASP:O    | 19:T:69:LEU:HG    | 2.19                     | 0.42              |
| 20:U:72:GLN:HG3  | 20:U:73:ARG:HD2   | 2.02                     | 0.42              |
| 24:Y:22:LEU:HD23 | 24:Y:22:LEU:HA    | 1.91                     | 0.42              |
| 26:a:21:LYS:HE3  | 26:a:21:LYS:HB2   | 1.78                     | 0.42              |
| 2:A:464:U:H2'    | 2:A:465:G:O4'     | 2.19                     | 0.42              |
| 2:A:635:C:O2'    | 2:A:639:U:OP1     | 2.38                     | 0.42              |
| 2:A:659:G:O5'    | 6:E:95:LYS:HD3    | 2.20                     | 0.42              |
| 2:A:843:G:H2'    | 2:A:844:A:H8      | 1.84                     | 0.42              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:A:1056:G:H4'   | 2:A:1086:A:C8    | 2.55                     | 0.42              |
| 2:A:1464:G:O2'   | 2:A:1465:G:H5'   | 2.20                     | 0.42              |
| 2:A:1638:C:O2    | 2:A:2698:U:O2'   | 2.35                     | 0.42              |
| 2:A:1683:U:H2'   | 2:A:1684:G:H8    | 1.85                     | 0.42              |
| 2:A:2265:U:OP2   | 2:A:2266:A:O2'   | 2.16                     | 0.42              |
| 2:A:2572:A:OP2   | 5:D:149:ASN:HB3  | 2.20                     | 0.42              |
| 2:A:2591:C:H2'   | 2:A:2592:G:H8    | 1.85                     | 0.42              |
| 7:F:69:LYS:HG3   | 7:F:82:GLY:O     | 2.20                     | 0.42              |
| 8:G:18:LYS:HB3   | 8:G:25:THR:HB    | 2.01                     | 0.42              |
| 11:L:87:LEU:HD11 | 11:L:112:PHE:HE1 | 1.85                     | 0.42              |
| 21:V:23:GLY:HA3  | 21:V:36:VAL:CG1  | 2.50                     | 0.42              |
| 2:A:289:G:O2'    | 2:A:290:U:H5'    | 2.20                     | 0.41              |
| 2:A:689:A:H2'    | 2:A:690:G:C8     | 2.54                     | 0.41              |
| 2:A:703:U:C2'    | 2:A:704:G:H5'    | 2.50                     | 0.41              |
| 2:A:820:A:H4'    | 2:A:836:G:N2     | 2.27                     | 0.41              |
| 2:A:851:C:O2'    | 26:a:43:ALA:O    | 2.37                     | 0.41              |
| 2:A:1498:C:H2'   | 2:A:1499:C:C6    | 2.55                     | 0.41              |
| 2:A:1833:C:H2'   | 2:A:1834:U:O4'   | 2.19                     | 0.41              |
| 2:A:1886:U:O2'   | 2:A:1887:C:H5'   | 2.20                     | 0.41              |
| 2:A:1952:A:C6    | 11:L:22:ILE:HB   | 2.55                     | 0.41              |
| 2:A:2205:A:H2'   | 2:A:2206:C:C6    | 2.55                     | 0.41              |
| 2:A:2526:G:O2'   | 2:A:2527:C:H5'   | 2.20                     | 0.41              |
| 2:A:2593:U:O2'   | 2:A:2594:C:H5'   | 2.20                     | 0.41              |
| 2:A:2712:C:OP1   | 2:A:2714:G:H4'   | 2.20                     | 0.41              |
| 3:B:73:A:H2'     | 3:B:73:A:N3      | 2.35                     | 0.41              |
| 11:L:66:LYS:HE2  | 11:L:66:LYS:HB3  | 1.84                     | 0.41              |
| 27:b:29:SER:O    | 27:b:37:LYS:HA   | 2.19                     | 0.41              |
| 2:A:76:C:O3'     | 25:Z:52:ARG:HG2  | 2.21                     | 0.41              |
| 2:A:676:A:H62    | 2:A:802:A:H61    | 1.68                     | 0.41              |
| 2:A:1782:U:O2'   | 2:A:2609:U:H5''  | 2.19                     | 0.41              |
| 2:A:2564:A:C6    | 2:A:2647:U:H4'   | 2.55                     | 0.41              |
| 4:C:25:HIS:HB3   | 4:C:82:GLU:HG2   | 2.01                     | 0.41              |
| 2:A:1418:G:N1    | 2:A:1579:A:OP2   | 2.36                     | 0.41              |
| 2:A:1485:U:O2'   | 2:A:1486:U:H5'   | 2.20                     | 0.41              |
| 2:A:1771:C:O2'   | 2:A:1786:A:O4'   | 2.33                     | 0.41              |
| 2:A:2017:U:H4'   | 27:b:5:GLN:O     | 2.20                     | 0.41              |
| 2:A:2037:A:H2'   | 2:A:2038:G:C8    | 2.55                     | 0.41              |
| 2:A:2404:U:O2'   | 2:A:2405:G:H5'   | 2.21                     | 0.41              |
| 2:A:2548:U:O2    | 11:L:23:LYS:NZ   | 2.53                     | 0.41              |
| 2:A:2694:G:H2'   | 2:A:2695:U:O4'   | 2.20                     | 0.41              |
| 3:B:70:C:H2'     | 3:B:71:C:H6      | 1.85                     | 0.41              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 6:E:128:ALA:HB1  | 6:E:129:PRO:HD2   | 2.02                     | 0.41              |
| 8:G:91:GLY:HA3   | 8:G:94:TYR:CD2    | 2.55                     | 0.41              |
| 8:G:168:VAL:O    | 8:G:168:VAL:HG13  | 2.20                     | 0.41              |
| 16:Q:33:VAL:HB   | 16:Q:38:LYS:HG2   | 2.03                     | 0.41              |
| 19:T:70:LYS:O    | 19:T:107:VAL:HA   | 2.20                     | 0.41              |
| 30:e:29:LEU:O    | 30:e:33:LEU:HD23  | 2.20                     | 0.41              |
| 1:1:74:C:H4'     | 2:A:2602[B]:A:OP1 | 2.20                     | 0.41              |
| 2:A:56:A:H2'     | 2:A:57:C:O4'      | 2.20                     | 0.41              |
| 2:A:371:A:H3'    | 2:A:371:A:OP1     | 2.20                     | 0.41              |
| 2:A:441:U:O2'    | 2:A:442:G:H5'     | 2.19                     | 0.41              |
| 2:A:483:A:O2'    | 21:V:57:GLY:N     | 2.40                     | 0.41              |
| 2:A:917:A:H5''   | 2:A:2268:A:N1     | 2.35                     | 0.41              |
| 2:A:1312:U:H4'   | 2:A:1313:U:O5'    | 2.21                     | 0.41              |
| 2:A:1391:U:H2'   | 2:A:1393:A:OP2    | 2.20                     | 0.41              |
| 2:A:2323:G:C2'   | 2:A:2324:U:H5'    | 2.50                     | 0.41              |
| 2:A:2861:U:H2'   | 2:A:2862:G:C8     | 2.56                     | 0.41              |
| 2:A:2881:U:O2'   | 2:A:2882:A:H5'    | 2.19                     | 0.41              |
| 7:F:3:LYS:O      | 7:F:3:LYS:HD3     | 2.20                     | 0.41              |
| 19:T:72:THR:HG21 | 19:T:108:SER:HB3  | 2.02                     | 0.41              |
| 2:A:26:G:O2'     | 2:A:27:G:O4'      | 2.36                     | 0.41              |
| 2:A:355:U:O2'    | 2:A:356:G:H5'     | 2.20                     | 0.41              |
| 2:A:924:G:H2'    | 2:A:925:A:C8      | 2.54                     | 0.41              |
| 2:A:1028:A:N3    | 2:A:2486:C:O2'    | 2.41                     | 0.41              |
| 2:A:1130:U:C2    | 5:D:152:PRO:HB3   | 2.55                     | 0.41              |
| 2:A:1178:C:H2'   | 2:A:1179:G:H8     | 1.86                     | 0.41              |
| 2:A:1401:G:H2'   | 2:A:1402:U:O4'    | 2.21                     | 0.41              |
| 2:A:1837:C:O2'   | 2:A:1927:A:H1'    | 2.20                     | 0.41              |
| 2:A:2050:C:O2'   | 2:A:2051:A:H5'    | 2.20                     | 0.41              |
| 2:A:2197:U:H1'   | 2:A:2198:A:C8     | 2.55                     | 0.41              |
| 2:A:2545:G:H2'   | 2:A:2546:U:O4'    | 2.20                     | 0.41              |
| 2:A:2662:A:H2'   | 2:A:2663:G:O4'    | 2.20                     | 0.41              |
| 3:B:7:G:O2'      | 3:B:8:C:H5'       | 2.20                     | 0.41              |
| 10:K:60:ASP:HB3  | 10:K:97:PRO:CB    | 2.50                     | 0.41              |
| 21:V:12:ILE:CG2  | 21:V:80:ALA:HB2   | 2.49                     | 0.41              |
| 25:Z:6:LEU:HB2   | 25:Z:56:LEU:CD1   | 2.49                     | 0.41              |
| 28:c:35:GLU:HA   | 28:c:49:TYR:O     | 2.19                     | 0.41              |
| 2:A:45:G:C4'     | 2:A:46:G:H5'      | 2.51                     | 0.41              |
| 2:A:191:A:O2'    | 2:A:678:C:O2'     | 2.31                     | 0.41              |
| 2:A:231:A:O2'    | 2:A:232:G:H5'     | 2.20                     | 0.41              |
| 2:A:409:G:H2'    | 2:A:410:G:C8      | 2.56                     | 0.41              |
| 2:A:491:G:O6     | 19:T:49:LYS:NZ    | 2.48                     | 0.41              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 2:A:1068:G:O2'    | 2:A:1096:A:H1'    | 2.21                     | 0.41              |
| 2:A:1825:U:H2'    | 2:A:1826:G:H8     | 1.86                     | 0.41              |
| 2:A:2584:U:H2'    | 2:A:2585:U:C6     | 2.55                     | 0.41              |
| 2:A:2623:G:H4'    | 2:A:2825:G:H8     | 1.86                     | 0.41              |
| 2:A:2627:G:N2     | 2:A:2777:G:OP2    | 2.52                     | 0.41              |
| 2:A:2776:A:H4'    | 2:A:2777:G:O5'    | 2.20                     | 0.41              |
| 11:L:108:ARG:HA   | 11:L:116:ILE:HD11 | 2.02                     | 0.41              |
| 12:M:121:THR:HG23 | 12:M:141:LYS:O    | 2.21                     | 0.41              |
| 25:Z:12:GLU:HG2   | 25:Z:13:GLU:N     | 2.36                     | 0.41              |
| 2:A:5:A:O2'       | 2:A:6:A:H5'       | 2.20                     | 0.41              |
| 2:A:134:G:H2'     | 2:A:135:U:C6      | 2.55                     | 0.41              |
| 2:A:1007:C:OP2    | 2:A:1008:A:O2'    | 2.35                     | 0.41              |
| 2:A:1296:G:O2'    | 2:A:1297:C:H5'    | 2.21                     | 0.41              |
| 2:A:1406:U:H2'    | 2:A:1407:G:C8     | 2.56                     | 0.41              |
| 2:A:1632:A:H2'    | 2:A:1633:G:O4'    | 2.21                     | 0.41              |
| 2:A:1636:U:H2'    | 2:A:1637:A:H8     | 1.85                     | 0.41              |
| 2:A:1663:G:O2'    | 2:A:2686:G:H4'    | 2.21                     | 0.41              |
| 2:A:1789:A:H2'    | 2:A:1790:C:O4'    | 2.19                     | 0.41              |
| 2:A:2034:U:H2'    | 2:A:2035:G:C8     | 2.55                     | 0.41              |
| 2:A:2295:C:OP2    | 15:P:10:ARG:HD3   | 2.20                     | 0.41              |
| 2:A:2391:G:OP2    | 30:e:32:ILE:HG21  | 2.19                     | 0.41              |
| 8:G:37:LEU:HD11   | 8:G:72:LEU:HD11   | 2.01                     | 0.41              |
| 8:G:170:ARG:NH2   | 31:f:29:ALA:HA    | 2.35                     | 0.41              |
| 16:Q:32:VAL:O     | 16:Q:32:VAL:HG23  | 2.20                     | 0.41              |
| 19:T:5:ALA:HB2    | 19:T:54:ALA:HA    | 2.03                     | 0.41              |
| 29:d:16:HIS:HB2   | 29:d:44:VAL:HG21  | 2.01                     | 0.41              |
| 30:e:62:LEU:HB3   | 30:e:65:ALA:CB    | 2.50                     | 0.41              |
| 2:A:158:U:H3      | 2:A:168:G:H1      | 1.67                     | 0.41              |
| 2:A:774:G:O2'     | 2:A:775:G:OP2     | 2.36                     | 0.41              |
| 2:A:1260:A:H2'    | 2:A:1261:C:O4'    | 2.20                     | 0.41              |
| 2:A:1410:G:H2'    | 2:A:1411:U:H6     | 1.86                     | 0.41              |
| 2:A:1420:A:O2'    | 2:A:2211:A:N7     | 2.45                     | 0.41              |
| 2:A:1466:U:O3'    | 2:A:1546:G:O2'    | 2.38                     | 0.41              |
| 2:A:1989:G:O2'    | 2:A:1990:C:H5'    | 2.21                     | 0.41              |
| 2:A:2065:C:H2'    | 2:A:2066:C:H6     | 1.86                     | 0.41              |
| 2:A:2308:G:H2'    | 2:A:2308:G:N3     | 2.35                     | 0.41              |
| 2:A:2654:A:N1     | 2:A:2665:A:H5'    | 2.35                     | 0.41              |
| 5:D:37:VAL:HG22   | 5:D:48:ILE:HG22   | 2.02                     | 0.41              |
| 6:E:127:GLU:CG    | 6:E:133:LEU:HD13  | 2.51                     | 0.41              |
| 9:H:4:ILE:HG13    | 9:H:18:GLN:CB     | 2.51                     | 0.41              |
| 10:K:88:THR:OG1   | 10:K:89:PHE:N     | 2.51                     | 0.41              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 11:L:24:VAL:CG1  | 11:L:30:ARG:HG2  | 2.51                     | 0.41              |
| 11:L:43:ILE:CD1  | 11:L:52:VAL:HB   | 2.51                     | 0.41              |
| 15:P:71:ALA:HB1  | 15:P:106:LEU:HB2 | 2.02                     | 0.41              |
| 22:W:86:LEU:HD13 | 22:W:89:ILE:HD11 | 2.01                     | 0.41              |
| 2:A:50:U:H3'     | 2:A:51:G:C5'     | 2.51                     | 0.41              |
| 2:A:184:C:H2'    | 2:A:185:G:C8     | 2.56                     | 0.41              |
| 2:A:247:G:OP2    | 2:A:249:C:N4     | 2.54                     | 0.41              |
| 2:A:307:G:N2     | 2:A:309:A:H3'    | 2.36                     | 0.41              |
| 2:A:340:A:H2'    | 2:A:341:C:O4'    | 2.21                     | 0.41              |
| 2:A:383:C:H5''   | 2:A:385:C:OP2    | 2.20                     | 0.41              |
| 2:A:680:C:O2'    | 2:A:681:G:H5'    | 2.20                     | 0.41              |
| 2:A:841:G:O2'    | 2:A:842:U:H5'    | 2.21                     | 0.41              |
| 2:A:967:U:H2'    | 2:A:968:C:H6     | 1.85                     | 0.41              |
| 2:A:1112:G:H2'   | 2:A:1113:U:O4'   | 2.21                     | 0.41              |
| 2:A:1114:C:H2'   | 2:A:1115:G:H8    | 1.85                     | 0.41              |
| 2:A:1310:G:O2'   | 2:A:1311:G:H5'   | 2.21                     | 0.41              |
| 2:A:1408:G:H2'   | 2:A:1409:U:H6    | 1.86                     | 0.41              |
| 2:A:1412:U:H2'   | 2:A:1413:A:H8    | 1.86                     | 0.41              |
| 2:A:1450:G:H2'   | 2:A:1451:C:C6    | 2.56                     | 0.41              |
| 2:A:1485:U:H6    | 2:A:1485:U:H5'   | 1.86                     | 0.41              |
| 2:A:1631:G:H1'   | 2:A:1635:A:H61   | 1.85                     | 0.41              |
| 2:A:1746:A:H2'   | 2:A:1747:U:H6    | 1.81                     | 0.41              |
| 2:A:1833:C:H2'   | 2:A:1834:U:C6    | 2.56                     | 0.41              |
| 2:A:2347:C:O2'   | 28:c:21:TYR:OH   | 2.36                     | 0.41              |
| 2:A:2350:C:H2'   | 2:A:2351:G:O4'   | 2.20                     | 0.41              |
| 2:A:2846:G:OP1   | 16:Q:53:ARG:NH1  | 2.54                     | 0.41              |
| 2:A:2888:C:H2'   | 2:A:2889:C:H6    | 1.85                     | 0.41              |
| 3:B:40:U:H1'     | 3:B:45:A:N6      | 2.35                     | 0.41              |
| 5:D:184:ARG:HB3  | 5:D:186:LEU:HD13 | 2.02                     | 0.41              |
| 8:G:42:GLU:HG2   | 8:G:44:LYS:HE3   | 2.02                     | 0.41              |
| 11:L:71:ARG:HD3  | 11:L:71:ARG:HA   | 1.84                     | 0.41              |
| 13:N:21:ALA:CB   | 13:N:100:LYS:HB2 | 2.51                     | 0.41              |
| 14:O:49:GLU:HB2  | 14:O:50:PRO:HD3  | 2.02                     | 0.41              |
| 14:O:86:ARG:HD3  | 14:O:117:ASP:HB3 | 2.03                     | 0.41              |
| 16:Q:21:ARG:HD3  | 16:Q:113:ARG:NH2 | 2.36                     | 0.41              |
| 21:V:28:VAL:C    | 21:V:29:LEU:HD23 | 2.45                     | 0.41              |
| 28:c:34:LEU:N    | 28:c:51:GLU:OE1  | 2.49                     | 0.41              |
| 30:e:4:ILE:CG2   | 30:e:63:PRO:HG3  | 2.50                     | 0.41              |
| 2:A:436:C:O2'    | 2:A:437:U:H5'    | 2.20                     | 0.41              |
| 2:A:473:G:O2'    | 2:A:474:G:H5'    | 2.21                     | 0.41              |
| 2:A:554:U:C2'    | 2:A:555:G:H5'    | 2.50                     | 0.41              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:A:939:G:O2'    | 2:A:940:G:H5'    | 2.21                     | 0.41              |
| 2:A:1347:A:H2'   | 2:A:1348:C:H5'   | 2.02                     | 0.41              |
| 2:A:1430:G:H2'   | 2:A:1431:A:H8    | 1.85                     | 0.41              |
| 2:A:1624:U:O2'   | 2:A:1625:C:H5'   | 2.21                     | 0.41              |
| 2:A:2060:A:O4'   | 2:A:2502:G:H1'   | 2.20                     | 0.41              |
| 2:A:2196:C:O2'   | 2:A:2197:U:H5'   | 2.20                     | 0.41              |
| 2:A:2266:A:H4'   | 2:A:2267:A:O5'   | 2.21                     | 0.41              |
| 2:A:2322:A:H2'   | 2:A:2323:G:C8    | 2.56                     | 0.41              |
| 2:A:2694:G:H2'   | 2:A:2695:U:C6    | 2.56                     | 0.41              |
| 3:B:96:G:O2'     | 3:B:97:C:H5'     | 2.21                     | 0.41              |
| 9:H:33:GLN:HE21  | 9:H:33:GLN:HB3   | 1.68                     | 0.41              |
| 14:O:20:MET:HE2  | 14:O:20:MET:HB3  | 1.99                     | 0.41              |
| 14:O:24:MET:HG2  | 14:O:44:LEU:HD22 | 2.02                     | 0.41              |
| 14:O:79:LEU:HD23 | 14:O:83:LEU:HD12 | 2.03                     | 0.41              |
| 2:A:26:G:H1'     | 2:A:514:A:H61    | 1.86                     | 0.40              |
| 2:A:272:A:H2'    | 2:A:273:G:H8     | 1.84                     | 0.40              |
| 2:A:516:C:O2'    | 2:A:517:C:H5'    | 2.21                     | 0.40              |
| 2:A:588:U:H2'    | 2:A:589:U:C6     | 2.56                     | 0.40              |
| 2:A:598:U:H2'    | 2:A:599:A:C8     | 2.57                     | 0.40              |
| 2:A:745:G:C2'    | 2:A:746:U:H5'    | 2.51                     | 0.40              |
| 2:A:850:U:O2'    | 26:a:23:THR:HA   | 2.21                     | 0.40              |
| 2:A:1468:U:H2'   | 2:A:1522:A:N6    | 2.36                     | 0.40              |
| 2:A:2099:U:H2'   | 2:A:2100:G:C8    | 2.56                     | 0.40              |
| 2:A:2258:C:O2'   | 2:A:2426:A:H4'   | 2.20                     | 0.40              |
| 2:A:2294:G:H5'   | 15:P:98:GLN:HE22 | 1.87                     | 0.40              |
| 2:A:2472:G:O6    | 2:A:2475:C:H2'   | 2.21                     | 0.40              |
| 2:A:2660:A:H2'   | 2:A:2661:G:C8    | 2.56                     | 0.40              |
| 2:A:2783:U:O2'   | 2:A:2784:U:H5'   | 2.21                     | 0.40              |
| 3:B:30:C:C2'     | 3:B:31:C:H5'     | 2.51                     | 0.40              |
| 8:G:73:ASN:O     | 8:G:76:VAL:HG22  | 2.21                     | 0.40              |
| 19:T:83:LYS:HD3  | 19:T:95:ARG:HE   | 1.86                     | 0.40              |
| 21:V:74:ASN:O    | 21:V:78:GLY:N    | 2.45                     | 0.40              |
| 24:Y:40:VAL:O    | 24:Y:44:LYS:N    | 2.53                     | 0.40              |
| 2:A:429:A:H2'    | 2:A:430:A:N9     | 2.36                     | 0.40              |
| 2:A:511:U:H4'    | 2:A:1235:G:H4'   | 2.02                     | 0.40              |
| 2:A:595:C:H2'    | 2:A:596:U:C6     | 2.57                     | 0.40              |
| 2:A:644:A:C2     | 2:A:2369:A:H1'   | 2.57                     | 0.40              |
| 2:A:1072:C:H2'   | 2:A:1093:G:O6    | 2.22                     | 0.40              |
| 2:A:1182:G:H2'   | 2:A:1183:U:O4'   | 2.21                     | 0.40              |
| 2:A:1190:G:H2'   | 2:A:1191:G:C8    | 2.56                     | 0.40              |
| 2:A:1223:G:OP2   | 18:S:90:ARG:NH1  | 2.51                     | 0.40              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:A:2430:A:O2'   | 2:A:2431:U:H5'   | 2.21                     | 0.40              |
| 2:A:2492:U:H2'   | 2:A:2493:U:C6    | 2.56                     | 0.40              |
| 2:A:2508:G:O3'   | 2:A:2555:U:H5'   | 2.21                     | 0.40              |
| 5:D:184:ARG:CB   | 5:D:186:LEU:HD13 | 2.51                     | 0.40              |
| 6:E:104:ALA:O    | 6:E:108:ILE:HG13 | 2.22                     | 0.40              |
| 6:E:143:LEU:HD23 | 6:E:146:VAL:CG2  | 2.52                     | 0.40              |
| 11:L:38:ILE:HD11 | 11:L:112:PHE:HZ  | 1.86                     | 0.40              |
| 14:O:35:LYS:HD2  | 14:O:112:TYR:CZ  | 2.56                     | 0.40              |
| 15:P:16:ARG:O    | 15:P:20:GLU:HG2  | 2.21                     | 0.40              |
| 20:U:28:ASN:ND2  | 20:U:88:LYS:O    | 2.54                     | 0.40              |
| 26:a:12:SER:OG   | 26:a:14:ILE:HG13 | 2.22                     | 0.40              |
| 2:A:44:A:H2'     | 2:A:45:G:O4'     | 2.21                     | 0.40              |
| 2:A:587:C:H4'    | 2:A:588:U:C6     | 2.56                     | 0.40              |
| 2:A:682:G:H5'    | 29:d:26:ASN:ND2  | 2.36                     | 0.40              |
| 2:A:704:G:H1'    | 2:A:727:A:H61    | 1.86                     | 0.40              |
| 2:A:864:G:O2'    | 2:A:865:C:H5'    | 2.21                     | 0.40              |
| 2:A:966:G:O4'    | 2:A:2267:A:N6    | 2.54                     | 0.40              |
| 2:A:1079:C:H2'   | 2:A:1080:A:H8    | 1.84                     | 0.40              |
| 2:A:1426:G:OP2   | 2:A:1427:A:O2'   | 2.17                     | 0.40              |
| 2:A:1651:G:C5'   | 14:O:39:PRO:HG2  | 2.51                     | 0.40              |
| 2:A:1666:G:C2'   | 2:A:1667:G:H5'   | 2.50                     | 0.40              |
| 2:A:1942:C:P     | 2:A:1943:U:HO2'  | 2.35                     | 0.40              |
| 2:A:2366:A:C2    | 2:A:2367:G:H1'   | 2.57                     | 0.40              |
| 2:A:2512:C:H2'   | 2:A:2513:A:O4'   | 2.22                     | 0.40              |
| 2:A:2757:A:H2'   | 2:A:2757:A:N3    | 2.36                     | 0.40              |
| 5:D:4:LEU:HD21   | 5:D:96:ILE:HG21  | 2.02                     | 0.40              |
| 12:M:89:VAL:HG21 | 12:M:123:ARG:NH1 | 2.37                     | 0.40              |
| 21:V:96:PHE:HB2  | 21:V:99:ASN:OD1  | 2.21                     | 0.40              |
| 31:f:24:ARG:HG2  | 31:f:36:ARG:HB2  | 2.03                     | 0.40              |
| 2:A:48:G:H22     | 2:A:177:G:P      | 2.45                     | 0.40              |
| 2:A:439:A:O2'    | 2:A:440:C:H5'    | 2.20                     | 0.40              |
| 2:A:499:U:H5''   | 21:V:43:LYS:HE3  | 2.03                     | 0.40              |
| 2:A:1196:C:H2'   | 2:A:1197:G:C8    | 2.56                     | 0.40              |
| 2:A:1483:G:H2'   | 2:A:1484:U:H6    | 1.83                     | 0.40              |
| 2:A:1851:U:O2'   | 2:A:1852:U:H5'   | 2.21                     | 0.40              |
| 2:A:2420:C:OP1   | 30:e:34:THR:HB   | 2.21                     | 0.40              |
| 2:A:2488:G:O2'   | 2:A:2489:U:H5'   | 2.21                     | 0.40              |
| 2:A:2756:U:H4'   | 2:A:2757:A:OP1   | 2.19                     | 0.40              |
| 8:G:8:PRO:HB2    | 8:G:49:THR:HG21  | 2.02                     | 0.40              |
| 11:L:92:GLU:O    | 11:L:92:GLU:HG3  | 2.21                     | 0.40              |
| 12:M:74:THR:HA   | 12:M:107:PHE:O   | 2.21                     | 0.40              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 14:O:103:ARG:HD3 | 14:O:110:MET:SD  | 2.62                     | 0.40              |
| 21:V:4:LYS:O     | 21:V:94:ARG:NH2  | 2.51                     | 0.40              |
| 28:c:11:LEU:HD23 | 28:c:51:GLU:HA   | 2.03                     | 0.40              |
| 30:e:16:LYS:HA   | 30:e:21:GLY:O    | 2.21                     | 0.40              |
| 30:e:26:HIS:NE2  | 30:e:48:ALA:HB2  | 2.37                     | 0.40              |
| 2:A:103:A:H3'    | 2:A:104:A:H8     | 1.87                     | 0.40              |
| 2:A:736:C:H2'    | 2:A:737:C:H6     | 1.87                     | 0.40              |
| 2:A:858:G:H3'    | 2:A:859:G:C8     | 2.56                     | 0.40              |
| 2:A:1449:G:O2'   | 2:A:1450:G:H5'   | 2.21                     | 0.40              |
| 2:A:1491:G:H4'   | 4:C:100:GLU:OE1  | 2.20                     | 0.40              |
| 2:A:1604:C:O2'   | 2:A:1610:A:N1    | 2.55                     | 0.40              |
| 2:A:1668:A:H4'   | 2:A:1669:A:O5'   | 2.22                     | 0.40              |
| 2:A:1800:C:C2'   | 4:C:146:MET:HE1  | 2.51                     | 0.40              |
| 2:A:2090:A:O2'   | 2:A:2091:C:H5'   | 2.22                     | 0.40              |
| 2:A:2244:U:H2'   | 2:A:2245:U:O4'   | 2.21                     | 0.40              |
| 2:A:2373:G:H2'   | 2:A:2374:C:C6    | 2.57                     | 0.40              |
| 2:A:2543:G:H2'   | 2:A:2544:G:C8    | 2.56                     | 0.40              |
| 2:A:2732:G:H3'   | 2:A:2733:A:O4'   | 2.21                     | 0.40              |
| 2:A:2861:U:H2'   | 2:A:2862:G:H8    | 1.87                     | 0.40              |
| 4:C:81:LEU:HD22  | 4:C:92:ALA:HB2   | 2.03                     | 0.40              |
| 4:C:118:SER:HB2  | 4:C:129:THR:HB   | 2.04                     | 0.40              |
| 6:E:121:VAL:O    | 6:E:189:THR:HA   | 2.20                     | 0.40              |
| 14:O:29:VAL:CG1  | 14:O:75:ILE:HG23 | 2.49                     | 0.40              |
| 29:d:25:LYS:HD3  | 29:d:29:GLN:NE2  | 2.36                     | 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 |     |
|-----|-------|---------------|-----------|---------|----------|-------------|-----|
| 4   | C     | 269/273 (98%) | 258 (96%) | 11 (4%) | 0        | 100         | 100 |

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| Mol | Chain | Analysed        | Favoured   | Allowed | Outliers | Percentiles |     |
|-----|-------|-----------------|------------|---------|----------|-------------|-----|
| 5   | D     | 207/209 (99%)   | 203 (98%)  | 4 (2%)  | 0        | 100         | 100 |
| 6   | E     | 199/201 (99%)   | 197 (99%)  | 2 (1%)  | 0        | 100         | 100 |
| 7   | F     | 175/179 (98%)   | 172 (98%)  | 3 (2%)  | 0        | 100         | 100 |
| 8   | G     | 174/177 (98%)   | 170 (98%)  | 4 (2%)  | 0        | 100         | 100 |
| 9   | H     | 48/149 (32%)    | 45 (94%)   | 3 (6%)  | 0        | 100         | 100 |
| 10  | K     | 140/142 (99%)   | 137 (98%)  | 3 (2%)  | 0        | 100         | 100 |
| 11  | L     | 121/123 (98%)   | 118 (98%)  | 3 (2%)  | 0        | 100         | 100 |
| 12  | M     | 142/144 (99%)   | 135 (95%)  | 7 (5%)  | 0        | 100         | 100 |
| 13  | N     | 134/136 (98%)   | 134 (100%) | 0       | 0        | 100         | 100 |
| 14  | O     | 123/127 (97%)   | 119 (97%)  | 4 (3%)  | 0        | 100         | 100 |
| 15  | P     | 115/117 (98%)   | 115 (100%) | 0       | 0        | 100         | 100 |
| 16  | Q     | 112/115 (97%)   | 110 (98%)  | 2 (2%)  | 0        | 100         | 100 |
| 17  | R     | 115/118 (98%)   | 114 (99%)  | 1 (1%)  | 0        | 100         | 100 |
| 18  | S     | 101/103 (98%)   | 99 (98%)   | 2 (2%)  | 0        | 100         | 100 |
| 19  | T     | 108/110 (98%)   | 106 (98%)  | 2 (2%)  | 0        | 100         | 100 |
| 20  | U     | 93/100 (93%)    | 93 (100%)  | 0       | 0        | 100         | 100 |
| 21  | V     | 100/104 (96%)   | 95 (95%)   | 5 (5%)  | 0        | 100         | 100 |
| 22  | W     | 92/94 (98%)     | 91 (99%)   | 1 (1%)  | 0        | 100         | 100 |
| 23  | X     | 74/85 (87%)     | 73 (99%)   | 1 (1%)  | 0        | 100         | 100 |
| 24  | Y     | 75/78 (96%)     | 75 (100%)  | 0       | 0        | 100         | 100 |
| 25  | Z     | 60/63 (95%)     | 60 (100%)  | 0       | 0        | 100         | 100 |
| 26  | a     | 56/59 (95%)     | 55 (98%)   | 1 (2%)  | 0        | 100         | 100 |
| 27  | b     | 54/57 (95%)     | 54 (100%)  | 0       | 0        | 100         | 100 |
| 28  | c     | 49/55 (89%)     | 49 (100%)  | 0       | 0        | 100         | 100 |
| 29  | d     | 44/46 (96%)     | 42 (96%)   | 2 (4%)  | 0        | 100         | 100 |
| 30  | e     | 62/65 (95%)     | 56 (90%)   | 6 (10%) | 0        | 100         | 100 |
| 31  | f     | 36/38 (95%)     | 35 (97%)   | 1 (3%)  | 0        | 100         | 100 |
| All | All   | 3078/3267 (94%) | 3010 (98%) | 68 (2%) | 0        | 100         | 100 |

There are no Ramachandran outliers to report.

### 5.3.2 Protein sidechains ⓘ

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

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

| Mol | Chain | Analysed       | Rotameric  | Outliers | Percentiles |     |
|-----|-------|----------------|------------|----------|-------------|-----|
| 4   | C     | 216/218 (99%)  | 216 (100%) | 0        | 100         | 100 |
| 5   | D     | 164/164 (100%) | 164 (100%) | 0        | 100         | 100 |
| 6   | E     | 165/165 (100%) | 165 (100%) | 0        | 100         | 100 |
| 7   | F     | 148/150 (99%)  | 148 (100%) | 0        | 100         | 100 |
| 8   | G     | 137/138 (99%)  | 137 (100%) | 0        | 100         | 100 |
| 9   | H     | 40/114 (35%)   | 40 (100%)  | 0        | 100         | 100 |
| 10  | K     | 116/116 (100%) | 116 (100%) | 0        | 100         | 100 |
| 11  | L     | 104/104 (100%) | 104 (100%) | 0        | 100         | 100 |
| 12  | M     | 103/103 (100%) | 103 (100%) | 0        | 100         | 100 |
| 13  | N     | 109/109 (100%) | 109 (100%) | 0        | 100         | 100 |
| 14  | O     | 102/103 (99%)  | 102 (100%) | 0        | 100         | 100 |
| 15  | P     | 87/87 (100%)   | 87 (100%)  | 0        | 100         | 100 |
| 16  | Q     | 99/100 (99%)   | 99 (100%)  | 0        | 100         | 100 |
| 17  | R     | 89/90 (99%)    | 89 (100%)  | 0        | 100         | 100 |
| 18  | S     | 84/84 (100%)   | 84 (100%)  | 0        | 100         | 100 |
| 19  | T     | 93/93 (100%)   | 93 (100%)  | 0        | 100         | 100 |
| 20  | U     | 82/84 (98%)    | 82 (100%)  | 0        | 100         | 100 |
| 21  | V     | 83/85 (98%)    | 83 (100%)  | 0        | 100         | 100 |
| 22  | W     | 78/78 (100%)   | 78 (100%)  | 0        | 100         | 100 |
| 23  | X     | 57/63 (90%)    | 57 (100%)  | 0        | 100         | 100 |
| 24  | Y     | 67/68 (98%)    | 67 (100%)  | 0        | 100         | 100 |
| 25  | Z     | 54/55 (98%)    | 54 (100%)  | 0        | 100         | 100 |
| 26  | a     | 48/49 (98%)    | 48 (100%)  | 0        | 100         | 100 |
| 27  | b     | 47/48 (98%)    | 47 (100%)  | 0        | 100         | 100 |
| 28  | c     | 45/49 (92%)    | 45 (100%)  | 0        | 100         | 100 |
| 29  | d     | 38/38 (100%)   | 38 (100%)  | 0        | 100         | 100 |

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| Mol | Chain | Analysed        | Rotameric   | Outliers | Percentiles |     |
|-----|-------|-----------------|-------------|----------|-------------|-----|
| 30  | e     | 51/52 (98%)     | 51 (100%)   | 0        | 100         | 100 |
| 31  | f     | 34/34 (100%)    | 34 (100%)   | 0        | 100         | 100 |
| All | All   | 2540/2641 (96%) | 2540 (100%) | 0        | 100         | 100 |

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (38) such sidechains are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 4   | C     | 15  | HIS  |
| 4   | C     | 86  | ASN  |
| 4   | C     | 134 | ASN  |
| 5   | D     | 32  | ASN  |
| 5   | D     | 42  | ASN  |
| 5   | D     | 94  | GLN  |
| 5   | D     | 173 | GLN  |
| 6   | E     | 62  | GLN  |
| 6   | E     | 115 | GLN  |
| 7   | F     | 52  | ASN  |
| 7   | F     | 81  | GLN  |
| 8   | G     | 22  | GLN  |
| 8   | G     | 45  | HIS  |
| 8   | G     | 115 | HIS  |
| 9   | H     | 2   | GLN  |
| 9   | H     | 11  | ASN  |
| 9   | H     | 20  | ASN  |
| 9   | H     | 33  | GLN  |
| 10  | K     | 47  | HIS  |
| 10  | K     | 128 | ASN  |
| 10  | K     | 138 | GLN  |
| 11  | L     | 89  | ASN  |
| 11  | L     | 90  | ASN  |
| 11  | L     | 93  | GLN  |
| 12  | M     | 104 | GLN  |
| 13  | N     | 3   | GLN  |
| 15  | P     | 38  | GLN  |
| 16  | Q     | 10  | GLN  |
| 16  | Q     | 12  | GLN  |
| 16  | Q     | 56  | HIS  |
| 16  | Q     | 66  | ASN  |
| 17  | R     | 52  | GLN  |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 22  | W     | 78  | GLN  |
| 23  | X     | 76  | ASN  |
| 24  | Y     | 20  | HIS  |
| 24  | Y     | 34  | HIS  |
| 25  | Z     | 39  | GLN  |
| 29  | d     | 26  | ASN  |

### 5.3.3 RNA ⓘ

| Mol | Chain | Analysed        | Backbone Outliers | Pucker Outliers |
|-----|-------|-----------------|-------------------|-----------------|
| 1   | 1     | 3/4 (75%)       | 1 (33%)           | 0               |
| 2   | A     | 2786/2795 (99%) | 327 (11%)         | 8 (0%)          |
| 3   | B     | 119/120 (99%)   | 9 (7%)            | 0               |
| All | All   | 2908/2919 (99%) | 337 (11%)         | 8 (0%)          |

All (337) RNA backbone outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | 1     | 76  | A    |
| 2   | A     | 10  | A    |
| 2   | A     | 12  | U    |
| 2   | A     | 15  | G    |
| 2   | A     | 34  | U    |
| 2   | A     | 45  | G    |
| 2   | A     | 46  | G    |
| 2   | A     | 51  | G    |
| 2   | A     | 63  | A    |
| 2   | A     | 64  | A    |
| 2   | A     | 71  | A    |
| 2   | A     | 74  | A    |
| 2   | A     | 75  | G    |
| 2   | A     | 84  | A    |
| 2   | A     | 91  | A    |
| 2   | A     | 96  | C    |
| 2   | A     | 101 | A    |
| 2   | A     | 102 | U    |
| 2   | A     | 118 | A    |
| 2   | A     | 120 | U    |
| 2   | A     | 138 | U    |
| 2   | A     | 139 | U    |
| 2   | A     | 140 | C    |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 2   | A     | 141 | G    |
| 2   | A     | 142 | A    |
| 2   | A     | 163 | C    |
| 2   | A     | 181 | A    |
| 2   | A     | 196 | A    |
| 2   | A     | 199 | A    |
| 2   | A     | 216 | A    |
| 2   | A     | 222 | A    |
| 2   | A     | 233 | A    |
| 2   | A     | 248 | G    |
| 2   | A     | 266 | G    |
| 2   | A     | 272 | A    |
| 2   | A     | 275 | C    |
| 2   | A     | 276 | U    |
| 2   | A     | 277 | G    |
| 2   | A     | 278 | A    |
| 2   | A     | 302 | C    |
| 2   | A     | 311 | A    |
| 2   | A     | 329 | G    |
| 2   | A     | 330 | A    |
| 2   | A     | 353 | C    |
| 2   | A     | 361 | G    |
| 2   | A     | 362 | A    |
| 2   | A     | 372 | G    |
| 2   | A     | 386 | G    |
| 2   | A     | 396 | G    |
| 2   | A     | 404 | A    |
| 2   | A     | 411 | G    |
| 2   | A     | 412 | A    |
| 2   | A     | 424 | G    |
| 2   | A     | 451 | U    |
| 2   | A     | 456 | C    |
| 2   | A     | 481 | G    |
| 2   | A     | 491 | G    |
| 2   | A     | 505 | A    |
| 2   | A     | 509 | C    |
| 2   | A     | 529 | A    |
| 2   | A     | 530 | G    |
| 2   | A     | 532 | A    |
| 2   | A     | 543 | G    |
| 2   | A     | 549 | G    |
| 2   | A     | 563 | A    |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 2   | A     | 573 | U    |
| 2   | A     | 575 | A    |
| 2   | A     | 603 | A    |
| 2   | A     | 614 | A    |
| 2   | A     | 615 | U    |
| 2   | A     | 616 | A    |
| 2   | A     | 621 | A    |
| 2   | A     | 627 | A    |
| 2   | A     | 637 | A    |
| 2   | A     | 645 | C    |
| 2   | A     | 646 | U    |
| 2   | A     | 647 | G    |
| 2   | A     | 654 | A    |
| 2   | A     | 655 | A    |
| 2   | A     | 686 | U    |
| 2   | A     | 704 | G    |
| 2   | A     | 717 | C    |
| 2   | A     | 726 | G    |
| 2   | A     | 729 | G    |
| 2   | A     | 730 | A    |
| 2   | A     | 739 | A    |
| 2   | A     | 747 | U    |
| 2   | A     | 764 | A    |
| 2   | A     | 765 | C    |
| 2   | A     | 782 | A    |
| 2   | A     | 784 | G    |
| 2   | A     | 785 | G    |
| 2   | A     | 789 | A    |
| 2   | A     | 790 | U    |
| 2   | A     | 805 | G    |
| 2   | A     | 812 | C    |
| 2   | A     | 827 | U    |
| 2   | A     | 828 | U    |
| 2   | A     | 846 | U    |
| 2   | A     | 858 | G    |
| 2   | A     | 877 | A    |
| 2   | A     | 878 | A    |
| 2   | A     | 896 | A    |
| 2   | A     | 897 | C    |
| 2   | A     | 901 | C    |
| 2   | A     | 902 | C    |
| 2   | A     | 910 | A    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 2   | A     | 914  | G    |
| 2   | A     | 931  | U    |
| 2   | A     | 946  | C    |
| 2   | A     | 961  | C    |
| 2   | A     | 974  | G    |
| 2   | A     | 983  | A    |
| 2   | A     | 996  | A    |
| 2   | A     | 1009 | A    |
| 2   | A     | 1012 | U    |
| 2   | A     | 1013 | C    |
| 2   | A     | 1026 | G    |
| 2   | A     | 1033 | U    |
| 2   | A     | 1046 | A    |
| 2   | A     | 1047 | G    |
| 2   | A     | 1070 | A    |
| 2   | A     | 1071 | G    |
| 2   | A     | 1083 | U    |
| 2   | A     | 1088 | A    |
| 2   | A     | 1112 | G    |
| 2   | A     | 1119 | U    |
| 2   | A     | 1132 | U    |
| 2   | A     | 1133 | A    |
| 2   | A     | 1135 | C    |
| 2   | A     | 1142 | A    |
| 2   | A     | 1143 | A    |
| 2   | A     | 1157 | G    |
| 2   | A     | 1167 | C    |
| 2   | A     | 1173 | U    |
| 2   | A     | 1204 | A    |
| 2   | A     | 1206 | G    |
| 2   | A     | 1211 | C    |
| 2   | A     | 1212 | G    |
| 2   | A     | 1236 | G    |
| 2   | A     | 1238 | G    |
| 2   | A     | 1250 | G    |
| 2   | A     | 1253 | A    |
| 2   | A     | 1256 | G    |
| 2   | A     | 1271 | G    |
| 2   | A     | 1272 | A    |
| 2   | A     | 1276 | A    |
| 2   | A     | 1300 | G    |
| 2   | A     | 1301 | A    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 2   | A     | 1321 | A    |
| 2   | A     | 1325 | U    |
| 2   | A     | 1329 | U    |
| 2   | A     | 1352 | U    |
| 2   | A     | 1359 | A    |
| 2   | A     | 1365 | A    |
| 2   | A     | 1378 | A    |
| 2   | A     | 1379 | U    |
| 2   | A     | 1383 | A    |
| 2   | A     | 1395 | A    |
| 2   | A     | 1416 | G    |
| 2   | A     | 1417 | C    |
| 2   | A     | 1420 | A    |
| 2   | A     | 1421 | G    |
| 2   | A     | 1427 | A    |
| 2   | A     | 1428 | C    |
| 2   | A     | 1435 | G    |
| 2   | A     | 1437 | C    |
| 2   | A     | 1452 | G    |
| 2   | A     | 1453 | A    |
| 2   | A     | 1455 | G    |
| 2   | A     | 1482 | G    |
| 2   | A     | 1485 | U    |
| 2   | A     | 1487 | U    |
| 2   | A     | 1488 | C    |
| 2   | A     | 1491 | G    |
| 2   | A     | 1494 | A    |
| 2   | A     | 1497 | U    |
| 2   | A     | 1504 | A    |
| 2   | A     | 1507 | C    |
| 2   | A     | 1508 | A    |
| 2   | A     | 1509 | A    |
| 2   | A     | 1515 | A    |
| 2   | A     | 1522 | A    |
| 2   | A     | 1524 | G    |
| 2   | A     | 1569 | A    |
| 2   | A     | 1584 | U    |
| 2   | A     | 1585 | C    |
| 2   | A     | 1594 | U    |
| 2   | A     | 1607 | C    |
| 2   | A     | 1608 | A    |
| 2   | A     | 1626 | A    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 2   | A     | 1634 | A    |
| 2   | A     | 1646 | C    |
| 2   | A     | 1647 | U    |
| 2   | A     | 1648 | U    |
| 2   | A     | 1674 | G    |
| 2   | A     | 1715 | G    |
| 2   | A     | 1729 | U    |
| 2   | A     | 1730 | C    |
| 2   | A     | 1737 | G    |
| 2   | A     | 1738 | G    |
| 2   | A     | 1756 | G    |
| 2   | A     | 1758 | U    |
| 2   | A     | 1764 | C    |
| 2   | A     | 1773 | A    |
| 2   | A     | 1784 | A    |
| 2   | A     | 1800 | C    |
| 2   | A     | 1801 | A    |
| 2   | A     | 1808 | A    |
| 2   | A     | 1816 | C    |
| 2   | A     | 1829 | A    |
| 2   | A     | 1847 | A    |
| 2   | A     | 1866 | A    |
| 2   | A     | 1870 | C    |
| 2   | A     | 1906 | G    |
| 2   | A     | 1913 | A    |
| 2   | A     | 1914 | C    |
| 2   | A     | 1916 | A    |
| 2   | A     | 1929 | G    |
| 2   | A     | 1936 | A    |
| 2   | A     | 1937 | A    |
| 2   | A     | 1938 | A    |
| 2   | A     | 1955 | U    |
| 2   | A     | 1965 | C    |
| 2   | A     | 1967 | C    |
| 2   | A     | 1970 | A    |
| 2   | A     | 1971 | U    |
| 2   | A     | 1972 | G    |
| 2   | A     | 1991 | U    |
| 2   | A     | 1992 | G    |
| 2   | A     | 1993 | U    |
| 2   | A     | 1997 | C    |
| 2   | A     | 2021 | C    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 2   | A     | 2023 | C    |
| 2   | A     | 2030 | A    |
| 2   | A     | 2031 | A    |
| 2   | A     | 2033 | A    |
| 2   | A     | 2036 | C    |
| 2   | A     | 2043 | C    |
| 2   | A     | 2055 | C    |
| 2   | A     | 2056 | G    |
| 2   | A     | 2060 | A    |
| 2   | A     | 2061 | G    |
| 2   | A     | 2069 | G    |
| 2   | A     | 2077 | A    |
| 2   | A     | 2092 | U    |
| 2   | A     | 2093 | G    |
| 2   | A     | 2097 | A    |
| 2   | A     | 2198 | A    |
| 2   | A     | 2199 | A    |
| 2   | A     | 2204 | G    |
| 2   | A     | 2211 | A    |
| 2   | A     | 2212 | A    |
| 2   | A     | 2225 | A    |
| 2   | A     | 2238 | G    |
| 2   | A     | 2239 | G    |
| 2   | A     | 2279 | G    |
| 2   | A     | 2283 | C    |
| 2   | A     | 2287 | A    |
| 2   | A     | 2297 | A    |
| 2   | A     | 2305 | U    |
| 2   | A     | 2308 | G    |
| 2   | A     | 2322 | A    |
| 2   | A     | 2323 | G    |
| 2   | A     | 2325 | G    |
| 2   | A     | 2333 | A    |
| 2   | A     | 2347 | C    |
| 2   | A     | 2350 | C    |
| 2   | A     | 2383 | G    |
| 2   | A     | 2385 | C    |
| 2   | A     | 2396 | G    |
| 2   | A     | 2402 | U    |
| 2   | A     | 2406 | A    |
| 2   | A     | 2425 | A    |
| 2   | A     | 2428 | G    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 2   | A     | 2429 | G    |
| 2   | A     | 2430 | A    |
| 2   | A     | 2431 | U    |
| 2   | A     | 2435 | A    |
| 2   | A     | 2441 | U    |
| 2   | A     | 2447 | G    |
| 2   | A     | 2448 | A    |
| 2   | A     | 2473 | U    |
| 2   | A     | 2475 | C    |
| 2   | A     | 2476 | A    |
| 2   | A     | 2484 | G    |
| 2   | A     | 2491 | U    |
| 2   | A     | 2502 | G    |
| 2   | A     | 2505 | G    |
| 2   | A     | 2518 | A    |
| 2   | A     | 2529 | G    |
| 2   | A     | 2549 | G    |
| 2   | A     | 2566 | A    |
| 2   | A     | 2567 | G    |
| 2   | A     | 2572 | A    |
| 2   | A     | 2578 | G    |
| 2   | A     | 2586 | U    |
| 2   | A     | 2609 | U    |
| 2   | A     | 2613 | U    |
| 2   | A     | 2615 | U    |
| 2   | A     | 2629 | U    |
| 2   | A     | 2630 | G    |
| 2   | A     | 2639 | A    |
| 2   | A     | 2646 | C    |
| 2   | A     | 2689 | U    |
| 2   | A     | 2690 | U    |
| 2   | A     | 2714 | G    |
| 2   | A     | 2718 | G    |
| 2   | A     | 2726 | A    |
| 2   | A     | 2729 | G    |
| 2   | A     | 2733 | A    |
| 2   | A     | 2744 | G    |
| 2   | A     | 2748 | A    |
| 2   | A     | 2757 | A    |
| 2   | A     | 2778 | A    |
| 2   | A     | 2791 | G    |
| 2   | A     | 2792 | A    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 2   | A     | 2798 | U    |
| 2   | A     | 2820 | A    |
| 2   | A     | 2835 | A    |
| 2   | A     | 2843 | G    |
| 2   | A     | 2849 | U    |
| 2   | A     | 2850 | A    |
| 2   | A     | 2867 | G    |
| 2   | A     | 2873 | A    |
| 2   | A     | 2880 | C    |
| 2   | A     | 2883 | A    |
| 2   | A     | 2884 | U    |
| 3   | B     | 13   | G    |
| 3   | B     | 15   | A    |
| 3   | B     | 24   | G    |
| 3   | B     | 35   | C    |
| 3   | B     | 41   | G    |
| 3   | B     | 56   | G    |
| 3   | B     | 89   | U    |
| 3   | B     | 90   | C    |
| 3   | B     | 109  | A    |

All (8) RNA pucker outliers are listed below:

| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 2   | A     | 62   | U    |
| 2   | A     | 784  | G    |
| 2   | A     | 1275 | A    |
| 2   | A     | 1358 | G    |
| 2   | A     | 1757 | A    |
| 2   | A     | 2211 | A    |
| 2   | A     | 2474 | U    |
| 2   | A     | 2756 | U    |

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

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

## 5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

## 5.6 Ligand geometry

Of 386 ligands modelled in this entry, 383 are monoatomic - leaving 3 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 |
| 35  | JJH  | A     | 3370 | -    | 46,47,47     | 1.93 | 10 (21%) | 62,71,71    | 2.83 | 17 (27%) |
| 34  | AMP  | A     | 3001 | -    | 18,24,25     | 0.64 | 0        | 18,35,38    | 0.77 | 1 (5%)   |
| 32  | FME  | 1     | 101  | 1    | 8,9,10       | 0.93 | 0        | 7,9,11      | 0.99 | 1 (14%)  |

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

| Mol | Type | Chain | Res  | Link | Chirals | Torsions   | Rings   |
|-----|------|-------|------|------|---------|------------|---------|
| 35  | JJH  | A     | 3370 | -    | -       | 9/24/50/50 | 0/6/6/6 |
| 34  | AMP  | A     | 3001 | -    | -       | 0/3/25/26  | 0/3/3/3 |
| 32  | FME  | 1     | 101  | 1    | -       | 2/7/9/11   | -       |

All (10) bond length outliers are listed below:

| Mol | Chain | Res  | Type | Atoms   | Z     | Observed(Å) | Ideal(Å) |
|-----|-------|------|------|---------|-------|-------------|----------|
| 35  | A     | 3370 | JJH  | CBB-CBF | -5.10 | 1.40        | 1.48     |
| 35  | A     | 3370 | JJH  | CBJ-NAM | -4.73 | 1.33        | 1.43     |
| 35  | A     | 3370 | JJH  | CBA-CBD | -4.58 | 1.39        | 1.48     |
| 35  | A     | 3370 | JJH  | CAT-NAK | -4.18 | 1.35        | 1.40     |
| 35  | A     | 3370 | JJH  | CAX-NAK | 3.76  | 1.40        | 1.34     |
| 35  | A     | 3370 | JJH  | CAW-NAL | -3.06 | 1.34        | 1.41     |
| 35  | A     | 3370 | JJH  | CBK-CBL | -2.65 | 1.48        | 1.52     |
| 35  | A     | 3370 | JJH  | CAP-CAN | 2.30  | 1.53        | 1.48     |
| 35  | A     | 3370 | JJH  | FAB-CBH | -2.10 | 1.30        | 1.35     |
| 35  | A     | 3370 | JJH  | CBB-CBD | -2.03 | 1.39        | 1.44     |

All (19) bond angle outliers are listed below:

| Mol | Chain | Res  | Type | Atoms       | Z      | Observed(°) | Ideal(°) |
|-----|-------|------|------|-------------|--------|-------------|----------|
| 35  | A     | 3370 | JJH  | CBL-OAH-CBO | -11.65 | 100.96      | 110.15   |
| 35  | A     | 3370 | JJH  | CBK-NAM-CBO | -10.77 | 105.05      | 111.28   |
| 35  | A     | 3370 | JJH  | OAJ-CBO-NAM | -6.81  | 123.50      | 128.91   |
| 35  | A     | 3370 | JJH  | OAH-CBL-CBK | -5.27  | 99.26       | 104.57   |
| 35  | A     | 3370 | JJH  | CBE-CBC-CAW | -4.23  | 119.84      | 123.34   |
| 35  | A     | 3370 | JJH  | CAY-OAD-CBG | -3.96  | 108.01      | 117.67   |
| 35  | A     | 3370 | JJH  | CBL-CBK-NAM | -3.71  | 98.08       | 101.81   |
| 35  | A     | 3370 | JJH  | CAZ-CAW-CBC | 3.40   | 119.79      | 116.48   |
| 35  | A     | 3370 | JJH  | CBK-NAM-CBJ | 3.21   | 126.88      | 121.45   |
| 35  | A     | 3370 | JJH  | CAV-NAL-CAU | 3.17   | 118.51      | 111.52   |
| 35  | A     | 3370 | JJH  | OAH-CBO-OAJ | 2.87   | 125.55      | 122.37   |
| 35  | A     | 3370 | JJH  | CBB-CAX-NAK | -2.85  | 121.30      | 124.49   |
| 35  | A     | 3370 | JJH  | CBA-CBD-CBB | 2.77   | 119.11      | 115.59   |
| 35  | A     | 3370 | JJH  | CAV-NAL-CAW | 2.54   | 122.29      | 116.27   |
| 35  | A     | 3370 | JJH  | FAA-CBC-CAW | 2.31   | 120.52      | 118.42   |
| 35  | A     | 3370 | JJH  | CAZ-CAW-NAL | -2.22  | 119.24      | 122.52   |
| 34  | A     | 3001 | AMP  | C5-C6-N6    | 2.21   | 123.71      | 120.35   |
| 35  | A     | 3370 | JJH  | CBM-CBH-CBG | -2.05  | 119.80      | 122.81   |
| 32  | 1     | 101  | FME  | C-CA-N      | 2.05   | 113.44      | 109.73   |

There are no chirality outliers.

All (11) torsion outliers are listed below:

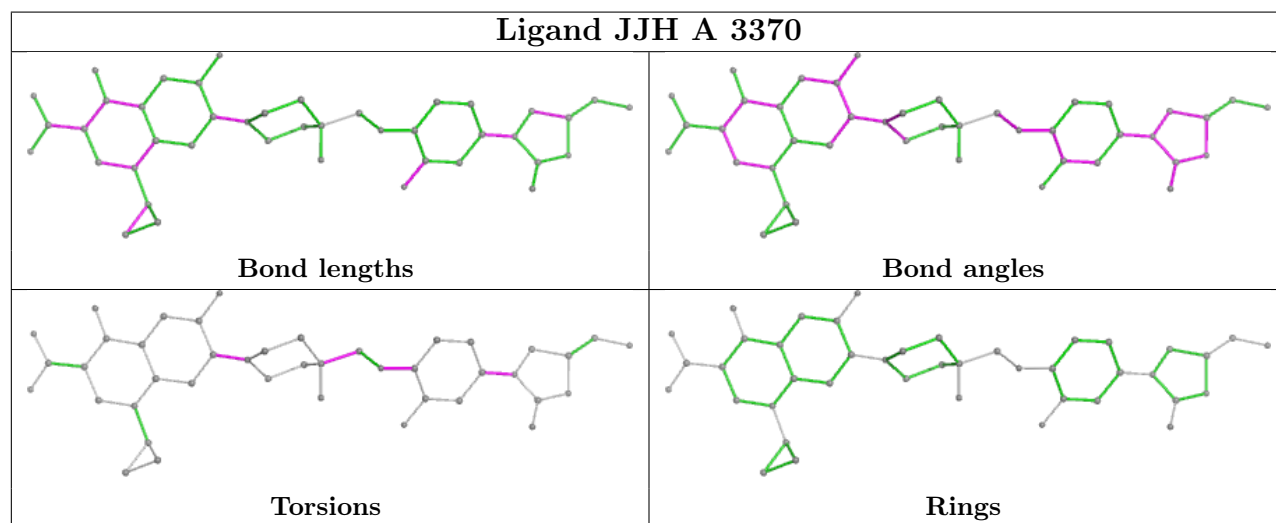
| Mol | Chain | Res  | Type | Atoms           |
|-----|-------|------|------|-----------------|
| 32  | 1     | 101  | FME  | O1-CN-N-CA      |
| 32  | 1     | 101  | FME  | CB-CA-N-CN      |
| 35  | A     | 3370 | JJH  | CAR-CAQ-CAY-OAD |
| 35  | A     | 3370 | JJH  | CAS-CAQ-CAY-OAD |
| 35  | A     | 3370 | JJH  | OAC-CAQ-CAY-OAD |
| 35  | A     | 3370 | JJH  | CBH-CBG-OAD-CAY |
| 35  | A     | 3370 | JJH  | CBC-CAW-NAL-CAU |
| 35  | A     | 3370 | JJH  | CBM-CBJ-NAM-CBO |
| 35  | A     | 3370 | JJH  | CBN-CBJ-NAM-CBO |
| 35  | A     | 3370 | JJH  | CBI-CBG-OAD-CAY |
| 35  | A     | 3370 | JJH  | CAZ-CAW-NAL-CAU |

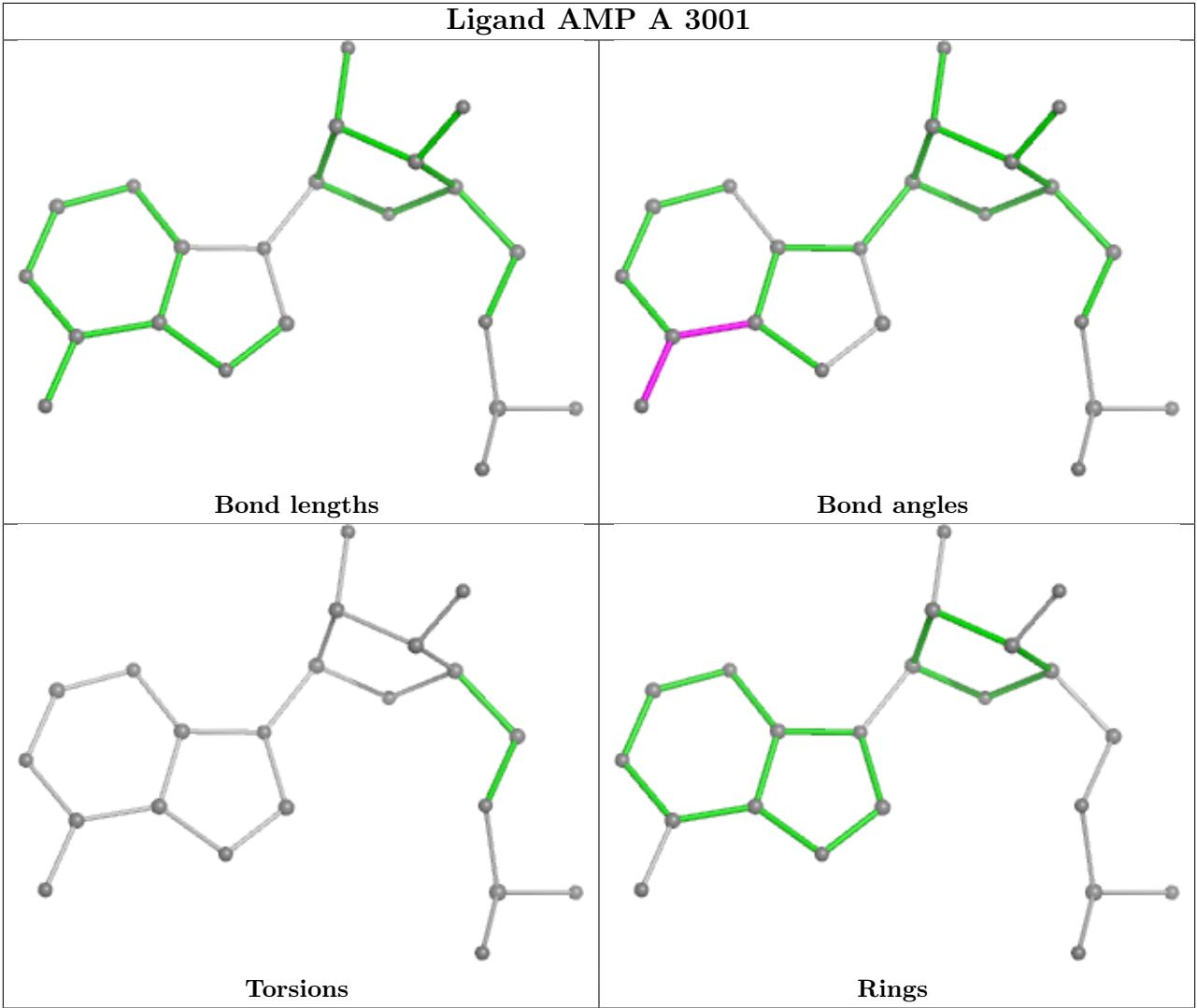
There are no ring outliers.

1 monomer is involved in 1 short contact:

| Mol | Chain | Res  | Type | Clashes | Symm-Clashes |
|-----|-------|------|------|---------|--------------|
| 34  | A     | 3001 | AMP  | 1       | 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 ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

The following chains have linkage breaks:

| Mol | Chain | Number of breaks |
|-----|-------|------------------|
| 2   | A     | 5                |

All chain breaks are listed below:

| Model | Chain | Residue-1 | Atom-1 | Residue-2 | Atom-2 | Distance (Å) |
|-------|-------|-----------|--------|-----------|--------|--------------|
| 1     | A     | 1531:C    | O3'    | 1540:G    | P      | 18.12        |

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| Model | Chain | Residue-1 | Atom-1 | Residue-2 | Atom-2 | Distance (Å) |
|-------|-------|-----------|--------|-----------|--------|--------------|
| 1     | A     | 883:G     | O3'    | 893:C     | P      | 17.33        |
| 1     | A     | 2101:A    | O3'    | 2188:U    | P      | 16.18        |
| 1     | A     | 545:U     | O3'    | 548:G     | P      | 15.10        |
| 1     | A     | 1173:U    | O3'    | 1177:G    | P      | 12.82        |

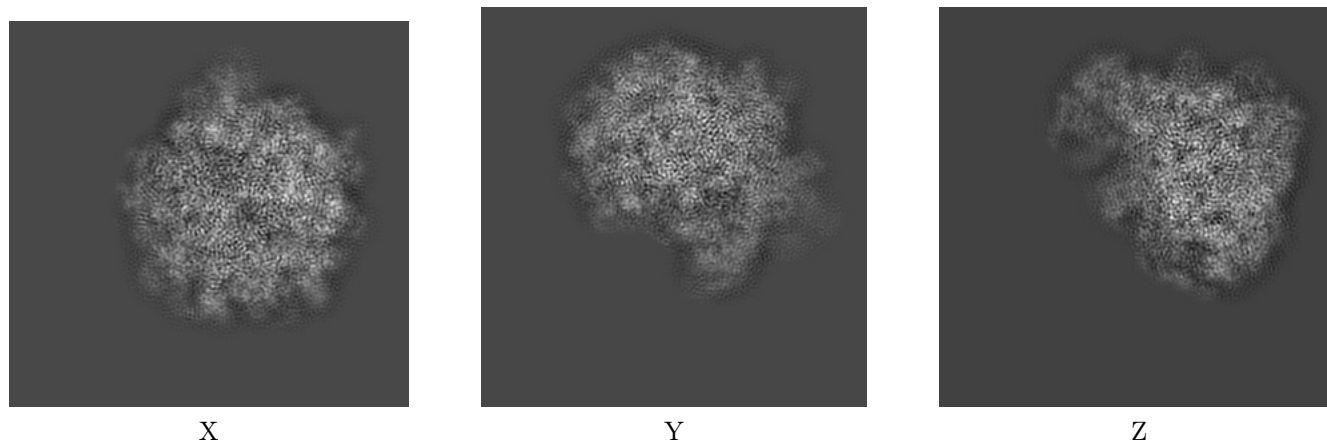
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-4638. These allow visual inspection of the internal detail of the map and identification of artifacts.

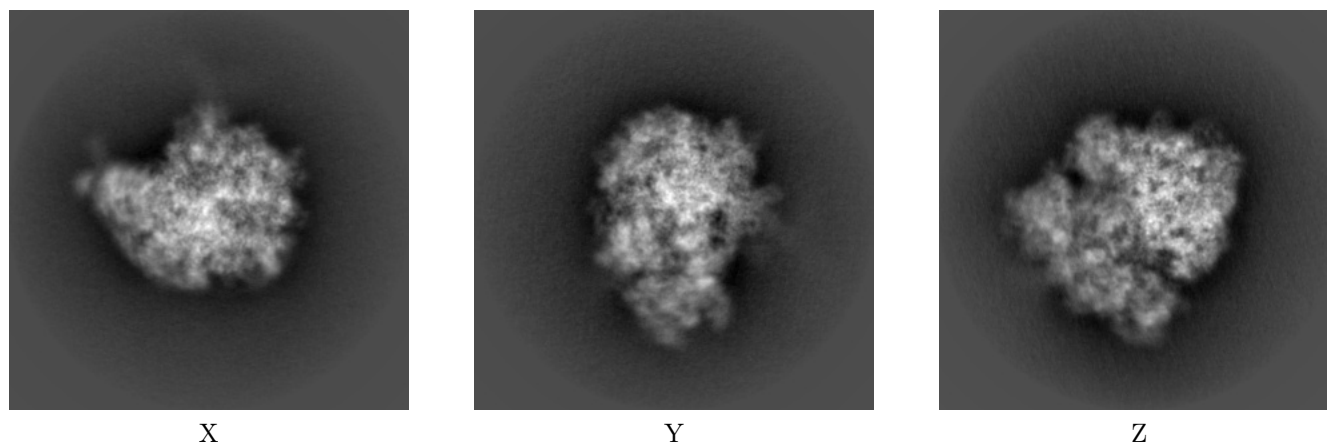
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

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

#### 6.1.1 Primary map



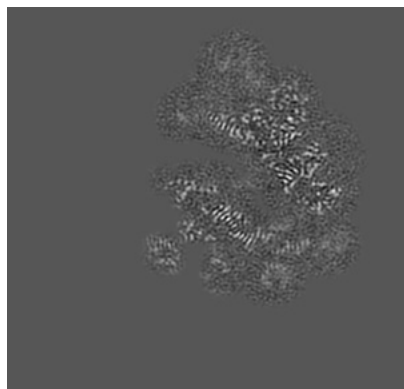
#### 6.1.2 Raw map



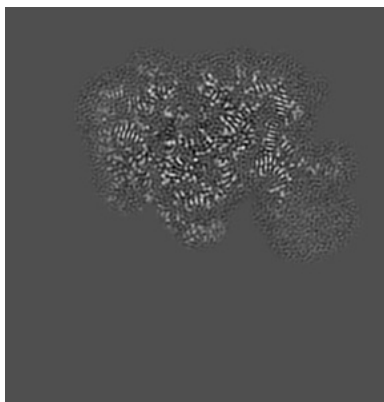
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices [i](#)

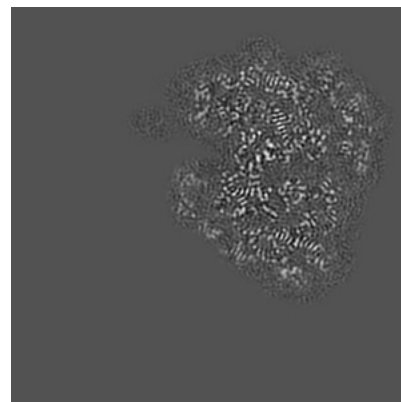
### 6.2.1 Primary map



X Index: 145

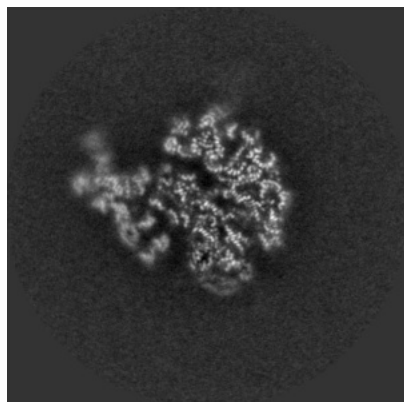


Y Index: 145

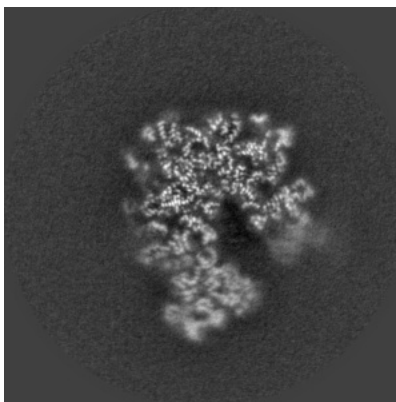


Z Index: 140

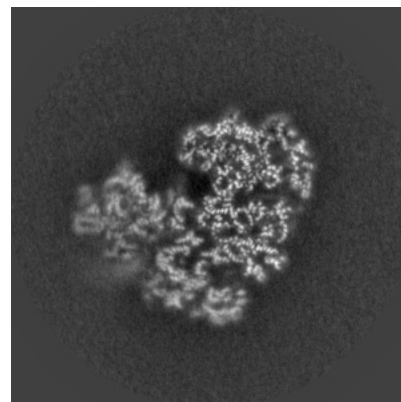
### 6.2.2 Raw map



X Index: 200



Y Index: 200

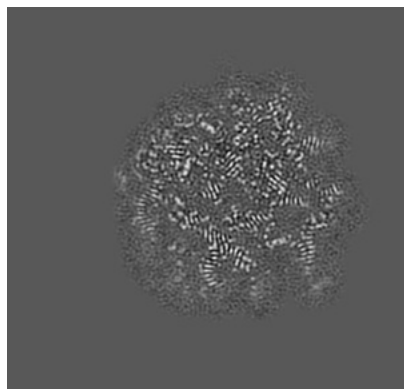


Z Index: 200

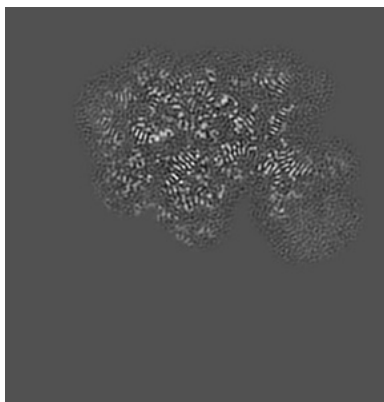
The images above show central slices of the map in three orthogonal directions.

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

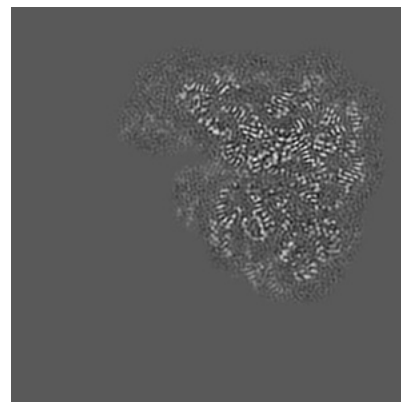
### 6.3.1 Primary map



X Index: 196

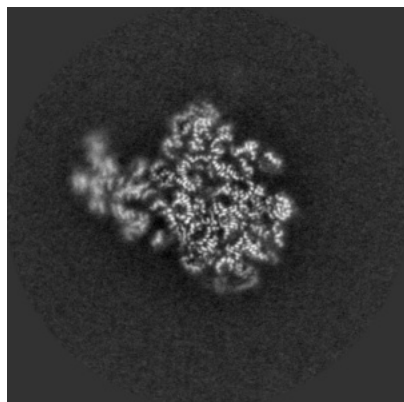


Y Index: 150

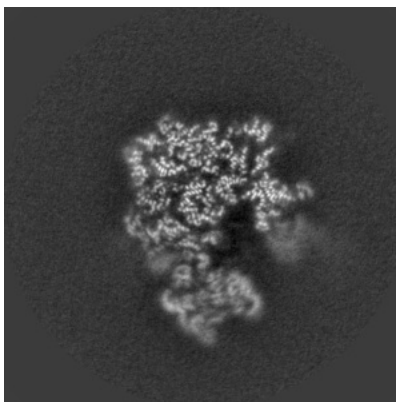


Z Index: 153

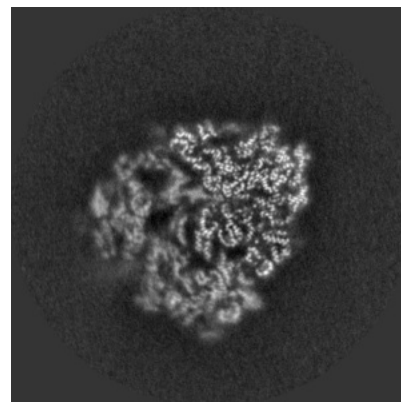
### 6.3.2 Raw map



X Index: 208



Y Index: 190

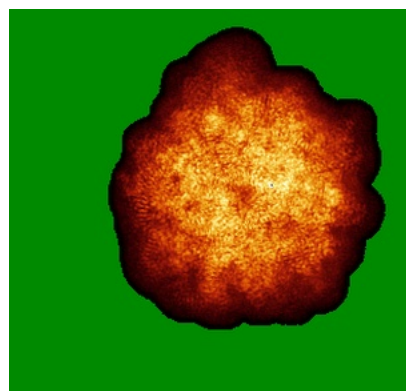


Z Index: 213

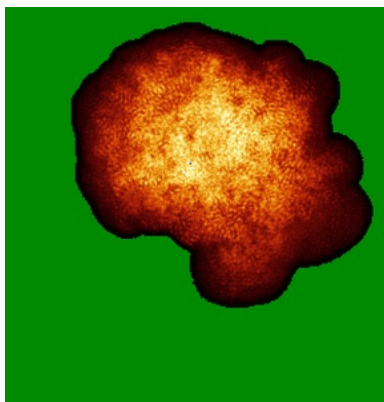
The images above show the largest variance slices of the map in three orthogonal directions.

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

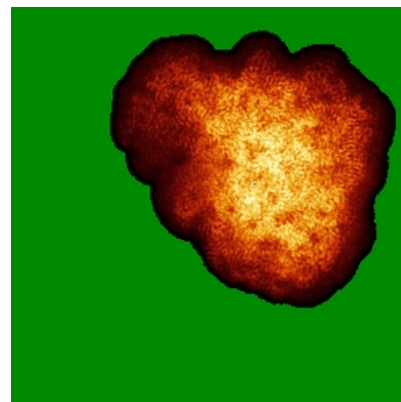
### 6.4.1 Primary map



X

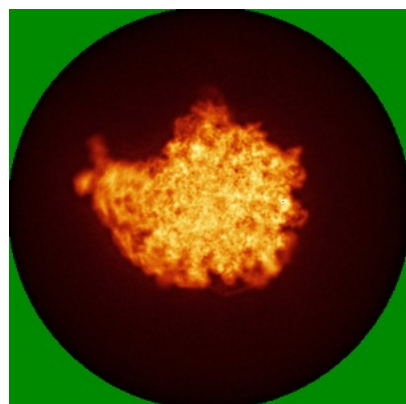


Y

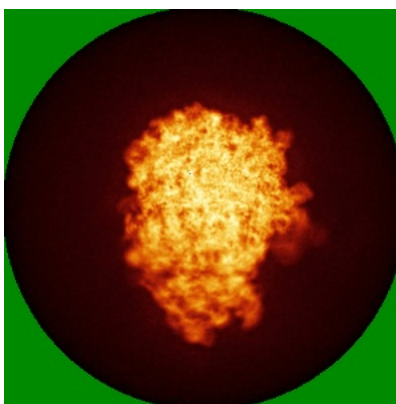


Z

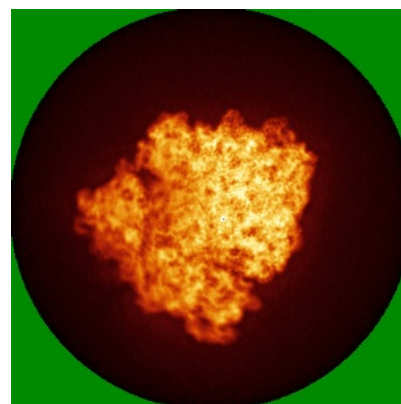
### 6.4.2 Raw map



X



Y

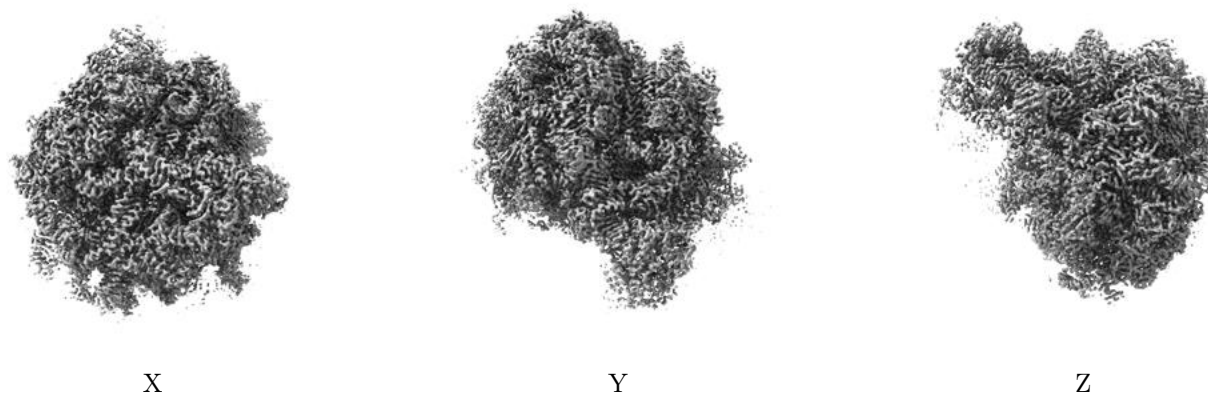


Z

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

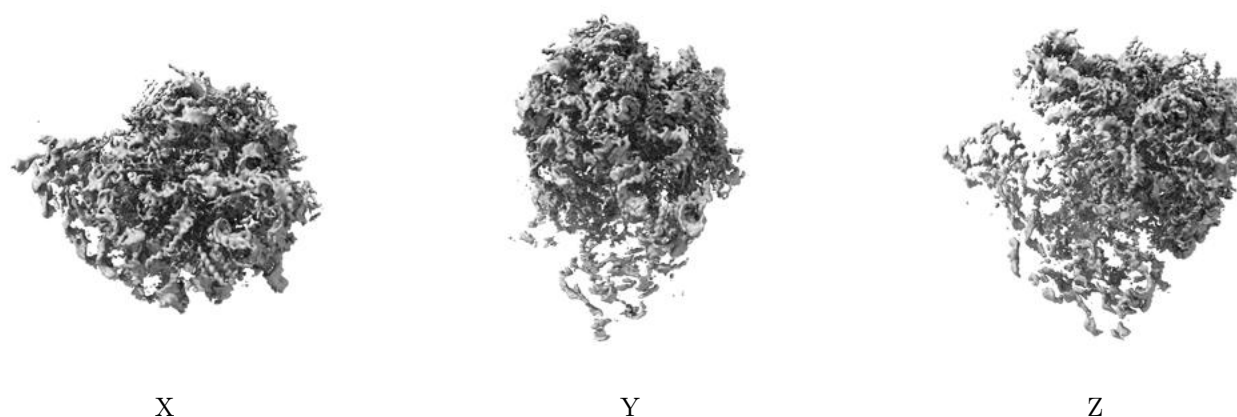
## 6.5 Orthogonal surface views [i](#)

### 6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.1. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

### 6.5.2 Raw map



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

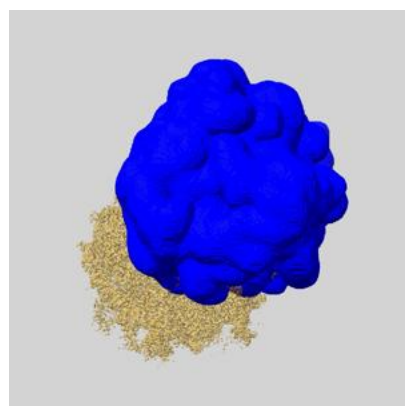
## 6.6 Mask visualisation [i](#)

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

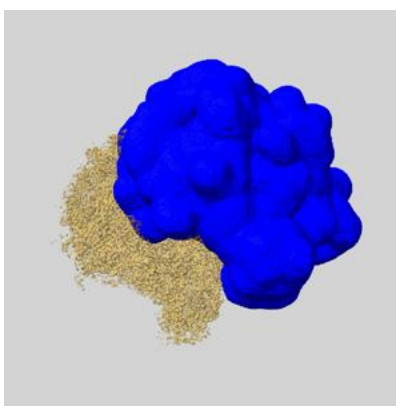
A mask typically either:

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

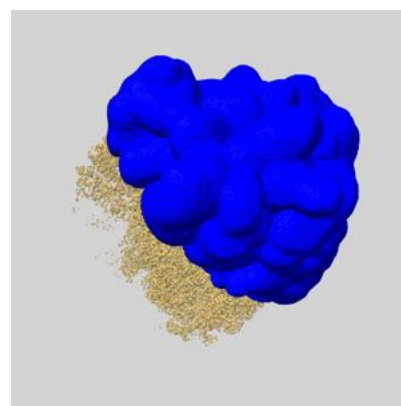
### 6.6.1 emd\_4638\_msk\_1.map [i](#)



X



Y

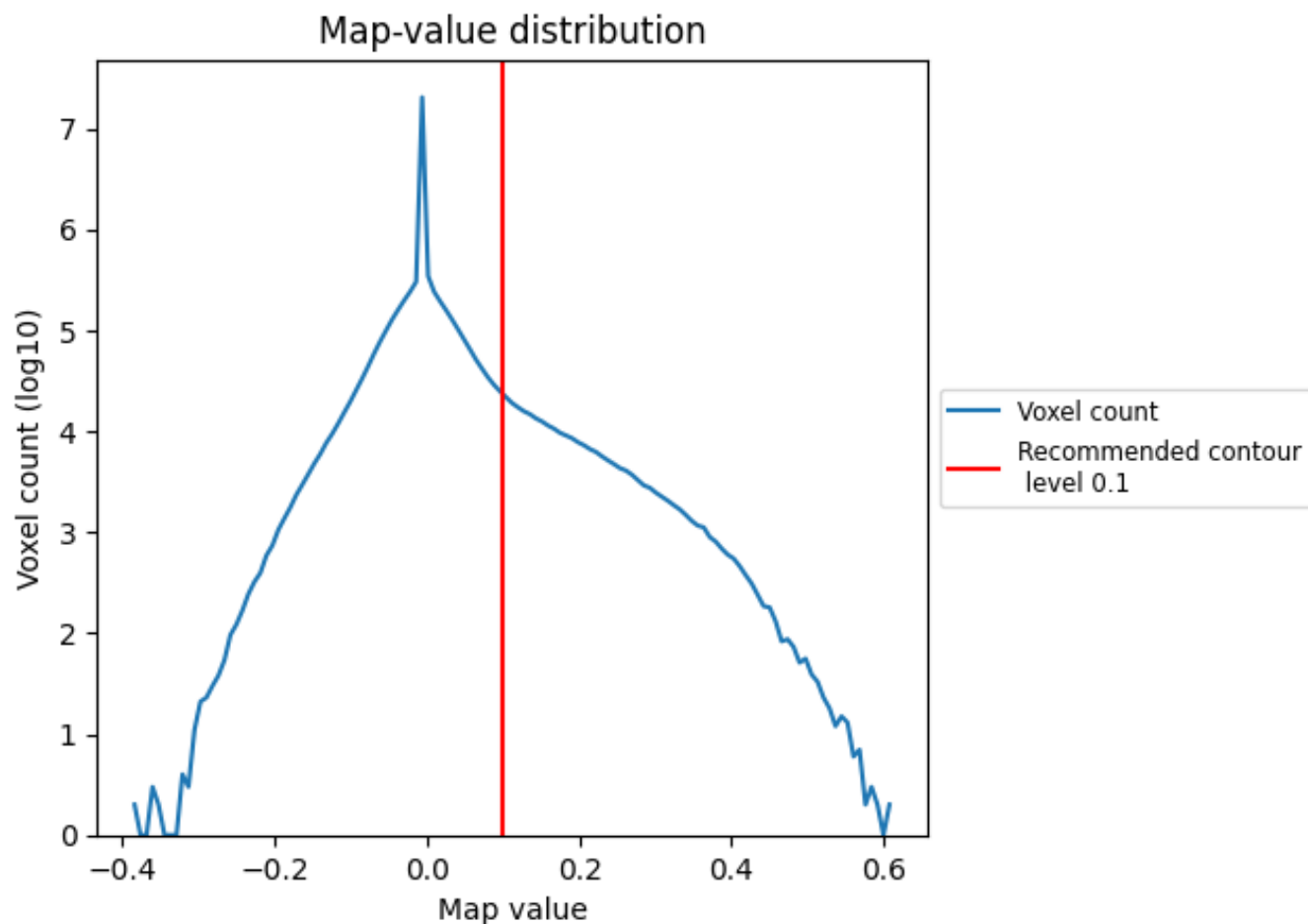


Z

## 7 Map analysis [i](#)

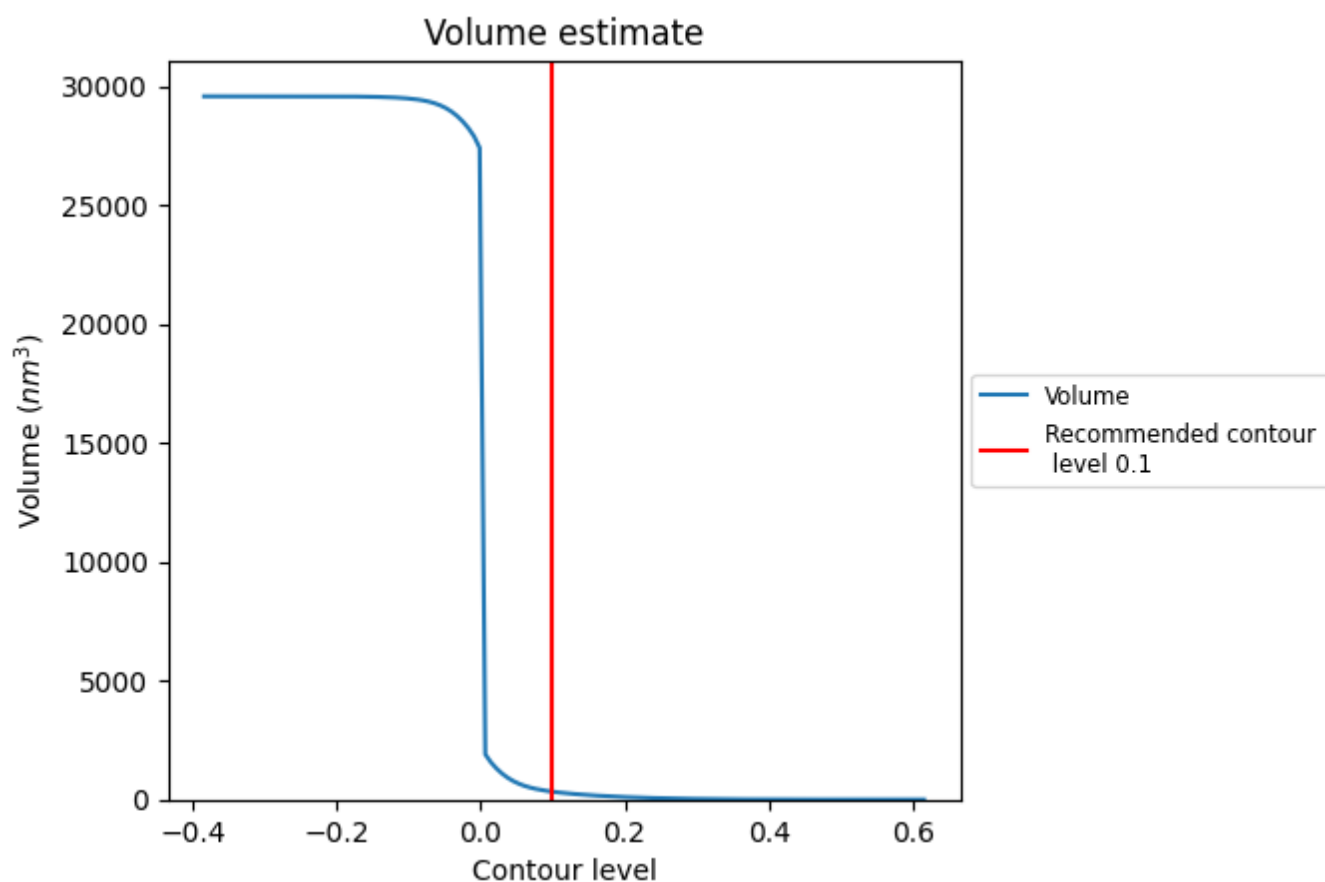
This section contains the results of statistical analysis of the map.

### 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 329 nm<sup>3</sup>; this corresponds to an approximate mass of 297 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.

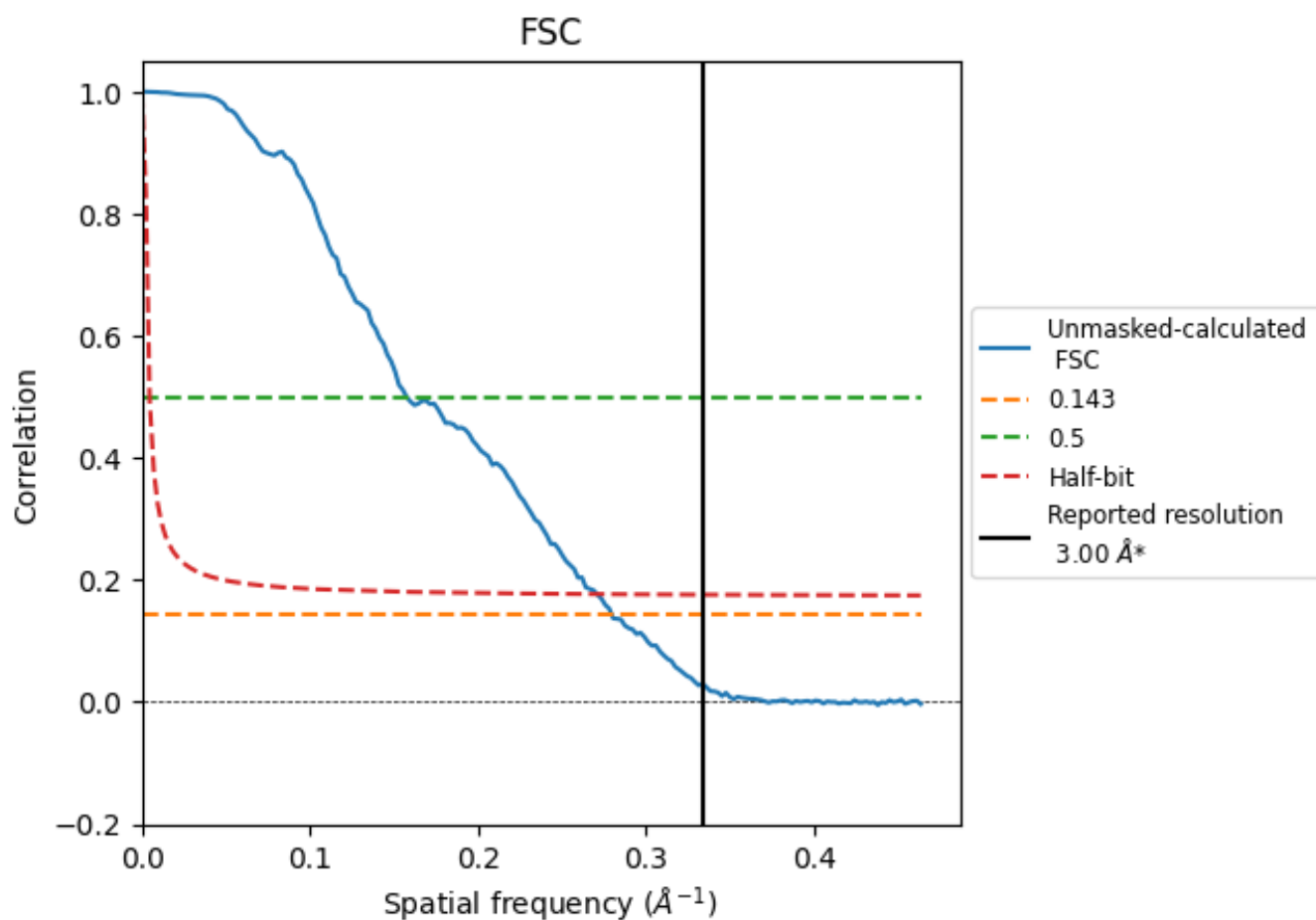
## 7.3 Rotationally averaged power spectrum [i](#)

This section was not generated. The rotationally averaged power spectrum is only generated for cubic maps.

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

## 8.2 Resolution estimates [i](#)

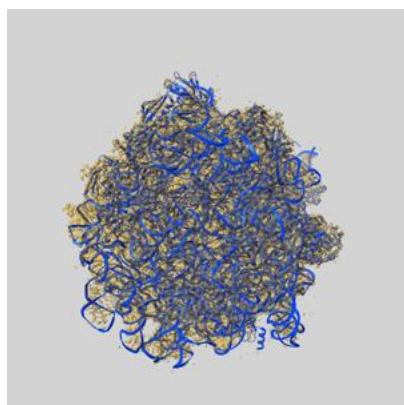
| Resolution estimate (Å)   | Estimation criterion (FSC cut-off) |      |          |
|---------------------------|------------------------------------|------|----------|
|                           | 0.143                              | 0.5  | Half-bit |
| Reported by author        | 3.00                               | -    | -        |
| Author-provided FSC curve | -                                  | -    | -        |
| Unmasked-calculated*      | 3.58                               | 6.35 | 3.69     |

\*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 3.58 differs from the reported value 3.0 by more than 10 %

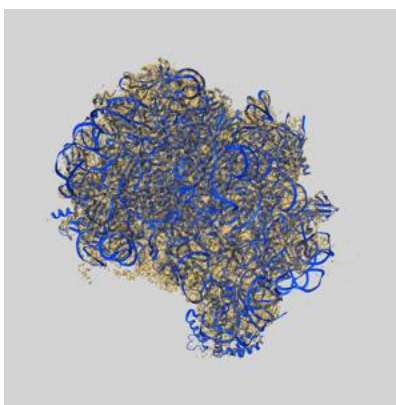
## 9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-4638 and PDB model 6QUL. Per-residue inclusion information can be found in section 3 on page 12.

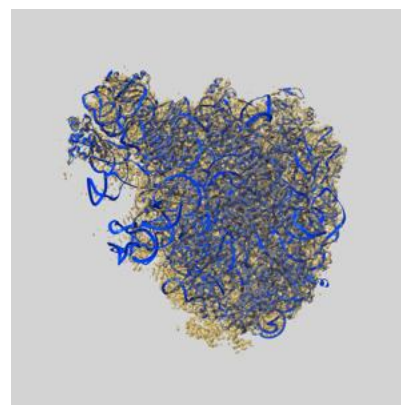
### 9.1 Map-model overlay [i](#)



X



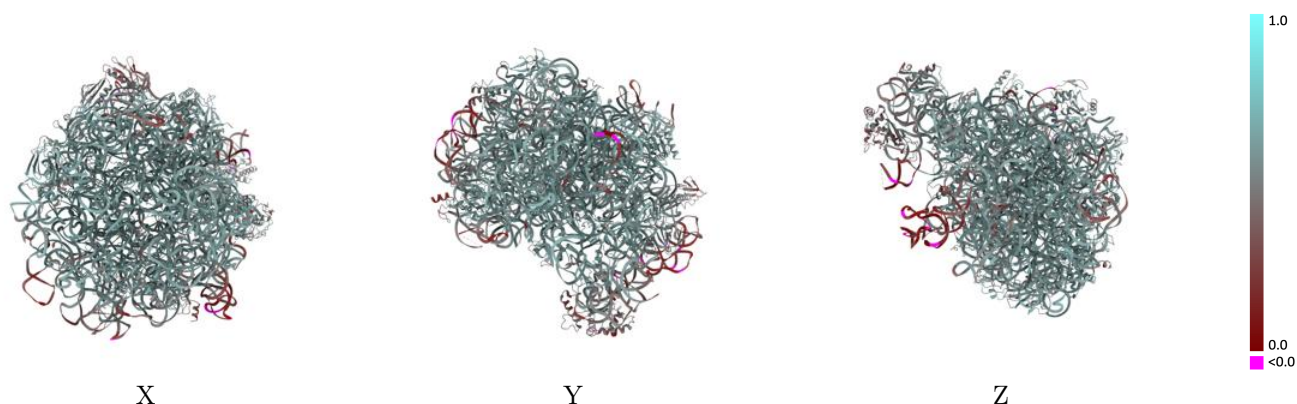
Y



Z

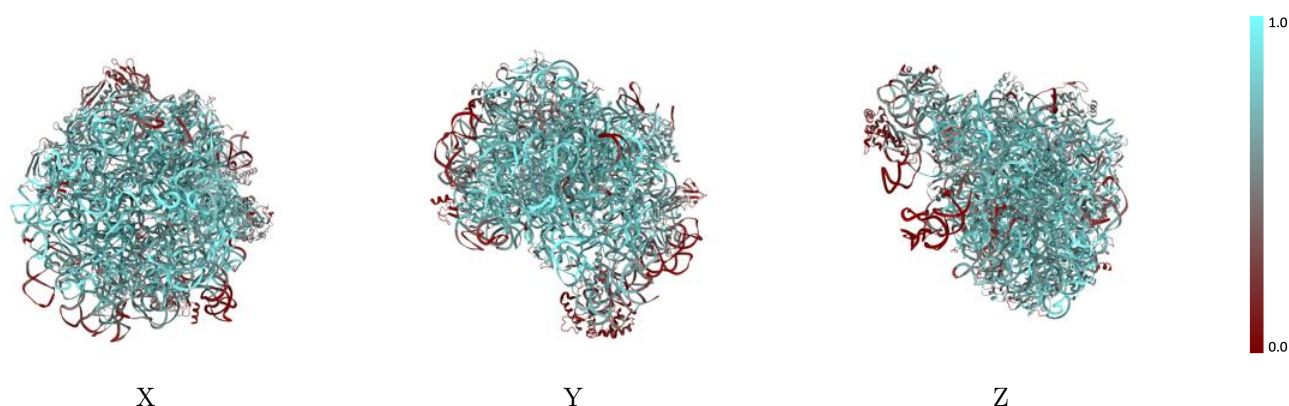
The images above show the 3D surface view of the map at the recommended contour level 0.1 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



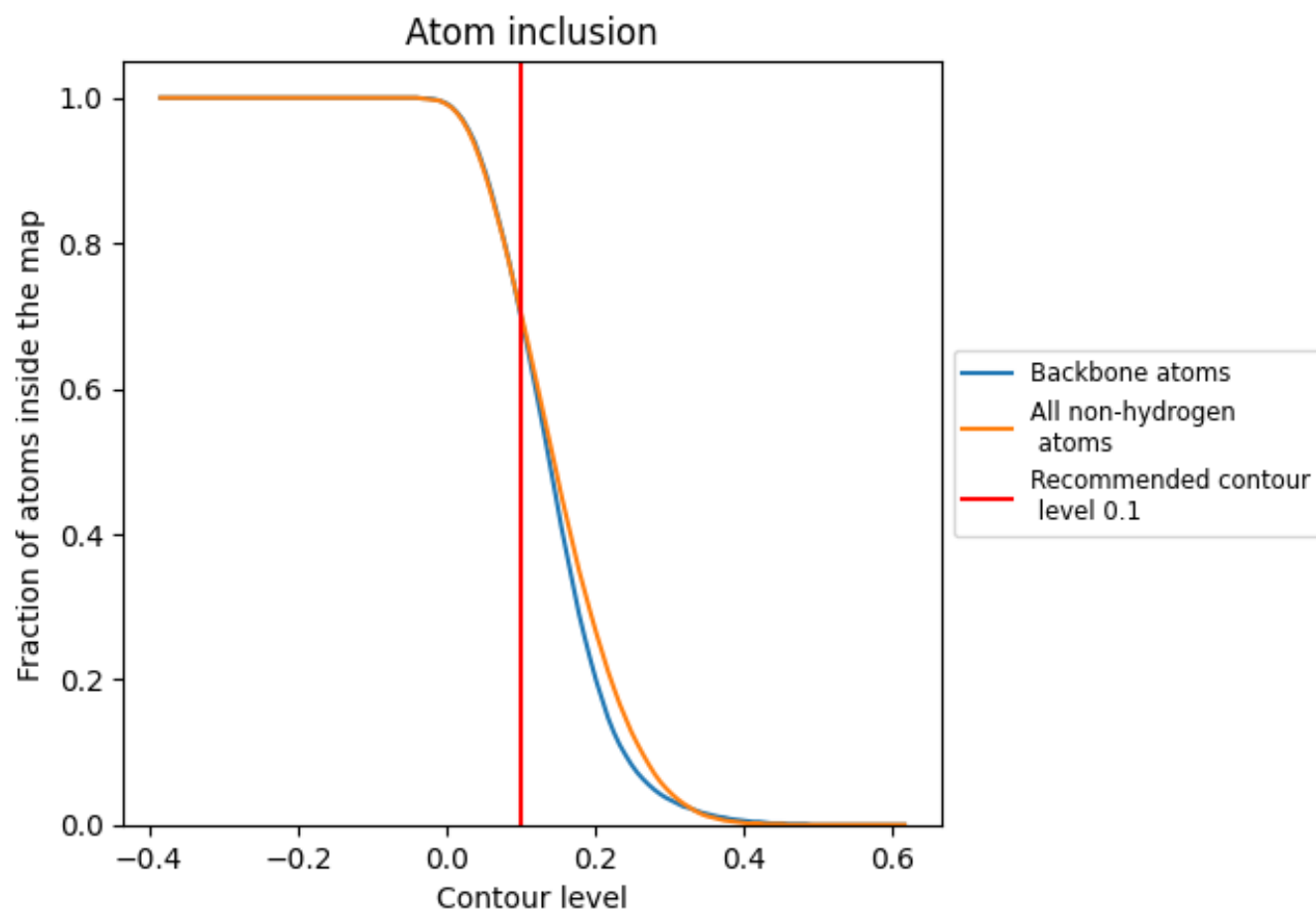
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.1).

## 9.4 Atom inclusion [i](#)



At the recommended contour level, 70% of all backbone atoms, 70% 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 (0.1) and Q-score for the entire model and for each chain.

| Chain | Atom inclusion                                                                             | Q-score                                                                                    |
|-------|--------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| All   |  0.7050   |  0.5560   |
| 1     |  0.3900   |  0.4680   |
| A     |  0.7570   |  0.5590   |
| B     |  0.6120   |  0.5120   |
| C     |  0.7030   |  0.5940   |
| D     |  0.6840   |  0.5880   |
| E     |  0.5980   |  0.5610   |
| F     |  0.1780   |  0.4100   |
| G     |  0.3240   |  0.4600   |
| H     |  0.2240   |  0.4210   |
| K     |  0.7030   |  0.5900   |
| L     |  0.6440   |  0.5840   |
| M     |  0.6620   |  0.5720   |
| N     |  0.6600   |  0.5830   |
| O     |  0.7020  |  0.5810  |
| P     |  0.5070 |  0.5260 |
| Q     |  0.6080 |  0.5710 |
| R     |  0.7380 |  0.5940 |
| S     |  0.6490 |  0.5750 |
| T     |  0.6570 |  0.5800 |
| U     |  0.5650 |  0.5500 |
| V     |  0.5350 |  0.5300 |
| W     |  0.5480 |  0.5390 |
| X     |  0.6980 |  0.5910 |
| Y     |  0.6230 |  0.5760 |
| Z     |  0.5080 |  0.5210 |
| a     |  0.6650 |  0.5750 |
| b     |  0.6450 |  0.5610 |
| c     |  0.5860 |  0.5550 |
| d     |  0.7510 |  0.6080 |
| e     |  0.7310 |  0.5940 |
| f     |  0.6030 |  0.5590 |

